Undergraduate Public Health Majors: Why They Choose Public Health or Medicine?

A Thesis

Submitted to the Faculty

of

Drexel University

by

Warren Hilton

in partial fulfillment of the requirement for the degree

of

Doctor of Education

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Author: Warren Hilton

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Signatures:

Examining Committee

Chair

Members

Joyce Pittman

Marcia Polansky

Academic Advisor

Department Head

Office of Graduate Studies • 3141 Chestnut Street • Randell Hall 240 • Philadelphia, PA 19104
Tel: 215-895-0866 • Fax: 215-895-0495 • Email: graduate@drexel.edu • Web: www.drexel.edu/provost/graduatestudies

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This Dissertation Committee certifies that this is the approved version of the following dissertation:

UNDERGRADUATE PUBLIC HEALTH MAJORS: WHY THEY CHOOSE PUBLIC HEALTH OR MEDICINE?

Committee:

Dr. Allen Grant, Supervisor

Joyce Pittman

Dr. Joyce Pittman

Marcia Polansky

Dr. Marcia Polansky

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Dedication

I dedicate this dissertation to my family. I thank you for your support, encouragement and love. You inspired me to complete this dissertation.

To my wife Jana, I thank you for being my biggest supporter and helping me to stay grounded in faith. Your love and support has been and continues to be tremendous. I am blessed to have you in my life.

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Abstract

Undergraduate Public Health Majors: Why They Choose Public Health or Medicine?

Warren Hilton, Ed.D.

Drexel University, May 2013

Chairperson: Allen Grant

This mixed methods study examined the relationship between the motivations for attending college of undergraduate students with a focus on students with a public health major, and their desire to pursue graduate training in public health and subsequently, public health careers. The study highlighted the current public health workforce shortage and the need for more undergraduate students in public health to matriculate in graduate programs at schools of public health and then on to careers in public health. The problem that was addressed in this study was determining how to recruit more undergraduate public health majors and undergraduates in general to pursue master's level training in public health at a School of Public Health (SPH) at a large urban east coast university. The purpose of this research was to explore what factors influence public health undergraduates to pursue or not pursue graduate study and careers in public health. The research is significant because it provided evidence for administrators and faculty at the SPH to support new or enhanced recruitment/marketing strategies and curricular/co-curricular experiences that positively motivate undergraduate public health students to pursue public health graduate degrees and subsequently careers in public health. The research questions of the study focused on exploring how the motivations for attending college of undergraduate students affected their desire to attend graduate programs in public health and to choose careers in public health. The research questions also 1) uncovered curricular and/or co-

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curricular activities that influence public health undergraduates to pursue or not pursue public health graduate or medical school training, and 2) examined demographics characteristics that determined the likelihood of undergraduate public health students pursuing a public health graduate degree or medical degree. The study utilized a mixed methods explanatory design to examine the research questions as they are related to graduate public health and medical degree students at a large private urban university, with a focus on students who majored in public health at the undergraduate level. The study used a quantitative correlation method that was followed by a qualitative case study design. The quantitative portion of the study utilized an online version of the Students Motivations for Attending University (SMAU) Scale. The qualitative part of the study consisted of focus interviews with public health graduate students in the MPH program. Analysis of the results revealed several key conclusions:

1. certain intrinsic and extrinsic motivations for attending college, based on an analysis of variance (ANOVA), affected a students' choice of public health or medicine for graduate study and careers; and a students' perceived value of a medical degree;
2. students' perceived that participation in health related internships, community service/service learning, and research experiences played a role in graduate study/career choice of public health;
3. the education level of study participants' mothers was determined via a chi-square test to be significantly associated with career/graduate study in public health; and
4. a majority of students' (62%) reported that they lacked sufficient information when they entered college to make an informed decision on graduate study/career choice related to healthcare fields.

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The findings from the study provided data to individuals at the site who are responsible for recruitment, marketing, and undergraduate public health curricular/co-curricular decision. In particular, the study provides evidence for:

1. developing information via websites, campus visits and other mechanisms about public health graduate study and careers that appeals to the intrinsic and extrinsic motivations of undergraduates;
2. incorporating opportunities for undergraduates at the site to participate in health related experiential opportunities, have positive faculty-student interactions, and introducing public health concepts to all undergraduate students; and
3. creating information for websites and coordinating in-person events that provide information about public health careers and graduate study options.

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Chapter 1: Introduction

Introduction

The public health workforce that is critical to the survival of the U.S. population is facing a worker shortage that is estimated to leave America with a deficit of 250,000 public health professionals by 2020 (Association of Schools of Public Health, 2008). There are many suggested avenues for solving the "looming workforce crisis" (Rosenstock, et al., 2008, p. 395). It is widely held that the terminal professional degree for public health is the Master's of Public Health (MPH) (Council on Education in Public Health, 2012a; Hayden, 2002). As such, one of the suggested paths to increasing the number of public health professionals is to increase the number of students in graduate programs, particularly the MPH program, at fully accredited schools of public health (Rosenstock, et al., 2008). A significant pathway to boost the amount of students in master's level programs is to improve undergraduate students' "awareness of public health career and educational opportunities" (Council on Linkages Between Academia and Public Health Practice, 2005, p. 4). While there has been success in recent years related to educating more undergraduates on the "importance of public health to their everyday lives and to the health of the nation" (R. K. Riegelman, 2008, p. 261), it has not proven to be as successful in getting these students to pursue graduate programs in public health (Guttmacher, Bass, & Nezami, 2008). The health and well-being of the American population may very well depend on the country's ability to motivate undergraduate students to pursue graduate public health education and subsequently, careers in public health.

What is Public Health?

Public health is the "science and art of protecting and improving the health of communities through education, promotion of healthy lifestyles, and research for disease and

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injury prevention" (ASPH, 2012b). The field of public health focuses on preventing injury and disease in populations instead of focusing on treatment of a single individual. The public health field is "rooted in traditions of concerned, humane, directed science" (Milstein, 2008). Public health according to Pulitzer Prize winner, Richard Rhodes is "probably the most successful system of science and technology combined, as well as social policy that has ever been devised" (Milstein, 2008, p. 4).

The Public Health Workforce

The public health workforce is extremely important to the health of the people of the United States (K. M. Gebbie, Merrill, & Tilson, 2002; Mahan & Malecki, 2004; Perlino, 2006; Tilson & Gebbie, 2004). The public health workforce's responsibility is to:

> confront emerging communicable diseases (e.g., Ebola and avian influenza), prevent environmental hazards (e.g., protect food security and combat climate change) and chronic disease (e.g., obesity and its myriad health consequences), and assist communities in preparing for disasters such as earthquakes and biological and chemical terrorist attacks. (Rosenstock, et al., 2008, p. 395)

Some key contributions of the public health workforce include an "increase in life expectancy, worldwide reduction in infant and child mortality, and the elimination or reduction of numerous life-threatening communicable diseases" (Rosenstock, et al., 2008, p. 395). Additionally, as noted by the Centers for Disease Control and Prevention (CDC) ("Ten great public health achievements--United States, 1900-1999," 1999), public health professionals have played a major role in the greatest health and safety achievements in the U.S. These achievements include:

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1) vaccination, 2) motor-vehicle safety, 3) safer workplaces, 4) control of infectious diseases, 5) decline in deaths from coronary heart disease and stroke, 6) safer and healthier foods, 7) healthier mothers and babies, 8) family planning, 9) fluoridation of drinking water, and 10) recognition of tobacco use as a health hazard. ("Ten great public health achievements--United States, 1900-1999," 1999)

The public health workforce continues to make a significant impact on the health of the American population.

The public health workforce is comprised of individuals from various healthcare professions as well as engineering, legal, and social work fields. The focus of the public health workforce is to prevent injury and illness in the population as well as educate the public about healthy choices. The multidisciplinary nature of the public health workforce facilitates creative solutions to health problems in the U.S. (B. J. Turnock, 2009). The advantages of a diverse workforce are evident when dealing with complex public health issues such as bioterrorism, child hunger, and occupational safety. However, the complexity and breadth of the public health workforce causes a major challenge in unifying and enumerating the workforce (Bernard J. Turnock, 2006).

Size of the Public Health Workforce.

The size of the public health workforce is difficult to determine. Turnock (2006) notes that there is little consensus on the magnitude of the public health workforce (p. 13). Other scholars acknowledge the issue of establishing an agreed upon size of the public health workforce (Elliott, Gebbie, & Raziano, 2009; K. Gebbie, Merrill, Sanders, Gebbie, & Chen, 2007; Merrill, Btoush, Gupta, & Gebbie, 2003). The most recent estimates of the public health workforce have it numbered at 450,000 professionals (K. M. Gebbie, Raziano, & Elliott, 2009).

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Public Health Workforce Occupational Responsibilities.

The public health workforce carries out its occupational responsibilities in a variety of work settings. The largest percentage of the public health workforce performs its duties as employees of state and local governments (Bernard J. Turnock, 2006, p. 14). The next largest group of public health professionals are federal government employees (Bernard J. Turnock, 2006, p. 14) working at agencies such as the Centers for Disease Control and Prevention (CDC) and the Health Resources and Services Administration (HRSA). Another sector of the public health workforce is represented by employees of for-profit entities including insurance and pharmaceutical companies as well as consulting firms (Seltzer, 2010). Additionally, several public health workers are employed by universities, non-profit organizations, and hospitals or other health care facilities (Seltzer, 2010). The rest of the public health workforce provides services in public schools and other educational institutions (Bernard J. Turnock, 2006).

Public Health Job Classifications.

Professionals in public health occupy a plethora of job titles and functions. The occupational classifications of jobs in public health are usually separated into four categories: 1) administrative, 2) professional, 3) technical, and 4) administrative support (Bernard J. Turnock, 2006, p. 27). Administrative jobs in public health comprise five percent of the workforce while professional positions make up 56% of the total workforce (Bernard J. Turnock, 2006, p. 31). Additionally technical and administrative support jobs comprise 20% and 19% respectively of the public health workforce (Bernard J. Turnock, 2006, p. 31).

Administrative careers in public health "involve the exercise of analytical ability, judgment, discretion, personal responsibility, and the application of a substantial body of knowledge of principles, concepts, and practices applicable to one or more fields of

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administration or management" (Bernard J. Turnock, 2006, p. 31). Public health career titles in the administrative category include medical director, health commissioner, federal agency director, and communications director (Seltzer, 2010). Professional occupations require education at the bachelor's level or higher and involve an advanced knowledge of science and theoretical concepts (Bernard J. Turnock, 2006). Some careers that would be considered professional occupations are epidemiologist, health educator, behavioral health specialist, biostatistician, and health economist (Seltzer, 2010). Technical occupations in public health involve basic knowledge of science, as well as technical and manual skills (Bernard J. Turnock, 2006, p. 32). Technical job titles include study coordinator, procurement manager, employee health nurse, continuing education coordinator, and informatics specialist (Seltzer, 2010). Administrative support professionals in public health provide clerical and office support and include jobs such as computer operator, statistical clerk and legal assistant (Bernard J. Turnock, 2006, pp. 32-33).

Geographic Location of the Public Health Workforce.

Public health professionals performed their duties in all geographic areas of the U.S. and beyond. The bulk of public health workers live and perform their responsibilities in and around major metropolitan areas (Bernard J. Turnock, 2006). Additionally, many of the workers in the field are clustered around geographic regions with large populations such as the Northeast, Midwest, and Mid-Atlantic regions of America (Bernard J. Turnock, 2006). As the population in the U.S. shifts from the above mentioned regions to the South, Southwest and West regions, it is likely that more public health professionals will shift to these locations (Bernard J. Turnock, 2006, p. 213).

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Educational Background of the Public Health Workforce.

The educational background of public health professionals varies greatly. Turnock (2006) notes that professionals in the public health field have formal training in a variety of fields ranging from bachelor's level training all the way up to professional degrees in medicine and law (p. 23). Other authors support the notion that public health workers have entered the field through various educational pathways (K. M. Gebbie, 1999; Guttmacher, et al., 2008; Perlino, 2006; Seltzer, 2010). In general, the field is moving to requiring workers to have "at least one year of postsecondary specialized public health training" (Bernard J. Turnock, 2006, p. 14). This training can be completed in a variety of ways including formal education in undergraduate or graduate programs, continuing education courses, or training sessions offered by government agencies or non-profit organizations. However, it is widely accepted that the master's in public health (MPH) degree is the terminal degree for those who wish to practice public health as a profession (Hayden, 2002).

Future of the Public Health Workforce.

The future of the public health workforce will include new areas of specialization. The concern for climate change and bioterrorism will expand the need for public health professionals who specialize in natural disaster response and surveillance activities (Seltzer, 2010). Growth of populations in developing countries as well as the rise of immigration to the U.S. has highlighted the necessity for public health workers that specialize in global health (Seltzer, 2010). Additionally, the popularity and tremendous growth of new technologies including text messaging, Facebook and Twitter have underscored the need for public health professionals to expand their scope to include these new media (Seltzer, 2010). The future expansion of the public health workforce into new growth areas related to climate, global health and new media

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will increase the demand for workers in the field. This rise in demand for workers will place a burden on the public health workforce which may further exacerbate the predicted critical shortage of public health professionals (Bernard J. Turnock, 2006).

Public Health Workforce Shortage

The American population's need for public health services has grown tremendously in recent years (Amodeo, 2003; K. M. Gebbie, Rosenstock, & Hernandez, 2003; Bernard J. Turnock, 2003). However, the public health workforce has been inadequate in keeping up with the increased health issues of the U.S. population (Rosenstock, et al., 2008). The emergence of infectious diseases such as the H1N1 flu virus, the impact of chronic diseases including heart disease, cancer and diabetes; along with the aging population of the U.S. has created an overwhelming necessity for more trained and competent public health professionals (K. M. Gebbie & Turnock, 2006; Rosenstock, et al., 2008). Additionally, recent health care reform legislation (Howard & Kathleen, 2010) has contributed to the rising demand for workers in the field of public health. The Association of Schools of Public Health (ASPH) notes that the U.S. public health workforce decreased by 50,000 workers from 1980 to 2000 ("ASPH Policy Brief: Confronting the Public Health Workforce Crisis," 2010, p.1). This decrease occurred while the American population grew by 54,879,707 individuals (Rosenstock, et al., 2008, p. 396). Analyzing the public health workforce in relation to the enlarging U.S. population shows that action should be "taken immediately to rebuild the workforce" ("ASPH Policy Brief: Confronting the Public Health Workforce Crisis," 2010, p.1).

Data and government reports indicate the future public health workforce shortage may reach a point of national (K. M. Gebbie & Turnock, 2006; Rosenstock, et al., 2008) and global crisis (Gillam & Bagade, 2006; Houghton, Braunack-Mayer, & Hiller, 2002; Smith, 2008).

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ASPH estimates that by 2020, there will be a shortage of 250,000 public health professionals in America ("ASPH Policy Brief: Confronting the Public Health Workforce Crisis," 2010, p.1). In addition, further exacerbating the problem, "more than 100,000 government public health workers - approximately one-quarter" of the public sector workforce was eligible to retire beginning in 2012 ("ASPH Policy Brief: Confronting the Public Health Workforce Crisis," 2010, p.1). With the U.S. population forecasted to grow by 31,153,802 people between 2010 and 2020 (U.S. Census Bureau, 2008), the need for educating the public health workers of the future is evident.

The shortage of public health workers is not just a problem in the United States. European countries have experienced struggles in educating students related to public health (Gillam & Bagade, 2006). Additionally, researchers (Houghton, et al., 2002; Rotem, Dewdney, Mallock, & Jochelson, 2005) in Australia and New Zealand have documented the difficulties of providing appropriate public health education to meet the demand of the workforce. Developing countries, many of whom are in Asia and Africa, have a complex situation with the public health workforce shortage as they face a needed 2.36 million health worker shortage (Bangdiwala, Fonn, Okoye, & Tollman, 2010; Donya, 2008).

Problem Statement

The problem addressed by this study is determining how to recruit more undergraduate public health majors to pursue master's level training in public health including training at Schools of Public Health (SPHs). In particular, the site in which the problem was researched is a SPH at a large urban university. The site has roughly 250 full-time MPH students with approximately 15% that are undergraduate public health majors. The site also offers an executive MPH degree for working professionals as well as doctoral and master of science

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degree programs. The site is, at the time of the study, in the planning stages of starting an undergraduate public health major.

While SPHs are not the only source of graduate public health education, they are a widely suggested path to increasing the number of public health professionals (Rosenstock, et al., 2008). SPHs need to expand their capacity to educate 300% more students by 2020 to prevent a serious public health workforce crisis (Rosenstock, et al., 2008). The necessary increase in students matriculating in graduate public health programs will rely heavily on undergraduates who are now being exposed to public health curriculum (Guttmacher, et al., 2008; Riegelman, 2007). Recent history, however; has proven that undergraduates in public health related courses and programs (i.e. majors and minors) have not pursued graduate training in public health in large numbers (Guttmacher, et al., 2008). If more undergraduate students do not matriculate in public health graduate degree programs, the workforce shortage may reach a point in which Americans will "be at grave risk" " ("ASPH Policy Brief: Confronting the Public Health Workforce Crisis," 2010, p.1).

An exploration of the motivations undergraduate public health students have for attending college in relationship to their choice of graduate program is an important step in determining if there are particular motivations that guide students to graduate study in public health. There are several paths related to health fields other than graduate public health training in which these students pursue in large numbers upon completing their undergraduate degree (Guttmacher, et al., 2008; Lauren & Dona, 2010). While little reliable national data exists regarding undergraduate public health students' aggregate choices for graduate education or career choices, some data gathering has been done on a smaller scale. Guttmacher, et al (2008) note that two of the three universities in their study reported that on average only nine percent of

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undergraduate public health students pursued master's level training in public health. The nine percent figure is astounding considering that 33% of the students in Guttmacher, et al's (2008) study went on to non-public health graduate or professional school training. In addition, 17% of the student participants in the study decided to pursue careers outside of public health (Guttmacher, et al., 2008). This data suggests that undergraduates in public health courses and programs view their undergraduate training as a "stepping stone" (Guttmacher, et al., 2008, p. 11) to medical school or non-public health graduate programs. Guttmacher, et al's (2008) study is corroborated by the observations of two faculty members with roughly 30 years of combined experience (Lauren & Dona, 2010).

An investigation of the reasons that lead public health undergraduates to not pursue public health graduate training at SPHs can present valuable evidence for public health educators and practitioners. Likewise, an exploration of the motivations of public health undergraduate students that do matriculate in graduate programs in public health would also offer data that would be beneficial to educators and practitioners. Some work (ASPH, 2006; Purcell, 2009) has been completed to determine ways to increase the number of undergraduates who apply to graduate programs at SPHs. Purcell (2009) suggests that SPHs need to:

> communicate early and often (with prospective students), utilize technology, focus on personalization and quality, and collaborate with all faculty and staff in the institution to develop high impact recruitment communication strategies. (p. 220)

Purcell's (2009) work is important to expanding the number of undergraduates pursuing public health training, but it does not explain the relationship between the motivations of and influences on students and their choice of graduate training in public health or medicine.

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There is a documented need for more public health workers who are trained at the graduate level in public health (K. M. Gebbie, et al., 2003; K. M. Gebbie & Turnock, 2006; Perlino, 2006; Rosenstock, et al., 2008; Bernard J. Turnock, 2003), and effective pipelines from undergraduate public health education to graduate training (Guttmacher, et al., 2008; Lauren & Dona, 2010) in public health. Therefore, understanding how to guide more public health undergraduates to pursue graduate degrees in public health would be beneficial to the health on the American population (Purcell, 2009). Additionally, evidenced is needed to explore why undergraduate public health students choose medical degree programs instead of the MPH degree. This understanding is largely absent from the literature. Evidence regarding why public health undergraduates choose to pursue or not pursue graduate training in public health is needed. Further examination of undergraduates' motivations for attending college is necessary to improve recruitment/marketing efforts, and curricular/co-curricular offerings that lead undergraduate public health majors to continue their education in public health graduate programs.

Determining any barriers that might exist for public health undergraduates is an important gap in the literature that should be studied. Research regarding demographic characteristics that might influence the decision making process of public health undergraduates related to obtaining graduate degrees in public health or medicine is necessary. In addition, an exploration of how particular undergraduate public health program curricular and co-curricular activities affect a students' decision to obtain a graduate/professional degree could unlock the mystery of why these students do not engage in graduate public health training.

Research that produces evidence that substantiates the reasons for the lack of movement of public health undergraduates into graduate training in public health would be useful to many

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constituents. This research benefits public health educators and administrators at the site who are considering ways to encourage more undergraduates to matriculate in public health graduate degree programs and subsequently public health careers. This study provided evidence for the effective enhancing of recruiting and marketing strategies (Council on Linkages Between Academia and Public Health Practice, 2005) as an avenue to influencing more undergraduate public health students to choose public health graduate programs. Also, the research findings provide evidence to inform decisions to revise undergraduate public health curriculum (Council on Linkages Between Academia and Public Health Practice, 2005; Guttmacher, et al., 2008) to be more focused on areas that guide students into public health graduate programs.

Some data and observations exists that support the notion that service learning (Cashman & Seifer, 2008; Roe, 2009), and experiential learning such as internships (Houghton, et al., 2002; Koh, Nowinski, & Piotrowski, 2011) provide enriching experience that could lead to advance study and careers in public health. This research study provided data that supports the need for more incorporation of health-related experiential learning, research experiences, and service opportunities in public health undergraduate programs. The research also sheds light on career development and academic advising practices (Lauren & Dona, 2010) aimed at undergraduate students.

Purpose and Significance of the Study

The purpose of this study was to explore the relationship between undergraduate public health students' motivations for attending college; and the students' decisions to go to public health graduate training programs or medical school. Research (Guttmacher, et al., 2008) and educator observations (Lauren & Dona, 2010) indicate that public health undergraduates choose to explore medical school training in larger numbers than graduate public health education. In

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fact, one of the schools in Guttmacher, et al.'s (2008) study had 51% of its graduates report that they went to medical school or some other health related professional degree (e.g. dentistry, pharmacy, etc.). Studying how and why undergraduate public health students choose to pursue public health graduate training or a medical degree is important to assisting in solving the public health workforce crisis and improving the health of the American population.

