A Dissertation

entitled

A Qualitative Case Study on Human Subject Research Public Policy Implementation at One Selected Council on Undergraduate Research Institution

by

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Regulations for research involving human subjects in higher education have long been a critical issue. Federal public policy for research involving human subjects impacts institutions of higher education by requiring all federally funded research to be passed by an IRB. Undergraduate research is no exception. Given the literature on the benefits of undergraduate research to students, faculty, and institutions, how human subject research public policy is being implemented at the undergraduate level was a significant gap in the literature. This qualitative single case study examined the human subject research policies and practices of a selective, Mid-western, Council on Undergraduate Research institution. The purpose of the study was to determine how this institution implemented human subject research public policy to benefit its students. This institution used a hybrid approach of public policy implementation that met federal requirements while capitalizing on the role local actors can play in the implementation process. This model resulted in a student friendly implementation emphasizing various learning outcomes and student mentoring. Although there is considerable research and public discussion on the negative aspects of IRBs, if approached in a manner that embraces student learning, the
IRB experience can be an extremely beneficial aspect of the institution’s learning environment.
Dedication

To my eight year old daughter Emma, who gave me the last bit of motivation I needed to complete this work when she said: “Mom, is that the same paper you’ve been working on since I was born?”
Acknowledgements

This study could not have been completed without the support of my family, friends, and colleagues. They encouraged and supported me every step of the way. My success at the University of Toledo is, in large part, a result of the tremendous support from my husband, Bob. He has endured countless conversations about my research throughout its various stages, and carried a huge load with a full-time job and three small children at home, all while I have spent many nights away during my doctoral journey. I have had the privilege to work with, and be mentored by, some wonderful individuals who have encouraged me to pursue this degree. Dr. Rick Creehan, Dr. Jeffrey Docking, and Dr. Dale Nesbary, your mentoring and leadership early on in my career was inspirational. Dr. Randall Ripley, thank you for taking the time to review my findings and help me understand that public policy is both an art and a science. Finally, to the faculty at the University of Toledo, especially Dr. Meabon, thank you for helping me to understand that this research was both a product and a process.
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List of Abbreviations

AACU…….American Association Colleges and Universities
AAUP…….American Association of University Professors
ATP…….Adrian Tinsley Program

BSU…….Bridgewater State University

CASTL…….Carnegie Academy for Scholarship of Teaching and Learning
CUR…….Council on Undergraduate Research

DEEP…….Documenting Effective Educational Practice

IRB…….Institutional Review Board
IS…….Independent Student

MOU…….Memorandum of Understanding
MRC…….Midwestern Research College (pseudonym for case study institution)

NIH…….National Health Institute
NSC…….National Student Clearinghouse
NSSE…….National Survey on Student Engagement

OHRP…….Office of Human Research and Protection

REU…….Research Experience of Undergraduates

SURE…….Summer Undergraduate Research Experience
STEM…….Science, Technology, Engineering, and Mathematics

UR…….Undergraduate Research
UREs…….Undergraduate Research Experiences
URG…….Undergraduate Research Grants
Chapter One

Introduction

Regulations for research involving human subjects in higher education have long been a critical issue. The ethical treatment of human subjects dates as far back as 1760 B.C.E. where government penalties for medical malpractice were acknowledged in Hammurabi’s Code (Sanders & Ballengee-Morris, 2008). The Hippocratic oath, required of physicians as early as the late 4th century B.C.E., states “to abstain from all intentional wrong-doing and harm, especially from abusing the bodies of man or woman, found or free” (Sanders & Ballengee-Morris, 2008, p. 313). The Nuremberg Code, established in 1947, was a result of unethical medical experiments conducted on concentration camp prisoners. Although the code never became law in either Germany or the United States, it was the basis for the Code of Federal Regulations, title 45, volume 46, which was adopted some 40 years later (White, 2007).

The National Institutes for Health (NIH) opened their Clinical Center in 1953. It was a product of the huge growth in clinical research following World War II (Bankert & Amdur, 2006). It was also during this time that social scientists experienced a funding boom which added not only to the amount of social and behavioral research, but to its funding as well (Stark, 2007). Attention was brought to social and behavioral research’s utilization of human subjects in 1961 as a result of Stanley Milgram’s study on obedience to authority (Stark, 2007). This well known and highly debated experiment was the first outside the biomedical venue to receive such publicity.

The U.S. Surgeon General became involved in regulating of human subject research in 1966 by requiring reviews of studies receiving funding from the U.S. Public
Health Service. It was also during this time one of the most infamous studies in American history became public, the Tuskegee Syphilis Experiment. This federally funded study, which ran for nearly 50 years before the U.S. Department of Health, Education, and Welfare put an end to it, knowingly withheld information and treatment from syphilis patients. It was this study that led to the 1974 National Research Act, which required all federally funded research to be passed by an institutional review board (Sanders & Ballengee-Morris, 2008). The act required institutions to have diverse boards of at least five members to review research on human subjects, thus beginning the history of institutional review boards, also known as IRBs (White, 2007).