The significance of this study is that it provides evidence of why undergraduate students in public health choose to pursue advance study and careers in public health or medicine for administrators at the study's site. This study supports the need for improving recruiting and marketing efforts directed towards these students in order to encourage more of them to pursue public health graduate education. Additionally, the research findings inform the site's faculty and staff of curricular and co-curricular enhancements to their forthcoming undergraduate public health major that increase the efficacy of guiding undergraduate students into graduate public health programs.

Research Questions

The research questions for this study include one overarching question and two sub-questions. They are listed below with a notation of whether the question will be explored via quantitative, qualitative, or both methods:

How do the motivations for attending college of undergraduate public health majors affect their desire to attend graduate programs in public health? (Quantitative and Qualitative)

a. What curricular and/or co-curricular activities influence public health undergraduates to pursue or not pursue public health graduate training? (Quantitative and Qualitative)

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b. What demographics characteristics determine the likelihood of undergraduate public health students pursuing a public health graduate degree? (Quantitative)

Conceptual Framework

The conceptual framework of this study is based on Astin's (1993) Input-Environment-Output (I-E-O) Model (Figure 1) which purports that student outputs are determined by inputs, and the interaction between inputs and the environment.

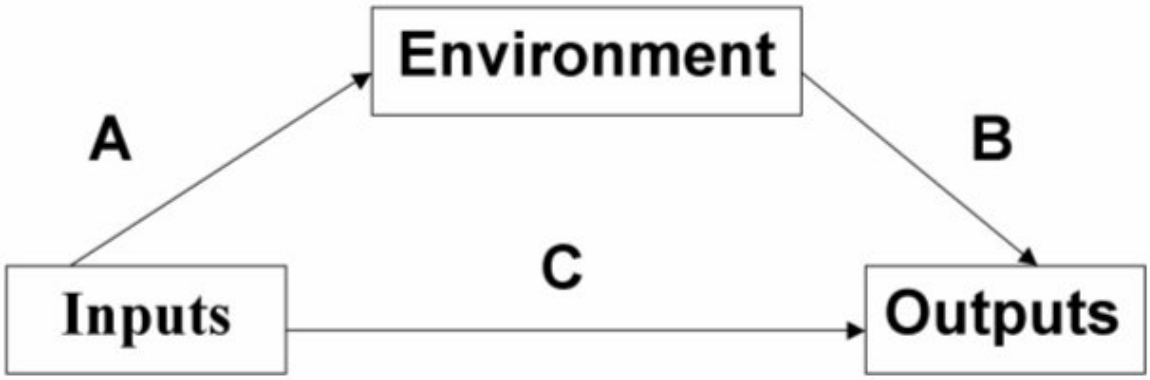

Figure 1. Astin's I-E-O Model

Moreover, the framework for the study is based on literature that supports the notion that motivations (Cote & Levine, 1997) and demographic characteristics (Laura, 2004; Rodgers & Summers, 2008), as inputs, play a factor in determining student outcomes (outputs). Additionally, the framework builds on observations (Koh, et al., 2011) and research (Cashman & Seifer, 2008) that indicates that environmental factors along with inputs determine student outcomes. The conceptual framework for this study is represented below graphically (Figure 2).

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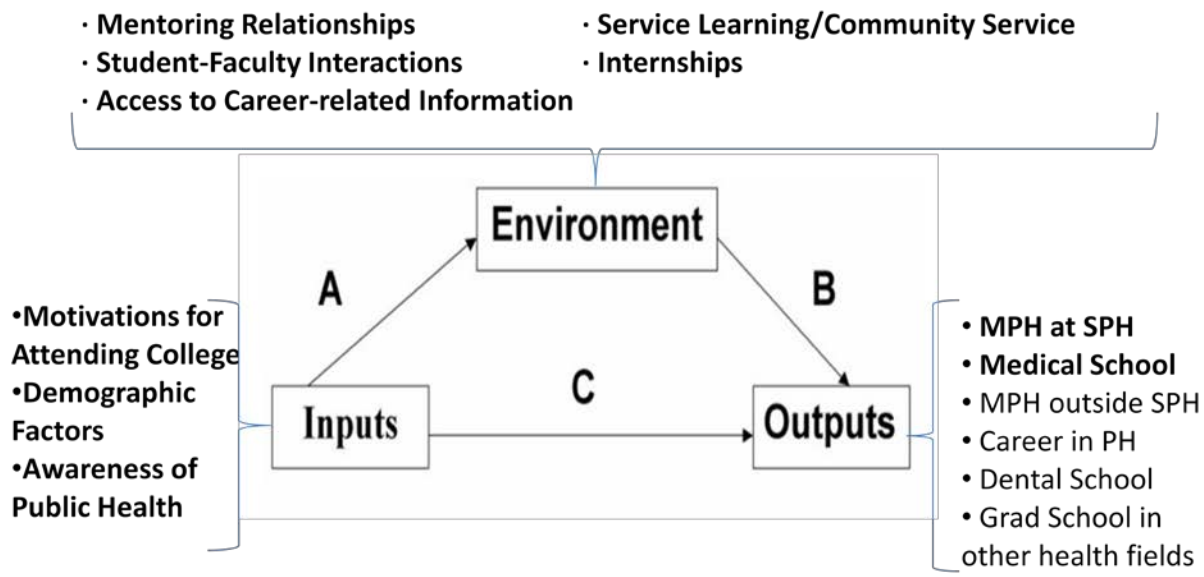

Figure 2. Conceptual Framework

Definition of Terms

Association of Schools of Public Health (ASPH): The national association of schools of public health that represents the Council on Education for Public Health (CEPH)-accredited schools of public health. Established in 1953, ASPH serves as a national resource for the schools by: a) improving the public's health by advancing professional and graduate education, research and service in public health; b) developing partnerships with governmental, private, professional, corporate, and community agencies to strengthen education, research, and service in accredited schools of public health; c) collecting national data and identifying trends relevant to public health education; d) facilitating cooperative initiatives among the schools, such as the development of competencies for MPH graduates and creation of portable public health curricula; e) promoting public health as a career option; and f) encouraging and promoting the development of practice-based training opportunities for students and graduates. ASPH is governed by its membership and a board of directors**.** (ASPH, 2012a)

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Council on Education for Public Health (CEPH): An independent agency recognized by the US Department of Education to accredit schools of public health and certain public health programs offered in settings other than schools of public health. These schools and programs prepare students for entry into careers in public health. (Council on Education for Public Health, 2012a)

Public health: The science and art of protecting and improving the health of communities through education, promotion of healthy lifestyles, and research for disease and injury prevention. (ASPH, 2012b).

School of public health (SPH): An entity as defined by the accrediting standards of CEPH. Schools of public health generally offer many more concentrations or specializations and degree offerings than public health programs. Schools must offer at least the MPH in the five areas of public health knowledge defined as core area, and must offer doctoral programs in three concentration areas. (Council on Education for Public Health, 2012b)

Master's in Public Health (MPH): Professional practice degree for public health. The curriculum for the degree includes coursework in the five core disciplines of public health: Biostatistics, Epidemiology, Environmental Health Science, Health Policy and Management, and Social and Behavioral Sciences. Additionally, individuals in the MPH degree program usually concentrate their studies in one of the five core areas or other public health area such as global health, or maternal and child health. (ASPH, 2012c)

Assumptions

This study assumes that undergraduate students in public health courses and programs are open to exploring public health as a career choice. For example, observations by educators (Lauren & Dona, 2010) indicate that some students who have chosen medicine as their future

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career field study public health as a means to go to medical school. In addition, this study is based on the widely held belief that the MPH is the terminal professional degree for a career in public health (Hayden, 2002).

Delimitations and Limitations

This study has several delimitations and limitations. This study is limited to students from one large urban east coast institution of higher education. Thus, geographic bias may exists because the institution enrolls a large percentage of east coast natives. Thus, presumably students from the east coast will be present in the sample in significantly larger numbers than students from other parts of the U.S. In addition, the action-oriented nature of the study at one institution does not allow the findings to be generalized to a larger population. Lastly, the study because of the small sample size is not suitable to determine a statistical relationship between race/ethnicity and choice of graduate program/career.

Summary

The U.S. population relies on the public health workforce to prevent injuries, reduce and eliminate diseases, and promote healthier lifestyles (K. M. Gebbie, et al., 2002; Mahan & Malecki, 2004; Perlino, 2006; Tilson & Gebbie, 2004). The workforce that is crucial to the health of the American population has a current and projected shortage that will leave the country with serious health issues. Graduate education is public health is deemed to be one of the best ways to educate a trained and competent public health workforce (Rosenstock, et al., 2008). Thus, a key pathway to solving the public health workforce shortage and subsequent health emergency of the U.S. is to expand the pipeline of students coming into graduate programs in public health (ASPH, 2006; Council on Linkages Between Academia and Public Health Practice, 2005; Mahan & Malecki, 2004). As noted by Riegelman (2007), undergraduate

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public health education is increasing the number of students in undergraduate public health majors and courses. This increase of undergraduate in public health has not led to increased enrollments in graduate public health education enough to meet the growing need for public health workers (Guttmacher, et al., 2008). Therefore, improved marketing and recruitment strategies (Purcell, 2009) as well as other methods are needed to increase the number of undergraduates in public health courses and programs who pursue graduate public health education.

Little research exists that explains why public health undergraduates matriculate in graduate public health programs or medical degree programs. Likewise, an understanding of how and why undergraduate public health majors choose a career in public health or medicine is largely absent in the literature. This study examined the motivations and influencing factors that cause undergraduates in public health to pursue a MPH or M.D. degree. The study also identified practices that would increase the percentages of public health undergraduates who matriculate in graduate public health programs and then into the public health workforce. The findings of the study inform educators and administrators of 1) ways to increase the number of undergraduate public health students in the site's full-time MPH program, and 2) opportunities to include and/or enhance curricular/co-curricular experiences in its forthcoming undergraduate public health major that would guide the students in the major into graduate public health education.

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Chapter 2: Literature Review

Introduction to the Problem

The public health profession, the education system that feeds the profession, and the public health workforce in the U.S. have significantly improved the health and well-being of all American citizens (K. M. Gebbie, et al., 2002; Mahan & Malecki, 2004; Perlino, 2006; Tilson & Gebbie, 2004). As noted previously, the U.S. public health workforce is headed to a crisis which includes a shortage of "250,000 public health professionals by 2020" (Association of Schools of Public Health, 2008). While there are many suggested pathways to solve this crisis, one of the most viable solutions is to enroll and graduate more individuals from graduate programs at schools of public health (Rosenstock, et al., 2008). Since 2006, the natural pipeline to graduate training in public health has been expanded with the increase in the number of undergraduate students taking public health courses (R. K. Riegelman, 2008). The influx of public health majors at the undergraduate level has also enlarged the natural pipeline to graduate public health education (R. Riegelman, 2008) but has not translated into significantly larger numbers of these students pursuing public health graduate training (Guttmacher, et al., 2008). Thus, there is a need to study why and how these students make their advance study and/or career choice.

Conceptual Framework

The conceptual framework of this study is based on Astin's (1993) Input-Environment-Output Model which asserts that student outcomes are determined by inputs, and the interaction between inputs and the environment. The framework also builds upon motivation theory which purports that motivations affect outcomes (Cote & Levine, 1997). In addition, the framework supports the notion that demographic characteristics (Laura, 2004; Rodgers & Summers, 2008), play a factor in determining student outcomes. Additionally, the framework incorporates

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observations (Koh, et al., 2011) and research (Cashman & Seifer, 2008) that indicates that environmental factors along with inputs determine student outcomes. The conceptual framework for this study is represented graphically in chapter 1 (Figure 2).

Literature Review

Understanding how public health majors' motivations for attending college along with demographic characteristics, as well as the environmental factors such as participation in service learning and internships, affect career and graduate study choice is central to this research study. Research related to undergraduate public health, and factors that influence career and graduate study choice will be explored in this literature review. In addition, this literature review examined the foundation for the study which is that motivations affect outcomes (Cote & Levine, 1997). First, a historical review along with the contemporary context of undergraduate public health education is presented to provide the context in which the research is being conducted. Then, the "theoretical underpinnings" (Ridley, 2008, p. 20) of the study related to motivations influencing outcomes is detailed. Lastly, historical background and analysis is provided regarding factors that influence graduate study and career choice. The three themes of this literature review work together to provide a context for the need for this study; and are represented in the literature map (Figure 3).

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Literature Map

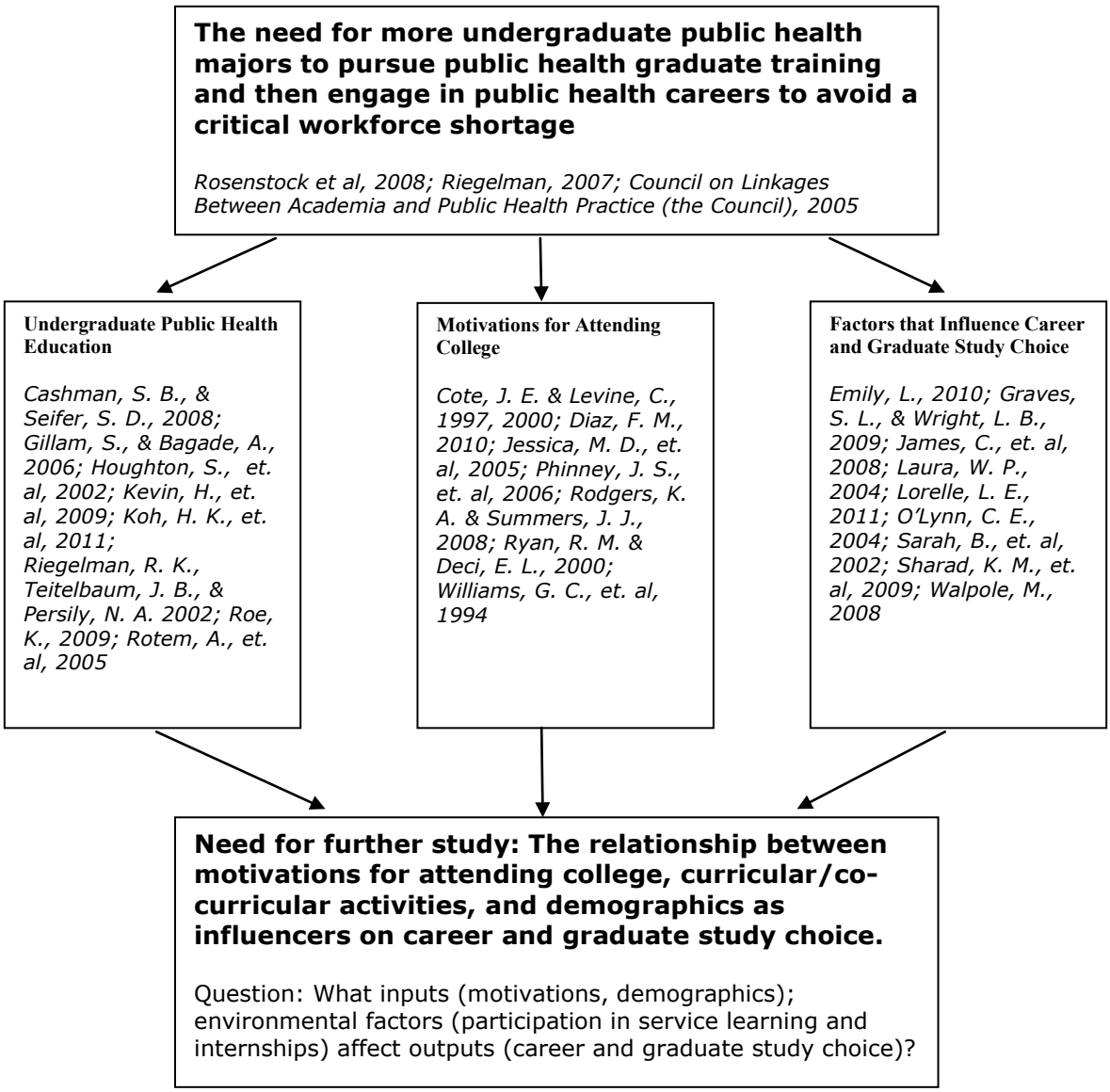

Figure 3. Literature Map

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Undergraduate Public Health Education

Training undergraduate students in public health can increase the number of public health workers and assist in solving the workforce shortage (Rosenstock, et al., 2008). Rosenstock et al (2008) state that undergraduate public health education is an excellent way to train future public health workers. Moreover, Guttmacher, et al's (2008) multi-site study of public health undergraduates' career/graduate study outcomes at three universities found that undergraduate students in public health do pursue public health careers without matriculating in graduate programs in public health. There have also been many supporting efforts to engage undergraduate students in public health but more work is needed (Riegelman, Teitelbaum, & Persily, 2002). Expanding undergraduate public health education can assist in providing more workers for the public health field (Guttmacher, et al., 2008); however, it is important to note that many believe that graduate public health education is the best pathway to public health careers ("Council on Education in Public Health," 2011; Hayden, 2002)

Origins of Undergraduate Public Health Education.

Public health is a relatively young academic discipline (R. Riegelman, 2008). Moreover, public health education at the undergraduate level is a new undertaking as it began as an offshoot and afterthought of graduate public health education (R. Riegelman, 2008). Understanding the origins of undergraduate public health education requires an understanding of the origins of its predecessor: graduate public health education.

Graduate Public Health Education.

While the origins of the public health field are over 4000 years old (Rosen, 1993), the formal public health education system began in the 19th century in Europe (R. Riegelman, 2008). Formalized public health education in the U.S. began with a critical event in 1914. At a 1914

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conference at the Rockefeller Foundation, public health experts took on the task of "defining the necessary knowledge base for public health practice and designing the educational system needed to train a new profession" (Welch & Rose, 1992, p. 6). From this conference the Welch-Rose Report, the seminal document for public health education, was created as the "central reference point for the design of schools of public health" (Welch & Rose, 1992, p. 6).

The first school of public health opened in 1916 with the founding of the Johns Hopkins School of Public Health and Hygiene (Turnock, 2006) made possible by the investment of the Rockefeller Foundation (Linda, Karen, & Barbara, 2011). By the 1960s, there were 12 schools of public health mostly funded by private donors (Linda, et al., 2011). The first investment into the public health education system of public money by the federal government came in the 1950s. This federal funding, from the Hill-Rhodes Act of 1957, "provided funds for training and project grants for public health" (Linda, et al., 2011, p. 41). The federal investment from the Hill-Rhodes Act spurred an increase in the number of schools of public health (Linda, et al., 2011) and by 2005 there were 37 schools of public health (Turnock, 2006).

The public health education system began by training physicians and individuals from other fields such as law, nursing, and engineering (Linda, et al., 2011; R. Riegelman, 2008; Turnock, 2006). Fifty years after the first school of public health in the U.S. opened in 1916, the graduate public health degree evolved from a second degree for physicians, lawyers, nurses, and engineers into the graduate degree of choice for public health workers (Turnock, 2006). A review of the institutions that offer public health graduate education follows.

Schools of Public Health (SPHs).

As noted above, SPHs began with the founding of the Johns Hopkins School of Public Health and Hygiene in 1916 (Turnock, 2006). Currently, there are 50 accredited SPHs in the

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U.S. with almost half of the schools located on the east coast ("Council on Education in Public Health," 2011). The characteristics of these SPHs are gathered each year and illustrated in the Association of Schools of Public Health's (ASPH) Annual Data Report. The 2011 ASPH Data Report is the most recent report and includes data from the 49 SPHs that existed at the time of data collection (Association of Schools of Public Health, 2011).

The characteristics of the students at SPHs are included in the ASPH Data Report and are summarized below. In the 2010 – 2011 academic year, there were 28,443 total students enrolled in SPHs which was an eight percent increase over the previous year and a 73% increase over a ten year period (Association of Schools of Public Health, 2011, p. 11). Master's degree students represented 74% of the total enrollment in SPHs(Association of Schools of Public Health, 2011, p. 11). Fifty one percent of students enrolled in SPHs were in the MPH degree program (Association of Schools of Public Health, 2011, p. 11). In addition, women represented 72% of the total enrollment and U.S. citizens comprised 85% of the enrollments at SPHs (Association of Schools of Public Health, 2011, p. 11). There were 9,717 graduates from SPHs in the 2010 – 2011 academic year with 88% of the graduates receiving master's degrees and 61% receiving MPH degrees (Association of Schools of Public Health, 2011, p. 14). The 9,717 graduates from SPHs represented an 8% increase in graduates over the previous year(Association of Schools of Public Health, 2011, p. 14).

It is clear from the 2011 ASPH Data Report that enrollments and graduation totals at SPHs have increased in recent history, however; the growth has not been substantial enough to solve the public health workforce shortage (Rosenstock, et al., 2008). While some state that SPHs are the "primary providers" (Rosenstock, et al., 2008, p. 397) of graduate public health education, it is important to note that public health graduate education has expanded beyond

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SPHs to include graduate degrees offered outside of SPHs (Gebbie, Rosenstock, & Hernandez, 2003). Moreover, some (Dandoy, 2001) feel that educating graduate students in public health outside of SPHs is a more viable option to solve the workforce shortage.

Graduate Public Health Training Outside of SPHs.

While SPHs are the most notable education training institutions for careers in public health (Rosenstock, et al., 2008), other educational entities can be helpful in solving the workforce shortage. In fact, the graduate programs in public health outside of SPHs are "growing at a faster pace than schools of public health" (Gebbie, et al., 2003, p. 129). Medical schools, nursing colleges and other health profession schools have been successful at providing quality public health graduate education (Gebbie, et al., 2003). Dandoy (2001) notes that graduate programs outside of SPHs are often forgotten as a pathway to the public health profession. These non-SPH graduate programs are capable of "credentialing of the public health workforce" (Dandoy, 2001, p. 468) and will assist in producing more public health professionals. Graduate education outside of SPHs is noteworthy, but for the purposes of this research study, the researcher focuses on graduate education in SPHs because of their more formalized and traceable development. Along with the growth of graduate public health education, in recent years, undergraduate public health offerings (R. Riegelman, 2008) including courses, minors, and majors have increased.

The MPH Degree as the Primary Terminal Professional Degree

There are various pathways to a career in public health. However, the Master of Public Health (MPH) degree "is the primary professional degree in public health" (Council on Education for Public Health (CEPH), 2012). More specifically, "the MPH prepares practitioners with a generalized knowledge of public health in addition to an area of specialization" (Hayden,

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2002). Rosenstock et al. (2008), note that graduate education in public health is the gold standard and is important to populating the field with professionals (p. 397). The MPH is based on a formalized, agreed upon set of competencies (Council on Education for Public Health (CEPH), 2012). These competencies are designed to graduate "professionals who are more fully prepared for the many challenges and opportunities in public health in the forthcoming decade" (Calhoun, Ramiah, Weist, & Shortell, 2008). The value of the MPH degree in preparing for a career in public health is well-documented (Council on Education for Public Health (CEPH), 2012; Hayden, 2002; Calhoun, et al., 2008; Rosenstock, et al., 2008).

Movement to Increase Undergraduate Public Health Education.

The first attempt to formalize undergraduate public health was in 1971 when a model for public health undergraduate education was developed with an emphasis on epidemiology and quantitative coursework" (Riegelman, Teitelbaum, & Persily, 2002, p. 485). It took more than 25 years for the next attempt to create a model of public health undergraduate education (Riegelman, et al., 2002). In 2003, undergraduate public health education took a more prominent role in the public health education system (R. Riegelman, 2008) with the Institute of Medicine's recommendation for public health undergraduate education (IOM, 2002). Riegelman (2008) notes that the Institute of Medicine recommended that "all undergraduates should have access to education in public health" (p. 258) because in is an "essential part of the training of citizens" (p. 258). Research indicated that in 2006, that majority of the 100 institutions that offered public health graduate degrees also taught undergraduate courses in public health (R. Riegelman, 2008). It was also concluded that while public health undergraduate courses were well received and highly sought after, there were very few undergraduate minors or majors in public health (R. Riegelman, 2008). Since 2006, a proliferation of efforts has helped to expand, formalize, and

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track undergraduate public health education offerings (Riegelman, 2007; R. K. Riegelman, 2008; Riegelman & Garr, 2008).

Current State of Undergraduate Public Health Education.

Contemporary undergraduate public health education became more formalized in 2006 at the Consensus Conference on Undergraduate Public Health Education (R. Riegelman, 2008). The conference "brought together public health, arts and science, and clinical health professions educators" (R. Riegelman, 2008, p. 258) who "supported the development of core undergraduate curricula" (R. Riegelman, 2008, p. 258). This core curricula and recommendations from the conference were:

- Core curriculum in public health should be available to students at all undergraduate institutions and should fulfill distribution requirements as part of general education;
- Core curriculum may include course work in Public Health 101, Epidemiology 101, and Global Health 101 as well as integrative interdisciplinary approaches; and
- Minors in public health/global health should build upon core curriculum, include course work that utilizes institutional and faculty strengths and includes options for experiential learning. (R. K. Riegelman, 2008, p. 259)

Since the conference, many efforts to implement the recommendations have taken place and the ongoing efforts to integrate public health into undergraduate education have evolved to create a standard for public health undergraduate education with the development of the undergraduate public health education competencies ("Undergraduate Public Health," 2011).

Enumerating undergraduate public health is a difficult task; however several attempts have been made to determine how many undergraduate public health programs exist. In 2009, it

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was noted that of the 837 Association of American Colleges and Universities (AAC&U) member institutions, 137 (16%) had a public health undergraduate major, minor, or concentration (Kevin, Brenda, Caleb, Marian, & Gillian, 2009, p. 6). Additionally, "thirty-three percent of research universities surveyed offer undergraduate programs in public health" (Kevin, et al., 2009, p. 7), while "16% of institutions categorized as comprehensive/Master's and only 5 percent of baccalaureate institutions offer such programs" (Kevin, et al., 2009, p. 7). Moreover, research universities, public institutions, and those institutions that offered graduate public health education were more likely to provide undergraduate public health course offerings (Kevin, et al., 2009, p. 7). Also, "70% of undergraduate public health programs are not affiliated with graduate programs" (Kevin, et al., 2009, p. 7). The AAC&U survey data displays the wide variety of institutions that offer public health undergraduate education.

In a separate survey conducted by the Association of Schools of Public Health (ASPH) in 2008, it was found that of the 38 out of 40 SPHs that responded to the survey, 12 had undergraduate public health majors (ASPH, 2008). In addition, 10 SPHs had an undergraduate minor, 13 SPHs offered courses at the undergraduate level and six SPHs were planning to develop an undergraduate major (ASPH, 2008). The ASPH survey corroborates the AAC&U's survey findings that institutions with graduate degrees in public health often have undergraduate public health educational offerings.

The proliferation of undergraduate programs has created a need for guidance for the "optimal format and content of undergraduate public health education" (ASPH, 2011). As such, the evolution of public health undergraduate education recently hit a milestone with the creation and dissemination of the Undergraduate Public Health Learning Outcomes Model (ASPH, 2011). The model provided a standard to guide institutions of higher learning in developing and revising

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public health undergraduate curriculum. Understanding the historical and contemporary context of undergraduate public health provides an understanding of why very little research exists on the outcomes of public health undergraduates. The newness of undergraduate public health education reinforces the need further study of the career and graduate school choices of undergraduate public health students. With the increase in public health undergraduate education (Riegelman, 2007), and the need for more undergraduate public health students to matriculate in SPHs (Rosenstock, et al., 2008), understanding the motivations of undergraduate public health students related to the graduate study and career choice can provide evidence for how to assist in stemming the public health workforce crisis.

Motivation Theory

Motivation theories relate to the notion that there are reasons for the behaviors of individuals ("Motivation, Theories of," 2006). These reasons can be internal to the individual or an external factor affecting the behavior of an individual ("Motivation, Theories of," 2006). In undergraduate student populations, motivation theory has been studied extensively. The research has shown various patterns of the motivations for students attending and persisting in college (Jessica, Jean, & Lizette Ivy, 2005; Marilla, 2005; Van Etten, Pressley, McInerney, & Liem, 2008). In particular, some studies review the goal achievement orientation and/or mastery orientation of students (Van Etten, et al., 2008). Goal achievement orientation refers to the motivation of a student to reach a goal such as finishing college (Van Etten, et al., 2008). Mastery orientation relates to student motivations' to learn and master a specific course, skill or body of knowledge (Marilla, 2005). Moreover, much of the research (Diaz, 2010; Haase & Lautenschläger, 2011) on motivation theory deals with intrinsic and extrinsic motivations.

Intrinsic vs. Extrinsic Motivations.

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Intrinsic and extrinsic motivations have been researched with abundance (Ryan & Deci, 2000). The research related to intrinsic and extrinsic motivations "has shed important light" (Ryan & Deci, 2000, p. 54) on "educational practices" (Ryan & Deci, 2000, p. 54). By definition, intrinsic motivation refers to an individual(s) being moved to do something because they are interested or enjoy it (Ryan & Deci, 2000, p. 55). While extrinsic motivation involves doing something "because it leads to a separable outcome" (Ryan & Deci, 2000, p. 55). Researchers (Fernández, Castro, Otero, Foltz, & Lorenzo, 2006) found that extrinsic motivations were associated more with non-health sciences majors signaling that health sciences majors, such as public health majors, might be more motivated by intrinsic motivations.

Diaz's (2010) quantitative study provides evidence from three southeastern universities that highlights how intrinsic and extrinsic motivations affect the outcomes of college students majoring in music related majors and groups. In Diaz's (2010) study, intrinsic motivations were found to lead to higher levels of engagement and positive outcomes than extrinsic motivations. Diaz's research signals the need to study both intrinsic and extrinsic motivations to determine outcomes. The proposed dissertation research builds on theories and literature related to motivation theory with an emphasis on correlating college students' intrinsic and extrinsic motivations for attending college and their graduate study and career choice.

Motivations for Attending College.

An exploration of the motivations undergraduate public health students have for attending college in relationship to their choice of graduate program and career is an important step in determining if there are particular motivations that guide students to graduate study and careers in public health. As such, the foundational framework for the study is based on research

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that purports that students' motivations for attending college, along with the college environment have an effect on student outcomes such as GPA, skills, and career pursuits (Cote & Levine, 1997). This framework is supported by researchers (Diaz, 2010; Fernández, et al., 2006; Gallagher, Clarke, & Wilson, 2008; Haase & Lautenschläger, 2011) who found that certain motivations supported higher levels of educational activities. Moreover, motivations were noted as impactful on student outcomes in studies that focused on specific populations including minorities (Phinney, Dennis, & Osorio, 2006), first generation college students (Jessica, Jean, & Lizette Ivy, 2005), students in certain undergraduate disciplines (Diaz, 2010; Fernández, et al., 2006) and medical school students (Williams, Wiener, Markakis, Reeve, & Deci, 1994).

Inputs, Environment and Outputs.

Understanding how inputs such as family background, and campus environments affect students' ability to achieve educational outcomes such as career and graduate school choice of undergraduates have been studied for over 30 years. Astin (1999) studied the correlation between student involvement and student outcomes beginning in the 1970s. Astin noted in his Input-Environment-Output Model (I-E-O) that student outcomes are determined by inputs, and the interaction between inputs and the campus environment (1999). Astin's I-E-O, the foundational model for this research study, intersects with and is supported by various student development theorists.

Tinto's theory of student departure (1993) examines how inputs, such as individual attributes and family background, and their interaction with the campus environment affect students' ability to achieve completion of their undergraduate degree. Terenzini and Pascarella (1978) explored the pre-college attributes of students, as inputs; and their effect on students' ability to persist past the first year of college. These early student development theorists

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provided an excellent backdrop for later researchers to build on their models to include motivation as an input.

Motivation and Student Outcomes.

The notion of motivation driving achievement is not a new concept. Beghetto (2004) examined students' motivational beliefs related to goal achievement. Beghetto (2004) notes that the three most commonly research motivational beliefs were "mastery-approach goals, performance-avoid goals, and performance-approach goals" (p. 1). These motivational beliefs were found to affect student outcomes (Beghetto, 2004). In particular, students who are mastery-approach goal oriented are focused on making progress toward a goal, which is an intrinsic motivation. While performance-avoid orientated students are driven by extrinsic motivations such as their desire to avoid a negative outcome. Performance-approach goal oriented students seek to perform better than others which relates to extrinsic motivations.

Meta-analysis research (Rodgers & Summers, 2008) also points to connection between students' motivation and retention. In Rodgers and Summers (2008) study, they found that traditional retention models need to be revised to include measurements of the motivations that students bring to college. Specifically, the authors note that seeing value in engaging in a task (extrinsic motivation) and enjoyment of the task (intrinsic motivation) would be useful to include in models of retention because these motivations affect student outcomes. Phinney et al. (2006) found in their quantitative study of an ethnically diverse college population at a California university that certain motivations such as the desired to help one's family and to prove self-worth correlated with positive ethnic identity. These researchers highlight the various correlations between motivations and outcomes but do not touch on how motivations play an important role in career and graduate school choice.

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The idea that motivations correlate and/or affect career choice has been explored by various researchers. Haase and Lautenschlager (2011) found that motivations affected career choice for undergraduate students. In particular, the cross sectional study of two German universities (2011) correlated "self-determination" (Haase & Lautenschläger, 2011, p. 7) motivations with a career choice to be self-employed. Kiener (2006) found in a quantitative study of 230 undergraduate students that intrinsic motivations produced outcomes that were positively linked to students taking steps to achieve their career goals.

Additional quantitative research (Williams, Wiener, Markakis, Reeve, & Deci, 1994) found that motivations affected specialty choice in medical school student populations. In Williams et. al's (1994), the researchers conducted a retrospective observational study of 89 medical school students. Williams et. al's (1994) research found that students in the study who were motivated by personal development when engaged by a supportive environment were more likely to choose a residency in internal medicine than those students who were met with a controlling environment (1994). Williams et. al's (1994) research suggests that students' motivations along with their learning environment/experiences have an impact on career choice.

Qualitative study (Gallagher, et al., 2008) also links motivation to students' choice of career. A study (Gallagher, et al., 2008) of a purposive sample of 35 students in their final year of a London dental school revealed that extrinsic motivations caused these students to choose a dental career. Specifically, the students in the study were motivated to go to dental school by their perception that a career in dentistry would provide financial security and status (Gallagher, et al., 2008).

The Need to Study Motivations of Public Health Undergraduates.

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Motivation theory provides a theoretical framework for this study as it underscores the ability to correlate motivations with outcomes. Motivation theory, in particular motivations for attending college, are a foundational base to explore the overarching research question for this study: how do the motivations for attending college of undergraduate public health majors affect their desire to attend graduate programs in public health, and subsequently pursue careers in public health? While a plethora of research exists with regards to correlating motivations and graduate study/career choice in various fields, little research is found that correlates motivations of public health undergraduate students with career/graduate study choice. In addition to student motivations, other factors exist that play a role in graduate study and career choice.

Factors that Influence Career Choice and Graduate Study

Understanding the factors that influence career choice and graduate study can provide insight into how to attract more undergraduate public health students to graduate public health training and subsequently, public health careers. While there is little research (Guttmacher, Bass, & Nezami, 2008) related to attracting public health undergraduates to pursue careers and graduate education in public health, research in other fields including nursing (Ann Strong, 2006; O'Lynn, 2004), engineering (Sarah, Peta, & Sue, 2002) and psychology (Nauta, 2000; Rogers & Molina, 2006) is helpful in addressing the research problem of this study. In addition, literature regarding the relationship between demographic characteristics such as ethnicity (Castellanos, Gloria, & Orozco, 2005) and gender (Maurutto, 1998; Schaub, Hanson, & Baker, 1996), and career and graduate study choice is beneficial in framing the research questions for this study. Researchers (Emily, 2010; Sarah, Peta, & Sue, 2002; Sharad, Anne, & Enrique, 2009) have shown that providing undergraduates with information about a particular career can have a positive impact on them choosing a career and/or graduate program. In addition, faculty-student

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interaction was determined by researchers (Graves & Wright, 2009) to play a major role in career and graduate school choice. Moreover, it was found that race, gender, and other social factors play a role in the decision of undergraduate students to attend graduate school and pursue certain careers (Laura, 2004; Lorelle, 2011). Additionally, curricular and co-curricular activities such as service learning (Cashman & Seifer, 2008) and internships (Houghton, et al., 2002) are important influencers in career and graduate study choice.

Undergraduates' Pursuit of Graduate Education.

There is a wealth of research that details the factors that influence students to choose a graduate program. Research shows that influencing factors vary by race, age, enrollment status, gender, and socio-economic status (Chuang & Lei, 2010; Michael & Patrick, 2001). Even with this variance related to demographics, evidence supports that involving faculty during a student's graduate school decision making process, and providing a sizeable number of opportunities for undergraduate students to learn about the graduate school environment increases the number of students that matriculated in graduate programs (Chuang & Lei, 2010; Michael & Patrick, 2001). Additionally, giving undergraduate students information about graduate programs and careers, and accommodating the needs of special populations such as minorities and international students provide a positive pathway for graduate decision making processes for students (Chuang & Lei, 2010). Other influential factors in guiding undergraduate students into graduate school include the location of the graduate program, "quality and other academic environment characteristics, work-related concerns, spouse considerations, financial aid, and the campus social environment" (Ruth, 1995, p. 109). Schapiro et. al (1991) found in a study of graduating seniors from highly selective private institutions that high academic achievement and certain types of institutions including women's colleges, and universities (not colleges) correlated with

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increased levels of undergraduates pursing graduate education. To further explore the factors that influence undergraduates to pursue graduate education and careers in a particular field, a review of studies related to demographic factors, provision of educational/career information, and curricular/co-curricular factors is below.

Demographics Factors.

Various demographic factors including gender, race, ethnicity, GPA, and family background have been determined to be influential in the progression of undergraduates to graduate school. Walpole (2008) utilized national data and found that African American students from low socioeconomic status (SES) backgrounds were less likely to pursue their desire to attend graduate school than their high SES counterparts. Walpole's (2008) study also revealed that African American students who were female, had a high GPA, and who aspired to attend graduate school were more likely to pursue graduate education than their male counterparts. Sarah et. al (2002) found in their exploratory survey study of students at a Canadian university that in the field of engineering, women faced barriers that caused them to not pursue graduate education. Conversely, O'Lynn (2004) found that in the field of nursing, males faced challenges that impeded their aspirations to pursue nursing education and careers.

Buddeberg-Fischer et al's (Buddeberg-Fischer, Klaghofer, Abel, & Buddeberg, 2006) cohort study of 522 fourth year residents from three Swiss medical schools found that gender was the biggest factor in determining a medical specialty. In particular, the study (2006) revealed that greater percentages of males pursued medical specialties than females. In addition, women were more inclined than men to pursue careers in pediatrics, gynaecology, obstetrics, and anaesthesiology (Buddeberg-Fischer, 2006). Lorelle (2011), in a nationwide comparison study of women of color and Caucasian women in science, technology, engineering, and math (STEM)

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fields, found that key factors including attending a private institution correlated with women of color persisting in STEM fields.

Laura's analysis (2004) of a national representative sample finds that more women and Asians are likely to attend graduate school than men and other racial groups. In addition, the research (Laura, 2004) finds that African American students in the study are less likely to attend graduate school than their white counterparts. Sharad et al (2009) determined in their study of factors that influenced minorities, at three Historical Black Colleges and Universities (HBCUs), to pursue graduate education in computer science that family and friends greatly influenced undergraduate students' decision to pursue graduate study. In addition to demographic characteristics, the source and amount of information that undergraduates have related to graduate study and careers affects their decision to pursue graduate study.

Provision of Educational/Career Information.

The lack of information and the amount of knowledge that undergraduate students have about careers and graduate study as it correlates to their pursuit of graduate study has been researched extensively. Emily (2010) found that minority students, at a large public university, had little understanding of the job responsibilities of a librarian. Additionally, the study (Emily, 2010) found that providing undergraduate students with information on the employment outlook, graduate school options for funding, and the benefits of a career in library science, led students to, in many cases, more seriously considered a career in library science. Sharad et al's (2009) study uncovered that one of the key factors of minority students' choice not to pursue graduate study was the "lack of information about graduate schools including the process of application" (p. 84). Sarah et al's (2002) mixed methods study found that a majority of study participants who were women undergraduate engineering majors expressed that the lack of information about

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graduate study in engineering was impactful in their decision to not pursue graduate education in engineering.

In the field of psychology, Gliman and Handwerk (2001) found that undergraduates in a study of students at five universities obtain information about school psychology from personal experience such as talking to a school psychologist. Interestingly, the knowledge gained by the study participants was proven to be either misleading or negative as a large number of study participants who had a desired to work with children failed to report school psychology as a graduate school option (Gilman & Handwerk, 2001). Graves and Wright (2009) note in their quantitative study of students at three Historically Black Colleges and Universities that 90% of the study participants who desired to attend graduate school, were less interested in pursuing advanced study and careers in school psychology in comparison to other psychology fields. The authors found that student participants in the study relied heavily on faculty members as the greatest source of information regarding psychology disciplines (Graves & Wright, 2009). However, faculty participants in the study indicated that they knew less about school psychology in comparison to other psychology disciplines (Graves & Wright, 2009) suggesting that students in the study should have not solely relied on faculty for graduate school information. In addition to the amount and access to information about graduate study and careers, curricular and co-curricular factors influence career and graduate school choice.

Curricular and Co-Curricular Factors.

Research and observations related to curricular and co-curricular factors that influenced the decision to attend graduate school and/or embarked on a particular career is important in understanding the career and graduate education pursuits of undergraduates. Co-curricular activities such as job shadowing, and participation in mentoring relationships have been shown

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to positively impact career choice (Emily, 2010). Lorelle (2011) found that co-curricular activities such as participation in an academic related club/organization improved the persistence of women of color in STEM fields. Sharad et al (2009) also suggest that mentoring programs would positively influence undergraduate students desired to attend graduate school.

In addition to co-curricular factors, several curricular factors influence career and graduate school choice. Involvement in research programs was shown to increase persistence of women of color in STEM fields (Lorelle, 2011). Experiential education such as internships was a suggested avenue to increase undergraduates in information technology (IT) related majors' pursuit of IT careers (Claire, Nicole, Rebecca, & Angela, 2006). Researchers (Houghton, Braunack-Mayer, & Hiller, 2002) in an Australian study of public health graduates, note that revising curriculum to include internships would better link students to careers in public health. Public health leaders (Koh, Nowinski, & Piotrowski, 2011) in the U.S., while providing no empirical evidence to support the notion, stress the importance of experiential learning opportunities as a mechanism for educating public health undergraduates and preparing them to be the future leaders in public health.

Roe's (2009) case study of a comprehensive university examines the characteristics that enriched the undergraduate public health program including service learning and experiential education. Roe's study (2009) notes the importance of service learning and experiential education to the educational experience but it does not establish how these activities affect outcomes such as graduate school and career choice. Cashman and Seifer (2008) discuss service learning in the context of the theory of experiential education, as an opportunity for students to enhance and deepen their classroom learning. The authors conclude that this deepening of the education experience for undergraduate public health majors serves as a vehicle for these

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students committing to the mission of the public health field: making nations healthier (Cashman & Seifer, 2008). However, Cashman and Seifer's study (2008) falls short of providing evidence that service learning leads to graduate school/career choice.

The environmental factors on college campuses presented above are supported by research and observations. These factors align with Astin's I-E-O model (1993) and support the need for studying how environmental factors influence the graduate and career choice of undergraduate public health students. The exploration of how environmental factors affect graduate school and career choice in various field, as noted in this chapter, is largely absent from literature related to public health. Thus, further study on the correlation between these factors and undergraduate student outcomes is needed.