The National Commission, a federal advisory committee on human subject research, issued the Belmont Report in 1979 which became one of the first handbooks for institutional review boards (Keane, 2008). The document outlines three key ethical principles that should govern human subject research: respect for persons, beneficence, and justice (Keane, 2008). Respect for persons suggests subjects should be treated as autonomous agents, and those who cannot be autonomous on their own should have added protection. Examples of protected populations include prisoners, pregnant women, and children. Beneficence, the second ethical principle, implies the researcher will do no harm, maximize benefits, and minimize risks (Hemmings, 2006). Lastly, justice is distributing benefits and burdens in a fair and equitable manner (Keane, 2008). Early initiatives such as the Belmont Report were specific to federally funded research.

The Applied Research Ethics National Association formed in 1986 to provide leadership as well as information to the IRB community (Bankert & Amdur, 2006). IRBs
were now responsible for the oversight of any research involving human subjects deemed to have generalizable knowledge, a term whose meaning has been highly debated.

In 1991, federal agencies adopted the Common Rule from the Code of Federal Regulations. The Common Rule refers to the basic standards of ethics that must be complied with during federally funded research. Throughout the following decade, many institutions adopted the Common Rule, not only for federally funded research, but for all research involving human subjects (White, 2007). By the turn of the 21st century, the National Bioethics Advisory Council proposed even more guidelines, including the certification of IRB members that would yet again widen the umbrella of IRBs to include any study using human subjects. These recommendations remain in what White (2007), refers to as bureaucratic limbo, but nonetheless they illustrate the trend in increased IRB oversight of research.

**Statement of the Problem**

There is a large body of research showing undergraduate research benefits for students (Bauer & Bennett, 2003; Dolan & Johnson, 2009; Hathaway, Nagda, & Gregerman, 2002; Hernandez Jarvis, Shaughnessy, Chase, & Barney, 2011; Kardas, 2000; Kuh, 2008; Lopatto, 2006; Summers & Hrabowski, 2006; Ward, Bauer, & Bennett, 2005). These benefits include enhanced educational outcomes, career development and preparation, graduate school preparation, positive mentorship experiences, higher retention rates, intellectual gains and skill attainment, and a better connection to their discipline.

Faculty benefit from undergraduate research (Beckman & Hensel, 2009; Bush, Cox, Harris, Torda, 2010; Corley, 2013; Crawford, Garg, & Neuhoff, 2008; Crosby,
Ronneberg, & Sadowski, 2011; Hernandez Jarvis et. al, 2011; Laursen, Seymour, & Hunter, 2012; Schultheis, Farrell, & Paul, 2011; Stocks, 2009; Thomas & Gillespie, 2008). Research indicated undergraduate research can help faculty with tenure and promotion, provides intrinsic value, and allows faculty to do research during the academic year.

Research indicated a number of institutional benefits from undergraduate research including lower attrition rates, increased admission selectivity, higher job and graduate school placement rates, and increased institutional funding (Kierniesky, 2005; Nagda, Gregerman, Jonides, von Hippel & Lerner, 1998.)

Since 1966, when the U.S. Surgeon General first became involved in regulating human subject research, federal regulations for human subject research have been applied to non-funded research and non-biomedical research (Howard, 2006; Jaschik, 2008; White, 2007). Nearly all academic areas, including the social sciences and humanities, are now required to seek IRB approval. It is unclear why IRB oversight has drifted into these areas, but what we do know is that it appears to have done so quickly. In 1974, the average number of IRB reviews per year was 43. By 1998, some IRBs were handling as many as 2000 reviews per year (Ghersi, 2004). There has not only been an increase in the number of reviews, but there has been expansion of IRB oversight into a variety of types of research (non-funded, non-medical, and undergraduate research). There is a large body of research on undergraduate research, particularly, its benefits (Bauer & Bennett, 2003; Dolan & Johnson, 2009; Hathaway, Nagda, & Gregerman, 2002; Hernandez Jarvis, Shaughnessy, Chase, & Barney, 2011; Kardas, 2000; Kuh, 2008; Lopatto, 2006; Summers & Hrabowski, 2006; Ward, Bauer, & Bennett, 2005). There is also research on
the evolution of IRBs and federal regulations (Keane, 2008; Ghersi, 2004; Hemmings, 2006; Sanders & Ballengee-Morris, 2008; Stark, 2007; White, 2007). While these research areas exist independent of one another, there is a research gap regarding how human subject research public policy is being implemented at the undergraduate level.

**Purpose of the Study**

The purpose of this case study was to determine how one Council on Undergraduate Research institution has implemented human subject research public policy to benefit its students.

**Significance of the Study**

The Council on Undergraduate Research (CUR) consists of over 650 institutional members and over 7,000 individual and affiliate members. The mission of CUR is to “support and promote high-quality undergraduate student-faculty collaborative research and scholarship” (Council on Undergraduate Research, para 1). CUR serves as a resource for institutions, students, faculty, and others on undergraduate research. It hosts conferences, publishes materials, and provides updates on government regulations and legislation pertinent to undergraduate research. CUR believes that undergraduate research is important to both student and faculty development. Kuh (2008) listed undergraduate research as one of ten high-impact educational practices beneficial to students. Lopatto (2006) discussed how undergraduate research engages students in active learning, provides academic challenge, and creates student-faculty interaction in ways that meet student engagement benchmarks reflected in the National Survey on Student Engagement (NSSE).
Undergraduate research also benefits faculty. Dotterer (2002) called undergraduate research “the pedagogy of the 21st century” (p. 81). Cooley, Garcia, and Hughes (2008) discussed how undergraduate student-faculty research facilitates the teaching process, can encourage additional faculty research, and provides additional lab assistants for research. Undergraduate research collaborations also allow faculty an opportunity to engage in research areas that may not necessarily lead to publications (Brakke, Crowe, & Karukstis, 2009).

According to Sanders & Ballengee-Morris (2008) there were more than 5,500 IRBs nationwide by 2008 that provided oversight to any federally funded project, and a large amount of unfunded research. None of the research reviewed argued against the need for the protection of human subjects, but there was research indicating a handful of isolated, unethical practices may have created a spiral of knee-jerk reactions resulting in a loss of academic freedom, and a laundry list of other problems for researchers (White, 2007). Administrators and academicians had mixed reviews as to this shift from individual to collective responsibility in the protection of human subjects. In a published report titled Research on Human Subjects: Academic Freedom and the Institutional Review Board, the American Association of University Professors (2006) spoke out strongly against IRB policies and practices stating, “there could hardly be a more obvious potential threat to academic freedom” (p. 1). Stark (2007) argued that the regulations aimed to protect the rights of human subjects actually violate the rights of researchers. Chadwick and Dunn (2000) summed up the last 50 years of IRB evolution by saying, “Like many highway projects, the IRB system was sound when it was designed, but became out-of-date and overloaded almost from the start” (p. 21).
Hyman (2007) indicated there is a lack of empirical evidence that IRBs provide a benefit to human subject protection. In a systematic review of IRB studies, Abbott and Grady (2011) acknowledged they found no study on the impact IRBs had on the protection of human subjects. Dash (2007) discussed the perplexity with which the biomedical “do no harm” model drifted into the social sciences, specifically commenting on its drift into “voluntary interviews about lifetime experiences and personal biographies” (p. 872).

There is literature acknowledging the history of IRBs (Sanders & Ballengee-Morris, 2008). The hindrances of IRB mission drift and how it may be affecting academic freedom is a widely researched topic (Hemmings, 2006; Howard, 2006; Jaschik, 2008; Sanders & Ballengee-Morris, 2008). There is research as to the causality of mission drift (Feeley, 2007; Hemmings, 2006). Liability appears to be one factor in IRB mission drift. Stalcup (2004) discussed the increase in subjects filing suit against researchers and institutions.

Despite the research noted above, there is still a great deal to be learned about IRBs and how they are implementing human subject research public policy at the undergraduate level. Additionally, the role and function of IRB chairs at institutions where undergraduate research is a significant portion of the undergraduate experience has yet to be looked at. Given the amount of literature on the benefits of undergraduate research to students, faculty, and institutions, understanding how human subject research public policy is being implemented at the undergraduate level is a significant gap in the existing research. This study has helped to fill this gap by examining how one CUR
institution has implemented human subject research public policy on its campus in a way that benefits its undergraduate students.

Conceptual Framework

Concern over the impact federal regulations have on the internal affairs of higher education institutions is, and has been, a critical issue in higher education (Dash, 2007; Feeley, 2007; Hemmings, 2006; Jaschik, 2008; White, 2007). Private colleges are no exception. All institutions of higher education receiving federal funding must comply with federal policies and regulations. Regulations for institutions of higher education receiving federal funding are specifically discussed in the Code of Federal Regulations, Title 45, Part 74 (U.S. Department of Health and Human Services, 1999). Gladieux, Hauptman, and Knapp (2010) noted “the framers of the U.S. Constitution lodged no specific responsibility for education with the national government, yet the federal influence on American colleges and universities has been enduring and pervasive” (p. 67). Protection of human subjects is one area that the Federal government has promulgated policy through its agencies to influence higher education policy and action at the institutional level. Specifically, the Code of Federal Regulations, Title 45, Part 46, outlines the basic Health and Human Services policy for protection of human research subjects. According to the U.S. Department of Health and Human Services:

“the federal policy for the protection of human subjects or the “Common Rule” was published in 1991 and codified in separate regulations by 15 Federal departments and agencies…for all participating departments and agencies the Common Rule outlines the basic provisions for IRBs, informed consent, and Assurances of Compliance… if an institution seeks
guidance on implementation of the Common Rule and other applicable federal regulations, the institution should contact the department/agency conducting or supporting research,” (Federal Policy for the Protection of Human Subjects, para 2).

Part 46 of Title 45 outlines the basic provisions for IRB, however, these provisions were written in such a way that allows for institutional interpretation and discretion. For example, it states that institutions must have diverse boards of at least five members, but it does not provide a limit on the maximum size of the board. It also tasks the IRB with minimizing risk, but it does not define risk. Additionally, how the components of Part 46 Title 45 of the Federal Code of Regulations are actually implemented is left to the institution. For example, some institutions form internal boards, while others choose to outsource. What I found in the literature review was that there are a variety of different interpretations of this policy, as well as a variety of different implementation models being used to carry it out at the institutional level.