Summary

Astin's I-E-O model (1993) as the foundation for this study presents a model to display the interrelation between the three themes presented in the literature review. Motivation theory, specifically motivations for attending college serve as the input for the model. The co-curricular experiences including service learning and internships fit into the category of environmental factors. Undergraduate public health majors' choice of graduate school and subsequently careers in public health serve as the outputs for the model. The three themes presented in the literature review work together, as espoused in I-E-O model (Alexander W. Astin, 1993), to study the research problem.

The historical and contemporary context of public health education provides a backdrop for the proposed dissertation study. Understanding that undergraduate public health is a relatively new field emphasizes the need for more research on how motivations' of undergraduate students affect their progression from undergraduate studies into graduate school

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and careers. Such research along with an examination of how demographics characteristics and environmental factors affect graduate study and career choice provide a clear understanding of the key influences on undergraduate public health majors' choice of career and graduate training.

Little research related to public health education exists regarding the relationship between the motivations, environmental factors, and demographic data of public health undergraduates as it relates to their choice of graduate program and career. Thus, further study is needed to determine the factors that encourage and/or discourage undergraduates in public health to pursue graduate degrees in public health and subsequently, careers in public health. This research study provided evidence that assists the site in encouraging more undergraduate students to pursue graduate training in public health. The literature explored in this literature review provides support for the methodology being proposed to explore the research questions of this study.

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Chapter 3: Methodology

The problem being addressed in this study is determining how to recruit more undergraduate public health students to pursue master's level training in public health and subsequently public health careers. As of now, one of the most logical populations to fill the void of graduate students at SPHs is undergraduates who are being exposed to public health curriculum (Guttmacher, Bass, & Nezami, 2008; Riegelman, 2007). This logic has been disproven as undergraduates in public health related courses and programs (i.e. majors and minors) have not pursued graduate training in public health in significantly large numbers (Guttmacher, et al., 2008; Lauren & Dona, 2010).

This explanatory mixed methods study is designed to examine how public health majors' motivations to attend college and other influencing factors affect their desire to pursue graduate training in public health or a medical degree. To examine this overarching research question, the study uses a quantitative correlation relational research design (Creswell, 2008) that is followed by a case study qualitative design (Creswell, 2007). This explanatory mixed methods design allows the researcher to collect relevant data related to the research questions via quantitative methods. In addition, this research design allows the researcher to follow-up on the findings of the quantitative data analysis using qualitative methods. The researcher obtained permission from the site and informed consent from participants. Additionally, the researcher exercised ethical research practices to ensure anonymity and confidentiality to the greatest extent possible.

This study answers the research questions by gathering relevant data from graduate public health students and medical school students at a large urban university by using the Student Motivation for Attending University (SMAU) Scale (Cote & Levine, 1997). In addition,

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focus group interviews with graduate public health students and medical school students who completed the survey were planned to explore findings from the quantitative portion of the study. This research assists the site by providing evidence of why undergraduate public health students choose to pursue public health graduate training and subsequently public health careers.

Site and Population

This section details the site and population for the study. The description includes an explanation of the population, the sample, the site and how the site will be accessed.

Population Description.

The target population for this study is graduate public health students and medical school students at a large urban university. The planned sample is taken from students who were undergraduate public health majors who are currently enrolled in the master's of public health (MPH) program and students in the M.D. program. The university represented in the study was chosen as a site because of its comprehensive nature including both an accredited school of public health and a large medical school. The population of students in the full-time MPH program is roughly 250 students and the approximately population of students in the M.D. program is 1000.

The planned sample for this study includes all students who respond to the survey from the MPH program and M.D. program who were public health undergraduate majors. This population and sample was chosen in an effort to survey students that had extended exposure to public health curriculum as undergraduates, and to capture data from students that have made their graduate study and career choice.

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Site Description.

The site for the study is a large private urban east coast institution in a major metropolitan area. The institution has approximately 25,000 students (16,000 undergraduates, 8,000 graduate and professional school students). The institution is a residential campus with multiple campus locations in the metropolitan area. The institution has over 70 undergraduate majors, more than 75 master's programs and over 30 doctoral programs. In addition, the institution has a doctor of medicine (M.D.) program and a juris doctor (JD) program. As noted, the institution has both an accredited school of public health and a large medical school. The institution is classified by the Carnegie Foundation as a Research University with very high research activity.

Site Access.

Access to the site relied on the permission of the dean of the school of public health and the academic dean of the medical school. Permission to access the site was obtained via formal letter. IRB approval was requested and approved via the appropriate mechanisms. Informed consent was obtained from all study participants.

Research Design and Rationale

This study utilized a sequential explanatory mixed methods design (Creswell, Ivankova, & Stick, 2006). The mixed methods approach was selected for this study to explore the research problem and questions in a more robust manner (Creswell, 2008). Creswell (2008) notes that mixing quantitative and qualitative methods "provides a better understanding of the research program and questions than either method by itself" (p. 252). More specifically, as noted by Onwuegbuzie and Leech (2009), the study uses a partially mixed sequential dominant status design (p. 270). This type of design involves collecting the data in two phases in sequence (Onwuegbuzie & Leech, 2009). One of the two phases, in the case of this study, the quantitative

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phase was given "greater emphasis" (Onwuegbuzie & Leech, 2009, p. 270). The design of the study is considered to be partially mixed because it does not mix, as noted by Onwuegbuzie and Leech (2009), "qualitative and quantitative research within one or more of the following or across the following four components in a single research study: a) the research objective, b) type of data and operations, c) type of analysis, and d) type of inference" (p. 270).

The quantitative phase of the study was based on a correlation relational research design (Creswell, 2008). The quantitative portion of the study occurred first and was followed by a single case study. The quantitative portion of the study utilized the Student Motivations for Attending University (SMAU) Scale (Cote & Levine, 1997). The correlation quantitative design was chosen to allow the researcher to "measure the degree of association between two or more variables" (Creswell, 2008, p. 356). In this study the researcher explored the association between several independent variables and the dependent variable, which is undergraduate students' choice of career and graduate study in public health or medicine.

Focus group interviews (Creswell, 2007) with students who took the survey were employed during the qualitative phase. The qualitative case study design was selected to allow the researcher to conduct an in depth action research oriented study at one institution to explore the research questions (Creswell, 2007). Additionally, the case study design was chosen to prevent the creation of an "unwieldy" (Creswell, 2008, p. 217) study. The explanatory design was ideal for this study because it allowed the researcher to use qualitative methods to further explain the data gathered during the quantitative phase (Creswell, 2008).

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Research Methods

Description of Methods Used

This study's design was based on the fundamental principle of mixed methods research (Onwuegbuzie & Johnson, 2004). This principle asserts that "researchers should collect multiple data using different strategies, approaches, and methods in such a way that the resulting mixture or combination is likely to result in complementary strengths and nonoverlapping weaknesses" (Onwuegbuzie & Johnson, 2004, p. 18). The strategies used in this study include focus group interviews and a survey. Each of these methods will be described in detail in this chapter.

Quantitative Data Collection

The data collection for this explanatory mixed methods design (Creswell, 2007, 2008; Creswell, et al., 2006) occurred in two phases. First, quantitative data was collected via an online version of the Student Motivations for Attending University (SMAU) Scale (Cote & Levine, 1997). The researcher, with permission of the survey's author, created an online version of the SMAU using Qualtrics Survey Software. The survey was administered to students who were (at the time of the study) pursuing a M.D. degree from the study's site and who were undergraduate public health majors; and to students who were (at the time of the study) pursuing a MPH degree from the study's site from any undergraduate major including public health. The researcher obtained permission to conduct the study from the appropriate academic administrators from the school of public health and the medical school. Upon receiving permission, the researcher asked for and was granted access to the email addresses of all full-time MPH students, and M.D. students who were undergraduate public health majors. The email addresses were sent to a third party doctoral trained evaluation consultant who the researcher

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chose to assist with the data collection. Since the institution uses email addresses that do not include the names of the students, anonymity was maintained.

The researcher via the aforementioned third party sent an email with a description of the study, instructions for completed the survey including the link to the online survey, text about informed consent, and a statement about the anonymity and confidentiality of the students' responses, a deadline for completing the survey, and notification that all survey respondents will be entered into a raffle for one of four $100 gift cards to local retail stores and restaurants. The email was sent to students in the fall of 2012. The quantitative data collection was followed by the qualitative data collection via focus group interviews conducted by a third party with students who completed the survey. The data from the surveys was analyzed and key findings and correlations probed in the qualitative stage of data collection.

Qualitative Data Collection

The qualitative data collection stage followed the quantitative phase. The purpose of the qualitative stage was to explain or better understand the data from the quantitative phase of data collection. During the qualitative phase, data was gathered by conducting focus group interviews with students who completed the survey. Students were asked during the quantitative phase if they would participate in a one hour long focus group to explore the research topic further. At the time students were asked about their interest to participate in a focus group, they were notified that all focus group participants would receive a $25 gift card. Study participants who indicated that they were interested in a focus group interview, were asked to provide their email address in a manner that maintained their anonymity. The students' email addresses were sent to a third party who invited the students to a focus group interview in which the third party conducted.

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The third party contacted students in November of 2012 to coordinate their participation in one of two focus groups with an anticipated participation of five to ten students in each group. One focus group was planned to include MPH students who were undergraduate public health majors and the other focus group was planned to include M.D. students who were undergraduate public health majors. Only one M.D. degree program student participated in the survey and thus, due to the low participation rate of M.D. students in the survey, the focus group participants' composition was changed, with IRB approval. Therefore, one focus group was conducted with MPH students who were undergraduate public health majors; and another with MPH students who were not undergraduate public health majors. The timeline for data collection is below (Figure 4).

Time Period	Project Activity
October and November	Online survey conducted
November	Performed basic analysis to confirm that the focus group questions would follow-up on themes from the quantitative data
November	Updated focus group questions and interview protocol
December	Two focus group interviews conducted

Figure 4. Data Collection Timeline

Description of Methods Used

Each of the methods utilized in this study is described below in detail. The quantitative method is explain first and is followed by an explanation of the qualitative method.

Student Motivations for Attending University (SMAU) Scale.

The online version of the SMAU Scale created by the researcher was utilized to capture quantitative data regarding the motivations that students have for attending college. The SMAU20 version of the SMAU was utilized in this study to allow for comparisons of the five subscales. Each subscale included four questions. The survey also collected demographic data

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including which graduate/professional degree, MPH or M.D., study participants are currently pursuing. The survey for the study is listed in Appendix A.

Instrument description.

The Student Motivations for Attending University (SMAU) Scale is a 20 question paper and pencil questionnaire. As noted previously, for the purposes of this study the survey was translated into an online survey utilizing the same questions from the paper and pencil version. The Student Motivations for Attending University (SMAU) Scale includes closed ended multiple choice questions. The online version of survey captured demographic information including undergraduate major, ethnicity, and undergraduate GPA. For the purposes of this study, the researcher added questions to ascertain students' level of participation, during their undergraduate education, in public health internships, research experiences and service learning activities. Study participants were also asked if participation in public health internships, research experiences and service learning activities influenced their choice of graduate/professional school degree program.

The SMAU Scale is based on the work of previous theories (Daniel Yankelovich inc. & JDR 3rd Fund., 1972; Durkheim, 1951). The authors of the SMAU Scale created an "empirically based typology of student motivations for attending college" (Cote & Levine, 1997). The survey creators piloted the SMAU Scale to a group of students at a large Canadian university (Cote & Levine, 1997). The survey was tested for concurrent validity by correlated the SMAU with other typologies (Astin, 1993). The reliability of the survey was established utilizing internal consistency reliability. Specifically, the survey creators employed factor analysis to determine internal consistency (Cote & Levine, 1997). The SMAU was shown to have predictive validity in terms of its correlation with outcomes (Cote & Levine, 1997; Côté &

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Levine, 2000; Phinney, et al., 2006). As noted by the survey creators, the survey includes five motivation subscales. The subscales are 1) careerism-materialism (CAR), 2) Personal-Intellectual Development (PER), 3) Humanitarian (HUM), 4) Expectation-Driven (EXP), and 5) Default (DEF). These subscales are described below.

Careerism-materialism (CAR) motivation is related to viewing attendance in college as a "means of gaining money, status, a career, success, and the finer things in life" (Cote & Levine, 1997, p. 233). Personal-Intellectual Development (PER) motivations revolve around "personal growth, studying and learning, and understanding the complexities of life and the world" (Cote & Levine, 1997, p. 233). Humanitarian (HUM) motivations involve "helping the less fortunate, improving the world, and changing the system" (Cote & Levine, 1997, p. 233). Expectation-Driven (EXP) motivations are responses to "expectations and pressures from family and friends" (Cote & Levine, 1997, p. 233) to attend college and get a degree. The Default (DEF) motivation relates to "students not really knowing why" (Cote & Levine, 1997, p. 233) they are in college except for their belief that college because it is better than other options.

Participant selection.

Participants for the quantitative phase were selected using purposive criterion sampling (Yu & Teddlie, 2007). While purposive sampling is normally reserved for qualitative methods, List (2005) notes that purposive sampling can be used in the quantitative phase of research studies. Participant selection using purposive sampling is ''based on a specific purpose rather than randomly'' (Tashakkori & Teddlie, 2003, p. 713). The criterion for the participants was that they must be students in the full-time MPH program from any undergraduate major, and students M.D. programs who were undergraduate public health majors. This population was chosen purposefully because of their sizable exposure to public health curriculum and their

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choice of advanced study in public health or medicine. Additionally, this population was selected because studies (Guttmacher, et al., 2008) and observations (Lauren & Dona, 2010) of similar populations, particularly those who were undergraduate public health majors, displayed that these students don't pursue public health graduate training in significant numbers. Also, this population was selected because researchers (Rosenstock, et al., 2008) hypothesize that this population was key to solving the public health workforce shortage.

Identification and invitation.

Participants were identified based on their current enrollment in the full-time MPH or M.D. degree programs, with a focus on students who completed an undergraduate major in public health. The Dean at the school of public health and the Vice Dean for Educational and Academic Affairs at the medical school, after permission was given to perform the study, were asked to have the email addresses of students from the above mentioned criteria sent to a third party chosen by the researcher. The third party emailed all students in the sample the link for the online survey along with text describing the research study, instructions for completing the survey, a note about informed consent and notification that all survey respondents will be entered into a raffle which includes four $100 gift cards as raffle items. The third party was utilized to ensure the anonymity of the students and to prevent study participants from providing responses based on the researcher's connection to the study's site.

Data collection.

The data from the completed surveys was gathered by the researcher and all incomplete surveys were discarded. The data from the surveys were entered into a SPSS to prepare for the data analysis phase.

Data analysis.

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The data from the surveys was analyzed using SPSS. The data analysis focused on uncovering correlations between the dependent variable and various independent variables. The study's dependent variable was the participants' choice of career and graduate program in either public health or medicine. The independent variables included the participants' motivations for attending college, the participants' participation in and perceived influence of health-related internships, research experiences, and/or service learning opportunities, as well as demographic data.

Mean differences were tested in continuous Student Motivations for Attending University (SMAU) survey subscales and Career/Graduate School choice. The analysis of variance (ANOVA) technique was employed to explore the relationship between the SMAU subscales and demographic variables. With this model, the mean of an arbitrary number of groups, each of which follows a normal distribution with the same variance, can be compared. The significance level was set at alpha = 0.05. Statistical analyses were performed to check for significant violations in the distribution assumptions.

In addition, chi-square tests (Ravid & Oyer, 2011) were employed in order to analyze the relationship of co-curricular/curricular experiences on career/graduate school choice as well as the relationship between demographics characteristics and career/graduate school choice. These initial evaluations were followed by a formal statistical assessment using fisher's exact test which is a non-parametric test, designed to assess the statistical association between two categorical variables without making any explicit assumptions about the sample distribution. This is the preferred method when any of the contingency table cell sizes are less than 5 (Samuels, Witmer, & Schaffner, 2012).

Focus group interviews.

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Focus group interviews were conducted with study participants who completed the SMAU in an effort to probe the findings from the quantitative phase. The interview was a "semistructured interview" (Merriam, 2009, p. 90). Two focus group interviews were conducted. One of the groups was comprised of students in the MPH program who were undergraduate public health majors. The other group included MPH students who were not undergraduate public health majors. These interviews focused on probing the findings established in the quantitative phase of this study.

Instrument description.

The instrument used to guide the focus group interviews consisted of an interview protocol with ten open-ended interview questions. The interview was developed to follow-up on the influencing factors identified in the literature that affect advanced study and career choice. The associations measured in the analysis of the data from the SMAU Survey were also probed via the instrument. In particular, questions focused on probing the positive and negative correlations between the independent variables and the dependent variable.

Participant selection.

The participants for the focus group interviews were selected using convenience sampling (Creswell, 2008). When students finished taking the online SMAU Survey, they were redirected to a separate webpage. On this webpage, study participants were asked two questions: 1) if they would be willing to participate in a focus group related to the research topic, and 2) if they want to be entered into a raffle for one of four $100 gift cards. Those students that answered positively to either or both questions were prompted to provide their email address and their current degree program which was sent to a third party identified by the researcher. The webpage included a statement confirming that students' who provided their email address would

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not have any of their SMAU Survey answers connected to their email address. This maintained the students' anonymity and prevented survey answers from being connecting to data collected via the survey. The focus group interviews were intended to have between five to ten study participants.

Identification and invitation.

Students, as noted above, were identified based on their willingness to participate in a focus group. Students were informed that indicating a willingness to participate in a focus group in no way connects them to the data collected via the SMAU survey. All contact info for study participants was separated from the SMAU survey data as noted previously. Therefore, the researcher maintained the anonymity of research participants who took the SMAU Survey. The researcher's chosen third party contacted the students via email and invited them to participate in a focus group. Specifically, the third party invited MPH students who were undergraduate public health majors to participate in a focus group, and MPH students who were not undergraduate public health majors to participate in a separate focus group. All students who participated in a focus group received a $25 gift card.

The focus group interviews took place online using WIMBA virtual classroom software. All focus group participants were asked to join the virtual focus group sessions using a pseudonym. In addition, focus group participants were informed that their participation in the focus group was confidential and that any quotes that the researcher used would be attributed to a pseudonym. The use of a pseudonym continued to maintain the anonymity of the study participants.

Data collection.

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The data from the interviews was collected by the researcher's third party. The third party made an audio recording of the focus group interviews via the WIMBA archive feature. This audio recording was utilized by the third party to transcribe the focus group interviews. Any information that could was construed as information that could be linked to the identity of study participants was removed from the transcript by the third party. Examples of possible identifiable information include a focus group participant saying their name, or providing their personal email address with their name or webpage during the interview.

The transcript provided by the third party was entered into NVivo qualitative data analysis software for coding. This coding along with the transcribed interview was presented to researcher's dissertation chair for feedback. The feedback was utilized to update the codes. The analysis of the interviews focused on the themes probed during the focus group interviews.

Data analysis.

Data for this study was gathered via virtual focus group interviews. The interviews were audio recorded and transcribed verbatim by a third party chosen by the researcher. Pseudonyms were used by focus group participants to protect their identity. The data from the interview was analyzed using grounded theory coding techniques (Creswell, 2007, pp. 64-67). The interview was analyzed using a coding technique where codes are grouped using open coding, axial coding and finally a selective coding technique to uncover central themes (Merriam, 2009, pp. 178-181).

The reliability and validity of the qualitative data was assessed using two criteria: credibility, and confirmability (Merriam, 2009). First, credibility was established by examining how well the codes represent the key themes in the data. Additionally, the researcher's third party, as espoused by Merriam (2009), adequately engaged in the data collection (p. 219) by audio recording the interview and transcribing the interview verbatim (Maxwell, 2005, p. 110).

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Secondly, confirmability, which refers to the extent to which the study's methods, data collection and analysis are thoroughly described (Merriam, 2009), was established by review from the researcher's dissertation committee. Quotes from the focus group participants are provided in chapter 4 to support the conclusions that are reached. All quotes are verbatim with the exception of a few minor edits to improve clarity. Pseudonyms were used for the focus group participants in order to ensure confidentiality and to protect the privacy of the interviewees.

The Use of Incentives

As noted previously, incentives were utilized to encourage a high response rate. The incentives were gift cards from giftcertificates.com. The recipients of the gift cards were chosen by using a random number generator. The gift cards were distributed via email by the researcher's third party. This ensured that research participants received their gift cards without the researcher compromising the anonymity of survey respondents and focus group participants.

Ethical Considerations

An Exempt Review IRB approval was requested because the study involves less than minimal risks to human subjects. Study participants in the quantitative and qualitative phases remained anonymous. Focus group participants' identities were protected by utilizing pseudonyms and a third party interviewer.

As noted by Creswell and Plano Clark (2011), mixed methods studies should include the plans of both the quantitative and qualitative phases in the initial IRB approval request. The IRB approval for this mixed methods study included the plans for both data collection phases. In addition, an amendment to the IRB application was sought based on quantitative findings which supported changing the focus group interview protocol and population submitted with the original IRB application (Creswell & Plano Clark, 2011).

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There are various ethical considerations for the study. The anonymity of student participants was ensured by not collecting identifiable information via the quantitative survey. In addition, as noted previously email addresses which could have possibly been linked to study participants were separated from survey responses, and only viewed by a third party. Additionally, informed consent was obtained from all participants. Informed consent was noted in the text that students received when they were invited to participate in the online survey. The informed consent information for the student participants in the quantitative phase of the study detailed the students' rights including their freedom to withdraw from the study at any time prior to the completion of the survey.

The anonymity of the focus group participants was ensured by using virtual focus group sessions. Focus group participants were asked to utilize a pseudonym at that time they join the virtual focus group session. The third party noted at the beginning of the focus group interviews that only pseudonyms were going to be used in reporting findings and thus, answers to focus group questions were anonymous. The third party also stated that the study participants could leave the focus group at any time. All data including completed surveys was kept on a secure computer only accessible by the researcher and third party. Additionally, any written notes and audio recordings were kept on secure computers only accessible by the research and the researcher's third party.

Summary

The methodology as described in Chapter 3 provides an explanation of the how the research for this study was conducted. This mixed methods research study was designed to examine undergraduate public health majors' motivations for attending college, the influence of service learning/community service, research experiences, and internships, as well as

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demographic information in relationship to students' choice of advanced study and careers in public health or medicine. The study utilized the Student Motivations for Attending University (SMAU) Scale to gather quantitative data and focus groups to gather qualitative data. The reliability and validity of the SMAU was examined in this chapter as well as specifics about how data for the study was collected and analyzed. In addition, ethical considerations related to the study were reviewed along with the appropriate solutions, if applicable, to these ethical considerations. The study informed educators and administrators at the site on how to increase the number of students attending public health graduate programs and subsequently pursing public health careers; and provided evidence to support curricular/co-curricular enhancements for the site's undergraduate public health major.

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Chapter 4: Findings and Results

Introduction

Literature indicates that motivations for attending college play a significant role in student outcomes including career and graduate school choice (Cote & Levine, 1997; Diaz, 2010; Fernández, et al., 2006; Gallagher, Clarke, & Wilson, 2008; Haase & Lautenschläger, 2011). Additionally, research concludes that motivations interact with students' experiences to determine outcomes (Cote & Levine, 1997; Astin, 1999). Understanding how career and graduate study choice is influenced by the motivations for attending college, demographic characteristics, and environmental factors such as participation in service learning and internships of undergraduates who study public health is the foundation for this research study.

The field of public health is expected to experience a crisis due to a shortage of "250,000 public health professionals by 2020" (Association of Schools of Public Health, 2008). There are many suggested pathways to solve this crisis. One solution is to funnel more individuals into graduate programs at schools of public health (Rosenstock, et al., 2008). One of the populations that could be easily directed into graduate school in public health is undergraduates who study public health (R. K. Riegelman, 2008); however these students are not pursuing public health graduate training in large numbers (Guttmacher, et al., 2008; Lauren & Dona, 2010). Thus, this research study examined why and how these students make their advance study and/or career choice.

This study's purpose was to explore how students' motivations for attending college, demographics, as well as curricular and co-curricular factors affect students' decisions to go to public health graduate training programs or medical school. The significance of this study is that it provided evidence for the site that supports curricular changes, recruitment strategies, and

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other ways to influence undergraduate students to choose public health for pursue advance study and careers. The study utilized three research questions to examine the problem being research:

1. How do the motivations for attending college of undergraduate public health majors affect their desire to attend graduate programs in public health?
2. What curricular and/or co-curricular activities influence public health undergraduates to pursue or not pursue public health graduate training?
3. What demographics characteristics determine the likelihood of undergraduate public health students pursuing a public health graduate degree?

The research questions were examined with both quantitative and qualitative methods.

The quantitative method for the study included an online survey which includes the Student Motivations for Attending University Scale along with additional questions regarding demographics and co-curricular/curricular experiences. The qualitative method for the study consisted of two online focus groups that explored the first two research questions. The findings and results gleaned from the analysis of the data collected using the above described research methods follows. Descriptive statistics are presented detailing the demographics and co-curricular/curricular experiences of the students who participated in the study. Inferential statistics are described that explore the relationship between career/graduate school choice and 1) students' motivations for attending college, 2) students' perception of the value of M.D. programs in comparison to MPH programs, 3) students' knowledge of the medical and public health fields, 4) co-curricular/curricular experiences, and 5) demographics. Qualitative data will be analyzed to build upon the quantitative findings.

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Findings - Descriptive Statistics

Descriptive statistics describe the data that was collected via the online survey (see Appendix B). The targeted population included a total of 256 students: 1) 8 MD students and 2) 248 full-time MPH students. Of the 256 students that were invited to participate, 114 completed the entire online survey which is a 45% response rate (Table 1). One respondent provided clearly erroneous data which was removed for the purposes of this analysis.

Table 1 – Graduate Degree Program

Degree Program	N	Percent
MPH	112	99.1
MD	1	0.9
Total	113	100.0

Undergraduate Major.

Study participants were asked to identify if they were undergraduate public health majors. Of the 113 respondents, 19 (17%) completed an undergraduate public health major (Table 2). The students who were not public health majors (Table 3) were comprised of 54% natural science majors, 28% social/behavioral science majors and 1% other.

Table 2 – Undergraduate Public Health Major

Response	N	Percent
Yes	19	16.8
No	94	83.2
Total	113	100.0

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Table 3 - Undergraduate Major

Discipline	N	Percent
Natural Science	61	54.0
Social/Behavioral Science	32	28.3
Public Health	19	16.8
Other	1	0.9
Total	113	100.0

Gender, Race and Undergraduate GPA.

The study's participants were comprised of a largely female population. Roughly 84% of the study participants were female (Table 4). This population of females is higher than the 70% female population represented in the entire population of MPH students at the site. With regards to race, the majority of study participants were Caucasian (42%), African American (25%), and Asian (17%). The complete breakdown of race of the study's participants in located in Table 5 and is consistent with the percentages of the entire MPH population at the site. Approximately 60% of the study participants reported GPAs at or higher than the average GPA (3.21) of the entire MPH population (Table 6). Thus, the study participants as self-reported represent a slightly more academically talented group of students than the entire MPH population at the site.

Table 4 - Gender

Gender	N	Percent
Male	18	15.9
Female	95	84.1
Total	113	100.0

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Table 5 - Race/Heritage

Race	N	Percent
African	3	2.7
African American	28	24.8
Arab	1	0.9
Asian	19	16.8
Caucasian	48	42.5
Latino	6	5.3
Multi-racial	8	7.1
Total	113	100.0

Table 6 - Undergraduate GPA

GPA	N	Percent
3.8 to 4.0	17	15.0
3.6 to 3.79	15	13.3
3.4 to 3.59	20	17.7
3.2 to 3.39	16	14.2
3.0 to 3.19	21	18.6
2.8 to 2.99	20	17.7
2.6 to 2.79	1	.9
2.4 to 2.59	3	2.7
Total	113	100.0

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Career Plans.

The majority (55%) of students indicated that their career choice at the beginning of their undergraduate education was medicine (Table 7). Nine percent of respondents chose public health as a career choice at the beginning of their undergraduate experience. Additionally, 34% of the study's participants responded that their career choice was a career field not listed as a response to the question. These fields included but were not limited to natural science research field (N=9) such as biology, biomedical research, and zoological research; anthropology (N=3), education/teaching (N=2), nursing (N=2), and psychology (N=2).

In juxtaposition to the career choice at the beginning of their undergraduate education, the majority (72%) of study respondents at the time of the study indicated that public health was their career of choice (Table 8). Medicine was a distance second choice (21%). A small percentage (5%) chose fields not represented in the possible responses to the question. This group (N=6) includes two respondents desiring further graduate study in an undisclosed field, one respondent desiring to obtain a Ph.D. in Environmental Health, two respondents desiring to pursue health related careers, and one respondent desiring to pursue a career that combined public health and medicine. These results indicate that study participants had originally chosen medicine as a career path and changed their career plans to public health as they progressed in their education. This phenomenon is explored more in depth through the inferential statistics this chapter.

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Table 7 - Career Plans as a Freshman

Career Field	N	Percent
Public Health	10	8.8
Medicine	62	54.9
Dentistry	2	1.8
Veterinary Medicine	0	0.0
Law	1	0.9
Other	38	33.6
Total	113	100.0

Table 8 - Career Plans in Graduate School

Career Field	N	Percent
Public Health	81	71.7
Medicine	24	21.2
Dentistry	1	0.9
Veterinary Medicine	0	0.0
Law	1	0.9
Other	6	5.3
Total	113	100.0

Knowledge and Perception of Medicine and Public Health as an Undergraduate.

Study participants were asked about their perception of graduate/professional degree programs in public health and medicine; and their knowledge of the medical and public health fields as career at the beginning of their undergraduate education. Forty one percent of respondents perceived at the start of their undergraduate experience that public health MPH degree programs were valuable or extremely valuable (Table 9). Eighty eight percent of study participants responded that MD degree programs were valuable or extremely valuable (Table 10). These results show that study participants felt at the beginning of their undergraduate experience that MD programs were a more valuable option than MPH programs.

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Table 9 - Perception of Public Health Graduate Program

Perception	N	Percent
Not Valuable	18	15.9
Somewhat Valuable	49	43.4
Valuable	36	31.9
Extremely Valuable	10	8.8
Total	113	100.0

Table 10 - Perception of Medical Degree Program

Category	N	Percent
Not Valuable	4	3.5
Somewhat Valuable	10	8.8
Valuable	47	41.6
Extremely Valuable	52	46.0
Total	113	100.0

Eighty five percent of study participants had little or no knowledge of the public health field at the beginning of their undergraduate experience (Table 11). Conversely, 45% of respondents indicated that they had little or no knowledge of the medical field (Table 12). This data shows that study participants at the beginning of their undergraduate education were more knowledgeable about the medical field than they were regarding the public health field as a career option. Additionally, 62% of study participants noted that they did not have enough information to make an informed career/graduate study choice related healthcare fields during their first year in their undergraduate education (Table 13).

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Table 11 - Knowledge of Public Health

Category	N	Percent
No Knowledge	49	43.4
Little Knowledge	47	41.6
Fairly Knowledgeable	15	13.3
Extremely Knowledgeable	2	1.8
Total	113	100.0

Table 12 - Knowledge of the Medical Field

Category	N	Percent
No Knowledge	7	6.2
Little Knowledge	44	38.9
Fairly Knowledgeable	52	46.0
Extremely Knowledgeable	10	8.8
Total	113	100.0

Table 13 – Enough Information to Make an Informed Career Choice

Response	N	Percent
Yes	43	38.1
No	70	61.9
Total	113	100.0

Undergraduate Institution Type.

The largest percentage (36%) of respondents in the study completed their undergraduate education at large public universities (Table 14). The next largest group of respondents (24%) was from small private colleges/universities. In comparison, 52% of study participants were from public institutions while 47% were from private colleges/universities. Additionally, 42% of students in the study attended large institutions, 29% were from medium institutions, and 28% matriculated at small colleges/universities. The relationship between institution type and

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students graduate study/career choice are explored in the inferential statistics section of this chapter.

Table 14 – Undergraduate Institution Type

Institution Type	N	Percent
Large Public University (20,000 or more students)	41	36.3
Large Private University (20,000 or more students)	6	5.3
Medium Public University/College (5000 to 19,999 students)	13	11.5
Medium Private University/College (5000 to 19,999 students)	20	17.7
Small Public College/University (Less than 5000 students)	5	4.4
Small Private College/University (Less than 5000 students)	27	23.8
Historically Black College or University	1	0.9
Total	113	100.0

Parental Education.

The majority of respondents (81% for maternal education level; and 82% for paternal education level) had parents who were college educated (Tables 15 and 16). This includes 66% of study participants stating that their mother completed an associate's degree or higher; and 72% indicating that their father had an associate's degree or higher. These results indicate that the study's population was the offspring of college educated parents.

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Table 15 - Education Level of Mother

Education Level	N	Percent
Less than high school	4	3.5
High school/GED	16	14.2
Some College	16	14.2
2-year College Degree	10	8.8
4-year College Degree	37	32.7
Master's Degree	16	14.2
Doctoral Degree	3	2.7
Profession Degree (JD, MD)	9	8.0
Unknown	2	1.8
Total	113	100.0

Table 16 - Education Level of Father

Education Level	N	Percent
Less than high school	8	7.1
High school/GED	10	8.8
Some College	12	10.6
2-year College Degree	10	8.8
4-year College Degree	34	30.1
Master's Degree	18	15.9
Doctoral Degree	6	5.3
Profession Degree (JD, MD)	13	11.5
Unknown	2	1.8
Total	113	100.0

Influence of Experiential Learning Experiences on Graduate School Choice.

Study participants were asked if various experiential learning experiences influenced their graduate school choice. Seventy-two (64%) of the 113 respondents indicated that they had participated in a health related internship (Table 17). Of the 72 students, 90% felt that participation in a health related internships assisted them in deciding to go to graduate school.

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Next, 75 (66%) of the students in the study reported doing a service learning or community service experience in a health related field (Table 18). Seventy one (95%) of the 75 students stated that their community service/service learning opportunity in a health related field helped them decide to attend graduate school.

Lastly, 46 students (41%) in the study responded that they had completed work as a research assistant for a faculty member in a health related field (Table 19). The majority of these students (89%) thought that their research assistant position influenced their decision to attend graduate school. This data is analyzed more in the inferential statistics and the qualitative analysis sections of this chapter.

Table 17 - Influence of Internship

Category	N	Percent
Strongly Agree	26	36.1
Agree	39	54.2
Disagree	6	8.3
Strongly Disagree	1	1.4
Total	72	100.0

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Table 18 - Influence of Service Learning/Community Service

Category	N	Percent
Strongly Agree	29	38.7
Agree	42	56.0
Disagree	4	5.3
Strongly Disagree	0	0.0
Total	75	100.0

Table 19 - Influence of RA Position

Category	N	Percent
Strongly Agree	25	54.3
Agree	16	34.8
Disagree	5	10.9
Strongly Disagree	0	0.0
Total	46	100.0

Results - Inferential Statistics

Data from the quantitative portion of the study was analyzed to determine if any statistical significance existed in the relationship between the subscales on the SMAU Scale and graduate school/career choice at the beginning of a student's undergraduate education. Additionally, the relationship between the subscales on the SMAU Scale and 1) the knowledge of the public health and medical professions that students had as a first year undergraduate and 2) the perception that first year undergraduates had of public health graduate programs and M.D. programs; is examined.

In order to explore the relationships, first the researcher tested for mean differences in continuous SMAU subscales and career/graduate school choice. After determining the mean scores, a one-way analysis of variance (ANOVA) was utilized to examine if the difference

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between the means was statistically significant. The significance level was set at .05 and therefore a p value less than .05 was significant.

Motivation and Graduate School/Career Choice as a Freshman.

First, the relationship between the subscales on the SMAU Scale and graduate school/career choice at the beginning of a student's undergraduate education is described. The mean score for each subscale is represented in tables 20 through 24; and the combined subscale mean score is represented in table 25. Table 26 displays the ANOVA results for each subscale and the combined ANOVA results for all subscales.

Table 20 - Mean Score for Careerism-Materialism (CAR) Subscale (Career Choice)

Category	N	Mean	SD
Public Health	10	5.43	0.72
Medicine (M.D., D.O)	62	5.75	0.80
Dentistry	2	5.50	0.71
Law	1	6.50	
Other	38	5.73	0.76

Table 21 - Mean Score for Default (DEF) Subscale (Career Choice)

Category	N	Mean	SD
Public Health	10	2.15	0.91
Medicine (M.D., D.O)	62	2.02	0.87
Dentistry	2	1.88	0.88
Law	1	1.50	
Other	38	2.30	1.00

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Table 22 - Mean Score for Expectation-Driven (EXP) Subscale (Career Choice)

Category	N	Mean	SD
Public Health	10	3.40	0.77
Medicine (M.D., D.O)	62	3.67	1.42
Dentistry	2	4.50	1.41
Law	1	2.00	
Other	38	3.93	1.62

Table 23 - Mean Score for Humanitarian (HUM) Subscale (Career Choice)

Category	N	Mean	SD
Public Health	10	6.28	0.85
Medicine (M.D., D.O)	62	6.41	0.63
Dentistry	2	6.13	0.53
Law	1	7.00	
Other	38	5.86	1.08

Table 24 - Mean Score for Personal-Intellectual Development (PER) Subscale (Career Choice)

Category	N	Mean	SD
Public Health	10	6.10	0.80
Medicine (M.D., D.O)	62	6.31	0.60
Dentistry	2	6.25	0.00
Law	1	7.00	
Other	38	6.10	0.66

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Table 25 - Mean Score for All Subscales Combined (Career Choice)

Category	N	Mean	SD
Public Health	10	23.35	2.22
Medicine (M.D., D.O)	62	24.16	2.67
Dentistry	2	24.25	2.47
Law	1	24.00	
Other	38	23.91	2.35

Table 26 - ANOVA Results for SMAU Subscales and Combined Subscales (Career Choice)

	Sum of Squares	*Mean Square*	*F(4,108)*	*Sig. (p)*
CAR				
Between Groups	1.63410573	0.40852643	0.67	0.6138
Within Groups	65.80394737	0.60929581		
DEF				
Between Groups	2.35739592	0.58934898	0.70	0.5967
Within Groups	91.52202886	0.84742619		
EXP				
Between Groups	7.1111319	1.7777830	0.84	0.4997
Within Groups	227.2284699	2.1039673		
HUM				
Between Groups	7.97411072	1.99352768	2.89	0.0257
Within Groups	74.55354414	0.69031059		
PER				
Between Groups	1.86032057	0.46508014	1.15	0.3390
Within Groups	43.83436969	0.40587379		
All Subscales Combined				
Between Groups	6.1590143	1.5397536	0.24	0.9142
Within Groups	688.4637733	6.3746646		

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Several hypotheses were formulated regarding the relationship between students' motivation as reported on each SMAU subscale and the combined SMAU score at the beginning of their undergraduate education and their desired career path (Table 27). H_0, the null hypothesis indicates that no significant difference was able to be determined. While H_1, the alternative hypothesis indicates that a significant difference was able to be determined. Only one of the subscales, Humanitarian had significance related to career choice. The p value for the Humanitarian subscale was .0257 and therefore the alternative hypothesis was accepted. In particular, the analysis showed that students who indicated that public health was their career choice at the beginning of their undergraduate education had on average higher Humanitarian subscale scores than students who indicated their career choice was not public health, law, or medicine. For all other subscales and the combined score, the null hypothesis was accepted as none of these p values were less than .05.

Table 27 - Motivation and Graduate School/Career Choice as a Freshman Summary of Significance

SMAU Subscale	*Significance (p)*	*Hypothesis Accepted*
Career-Materialism	0.6138	H_0
Default	0.5967	H_0
Expectation-Driven	0.4997	H_0
Humanitarian	0.0257	H_1
Personal-Intellectual Development	0.3390	H_0
All Subscales Combined	0.9142	H_0

Motivation and Perception of Public Health Graduate Programs as a Freshman.

The relationship between the subscales on the SMAU Scale and the perceived value that study participants had of public health graduate programs at the beginning of a student's

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undergraduate education is explained. The mean score for each subscale is illustrated in tables 28 through 32; and the combined subscale mean score is represented in table 32. Table 34 illustrates the ANOVA results for each subscale as well as the combined ANOVA results for all subscales.

Table 28 - Mean Score for Careerism-Materialism (CAR) Subscale (Perception of Public Health Graduate Programs)

Category	N	Mean	SD
Not Valuable	18	5.93	0.71
Somewhat Valuable	49	5.54	0.89
Valuable	36	5.74	0.61
Extremely Valuable	10	6.10	0.66

Table 29 - Mean Score for Default (DEF) Subscale (Perception of Public Health Graduate Programs)

Category	N	Mean	SD
Not Valuable	18	2.46	0.70
Somewhat Valuable	49	2.08	0.95
Valuable	36	1.97	0.90
Extremely Valuable	10	2.20	1.11

Table 30 - Mean Score for Expectation-Driven (EXP) Subscale (Perception of Public Health Graduate Programs)

Category	N	Mean	SD
Not Valuable	18	4.01	1.30
Somewhat Valuable	49	3.42	1.53
Valuable	36	4.03	1.28
Extremely Valuable	10	3.68	1.74

Table 31 - Mean Score for Humanitarian (HUM) Subscale (Perception of Public Health Graduate Programs)

Category	N	Mean	SD
Not Valuable	18	6.13	0.88
Somewhat Valuable	49	6.22	0.63
Valuable	36	6.19	1.11
Extremely Valuable	10	6.40	0.83

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Table 32 - Mean Score for Personal-Intellectual Development (PER) Subscale (Perception of Public Health Graduate Programs)

Category	N	Mean	SD
Not Valuable	18	6.07	0.81
Somewhat Valuable	49	6.19	0.67
Valuable	36	6.28	0.52
Extremely Valuable	10	6.50	0.51

Table 33 - Mean Score for All Subscales Combined (Perception of Public Health Graduate Programs)

Category	N	Mean	SD
Not Valuable	18	24.60	2.44
Somewhat Valuable	49	23.45	2.65
Valuable	36	24.22	2.14
Extremely Valuable	10	24.88	2.68

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Table 34 - ANOVA Results for SMAU Subscales and Combined Subscales (Perception of Public Health Graduate Programs

	Sum of Squares	*Mean Square*	*F(3, 109)*	*Sig. (p)*
CAR				
Between Groups	3.83322742	1.27774247	2.19	0.0934
Within Groups	63.60482568	0.58353051		
DEF				
Between Groups	3.00044235	1.00014745	1.20	0.3135
Within Groups	90.87898243	0.83375213		
EXP				
Between Groups	9.2765916	3.0921972	1.50	0.2193
Within Groups	225.0630102	2.0647983		
HUM				
Between Groups	0.50343435	0.16781145	0.22	0.8802
Within Groups	82.02422052	0.75251578		
PER				
Between Groups	1.38357207	0.46119069	1.13	0.3385
Within Groups	44.31111820	0.40652402		
All Subscales Combined				
Between Groups	30.7295053	10.2431684	1.68	0.1752
Within Groups	663.8932823	6.0907641		

Several hypotheses were proposed related to the relationship between students' motivation as reported on each SMAU subscale and the combined SMAU score at the beginning of their undergraduate education and their perception of public health graduate programs (Table 35). H_0, the null hypothesis indicates that no significant difference was able to be determined. While H_1, the alternative hypothesis indicates that a significant difference was able to be determined. The null hypothesis was accepted for all the SMAU subscales and the combined score as none of these p values were less than .05.