The influences of this federal policy determine institutional and faculty ability to gain access to federal research funds as outlined in the Code of Federal Regulations, Title 45, Part 74- Uniform Administrative Requirements for awards and subawards to institutions of higher education, other organizations, and commercial organizations; and certain grants and agreements with states, local governments and Indian tribal governments (U.S. Department of Health and Human Services, 1999).

According to LeCompte and Preissle (1993) “the purpose of theories is to help us sort out our world and make sense of it, guide how we behave in it, and predict what might happen next” (p. 42). The conceptual framework for this research was based on
Public policy theory. Public policy theory can not only inform policy formation and implementation at the federal level, but at the institutional level as well. Human subject research public policy was generated to protect various facets of society. Lowi (1972) identified four policy types: distributive, redistributive, constituent and regulatory. Ripley and Franklin (1982) further defined regulatory policy into two categories: protective and competitive. Protective regulatory policies are codified in the Federal Code of Regulations and protect people from negative effects of business. Human subject research public policy is a Federal, protective, regulatory policy. I am evaluating the implementation of Federal human subject research public policy at one CUR institution.

Public policy theories were examined during the literature review for this research project (deLeon & deLeon, 2002; Hill & Hupe, 2002; Kingdon, 2010; Mazmanian & Sabatier, 1983; Pulzi & Trieb, 2007; Sabatier, 2010; Ripley, 2010). Randall Ripley is a public policy theorist, whose research focuses on U.S. public policy process and creation and implementation of programs (The Ohio State University, 2016). Public policy implementation theories can be broadly categorized in three ways: top-down models, bottom-up models, and hybrid models. Randall Ripley’s hybrid approach to the public policy process, when specifically applied on the implementation stage, best explained the phenomenon occurring at this case study campus. Figure 1 below illustrates an adapted version of Ripley’s model that can be applied to analyze human subject research public policy implementation at this case study institution. For example, in the adapted version of Ripley’s model, governmental public policy relates specifically to federal policy to protect human subjects. The second aspect of Ripley’s model relates to social policy activity, which in this case study is undergraduate research. The policy actors in this case
study are the IRB chair and members, the faculty mentors, etc. These individuals are part of the last aspect of Ripley’s model, the environment, which is the case study institution in this research. It is important to note the adaptation of this model because it informs this study and will be repeated in various ways throughout this research project. How policy implementation is occurring is described in greater detail in the following chapters.

**Figure 1.** Illustration of how Ripley’s model was applied by the researcher to analyze human subject research public policy implementation at this case study institution (Adapted from Ripley’s General Model, 2010).

**Research Question**

How has a selective, Midwestern, CUR affiliated college implemented human subject research public policy on its campus?
Methodology

This case study approach examined the human subject policies and practices of a selective, mid-western, Council on Undergraduate Research institution of higher education. According to Denzin and Lincoln (1994):

“Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense or interpret phenomena in terms of the meanings people bring to them. Qualitative research involves the use and study of a variety of empirical materials…that describe routine and problematic moments and meaning in individuals’ lives” (Denzin & Lincoln, 1994, p. 2).

- Data collection took place using semi-structured open ended interviews.

  Interviews were conducted with participants holding one or more of the following roles:

  - The IRB chair
  - IRB member
  - Undergraduate research advisors/faculty
  - Honors/Institute chair
  - Undergraduate researcher/student
  - CUR representation
  - Summer research program director
  - College controller
While this semi-structured method may not offer the same reliability as a structured interview, the goal was to create an interview environment where the interviewee felt comfortable speaking about a controversial and critical issue in higher education. Document and policy analysis was also be completed.

**Case.** The Council on Undergraduate Research (CUR) consists of over 650 institutional members and over 7,000 individual and affiliate members. The mission of CUR is to “support and promote high-quality undergraduate student-faculty collaborative research and scholarship” (Council on Undergraduate Research, para 1). The Council on Undergraduate Research serves as a resource for institutions, students, faculty, and others on undergraduate research. It hosts conferences, publishes materials, and provides updates on government regulations and legislation pertinent to undergraduate research. CUR believes that undergraduate research is important to both student and faculty development.

Purposeful sampling was used by the researcher to select a CUR institution for a case study analysis. A selective, Midwestern, CUR affiliated college was selected. They are a member of CUR and have a strong undergraduate research program where undergraduate research is a significant portion of the undergraduate experience.

**Analysis.** Interviews were recorded and then transcribed verbatim. Analysis of the transcripts were executed using NVivo software. NVivo software features an analysis tool for unstructured qualitative research that assisted the researcher in analyzing the qualitative data from the interviews. NVivo is a query tool that analyzes data and detects trends (QSR International, 2012).
Limitations. The generalizability of the study was a limitation. Specifically, internal generalizability is of concern. Through the use of multiple triangulation, the researcher has made every attempt to minimize these concerns. According to Maxwell (1992) the in-depth understanding gained through qualitative research take precedence over the ability to generalize findings outside a case study.