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Table 35 - Motivation and Perception of Public Health Graduate Programs as a Freshman Summary of Significance

SMAU Subscale	*Significance (p)*	*Hypothesis Accepted*
Career-Materialism	0.0934	H_0
Default	0.3135	H_0
Expectation-Driven	0.2193	H_0
Humanitarian	0.8802	H_0
Personal-Intellectual Development	0.3385	H_0
All Subscales Combined	0.1752	H_0

Motivation and Perception of MD Programs as a Freshman.

The relationship between the subscales on the SMAU Scale and the perceived value that study participants had of MD programs at the beginning of a student's undergraduate education is described below. The mean score for each subscale is listed in tables 36 through 40; and the combined subscale mean score is in table 41. Table 42 shows the ANOVA results for each subscale and the combined ANOVA results for all subscales.

Table 36 - Mean Score for Careerism-Materialism (CAR) Subscale (Perception of MD Programs)

Category	N	Mean	SD
Not Valuable	4	4.44	0.55
Somewhat Valuable	10	5.70	0.63
Valuable	47	5.53	0.77
Extremely Valuable	52	5.99	0.68

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Table 37 - Mean Score for Default (DEF) Subscale (Perception of MD Programs)

Category	N	Mean	SD
Not Valuable	4	1.81	0.63
Somewhat Valuable	10	2.45	0.79
Valuable	47	2.11	0.82
Extremely Valuable	52	2.08	1.04

Table 38 - Mean Score for Expectation-Driven (EXP) Subscale (Perception of MD Programs)

Category	N	Mean	SD
Not Valuable	4	3.06	0.59
Somewhat Valuable	10	3.83	1.55
Valuable	47	3.41	1.39
Extremely Valuable	52	4.05	1.47

Table 39 - Mean Score for Humanitarian (HUM) Subscale (Perception of MD Programs)

Category	N	Mean	SD
Not Valuable	4	5.94	0.43
Somewhat Valuable	10	6.13	0.70
Valuable	47	6.13	0.71
Extremely Valuable	52	6.33	1.02

Table 40 - Mean Score for Personal-Intellectual Development (PER) Subscale (Perception of MD Programs)

Category	N	Mean	SD
Not Valuable	4	5.94	0.52
Somewhat Valuable	10	6.18	0.59
Valuable	47	6.20	0.63
Extremely Valuable	52	6.28	0.67

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Table 41 - Mean Score for All Subscales Combined (Perception of MD Programs)

Category	N	Mean	SD
Not Valuable	4	21.19	0.69
Somewhat Valuable	10	24.28	1.81
Valuable	47	23.39	2.17
Extremely Valuable	52	24.73	2.69

Table 42 - ANOVA Results for SMAU Subscales and Combined Subscales (Perception of MD Programs)

	Sum of Squares	*Mean Square*	*F(3, 109)*	*Sig. (p)*
CAR				
Between Groups	11.91236775	3.97078925	7.79	<.0001
Within Groups	55.52568535	0.50940996		
DEF				
Between Groups	1.56417826	0.52139275	0.62	0.6063
Within Groups	92.31524652	0.84692887		
EXP				
Between Groups	11.9598350	3.9866117	1.95	0.1252
Within Groups	222.3797668	2.0401813		
HUM	234.3396018			
Between Groups	1.39817962	0.46605987	0.63	0.5996
Within Groups	81.12947525	0.74430711		
PER				
Between Groups	0.55817226	0.18605742	0.45	0.7183
Within Groups	45.13651800	0.41409650		
All Subscales Combined				
Between Groups	77.3861469	25.7953823	4.56	0.0048
Within Groups	617.2366408	5.6627215		

Several hypotheses were proposed related to the relationship between students' motivation as reported on each SMAU subscale and the combined SMAU score at the beginning of their undergraduate education and their perception of public health graduate programs (Table

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43). H_0, the null hypothesis indicates that no significant difference was able to be determined. While H_1, the alternative hypothesis indicates that a significant difference was able to be determined. The null hypothesis was accepted for all the SMAU subscales except for the Career-Materialism subscale which had a p value of <.0001. More specifically, when compared to students who had a perception that MD programs were valuable, students who perceived MD programs as extremely valuable on average had a higher CAR subscale score (p value = .0021). While, students who perceived MD program as not valuable on average had lower CAR subscale scores (p value = .0040) than students who had a perception that MD programs were valuable. Additionally, the null hypothesis was rejected for the combined score because its p value was .0048. In particular, study participants who perceived MD program to be extremely valuable on average had a higher overall score for all of the subscales combined (p value = .0062).

Table 43 - Motivation and Perception of MD Programs as a Freshman Summary of Significance

SMAU Subscale	*Significance (p)*	*Hypothesis Accepted*
Career-Materialism	<.0001	H_1
Default	0.6063	H_0
Expectation-Driven	0.1252	H_0
Humanitarian	0.5996	H_0
Personal-Intellectual Development	0.7183	H_0
All Subscales Combined	0.0048	H_1

Motivation and Knowledge of Public Health Profession as a Freshman.

The relationship between the subscales on the SMAU Scale and knowledge of the public health profession that study participants had as first year undergraduates was analyzed. The findings are depicted below. The mean score for each subscale is listed in tables 44 through 48;

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and the combined subscale mean score is in table 49. Table 50 shows the ANOVA results for each subscale and the combined ANOVA results for all subscales.

Table 44 - Mean Score for Careerism-Materialism (CAR) Subscale (Knowledge of Public Health Profession)

Category	N	Mean	SD
No Knowledge	49	5.67	0.92
Little Knowledge	47	5.70	0.63
Fairly Knowledgeable	15	5.92	0.69
Extremely Knowledgeable	2	5.75	1.06

Table 45 - Mean Score for Default (DEF) Subscale (Knowledge of Public Health Profession)

Category	N	Mean	SD
No Knowledge	49	2.19	0.98
Little Knowledge	47	2.02	0.87
Fairly Knowledgeable	15	2.08	0.85
Extremely Knowledgeable	2	2.75	1.41

Table 46 - Mean Score for Expectation-Driven (EXP) Subscale (Knowledge of Public Health Profession)

Category	N	Mean	SD
No Knowledge	49	3.70	1.44
Little Knowledge	47	3.80	1.43
Fairly Knowledgeable	15	3.52	1.62
Extremely Knowledgeable	2	4.50	1.41

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Table 47 - Mean Score for Humanitarian (HUM) Subscale (Knowledge of Public Health Profession)

Category	N	Mean	SD
No Knowledge	49	6.10	0.79
Little Knowledge	47	6.23	0.98
Fairly Knowledgeable	15	6.48	0.67
Extremely Knowledgeable	2	6.63	0.53

Table 48 - Mean Score for Personal-Intellectual Development (PER) Subscale (Knowledge of Public Health Profession)

Category	N	Mean	SD
No Knowledge	49	6.17	0.66
Little Knowledge	47	6.24	0.58
Fairly Knowledgeable	15	6.30	0.77
Extremely Knowledgeable	2	6.63	0.53

Table 49 - Mean Score for All Subscales Combined (Knowledge of Public Health Profession)

Category	N	Mean	SD
No Knowledge	49	23.84	2.61
Little Knowledge	47	23.99	2.19
Fairly Knowledgeable	15	24.30	3.08
Extremely Knowledgeable	2	26.25	0.71

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Table 50 - ANOVA Results for SMAU Subscales and Combined Subscales (Knowledge of Public Health Profession)

	Sum of Squares	*Mean Square*	*F(1, 111)*	*Sig. (p)*
CAR				
Between Groups	0.71218828	0.23739609	0.39	0.7620
Within Groups	66.72586481	0.61216390		
DEF				
Between Groups	1.50104151	0.50034717	0.59	0.6226
Within Groups	92.37838327	0.84750810		
EXP				
Between Groups	2.1172975	0.7057658	0.33	0.8027
Within Groups	232.2223042	2.1304799		
HUM				
Between Groups	2.10730731	0.70243577	0.95	0.4182
Within Groups	80.42034755	0.73780135		
PER				
Between Groups	0.55175985	0.18391995	0.44	0.7220
Within Groups	45.14293042	0.41415532		
All Subscales Combined				
Between Groups	12.7842292	4.2614097	0.68	0.5654
Within Groups	681.8385584	6.2553996		

Several hypotheses are noted related to the relationship between students' motivation as reported on each SMAU subscale and the combined SMAU score at the beginning of their undergraduate education and their knowledge of public health profession (Table 51). H_0, the null hypothesis indicates that no significant difference was able to be determined. While H_1, the alternative hypothesis indicates that a significant difference was able to be determined. The null hypothesis was accepted for all the SMAU subscales and the combined score as none of the p values were less than .05.

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Table 51 - Motivation and Knowledge of the Public Health Profession as a Freshman Summary of Significance

SMAU Subscale	*Significance (p)*	*Hypothesis Accepted*
Career-Materialism	0.7620	H_0
Default	0.6226	H_0
Expectation-Driven	0.8027	H_0
Humanitarian	0.4182	H_0
Personal-Intellectual Development	0.7220	H_0
All Subscales Combined	0.5654	H_0

Motivation and Knowledge of the Medical Profession as a Freshman.

The relationship between the subscales on the SMAU Scale and knowledge of the medical profession that study participants had as first year undergraduates was analyzed. The mean score for each subscale is listed in tables 52 through 56; and the combined subscale mean score is in table 57. Table 58 displays the ANOVA results for each subscale and the combined ANOVA results for all subscales.

Table 52 - Mean Score for Careerism-Materialism (CAR) Subscale (Knowledge of Medical Profession)

Category	N	Mean	SD
No Knowledge	7	5.86	0.66
Little Knowledge	44	5.74	0.75
Fairly Knowledgeable	52	5.66	0.78
Extremely Knowledgeable	10	5.83	1.01

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Table 53 - Mean Score for Default (DEF) Subscale (Knowledge of Medical Profession)

Category	N	Mean	SD
No Knowledge	7	2.32	0.81
Little Knowledge	44	2.28	1.02
Fairly Knowledgeable	52	1.94	0.81
Extremely Knowledgeable	10	2.18	0.94

Table 54 - Mean Score for Expectation-Driven (EXP) Subscale (Knowledge of Medical Profession)

Category	N	Mean	SD
No Knowledge	7	3.64	1.49
Little Knowledge	44	3.72	1.40
Fairly Knowledgeable	52	3.71	1.50
Extremely Knowledgeable	10	3.98	1.53

Table 55 - Mean Score for Humanitarian (HUM) Subscale (Knowledge of Medical Profession)

Category	N	Mean	SD
No Knowledge	7	5.25	0.60
Little Knowledge	44	6.28	1.00
Fairly Knowledgeable	52	6.22	0.71
Extremely Knowledgeable	10	6.53	0.68

Table 56 - Mean Score for Personal-Intellectual Development (PER) Subscale (Knowledge of Medical Profession)

Category	N	Mean	SD
No Knowledge	7	5.82	0.62
Little Knowledge	44	6.26	0.61
Fairly Knowledgeable	52	6.19	0.67
Extremely Knowledgeable	10	6.55	0.48

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Table 57 - Mean Score for All Subscales Combined

Category	N	Mean	SD
No Knowledge	7	22.89	2.61
Little Knowledge	44	24.28	2.24
Fairly Knowledgeable	52	23.72	2.51
Extremely Knowledgeable	10	25.05	3.18

Table 58 - ANOVA Results for SMAU Subscales and Combined Subscales (Knowledge of the Medical Profession)

	Sum of Squares	*Mean Square*	*F(3,109)*	*Sig. (p)*
CAR				
Between Groups	0.45173629	0.15057876	0.25	0.8647
Within Groups	66.98631681	0.61455337		
DEF				
Between Groups	3.14752543	1.04917514	1.26	0.2916
Within Groups	90.73189935	0.83240275		
EXP				
Between Groups	0.6840760	0.2280253	0.11	0.9562
Within Groups	233.6555257	2.1436287		
HUM				
Between Groups	7.69081046	2.56360349	3.73	0.0134
Within Groups	74.83684441	0.68657655		
PER				
Between Groups	2.30916329	0.76972110	1.93	0.1284
Within Groups	43.38552697	0.39803236		
All Subscales Combined				
Between Groups	27.3381753	9.1127251	1.49	0.2217
Within Groups	667.2846123	6.1218772		

Several hypotheses were reviewed related to the relationship between students' motivation as reported on each SMAU subscale and the combined SMAU score at the beginning

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of their undergraduate education and their knowledge of medical profession (Table 59). H_0, the null hypothesis indicates that no significant difference was able to be determined. While H_1, the alternative hypothesis indicates that a significant difference was able to be determined. The null hypothesis was accepted for all the SMAU subscales with the exception of the Humanitarian subscale which had a p value of .0134. The analysis indicated that study participants who had no knowledge of the medical profession as freshman had lower Humanitarian subscale scores than students who were a little, fairly or extremely knowledgeable of the medical profession. In addition, the null hypothesis was accepted for the combined score.

Table 59 - Motivation and Knowledge of the Medical Profession as a Freshman Summary of Significance

SMAU Subscale	*Significance (p)*	*Hypothesis Accepted*
Career-Materialism	0.8647	H_0
Default	0.2916	H_0
Expectation-Driven	0.9562	H_0
Humanitarian	0.0134	H_1
Personal-Intellectual Development	0.1284	H_0
All Subscales Combined	0.2217	H_0

Curricular/Co-Curricular Experiences and Graduate Study/Career Choice.

Research indicates that curricular and co-curricular experiences such as internships, community service/service learning, and research experiences with faculty can impact career/graduate study choice (Cashman & Seifer, 2008; Graves & Wright, 2009; Houghton, et al., 2002,). The influence of the above mentioned curricular/co-curricular experiences were analyzed in relationship to study participants reported career plans. The analysis was done using the chi-square test. The chi-square test was followed by a Fisher's Exact test (FET) which is designed to assess the statistical association between two categorical variables without making

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any explicit assumptions about the sample distribution. This is the preferred method when any of the contingency table cell-sizes are less than five (Samuels, Witmer, & Schaffner, 2012). The results of the chi-square test related to curricular/co-curricular experiences are summarized below.

Internships

Study participants were asked to indicate if they felt internships in health related fields influenced their graduate study/career choice. The chi-square test failed to indicate a significant difference, $x^2(1) = 2.5$, $p = .87$, FET = .79 (an alpha value of .05 was utilized for this and all subsequent chi-square tests).

Community Service/Service Learning

Study participants were asked if they felt community service/service learning experiences in a health-related field helped them to decide on their graduate study/career choice. The chi-square test failed to show a significant difference, $x^2(1) = 5.1$, $p = .28$, FET = .26.

Research Assistant Position with a Faculty Member

Students in the study were solicited to indicate if they felt research positions with a faculty member in a health-related field played a role in their graduate study/career choice. The chi-square test failed to show a significant difference, $x^2(1) = 7.0$, $p = .13$, FET = .17.

Demographics and Career Choice.

Various demographic characteristics were analyzed to determine if there was a relationship between certain characteristics of study participants and their graduate study/career choice. As with the analysis of curricular/co-curricular experiences, a chi-square test followed by a Fisher's Exact test (FET) was used to decide if there was a statistical association between graduate study/career choice and a variety of demographic factors. The analysis revealed that

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the chi-square test failed to show significant difference in all demographic characteristics except for the maternal education level of study participants (Table 60).

Table 60 - Summary of Chi-Square Tests Related to Demographics

Demographic	$x^2(1)$	r	FET
Institution Type	8.5	.20	.18
Gender	2.7	.25	.19
Race	8.7	.56	.47
Undergraduate GPA	3.5	.48	.62
Undergraduate Major in Public Health or Not	1.8	.40	.43
Undergraduate Major	5.6	.46	.51
Maternal Education Level	18.8	.004	.006
Paternal Education Level	7.5	.27	.28

Qualitative Findings

As noted in chapter 3, the explanatory design of the study was chosen to provide the researcher an opportunity to further explain the data gathered during the quantitative phase (Creswell, 2008). As such, focus group interviews (Creswell, 2007) with students who completed the online survey were utilized during the qualitative phase. Students were asked during the quantitative phase if they would participate in a one-hour long focus group to explore the research topic further. The focus group interviews in which a third party, who is a doctoral trained evaluation consultant conducted were held approximately one month after the online survey was administered. One focus group was conducted with two MPH students who were undergraduate public health majors and the other focus group included four MPH students who were not undergraduate public health majors. While it is good research design to have approximately ten focus group participants (Creswell, 2007), the consistency of the patterns in

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answers represented in the study's focus groups provided the researcher with sufficient data to report useable findings and interpretations.

The instrument used for the focus group interviews consisted of ten open-ended interview questions (Appendix B). The interview was developed to follow-up on the influencing factors and student motivations identified in the literature that affect advanced study and career choice, and from the quantitative findings of the study. The data was coded by employing open coding, axial coding and selective coding techniques to explore central themes (Merriam, 2009, pp. 178-181). The codebook for the study is located in Appendix C. The findings from the focus groups are detailed below for each of the ten questions asked during the focus group interviews. Additionally, profiles of the six focus group participants are located in Appendix D. Verbatim quotes, with minor edits for clarity purposes when needed, from the focus group participants are used to emphasize the findings.

1. Factors that Influenced Graduate Study and Career Choice.

Study participants expressed various factors that influenced their graduate study/career choice. These factors included inputs such as students' career interests at the beginning of their undergraduate career, extrinsic and intrinsic motivations, environmental factors such as experiential learning and information gleaned from professionals. The most frequent factors that influenced graduate study/career choice involved student characteristics (inputs), environmental factors, and motivations (Table 61).

Theme	Description	Number Of Coding References
inputs and environment	As related to Astin's theory and I-E-O model, inputs are characteristics, etc. that students bring to the college; and environment refers to factors/influences in the environment that with interactions with inputs produce outputs such as career/graduate study choice.	86

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Intrinsic/extrinsic motivations	Motivations that students have related to graduate study and career choice as well as for attending college.	26
curricular and co-curricular experiences	Experiences that the literature suggests could have an impact on graduate study/career choice.	14

Table 61 -Coded Focus Group Themes

Non-public health undergraduates.

Of the four non-public health undergraduates two referenced extrinsic motivations and the other two referred to intrinsic motivations for their reasons of pursuing public health graduate study. The extrinsic motivations dealt with their desire to use public health graduate study as a stepping stone to medical school. One student, named Student #6, noted that they were "interested in pursuing medicine…and thought that public health would be a nice foundation before going into medical school." The intrinsic motivations were related to helping populations improve their health status and overcoming health disparities. One study participant, Student #3 remarked that he "had seen devastation…and the impact that poverty can have on health." Another participant, Student #5 stated that public health provided her the opportunity to have the "greatest impact on the greatest number of people health-wise."

Public health undergraduates.

The two public health undergraduates discussed environmental factors such as internships, and positive interactions with professionals in the field. One student, Student #2 felt that her decision to pursue a public health career was influenced by "people in the field" who had "master's and doctoral degrees." This same student noted that her "time in the field as part of (her) undergraduate training" played a significant role in her career choice of public health. The other public health undergraduate, Student #1 thought that public health was simply a "natural progression of (her) career interest."

2. Defining Moment for Career Choice.

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Focus group participants were asked to discuss if they had a defining moment in which they chose to pursue a career in public health. The participants also were prompted to describe the moment. The students' answers are highlighted below.

Non-public health undergraduates.

One of the four non-public health undergraduates, Student #3 indicated that he did not have a defining moment, while the answers of the other three focused on work/volunteer experiences were they had moments that involved observing poor health status and/or health inequities. Student #5 commented that while working as a paralegal, she saw how asbestos exposure had negatively affected "many peoples' lives" and how the resulting cancer from exposure was "totally preventable." Another student, Student #4 elaborated on her experience "working with a doctor at the free clinic" and witnessing a patient that had experienced a stroke who "just wanted to go home." Observing the lack of health knowledge by the patient "caught" Student #4's attention and as she notes the experience "made me really start to consider a career in public health."

Public health undergraduates.

The two public health undergraduates felt their defining moments were shaped by their exposure to public health in the curriculum, and their career interests. Student #1 felt that the defining moment came in her "introduction to public health course as an undergrad." While, Student #2 wanted to combine her interests in infectious disease with the fact that she "did not want to be in a lab" or "be a clinician." She stated her moment occurred when she realized how her interests aligned with "what public health was" when she was introduced to public health as an undergraduate.

3. Influence of Undergraduate Major on Graduate Study and Career Choice.

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Study participants were asked to discuss if they felt their undergraduate major influenced their graduate study/career choice. The range of answers varied including some who felt their major had no bearing on their career plans. While others felt that exposure to public health concepts in their undergraduate major made an impact on their graduate study/career decisions.

Non-public health undergraduates.

Three of the four non-public health undergraduates indicated that their major had very little or no influence on their graduate study/career choice. However, one of the three students indicated that exposure to psychology and "how mental illness happens in different ethnicity groups" got her to think about public health. The last of the four non-public health undergraduate students noted that the research she conducted with a professor in a natural science major got her "interested in infectious disease." Thus, her major inadvertently led her to public health as a career choice.

Public health undergraduates.

The consistent theme of the two public health undergraduates was that their public health professors positively influenced their decision to pursue public health as a career. One of the students stated that her "professors relaying a lot of their field experience…in the classroom" was impactful on her decision. This same student, Student #2 also discussed how her professors made reference to the need for graduate study in public health for her to explore public health concepts more in depth. The other student, Student #1 commented that seeing the work that her instructors did "required a degree after a bachelor's level degree, which is the main factor why I decided to go to graduate school."

4. Internships and Graduate Study and Career Choice.

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As noted in the literature (Houghton, et al., 2002) internships can play a significant part in graduate study/career choice. Thus, focus group participants were asked to indicate if they completed an internship during their undergraduate years. The partcipants who completed an internship were prompted to comment on the type of internship and the influence it had on their decision to pursue public health in graduate school and as a career choice.

Non-public health undergraduates.

All four of the non-public health undergraduate majors indicated that they did not complete an internship. Thus, they were not prompted further to discuss how an internship impacted their graduate study/career choice.

Public health undergraduates.

Each of the two public health undergraduates completed internships. One of the students did their internship at a county health department and the other at the YMCA. The student, Student #1, whose internship was at the YMCA stated that her internship help her to see "the determinants of what caused the diabetes epidemic in the country." This exposure, as Student #1 noted made her "really want to go ahead and proceed with a public health degree." The other student, Student #2 noted that her internship experience at the county health department assisted her is recognizing the need for improvements in the county and further enhanced her desire to purse public health graduate study.

5. Community Service/Service Learning and Graduate Study and Career Choice.

As with internships, service learning/community service opportunities provide students with impactful experiences that influence graduate study/career choice (Cashman & Seifer, 2008; Roe, 2009). Thus, study participants were invited to describe their previous service activities and how they affected their gradaute study/career choice in public health

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Non-public health undergraduates.

All four of the non-public health undergraduate completed a community service/service learning experience. Two of the students indicated that the experience had no bearing on their career choice. Both of these students noted that their service activities were not in health-related settings with one performing service in an elementary school and the other in a setting where they worked on carpentry related projects. The two students who completed their service opportunities in health related settings both noted that the experience influenced their decision to pursue graduate study in public health. One of these students, Student #4 noted that her experience volunteering in an emergency room confirmed her choice of "graduate study in public health" as it opened her "eyes…to the discrepancies that exist" in health status.

Public health undergraduates.

Each of the two public health undergraduates completed service opportunities related to public health. One of the students, Student #2 performed community service as part of a public health student group. She commented that while the experience was not a huge driver for her graduate school choice, it did affirm "that there were opportunities to do good work for the community." The other student, Student #1 completed a service project in support of Hurricane Katrina victims. She stated that she observed how income played a role in access to healthy housing. The experience "definitely did make an impact" on her choice to pursue public health further in graduate school.

6. Research Experiences and Graduate Study and Career Choice.

Faculty-student interaction, as noted in the literature (Graves & Wright, 2009) can play a major role in career and graduate school choice. Research experiences also were noted in the literature (Lorelle, 2011) as impactful in graduate study/career choice. Thus, research assistant

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work with a faculty member could influence a student's choice to pursue a particular career and/or subject matter to study in graduate education. Focus group participants were solicited to explain the effect of any research assistant experiences with a faculty member on their career and/or graduate study choice.

Non-public health undergraduates.

Three of the four of the non-public health undergraduate completed a research assistant position with a faculty member. Two of the three students reported that the research assistant experience did influence their graduate study choice. One of these two students, Student #6 participated in a qualitative study that exposed them to the community. The student noted that the experience "had the most influence on me pursuing public health." The other student, Student #4 conducted medical research which sparked her interest in infectious disease. She commented that the experience helped her to realize that she wanted to pursue a position that had components of public health. The student, Student #5 that indicated that the research assistant experience did not impact their graduate study choice mentioned that the experience did help her confirm that bio-research was not something she wanted to pursue.

Public health undergraduates.

Only one of the public health undergraduates completed a research assistantship with a faculty member. The student, Student #1 completed the experience prior to declaring public health as a major. She discussed that when she was a cell biology major that she conducted biology research under the direction of a faculty member that "really didn't influence my graduate school or career choice."

7. Sources of Information for Graduate Study Choice.

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Research (Sarah, et al., 2002; Sharad, et al., 2009) has displayed that providing undergraduates with information about a particular field can positively impact their choice of a graduate program. Therefore, focus group participants were asked to comment on where they obtained helpful information as they made their graduate study decision.

Non-public health undergraduates.

The non-public health graduates all reported that the info they utilized that was most helpful including websites. One student, Student #3 stated that websites was his "primary source." Three of the students reported that campus visits to public health graduate programs were a helpful source of information in making their decision. Additionally, two of the students reported that they talked to students in public health graduate programs as a good source of information. Lastly, one student, Student #4 reported that she was really influenced by family members who had "master's degrees and further education."

Public health undergraduates.

Both public health undergraduates responded that websites, interactions with their undergraduate professors and campus visits were helpful in their decision making process. Additionally, Student #2 noted that the information she obtained during her internship was a useful information source. Also, Student #1 commented that "attending a graduate school fair after my sophomore year of college…helped me to see the avenues I could take in public health."

8. Sources of Information for Career Choice.

Just as career-related information can influence graduate study choice (Sarah, et al., 2002; Sharad, et al., 2009), it can also affect career choice (Emily, 2010). As such, focus group

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participants were prompted to discuss the information sources they found to be influential in their career decision making process.

Non-public health undergraduates.

Each of the non-public health undergraduates noted that they researched the type of jobs/careers that MPH graduates could obtain. One student, Student #5 responded that she "just Google(d)…what to do with an MPH" and found "a lot of valuable information". Three of the four students talked with and/or researched the career paths of MPH graduates. One of the four consulted with a career counselor.

Public health undergraduates.

Both public health undergraduates expressed that the information they received from their undergraduate professors as well as attending career panels/talks by public health experts was impactful in their career decision making process. Student #2 stated that as an undergraduate she "had professors who would bring in subject area experts for lectures…and that was probably one of the best experiences" that she had as an undergraduate.

9. Knowledge of Public Health and Medical Fields.

The knowledge that a student has of a particular field can be a factor in the career choice of a student (Astin, 199 3; Sharad, et al., 2009). Students in the focus groups were invited to talk about their knowledge of the medical and public health fields at the beginning of their undergraduate education.

Non-public health undergraduates.

All of the non-public health undergraduates reported that they were very aware of the medical field. They also indicated that they had little or no knowledge of the public health field. One of the students, Student #5 described that she was familiar with public health in "an abstract

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sense…but wasn't aware of the wide breath of the scope of public health." Another student, Student #4 explained that her friend told her about public health in her junior year.

Public health undergraduates.

Both public health undergraduates also noted that they were not knowledgeable about the public health field and that they were much more aware and interested in the medical field. Student #1 revealed that she "had to draw on (her) research to learn what" public health "was, and what you have to do to pursue a career in it." The other student, Student #2 explicated that knowing she did not want to be clinician coupled with her interest in working with the community drove her to find out more about public health.

10. Choice of Career at the Beginning of Undergraduate Education.

Pre-college attributes, such as career choice at the beginning of one's undergraduate education is known to affect outcomes such as career choice at the end of undergraduate education (Astin, 1993). To explore this concept further, an inquiry was made of focus groups participants regarding their career choice at the outset of the higher education journey.

Non-public health undergraduates.

Two of the four non-public health undergraduates reported that their field of choice when they started college was medicine. Of the two remaining students, one reported anthropology as a career choice and the other, Student #3, commented that he wanted "to pursue a career in health but not necessarily public health." Two of these four students noted specifically that their career interests changed during their undergraduate years. Another student, Student #6 revealed that she actually worked in the medical research field after graduating from her undergraduate degree program which aligned with her career choice as a first year undergraduate.

Public health undergraduates.

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The two public health undergraduate majors indicated two different career desires at the beginning of their undergraduate experience. Student #2 stated that she wanted to study infectious disease and ways to prevent it but she did not realize that this interest was aligned with the public health field. The other student, Student #1 commented that she wanted to be a biomedical researcher but changed her interests to public health because she felt it "would be a better fit" for her.

Summary

The purpose of this study was to explore factors that influence undergraduates to pursue or not pursue graduate study and careers in public health. The quantitative analysis revealed that the Humanitarian motivation subscale was a significant factor in graduate study/career choice. Additionally, Career-Materialism was significant with relationship to study participants who when they were freshman felt MD programs were extremely valuable or not valuable. The findings and results related to motivations having an effect on students graduate study/career choice align with the conceptual framework of the study which purports that inputs such as motivations for the attending college play a role in outputs such as graduate study/career choice.

Curricular/co-curricular experiences as well as demographic factors with the exception of maternal education level did not via the statistical analysis display any significant relationship. These findings contradict the conceptual framework of the study that indicates that inputs such as demographic characteristics interact with environment factors such as co-curricular/curricular experiences to affect outcomes including graduate study/career choice. However, the qualitative analysis found that motivations, undergraduate major (demographic), and curricular/co-curricular experiences played a role in the focus group participants' decision to study public health in

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graduate school which aligns with the conceptual framework. The interpretation of the findings, conclusions, implications and recommendations from the study will be discussed in chapter 5.

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Chapter 5: Interpretations, Conclusions, and Recommendations

Introduction

It has been established that Schools of Public Health (SPHs) need to expand their educational capacity to accommodate 300% more students by 2020 to assist in preventing a serious public health workforce crisis (Rosenstock, et al., 2008). This study explored how an urban SPH in a large university can recruit more undergraduate students to pursue master's level education in public health and subsequently, careers in public health. In particular, the study focused on what factors and motivations were influential for undergraduate students in public health and other majors in deciding to pursue graduate training in public health as opposed to other fields such as medicine.

The purpose of this study was to explore the relationship between undergraduate public health students' motivations for attending college; and their decision to engage in master's level public health education or medical school. Additionally, the study explores how certain curricular/co-curricular experiences and demographic characteristics influence the choice of graduate study and careers. The study is significant because recent history at the national level and at the site has proven that undergraduates in public health related courses and programs (i.e. majors and minors) have not pursued graduate training in public health as many would have expected (Guttmacher, et al., 2008).

The findings from this study revealed that the Humanitarian motivation for attending college was statistically significant related to students graduate study/career choice in public health. Additionally, the Career-Materialism motivation for attending college had a statistically significant relationship to study participants who when they were freshman felt MD programs were extremely valuable or not valuable. The study revealed that the only statistically significant

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relationship between graduate study/career choice, and curricular/co-curricular experiences or demographic factors; was the maternal education level of study participants. However, the qualitative analysis supported that curricular/co-curricular experiences and demographic characteristics were impactful for the students that participated in the focus group interviews.

The study's findings are not generalizable to all schools of public health. Therefore, the interpretations and findings from the data analysis; as well as recommendations for actionable solutions included in this chapter are limited to the site. Recommendations for future research at the site and the national level are also presented in this chapter.

Interpretations and Conclusions

This mixed methods study utilized three research questions to examine the research problem. The research questions are:

1. How do the motivations for attending college of undergraduate public health majors affect their desire to attend graduate programs in public health?
2. What curricular and/or co-curricular activities influence public health undergraduates to pursue or not pursue public health graduate training?
3. What demographics characteristics determine the likelihood of undergraduate public health students pursuing a public health graduate degree?

The interpretations and conclusions from the findings and results for each research question are below.

Research Question One: How do the motivations for attending college of undergraduate public health majors affect their desire to attend graduate programs in public health?

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Both intrinsic and extrinsic motivations had an impact on graduate study and career choice. The Humanitarian (HUM) motivation, an intrinsic motivation played a role for students who indicated that public health was their career choice at the beginning of their undergraduate education (Table 27). Students with a higher Humanitarian motivation were more likely to choose public health as a career than students whose career choice was not public health, law, or medicine. This indicates that students who have a high Humanitarian motivation are likely to pursue a career in public health. This evidence was supported in the qualitative findings as students with intrinsic motivations wanted to pursue public health to have "greatest impact on the greatest number of people health-wise."

Students with a higher Career-Materialism (CAR) motivation, an extrinsic motivation were more apt to perceived MD programs as extremely valuable (Table 43). While students with a lower Career-Materialism motivation perceived MD programs as not valuable. Thus, students with a high Career-Materialism motivation are more likely to view medicine as a worthwhile career choice. The qualitative findings support this data which shows an association between extrinsic motivations and the pursuit of medical careers. Focus group participants currently in a public health graduate program with extrinsic motivations as noted by one student were "interested in pursuing medicine…and thought that public health would be a nice foundation before going into medical school."

The Humanitarian motivation was also found to be significant for students who had no knowledge of the medical profession as freshman (Table 59). Specifically, students with lower Humanitarian motivations had no knowledge of the medical profession. Since these student at the time of the study were pursuing public health graduate education, this finding implies that these students might be good candidates to guide into public health graduate study/careers. The

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researcher is not confident that this finding has any relevance as only a small percentage (6%) of the study participants, seven of the 113 students, had no knowledge of the medical field.

The results from this study are consistent with research (Diaz, 2010; Fernández, et al., 2006; Gallagher, Clarke, & Wilson, 2008; Haase & Lautenschläger, 2011) that indicates that intrinsic and extrinsic motivations play a factor in student outcomes such as graduate study and career choice. Additionally, the results of this study align with the conceptual framework (Astin, 1993) of the study which asserts that inputs such as student motivations affect outputs including career choice. Moreover, students' motivations for attending college play a significant role in their outcomes (Cote & Levine, 1997). In particular, students with intrinsic motivations at the beginning of their undergraduate education perceived public health as a viable career option. On the other hand students with extrinsic motivations as first year undergraduates were more likely to view medicine as a valuable career choice.

Research Question Two: What curricular and/or co-curricular activities influence public health undergraduates to pursue or not pursue public health graduate training?

The literature notes that curricular and co-curricular activities such as service learning (Roe, 2009; Cashman & Seifer, 2008), internships (Claire, et al., 2006; Houghton, et al., 2002), and research experiences (Lorelle, 2011) are important factors in career and graduate study choice. The data from this study showed that curricular/co-curricular experiences such as community service, internships, and research assistant positions had no significant statistical association with career/graduate study choice. However, the descriptive statistics and focus group participants' perceptions indicated that these experiences played a role in their graduate study/career choice displayed a different picture.

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The majority of study participants, as reported in the descriptive statistics in chapter 4 indicated that internships, service learning/community service and research assistant positions were impactful in there career/graduate study choice. Ninety percent of study participants who completed a health related internships felt the experience assisted them in deciding to go to graduate school (Table 17). Seventy one (95%) of the 75 students noted that their community service/service learning opportunity in a health related field helped them decide to attend graduate school (Table 18). Lastly, 89% of students who participated in a research assistant position thought that the research experience influenced their decision to attend graduate school (Table 19).

The qualitative findings supports that co-curricular/curricular experiences impacted the graduate study/career choice of the six focus group participants. The researcher cautions against making generalizations to the population based on focus group interviews as the focus groups only included 5% of the study's participants. Nonetheless, the qualitative findings related to the relationship between curricular/co-curricular experiences and career/graduate study choice aligns with the descriptive statistics, research (Roe, 2009; Cashman & Seifer, 2008; Claire, et al., 2006; Houghton, et al., 2002; Lorelle, 2011), and the conceptual framework of the study.

Focus group participants who completed health related internships indicated that the experience influenced their choice to study public health in graduate school. One student stated that their internship is what made them "really want to go ahead and proceed with a public health degree." Another focus group participant stated that her internship enhanced her desire to pursue public health graduate study.

Four of the six focus group participants felt that their community service/community service opportunities played a role in their graduate study and career choice. The two students

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who did not feel that their community service opportunities had no bearing on their career choice participated in non-health related experiences. One focus group participant indicated that her community service experience confirmed her choice of "graduate study in public health."

Research experiences for both public health undergraduates and non-public health undergraduates were impactful on career/graduate study choice. One student noted that the research assistant position "had the most influence on me pursuing public health." Another student commented that the experience helped her to realize that she wanted to pursue a position that had components of public health.

Students' perceptions and qualitative findings supported the notion that certain co-curricular/curricular experiences influenced students' choice to pursue graduate study in public health and subsequently public health careers. In particular, health related experiences appear to be more impactful that non-health related experiences. Participation in internships, community service/service learning, and research experiences played a factor in graduate study/career choice regardless of whether a student was a public health undergraduate major or not. These findings also support the conceptual framework (Astin, 1993) of the study which asserts that environmental factors, such as co-curricular/curricular experiences influence the graduate and career choice of undergraduate public health students.

Research Question Three: What demographics characteristics determine the likelihood of undergraduate public health students pursuing a public health graduate degree?

Research indicates that student demographics play a role in career/graduate study choice (Castellanos, Gloria, & Orozco, 2005; Maurutto, 1998; Schaub, et al., 1996). This study's findings (Table 60) revealed that the only demographic factor that had a statistical association with graduate study/career choice was a student's mother's education level. However, research

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(Chuang & Lei, 2010; Emily, 2010; Graves & Wright, 2009; Castellanos, Gloria, & Orozco, 2005) indicates that demographic factors such as race/ethnicity play a significant role in graduate school/career choice and thus, more research at the site over time is needed to explore the effects of demographics on graduate school/career choice. Literature (Li, C., & Kerpelman, J., 2007; Welsh, W. M., & Stewart, A. J. 1995) supports that maternal education level more so than paternal education level effects females' career and educational choices. Thus, with this study's female majority (84%), the study's findings align with the research that maternal education level could be associated with career/graduate study choice.

In addition, other student characteristics played a role in their graduate study career choice. The study's findings aligns with research (Emily, 2010; Sarah, et al., 2002; Sharad, et al,, 2009) that purports that knowledge of career field influences a students' choice of graduate study/career choice. The study found that a large percentage of students (62%) lack enough information to make an informed decision of graduate study in health related fields. As such, it is clear that students need more information about the public health field during their secondary and post-secondary education in order to make an informed choice for graduate study.

Recommendations

The purpose of this study was to examine how motivations, demographics, and co-curricular/curricular factors affect graduate study in public health and subsequently public health careers at a school of public health at a large urban university. The significance of the study is that is provides evidence that can assist in encouraging more undergraduates to pursue graduate study/careers in public health at the site. While there is research in other career fields that indicate factors for graduate study and career choice, little research exists to provide evidence of factors that lead to students' choice of public for graduate education and careers. The data

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analysis led to several conclusions: 1) certain intrinsic and extrinsic motivations for attending college affects a students' choice of public health or medicine for graduate study and careers; 2) students' perceived that participation in health related internships, community service/service learning, and research experiences played a role in graduate study/career choice of public health; 3) the education level of the students' mother was significantly associated with career/graduate study in public health; and 4) students' lacked sufficient information to make an informed decision on graduate study/career choice related to healthcare fields.

Actionable Recommendations for the Site.

The conclusions from the study provide data for actionable solutions for administrators and faculty at the site to consider. The recommendations for actionable solutions related to 1) recruitment efforts, 2) curricular/co-curricular considerations, and 3) provision of information suitable to assist students in making an informed career/graduate study choice are discussed below.

Recruitment Recommendations

Since students with intrinsic motivations were found to be likely to pursue a career in public health, these students would be good candidates as first year undergraduates to educate about the benefits of a public health career that satisfy their intrinsic motivations. Characteristics of a public health career such as positively impacted the health of populations, improving the health status of underserved populations, and the ability to connect populations to helpful health education information are benefits of public health careers that appealed to focus group participants with intrinsic motivations. Conversely, students with extrinsic motivations should be given information about the public health field that appeals to their extrinsic motivations.

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Such information could include the relevance of public health as a foundation for medical careers, and the increasing role of public health in the healthcare field.

In order to recruit students from its forthcoming undergraduate public health major into the graduate public health program, it is recommended that the administrators encourage their undergraduate public health majors to take career assessments that helped to identify the students' motivations. Once the students' motivations are established, the appropriate information as noted above can be given to the students. To recruit students from outside of the site's undergraduate program, it is recommended that the site highlight the benefits of public health graduate study/careers that appeal to students with intrinsic or extrinsic motivations on its website and during prospective student visits to the site. The use of the website and campus visits was noted in the focus group interviews as primary sources of information for students in making their graduate study/career choice.

Curricular/Co-Curricular Recommendations.

The study's findings illustrated that students perceive health related internships, community service/service learning, and research experiences with faculty as impactful on their choice to pursue graduate study and/or careers in public health. Therefore, it is recommended that the site incorporate experiential learning experiences into the curricular and co-curricular offerings of its forthcoming undergraduate public heath major.

The focus group analysis revealed that positive interactions with public health faculty and the introduction of public health concepts via undergraduate coursework influenced students to pursue public health for graduate study and careers. As such, it is recommended that the site should explore ways to 1) create opportunities for positive interaction between public health

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faculty and undergraduate students regardless of major, and 2) introduce public health concepts to non-public health undergraduate majors at the site.

Provision of Educational/Career Information

The study also found that a large percentage (62%) of the study's participants felt that they did not have enough information regarding healthcare fields to make an informed career/graduate study choice as a first year undergraduate. It is recommended that the site examine the opportunities for providing information about public health careers/graduate study to secondary students and undergraduates, especially those in their first year of college. This information could include 1) overviews of public health careers, 2) alumni career profiles who graduated from the MPH program and 3) the requirements/qualifications needed to pursue graduate study/careers in public health. These recommended opportunities were highlighted as useful information sources for focus group participants in their career/graduate decision making process. The suggested avenues for information provision about public health careers/graduate study can be offered in person for undergraduates at the site; and via the site's website for undergraduates at the site or at other post-secondary institutions as well as for students at the secondary education level.

Additionally, providing public health career panels open to all undergraduates at the site is recommended to expose students to breadth and depth of public health careers. These types of career panels were identified by two focus group participants as helpful in making their career/graduate study choice. These panels can be offered in person to undergraduates at the site or in a webinar format accessible to students at the site and beyond.

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Recommendations for Future Research.

As the need for more students to pursue public health graduate study and careers is evident (Association of Schools of Public Health, 2008; Rosenstock, et al., 2008), it is important for further research to be conducted to examine effective mechanisms for recruiting and encouraging more undergraduate to pursue graduate training and subsequently, careers in public health. Future research in several areas at the site and nationally can assist in further answering the question of how to increase the number of undergraduates, particularly undergraduate public health majors to pursue graduate study/careers in public health.

Recommendations for Future Research at the Site

While the conclusions from the study provide useful data for the formulation of actionable solutions, the study is limited as it only examines the current cohort of students in the full-time MPH program. It is recommended that the site conduct annual or biennial research similar to this study to obtain data over time to support recruitment and curricular/co-curricular efforts aimed at encouraging more undergraduates to pursue careers/graduate study in public health. Such future studies should include more focus group participants than this study to assist in the site's ability to generalize focus group findings to the population at the site. Additional research to explore more in depth the relationship between race/ethnicity and graduate school/career choice is also recommended.