The choice to use semi-structured open-ended interviews was made with the hope of creating a comfortable opportunity for the interviewee to speak, however this interviewing method may lack reliability and cause a concern to internal validity. To minimize descriptive validity concerns the researcher used tape recordings, verbatim transcriptions, and NVivo software.

The case study institution requested that they not be named. For this reason, a number of photographs and documents that may have helped to paint a better visual picture have been excluded. Additionally, some scripters have been modified in an attempt to provide anonymity the institution.

Contributions to Future Research and Practice

It appears institutional review boards are a permanent part of higher education. Research indicated the importance of undergraduate research to a quality educational experience. If undergraduate research truly is the pedagogy of the 21st century, more disciplines, departments, and researchers will find their research going before IRBs.

Understanding how one CUR institution has implemented human subject research public policy to benefit its students is key to future research for a number of reasons. First, it will assist other institutions in examining their IRB implementation strategies and practices and assist them in shaping and implementing best practices.
Second, previous research indicated many feel IRBs not only infringe of academic freedom but impede it unnecessarily. A better understanding of how IRBs are implementing human subject research public policy at the institutional level is beneficial to researchers, institutions, and IRBs. Some researchers view IRBs as an unnecessary roadblock to their research. By examining human subject research public policy implementation at the institutional level, this study may help institutions to explain and further justify to researchers the need for the current state of IRB oversight.

Understanding how a CUR institution is implementing human subject research public policy for undergraduate research will help to shape future policy on the issue. More specifically, a better understanding of possible mission drift and liability will spark future research on the scope of practice exercised by IRBs. Many criticisms surrounding IRB mission drift focused on the IRB’s lack of knowledge with regards to non-biomedical research and qualitative methods research. Additional research on the IRB role and function in the implementation process will clarify IRB scope of practice, and, if a better understanding of IRB role and function can be gathered, it may be utilized and applied to better educate researchers on ethical practices.

Summary

This chapter contained an introduction to this study outlining the history of federal human subject research regulations and the birth of institutional review boards. It included a statement of the problem, highlighting research on the benefits of undergraduate research to students, faculty, and institutions and identified a research gap as to how human subject research public policy is being implemented at the undergraduate level. Given this gap in the research, the purpose of this case study was to determine how
one Council on Undergraduate Research college has implemented human subject research public policy on its campus. The research design for this case study utilized public policy theory as a conceptual framework. This study is important because undergraduate research is a high impact practice and understanding how IRBs are implementing human subject research public policy in a way that benefits students will help other institutions to improve their own policies and to shape future policies at both the federal and institutional level.

This research study is presented in five chapters. Chapter one provided an introduction and overview of the research. Chapter two will thoroughly review the literature on both institutional review boards as well as undergraduate research. Chapter three will provide a detailed explanation of the methodology used for this research study. Chapter four will present the findings of this research study. Finally, Chapter five will discuss the findings, their contributions to future research and practice, and end with concluding thoughts.
Chapter Two

Literature Review

The purpose of this chapter is to review literature on undergraduate research, institutional review boards, and policy theory. First, literature on the definition of undergraduate research, as well as the history and development of undergraduate research will be reviewed. Next, the literature review will look at the benefits of undergraduate research to the various stakeholders (students, alumni, faculty, and institutions). Once a thorough review of undergraduate research has been covered, we will shift gears and review the literature on institutional review boards. The history of IRBs will be covered including the evolution of government policy. The various IRB structures and stakeholder concerns will also be reviewed. Finally, a variety of different policy theories will be reviewed.

Defining Undergraduate Research

Lopatto (2006) defined undergraduate research as “experiences that include doing original research while being mentored by an experienced researcher” (p. 1). The Council on Undergraduate Research (CUR) defined undergraduate research as “an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline” (as cited in Beckman & Hensel, 2009, p. 40). Osborn and Karukstis (2009) listed the four main characteristics of undergraduate
research as mentorship, originality, acceptability, and dissemination. The definitions and application of these characteristics vary greatly.

The Carnegie Academy for the Scholarship of Teaching and Learning (CASTL) identified undergraduate research as a theme for its 2006-09 CASTL leadership program. Nine institutions and CUR were chosen to participate. At the first meeting, the group aimed to discuss the definition, purpose and benefits of undergraduate research. The hope was to find commonalities in how CUR and the various institutions defined undergraduate research. Instead of definitional similarities emerging, tensions arose from differing opinions as to whether undergraduate research was student or faculty initiated; whether it was process centered or product centered; who participated in undergraduate research (honors or all students); whether it was collaborative or individual; curricular or co-curricular based; original to the student or to the discipline; campus/community or professionally based. This further highlights the definitional differences of UR.

Individual institutions, departments, colleges, communities, faculty members, and programs may each define undergraduate research differently (Beckman & Hensel, 2009). Undergraduate research can be done on or off campus, or abroad, in any discipline, and can be a simple intellectual exercise or a formal one. Undergraduate research experiences (UREs) can be done during the summer or during the school year; can be part of a highly selective program, or can be open to any student; they can be mentored by graduate assistant or a faculty member (Hartmann, Widner, & Carrrick, 2013). Undergraduate research combines teaching and original scholarship (Dotterer, 2002). It takes many forms, including creative activity, empirical inquiry, and other forms of scholarship across the arts, humanities, sciences and social sciences (Thomas, &
Gillespie, 2008). It appears from the research, definitions of institutional research may be more cultural and contextual than anything else.

**History of Undergraduate Research**

Undergraduate research in the United States began in the 1960s. Early on, undergraduate research focused primarily on Science, Technology, Engineering, and Mathematics (STEM) fields. The Massachusetts Institute of Technology opened the first center for undergraduate research in 1969. The Council for Undergraduate Research was founded in 1978 by a group of chemists. The National Science Foundation created its first Research Experience of Undergraduates (REU) program in 1980 (Corley, 2013).

Undergraduate research has been slower to develop in history and other humanities related disciplines. Unlike the National Science Foundation, organizations like the National Endowment for the Humanities and the American Historical Association, have not sponsored or embraced research experiences for undergraduates. This same trend occurs at liberal arts colleges. The National Survey of Student Engagement (NSSE) suggests that humanities students at liberal arts colleges reported less undergraduate research experiences than did students in other disciplines. One common perception among scholars is that “fundamental disciplinary barriers exist in UR in the humanities that differentiate the process from what occurs in the sciences or even some of the social and behavioral sciences such as psychology” (Corley, 2013, p. 398).

In 1998, *Reinventing Undergraduate Education: A Blueprint for America’s Research Universities* was published by the Boyer Commission on Educating
Undergraduates in the Research University. The report found fault in large research institutions for not engaging in enough undergraduate research (Corley, 2013). The report called for increased involvement of undergraduates in faculty-mentored research experiences. This led to increased funding through the National Science Foundation, the National Institutes of Health, and the Howard Hughes Medical Institute to support American colleges and universities in creating opportunities for authentic research experiences for undergraduate students across multiple disciplines (Adedokun, Carleton Parker, Bessenbacher, Childress, & Daniels Burgess, 2012; Hunter, Laursen, & Seymour, 2006).

In 2002, The Association of American Colleges and Universities advocated for additional attention on undergraduate research calling it a key means to engage students, and in its 2007 *College Learning for the New Global Century* report, it recommended undergraduate research as a key focus area. In 2005, NSSE included undergraduate research as an indicator for effective teaching (Corley, 2013).

Liberal arts institutions have supported, embraced, and even required undergraduate research for quite some time, albeit, more in the STEM fields than the humanities and social sciences. Undergraduate research has historically been more strongly associated with the natural sciences and at many institutions, other disciplines lag behind or use different models of mentoring UR (Gesink, 2010). In recent years, undergraduate research has expanded to other institutional types, including community colleges. (Brakke et al., 2009). Brakke et al. (2009) discussed how maintaining a student learning centered approach is more difficult at a large research institution compared to a
small undergraduate institution because research success is not based on student learning, but instead, on publicizing or grants attained.

In the last ten years more and more colleges and universities have taken steps to promote undergraduate research on their campuses. Institutions have created centers for undergraduate research and undergraduate research fairs to encouraged faculty-student collaboration. They have also created undergraduate research journals highlighting student work (Corley, 2013). In addition to institutional support, many key organizations, projects, and programs encourage undergraduate research including: the Research Experiences for Undergraduates program funded by the National Science Foundation, the Ronald McNair Post-baccalaureate Program at the Howard Hughes Medical Institute, grants from the Lancy Institute, the 2002 AAC&U report, Greater Expectations, CUR, Project Kaleidoscope, and the National Conference on Undergraduate Research (Lopatto, 2006).

George Kuh’s Documenting Effective Educational Practice (DEEP) study provided further evidence in favor of undergraduate research. The study showed higher graduation rates for institutions that had effective methods for incorporating undergraduate research into their students’ education. The study also reported that students who participate in undergraduate research have higher satisfaction rates and increased retention rates compared to students who do not participate in undergraduate research (Corley, 2013). Undergraduate research has been broadly defined and a brief historical context has been covered. Now, the benefits of undergraduate research will be reviewed.

**Benefits of Undergraduate Research**
Undergraduate research benefits students, faculty, and institutions (Beckman & Hensel, 2009). Gafney (2005) stated undergraduate research may be viewed as an extension of the learning process that “leads to higher-order thinking, application, and integration” (p. 10). Undergraduate research is part of the NSSE and is a hallmark of outstanding colleges (Greenwald, 2010). After looking at 250 interviews and qualitative evaluations regarding UREs, Gafney (2005) found the largest difference between URE and classroom experiences, is UREs ask and answer questions while classroom experiences simply provide answers.

Medical schools have begun screening applicants more and more on whether or not they have conducted undergraduate research. Lopatto (2006) stated large companies such as DuPont and Pfizer are using undergraduate research as part of their hiring/interviewing criteria. Upon graduation from an undergraduate institution, students need to have the ability to “process, evaluate quality, and synthesize information” (Lopatto, 2006, p. 10). Research indicated that undergraduate research provides an opportunity for students to learn and develop these skills (Cole, 1995; Kardash, 2000; Seymour, Hunter, Laursen, & Deantoni, 2004).