Additionally, with the site's forthcoming undergraduate major, it is recommended that the site design a longitudinal study to track how its undergraduate public heath students' motivations and curricular/co-curricular experiences affect their career/graduate study decision making process during the lifespan of their undergraduate education. It is also recommended that since this study focused on students in the full-time MPH program, the site should conduct

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similar research on its executive MPH program which is for working professionals. This research will assist the site in determining factors that encourage working professionals to seek graduate public health education.

The quantitative analysis of this study found that the education level of students' mothers was statistically significant in relationship to graduate study/career choice. Further research at the site could be considered to explore if maternal education level was an important factor in students choosing public health for graduate study/careers. This conclusion could be drawn by expanding the focus group questions to examine that effect of the mother-child relationship on graduate study/career choice in public health. The actionable solutions from this study if adopted by the site should be researched and evaluated over time to determine the efficacy of the recommendations from this study.

Recommendations for Future Research at the National Level

The literature related to the need for more undergraduates to pursue public health graduate study/careers is clear that the need is at the national level (Association of Schools of Public Health, 2008; Rosenstock, et al., 2008). As such, it is recommended that similar research to this study be conducted at the national level to be able to provide actionable solutions that a generalizable to all schools of public health (SPHs) as well as graduate training programs outside of SPHs.

Summary

This study explored via quantitative and qualitative methods how a school of public health at a large urban university could encourage more undergraduates in public health and other majors to pursue graduate study/careers in public health. The study's conceptual framework along with previous research was consistent with the research methodology. The

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research methods produced original data and conclusions that the site did not have until this study.

The data analysis from the study revealed that the study's participants 1) had certain intrinsic and extrinsic motivations for attending college that played a role in their choice of public health or medicine for graduate study and careers; 2) perceived that participation in health related internships, community service/service learning, and research experiences played a role in graduate study/career choice of public health; 3) mother's education level was associated with career/graduate study in public health; and 4) when they entered college did not have enough information to make an informed decision on graduate study/career choice related to healthcare fields. The actionable solutions recommended to the site will assist the site in doing its part in encouraging more undergraduate students to pursue graduate study/careers in public health and to help in solving the "looming workforce crisis" in public health (Rosenstock, et al., 2008, p. 395).

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Appendix A

Survey Instrument (SMAU with demographic questions)

Student Motivations for Attending University (SMAU20 uni student version)

Instructions: **Think back to your days as a first year student in undergraduate and answer the questions based upon your thoughts/motivations when you were a college freshmen.**

Please rate the following statements in terms of how important you think they are in explaining your reasons for attending college/university . Do so by placing a circle around the number provided beside each statement according to how much you agree or disagree with it.

6 = Strongly Agree
5 = Agree
4 = Slightly Agree
3 = Neither Agree Nor Disagree
2 = Slightly Disagree
1 = Disagree
0 = Strongly Disagree

1.	**0 1 2 3 4 5 6**	I don't really get anything out of attending university, but it beats the alternatives (such as getting a job, going into the military, etc.)
2.	**0 1 2 3 4 5 6**	My education should enable me to help people who are less fortunate.
3.	**0 1 2 3 4 5 6**	My education should help me to understand the complexities of life.
4.	**0 1 2 3 4 5 6**	I intend to make sure that my education will be useful in contributing to the welfare of others.
5.	**0 1 2 3 4 5 6**	University is a practical means for me to achieve personal success.
6.	**0 1 2 3 4 5 6**	University is satisfying because it gives me the opportunity to study and learn.
7.	**0 1 2 3 4 5 6**	My parent(s) would be very disappointed in me if I didn't get a university degree.
8.	**0 1 2 3 4 5 6**	I don't learn anything from my courses.
9.	**0 1 2 3 4 5 6**	University will help me to obtain the “finer things in life."
10.	**0 1 2 3 4 5 6**	There were considerable pressures on me from my friends to get a university degree.

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11.	**0 1 2 3 4 5 6**	I intend to use my education to contribute to the improvement of the lives of other people.
12.	**0 1 2 3 4 5 6**	Through my education, I believe I can make meaningful changes to the "system" (system refers to systemic structures that create barriers for the improvement of the lives of others)
13.	**0 1 2 3 4 5 6**	University is a way to learn specific skills that can help me to earn more money.
14.	**0 1 2 3 4 5 6**	I am in university basically because there are few other options (such as getting a job, going into the military, etc.)
15.	**0 1 2 3 4 5 6**	University is a setting that allows me to improve my intellectual capacity.
16.	**0 1 2 3 4 5 6**	University is a way by which I can achieve a position of higher status in society.
17.	**0 1 2 3 4 5 6**	I often ask myself why am I in university.
18.	**0 1 2 3 4 5 6**	University should enable me to understand the complexities of the modern world (such as globalization, poverty, environmental sustainability, etc.)
19.	**0 1 2 3 4 5 6**	I basically had no choice but to come to university.
20.	**0 1 2 3 4 5 6**	There were considerable pressures on me from my family to get a university degree.

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Again, think back to your days as a first year student in undergraduate and answer the questions based upon your thoughts when you were a college freshmen.

a) How knowledgeable were you about the medical profession?
☐ 1 = No knowledge
☐ 2 = Little knowledge
☐ 3 = Fairly Knowledgeable
☐ 4 = Extremely knowledgeable

b) How knowledgeable were you about the public health profession?
☐ 1 = No knowledge
☐ 2 = Little knowledge
☐ 3 = Fairly Knowledgeable
☐ 4 = Extremely knowledgeable

c) What was your perception of M.D. programs?
☐ 1 = Not Valuable
☐ 2 = Somewhat Valuable
☐ 3 = Valuable
☐ 4 = Extremely Valuable

d) What was your perception of public health graduate programs?
☐ 1 = Not Valuable
☐ 2 = Somewhat Valuable
☐ 3 = Valuable
☐ 4 = Extremely Valuable

e) Do you think you had enough information about healthcare fields to make a potential career choice?
☐ 1 = Yes
☐ 2 = No

f) What career did you plan to go into when you were in your first year of your undergraduate program?
☐ Public Health
☐ Medicine (M.D., D.O)
☐ Dentistry
☐ Veterinary Medicine
☐ Law
☐ Other (please specify)

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Now, think about factors that influence your career and graduate school choice.

g) Did you complete an internship in a health related field?
☐ 1 = Yes
☐ 2 = No (If you selected no, go to question i)

h) Do you feel that your internship in a health related field helped you to decide to go to graduate/professional school?
☐ 1 = Strongly Agree
☐ 2 = Agree
☐ 3 = Disagree
☐ 4= Strongly Disagree

i) Please indicate the type of organization that you completed an internship in. (Select all that apply)
☐ Clinical (hospital, doctor's office, clinic)
☐ Laboratory
☐ Community Organization (non-profits)
☐ Government (federal, state, local)
☐ Pharmaceutical Company
☐ City, State, or Federal Health Department
☐ Insurance Company
☐ Other (Please be specific)_____

j) Did you complete a service learning or community service experience in a health related field?
☐ 1 = Yes
☐ 2 = No (If you selected no, go to question l)

k) Do you feel that your service learning or community service experience in a health related field helped you to decide to go to graduate/professional school?
☐ 1 = Strongly Agree
☐ 2 = Agree
☐ 3 = Disagree
☐ 4= Strongly Disagree

l) Please indicate the type of organization that you that you completed a service learning or community service experience in. Feel free to select more than one option if applicable.
☐ Clinical (hospital, doctor's office, clinic)
☐ Laboratory
☐ Community Organization (non-profits)
☐ Government (federal, state, local)
☐ Pharmaceutical Company
☐ City, State, or Federal Health Department
☐ Insurance Company
☐ Other (Please be specific)_____

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m) Did you have a research assistant position with a faculty member in a health related field?
☐ 1 = Yes
☐ 2 = No (If you selected no, go to question n)

n) Do you feel that your research assistant position with a faculty member in a health related field helped you to decide to go to graduate s chool?
☐ 1 = Strongly Agree
☐ 2 = Agree
☐ 3 = Disagree
☐ 4= Strongly Disagree

o) Please indicate the type of organization that had a research assistant position with a faculty member in. Feel free to select more than one option if applicable.
☐ Clinical (hospital, doctor's office, clinic)
☐ Laboratory
☐ Community Organization (non-profits)
☐ Government (federal, state, local)
☐ Pharmaceutical Company
☐ City, State, or Federal Health Department
☐ Insurance Company
☐ Other (Please be specific)_____

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Demographics – Please answer the below questions based on your background

1. **Undergraduate GPA (on a 4.0 scale):**

☐ 3.8 to 4.0
☐ 3.6 to 3.79
☐ 3.4 to 3.59
☐ 3.2 to 3.39
☐ 3.0 to 3.19
☐ 2.8 to 2.99
☐ 2.6 to 2.79
☐ 2.4 to 2.59
☐ Below 2.4

2. Gender:

☐ Female
☐ Male

3. Race (Choose one or more)

☐ American Indian or Alaskan Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☐ White
☐ Hispanic
☐ Other (Please be specific)_____

4. Please indicate which graduate/professional program you are currently in:

☐ MPH
☐ M.D.
☐ M.D./MPH

5. Which career path do you plan to take when you complete your current degree program? (Choose one):

☐ Public Health
☐ Medicine (M.D., D.O.)
☐ Dentistry
☐ Veterinary Medicine
☐ Law
☐ Other (please specify)

6. What type of institution did you receive your undergraduate public health degree from (Choose one):

☐ Large Public University (20,000 or more students)
☐ Large Private University (20,000 or more students)
☐ Medium Public University/College (5000 to 19,999 students)
☐ Medium Private University/College (5000 to 19,999 students)

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- ☐ Small Public College/University (Less than 5000 students)
- ☐ Small Private College/University (Less than 5000 students)
- ☐ Historically Black College or University
- ☐ Native American College or University

7. What university/college did you receive your undergraduate degree from: _____

8. What city/town was the university/college in that you receive your undergraduate degree from:_____

9 and 10. Please check the **highest level of education** that your mother and father have obtained.

EDUCATION LEVEL	Mother	Father
Less Than High School		
High School		
Associate's Degree		
Bachelor's Degree		
Master's Degree		
Professional (J.D., M.D., D.O., O.D.) or Doctoral Degree		

11. Was your undergraduate major in public health?

- ☐ Yes
- ☐ No

12. Type the specific name of your major:_____

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Appendix B

Interview Protocol

Two groups of 5 to 10 students: one group from the MPH program who were undergraduate public health majors; and one group from the MPH program who were NOT undergraduate public health majors. Both focus groups will be populated be MPH students at a large urban institution who have taken an online survey which includes all questions from the Student Motivations for Attending University Scale (SMAU). The SMAU is a twenty question instrument utilized to ascertain students' motivation for attending college. Students who complete the online survey will be asked to participate in an online focus group utilizing WIMBA software. Students will be asked to use a pseudonym when they join the online focus group to protect their identity.

During the focus group, students will be interviewed to explore their reasons for attending graduate school in public health and opting for a career in public health. The interview will be a "semistructured interview" (Merriam, 2009, p. 90) guided by the questions below:

1. Thinking back to when you entering your undergraduate education, how aware were you regarding the 1) public health field, 2) medical field?

2. Thinking back to when you entering your undergraduate education, how what career field did you want to pursue?

3. What would you consider to be the factors that influenced your graduate study in public health?

4. Was there a key or defining moment in which you choose to pursue a career in public health? If so, what was the key or defining moment?

5. What were the factors related to your undergraduate public health curriculum that helped you in making your graduate study/career choice? (FOR THE FOCUS GROUP WITH MPH STUDENTS WHO WERE UNDERGRADUATE PUBLIC HEALTH MAJORS)

   What were the factors related to your undergraduate major that helped you in making your graduate study/career choice? (FOR THE FOCUS GROUP WITH MPH STUDENTS WHO WERE NOT UNDERGRADUATE PUBLIC HEALTH MAJORS)

6. Did you do an internship during your undergraduate years?
   a. If so, what field what you classify the internship (public health, nursing, medicine)?
   b. Describe the internship
   c. How did the internship influence your graduate study and career choice?

7. Did you participate in service learning or community service experiences during your undergraduate years?

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   a. If so, what field what you classify the service learning or community service experiences (public health, nursing, medicine)?
   b. Describe the service learning or community service experiences
   c. How did the service learning or community service experiences influence your graduate study and career choice?

8. Did you participate in a research experiences with a faculty member (that was not considered an internship, service learning or community service experience) during your undergraduate years?
   a. If so, what field what you classify the research experience/program (public health, nursing, medicine)?
   b. Describe the research experience/program
   c. How did the research experience/program influence your graduate study and career choice?

9. Where did you get information about graduate school that was helpful in making your graduate study choice?

10. Where did you get information about potential careers that was helpful in making your career choice?

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Appendix C

Focus Group Codebook

Focus Group Themes			
Themes	**Description**	**Number Of Coding References**	**Number Of Sources Coded**
inputs and environment	As related to Astin's theory and I-E-O model, inputs are characteristics, etc. that students bring to the college; and environment refers to factors/influences in the environment that with interactions with inputs produce outputs such as career/graduate study choice.	86	6
intrinsic and extrinsic motivations	Motivations that students have related to graduate study and career choice as well as for attending college.	26	6
curricular and co-curricular experiences	Experiences that the literature suggest could have an impact on graduate study/career choice.	14	6

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Focus Group Theme: curricular and co-curricular experiences
Description of Focus Group Theme: Experiences that the literature suggests could have an impact on graduate study/career choice.

Code	Description	Number Of Coding References	Number Of Sources Coded
volunteering led to public health choice	service learning/community service	5	3
research experience help in the choice of public health	research assistant position with a faculty member	4	3
research had no influence	research assistant position with a faculty member	2	2
internship experience led to public health choice	impactful internship experience	2	2
volunteering had no influence	service learning/community service	1	1

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Focus Group Theme: inputs and environment

Focus Group Theme Description: As related to Astin's theory and I-E-O model, inputs are characteristics, etc. that students bring to the college; and environment refers to factors/influences in the environment that with interactions with inputs produce outputs such as career/graduate study choice.

Code	Description	Number Of Coding References	Number Of Sources
got info from websites	environment	13	5
not aware of ph at the beginning of undergrad	Input	11	6
aware of medicine at the beginning of undergrad	Input	8	6
being introduced to public health as a undergrad led to public health choice	environment	6	4
looked at potential jobs and their qualifications	environment	5	4
spoke to professionals	environment	4	3
positive professor experience	environment	4	2
work experience	input	4	3
major had no influence on pursuit of public health choice	environment	3	3
got info from family	environment	3	2
interested in infectious disease	input	3	2
got info from grad students	environment	2	2
natural career progression	input	2	2
medicine was the career choice at the beginning of undergrad	input	2	2

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campus visits	environment	1	1
did not want to be a clinician or doctor	input	1	1
CEPH website	environment	1	1
anthropology was the career choice at the beginning of undergrad (Nodes)	input	1	1
did not want to be in a lab	input	1	1
grad school fair	environment	1	1
got info from grad faculty	environment	1	1
likes epidemiology	input	1	1
something in health was the career choice at the beginning of undergrad (Nodes)	input	1	1
Rankings	environment	1	1
interested in a career in health	input	1	1
interested in outcomes research	input	1	1
got info from career counselors	environment	1	1
geographic preference	Input	1	1
interested in risk communication	Input	1	1
interested in ph career at the beginning of undergrad	Input	1	1

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Focus Group Theme: intrinsic and extrinsic motivations Focus Group Theme Description: Motivations that students have related to graduate study and career choice as well as for attending college.			
Code	**Description**	**Number Of Coding References**	**Number Of Sources Coded**
saw disparities and lack of health	intrinsic	13	6
interested in helping populations	intrinsic	7	5
wants to learn about socioeconomic status and health	intrinsic	2	2
Using PH to get to medicine	extrinsic	2	2
people person	extrinsic	1	1
wants to learn about environment and health	intrinsic	1	1

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Appendix D

Focus Group Participant Profiles

Focus Group Participant	**Profile**
Student #1	Student #1 was an undergraduate public health major who enter public health graduate education as a "natural progression" of her career interests. The moment she indicated that triggered her choice of public health as a career happened during her introduction to public health course as an undergraduate. During that class, she realized that "many of the health advances that we enjoy today are result of public health." She noted that she chose to pursue public health graduate education when she realized that the public health work her instructor was doing required more than a bachelor's degree. She did an internship at the YMCA related to health education and diabetes prevention. The internship helped her to see the health disparities that exist which made her "really want to go ahead and proceed with a public health degree." She also had a community service experience helping out after Hurricane Katrina. The experience opened her eyes to the social determinants of health and the impact that public health could make. She had a medical research experience that was laboratory based which she indicated did not influence her graduate/career choice. The information she used to make her graduate school choice included 1) attending graduate school fairs, 2) talking with her undergraduate professors, 3) campus visits, and 4) websites including sites that ranked MPH programs. She talked with several public health professionals to obtained information that helped her make her career choice. She had a clear picture of what the medical field entailed and was not very interested in public health at the beginning of her undergraduate education. She wanted to be a biomedical researcher when she entered college.
Student #2	Student #2, who declared her undergraduate public health major in her fourth year, "spent time in the field" during her undergraduate education as well as after she graduated which she considered to the most influential factor in her choice to study public health at the graduate level. She had an interest in infectious disease as an undergraduate. Her undergraduate public health professors helped her make her graduate study/career choice in public health. She noted that the field experience of her professors helped her understand that she needed a graduate degree in the field. She did an internship at a county health department that crystallized her choice of public health as a career as the internship helped her see the improvements in the health system that was needed. She completed

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	service in a public health related student organization in which she conducted small-scale public health interventions. She wasn't sure in the experience was a huge driver of her graduate study choice in public health but noted that the experience was gratifying as it confirmed that she could do "good work for the community." She didn't participate in any research assistant positions/experiences. She used Internet searches for accredited schools of public health in geographic areas of interests to her, and conversations with public health faculty and professionals to make her choice of where to study public health at the graduate level. She noted that the best information she received that led to her career choice in public health came from expert panels with public health professionals that she attended when she was an undergraduate. As she entered college, she was considering medicine as a career choice and did not know the field of public health existed. As such, she wanted to conducted research related to infectious disease at the beginning of her undergraduate career but did not realize public health was a field that would allow her to do so.
Student #3	Student #3, an undergraduate biology major felt that his choice of public health had nothing to do with his undergraduate major but came from his experience growing up in the developing country. He noted that he saw the impact that poverty has on health and he wanted a future career that was related to preventing health issues. He indicated that he did not have a defining moment in which he chose public health but rather had a "bunch of experiences" that led him to "try the public health field." He did not participate in an internship, research experience or health-related community service experience. His non-health related community service did not have an influence on his career/graduate study choice. He utilized websites, conversations with career counselors, and research on "career tracks" to make his career choice in public health. He indicated that websites were his primary sources of information related to making her choice of where to study public health at the graduate level. He also visited public health programs that were on the east coast. As a first year college student, he "wasn't really sure what (public health) entailed," but was aware of the medical field. He also noted that he was sure, when he entered college, that he did not want to pursue medicine as a career and knew that he wanted to pursue a career in a health-related field.
Student #4	Student #4, a double major in Psychology and Spanish, had a defining moment when she worked at a free clinic that helped her chose public health as a career. The experience educated her on the lack of health knowledge of populations which trigger her interest in public health. The doctors at the free clinic had MPH degrees which influenced her decision to pursue graduate education in public health. Her Psychology courses exposed her to how mental illness

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	affects different ethnic groups and people from different economic levels but felt that her major did not influence her graduate study/career choice. She did not complete an internship but her medical related community service opened her eyes to the concept of health disparities and influenced her career and graduate study choice. She participated in a medical research related experience with a faculty which confirmed her choice to pursue medicine but helped her realize she wanted to be a doctor with a public health background. She spoke to family members and professionals with master's degrees, and used websites to make her graduate study/career choice. She knew at the beginning of college that she wanted to be an emergency room doctor and had no knowledge of the public health field.
Student #5	Student #5, an undergraduate biology major with a good deal of research related experiences with professors, chose public health because it was the way for him "to have the greatest impact on the greatest number of people health-wise." His defining moment for his choice to pursue a career in public health came as a paralegal after his undergraduate graduation. He recognized that cancer due to asbestos exposure could be prevented and chose to pursue public health as career. As an undergraduate, he conducted malaria research with a faculty member in Southeast Asia which sparked his interest in infectious disease. He did not do an internship or participate in health-related community service. His community service in an education setting did expose him to the "hardships of people growing up in a very underserved rural community" but he did not think the experience really influenced his graduate study choice. He used websites "the most" as information sources for his career and graduate school choice. Campus visits to schools of public health on the east coast and conversations with students at the schools he visited were helpful in choice of graduate school and career. He also noted that a relative with a MPH degree helped him make his career choice. He was aware of the medical field as he entered college but knew little about public health. He "was planning on pursuing a degree in anthropology" when he began college. He noted that "he was not interested in health or science or math." During the course of his undergraduate career his tnterest changed.
Student #6	Student #6, a double major in biomedical engineering and sociology, knew when entered college that she wanted to pursue a career in medicine eventually and as an undergraduate began to think "that public health would be a nice foundation before going into medical school." Her defining moment for her choice to pursue a public health background came when she work at a health outcomes research company. The experience helped her recognize the lack of health information in populations which trigger her choice to pursue

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	public health. She did not feel that her undergraduate majors had an influence on her decision to pursue public health graduate study. She did not participate in an internship or community service experience. She conducted research with faculty members on two different research studies. One at a community health center and the other related to assisted technology devices for disabled children. She stated that the experience was "very eye-opening" and had "the most influence" on her choice to pursue public health. She mainly relied on websites for information to choose a graduate program in public health but also utilized campus visits and conversations with students in MPH programs. Her information sources related to her career choice included information she received from professionals and friends in the public health field, websites and Internet searches on the requirements needed for public health jobs.

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