I have organized the extensive literature review on the benefits of undergraduate research into three main categories. These categories are benefits to students, benefits to faculty, and benefits to institutions. Figure 2 provides a visual representation of each of these categories. Following Figure 2, each category will be fully explained in detail and research and literature reviewed will be examined.
The Benefits of Undergraduate Research

### Students
- Creates mentorship opportunities
  (Alexander, et al., 2002; Hartmann, et al., 2013)
- Increases retention
  (Hathaway, et al., 2002; Ishiyama, 2001; Schwartz, 2012)
- Increases intellectual gain and skill attainment
  (Chesniak, 2013; Greenwald, 2010; Ishiyama, 2002; Kardash, 2000)
- Graduate school and career preparation
  (Crowe & Brakke, 2008)
- Connection to discipline
  (Collins, et al., 2010; Crowe & Brakke, 2008; Russell, 2007)

### Faculty
- Assistance with tenure and promotion
  (Nagda, et al., 1999; Haney, et al., 2011)
- Contribute to field
  (Gates, 2013; Chancellor, et al., 2009)
- Opportunity to do ongoing research
  (Gates, 2013)

### Institutions
- Lower attrition rates
  (Nagda, et al., 1999)
- Increased admissions selectivity
  (Kierniesku, 2005)
- Higher job and graduate school placement rates
  (Lopatto, 2006)
- Increased institutional funding
  (Nagda, et al., 1999)

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**Figure 2.** Benefits of undergraduate research by individual stakeholder group including students, faculty, and institutions [Literature review by Hottenstein].

**Students.** Students are the greatest benefactor of undergraduate research.

Undergraduate research is one of the high-impact educational practices promoted by the Association of American College and Universities and CUR (Hernandez Jarvis et al., 2011). Kuh (2008) outlined teaching and learning practices beneficial for college students with a variety of backgrounds and discussed undergraduate research as one of the top 10 high impact educational practices citing its prominence in the sciences and strong support from the NSC.

Lopatto (2006) discussed how undergraduate research is a catalyst for student development and Summers and Hrabowski (2006) listed involving students early in research as a best practice for success. Research showed reported gains of UREs to students center mainly on enhanced educational outcomes and career development (Bauer et al., 2002; Hartmann, et al., 2013).

Some UR benefits to students include: interaction with mentor, guidance from mentor, learning to think like a scientist, finding solutions to obstacles, career exploration in science, career pathway clarification, and enhancing credentials (Lopatto, 2006). Research indicates undergraduate research provides greater learning experiences when compared to traditional classroom learning. In a study by Ward et al. (2005), 73% of participants reported a greater learning experience during a summer research experience when compared to traditional classroom learning in the subject area. Twenty five percent of participants reported equal value in the learning experiences and 95% reported improved technical skills do to their UR experience. Twenty nine percent reported greater self-confidence. Other reported benefits included ability to think creatively, improved ability to act independently, increased desire to learn. Thomas and Gillespie (2008) summarized the benefits of undergraduate research for students well by saying, “Consistent with the promotion of active learning, student-centered learning, and collaborative learning, scholars of teaching and learning advocate undergraduate research as a way to promote communication, critical thinking, and problem solving skills” (p. 30).

Retention. Participation in undergraduate research may also improve students’ retention rates. A study conducted with the University of Michigan’s Undergraduate Research Project found that the students who were selected to participate in UR were more likely to complete a college degree and to attend graduate and professional school (as cited in Hathaway et al., 2002). Findings from Schwartz (2012) provided additional
support citing involvement in undergraduate STEM research results in increased retention rates. Ishiyama (2001) found that UR experiences increased retention and increased likelihood of graduate school enrollment.

Mentorship. Hartmann, Widner, and Carrick (2013) found that individually mentored students reported stronger student-faculty relationships. Students in the study reported higher levels of faculty/student interaction and higher levels of student involvement and commitment than students not selected to participate in UR (as cited in Hathaway et al., 2002). The opportunity to interact with role models was listed as a successful component of a summer research experience (Alexander, Foertsch, Daffinrud, & Tapia, 2002). Research also indicated science students receive more direct contact with mentors, compared to social sciences and humanities students (Lopatto, 2006).

Intellectual gain and skill attainment. Undergraduate research participants have higher intellectual gains than their non-UR counterparts (Ishiyama, 2002). Seymour et al. (2004) looked to clarify benefits of undergraduate research. Their research cited a variety of student self-reported gains (in the areas of skills and professionalism) including: design and hypothesis formation, data collection and interpretation, information literacy, communication, computer work, opportunities to publish and present work, resume building and networking. Additionally, Greenwald (2010) cited enhancing curiosity, critical, and independent thinking as benefits of UR.

In addition to intellectual gain, research also indicated students can gain a variety of written, oral, and communicative skills from UR. Kardash (2000) reported students in a summer URE gain greater ability to orally communicate, make observations, collect data, and relate their research to the big picture. Chesniak (2013) gave additional
testimony to this stating, “the biggest transformative factor in UR for me was developing emotional intelligence…humility and communicating with others are two areas in which I focused on developing better skills” (p. 10). Undergraduate research positively contributes to student’s communicating, problem solving, teamwork, informed learning, and responsible learning (Hakim, 1998). Research indicated an increase in skills, confidence and motivation as a result of UR experiences. (Campbell & Skoog, 2004). Ownership of learning experiences, enhanced problem solving, analysis of literature, and communication skills are also student benefits of UR (Adhikari & Nolan, 2002; Bauer & Bennett, 2003; Cooley et al., 2008; Guterman, 2007); Kardash, 2000; Kremer & Bringle, 1990).

**Graduate school and career preparation.** Students and mentors agree that UR better prepares them for graduate school. “I feel like the research helped make me be a more well-rounded applicant in the application process especially since there is a large research component in the [program]” (Collins et al., 2010, p. 311). Undergraduate research helps students understand what it means to be a scientist (Hunter et al., 2006). Graduate schools seek applicants with publications or conference presentations under their belt (Crowe & Brakke, 2008). Undergraduate research experiences (UREs) can influence students to pursue advanced degrees and research careers (Floyd-Smith, 2008). Russell (2007) reported 70% of URE participants reported a greater interest in their field of study and 29% of URE students reported a newly found interest in Ph.D attainment in their field. Undergraduate research may also bridge a gap between what is taught and what is expected of competent graduates (i.e.-intellectual curiosity, understanding of
scientific findings, critical analysis of literature, effectiveness of public speaking, leadership development, and clarity of career goals (Collins et al., 2010).

**Connection to discipline.** Research indicated UR experiences start out as directed and quickly become self-driven. This may be due to increased intellectual curiosity. Beckman and Hensel (2009) reported students were more likely to actively engage in learning if curiosity is stimulated by a research question. URE participants report a connection to their discipline, and feel a vested interest in the field because they have contributed to it (Bruno, Thomas, James, & Frazier, 2011; & Hakim, 1998). UREs impact student’s aspirations for research careers, particularly in STEM disciplines (Adedokun, Zhang, Carleton Parker, Bessenbacher, Childress, & Daniels Burgess, 2012).

Undergraduate research experiences allow students to confirm or discover new career paths and gain confidence regarding graduate school (Gonzalez-Espada & LaDue, 2006). For example, at the conclusion of one summer research program, about 15% of students who initially thought of themselves as premedical students migrate toward planning for science PhD programs (Lopatto, 2010).

Lopatto (2004) indicated student participants in UREs report an increased understanding of the research process, lab techniques, and scientific problems. In a later study, Lopatto (2006) noted undergraduate research hits NSSE benchmarks of high academic challenge, active collaborative learning, intense faculty-student interaction, enriching educational experience, and supportive campus environment. Undergraduate researchers learned beneficial skills like tolerance for obstacles faced in the research process, how knowledge is constructed, independence, increased self-confidence, and a readiness for more demanding research that are advantageous in any career path. Lopatto
(2010) expounded upon his previous studies by discussing the Summer Undergraduate Research Experience (SURE) survey. The survey provided an opportunity for students to evaluate their UR experience. Student self-reported gains to be evaluated include: disciplinary skills, research design, information or data collection and analysis, information literacy, and communication. Students also reported on professional advancement and development and personal development. Lopatto (2010) discussed the benefit of having a standard set of measurable potential learning gains for students to evaluate, noting that these UR benefits align well with the essential learning outcomes that emerged from initiatives such as Liberal Education and America’s Promise despite the fact that they were studied independently from any of the Association of American Colleges and Universities’ initiatives.

Laursen et al. (2012) listed student benefits consistent with previous research (thinking like scientist, professional and personal growth, becoming a scientist). Additionally, students expressed a growing sense of identity with their profession. One student stated, “doing research shed light on earlier course material and made it make sense” (p. 33). Research helps students organize their thinking, think creatively, gain confidence, continue education, and pass the torch (Beckman & Hensel, 2009). URE students reported improved research skills within experimental design, data collection and statistical analysis, and an improved understanding of contemporary concepts in the field (Kardash, 2000).

Hunter et al. (2007) found that student gains related to becoming a scientist were supported by both faculty and students involved in projects. They identified 6 major categories of gains from UREs: thinking and working like a scientist; becoming a
scientist; personal and professional gains; clarification; confirmation; and refinement of career/grad school intentions; enhanced career/graduate school preparation; and skill development. Research reflected many benefits of UREs as self-reported by current or recent URE students. There was also research on alumni perceptions and reflections.

Alumni reflections. Research exists on the benefits of UR as noted by alumni (Bauer & Bennett, 2003; Collins et al., 2010; Crowe & Brakke, 2008). Among the benefits of UR, alumni list increased critical thinking skills, becoming good consumers in research studies, and enrolling in graduate school. Bauer and Bennett (2003) found alumni that participated in research as undergraduates were more likely to go on to graduate school and reported greater undergraduate experience satisfaction. Looking back on his undergraduate research experiences, Whitaker (2013) stated,

“Undergraduate research, in my opinion, is an unparalleled opportunity to explore something of great interest to an individual student...This strengthened my interpersonal skills and gave me a first-hand understanding of the breadth of the scientific research under way. I was thrilled to have been able to attend, present, exchange ideas and discuss my findings with many scientists and fellow students…The opportunity to summarize and present one’s findings to peers and professors provides a sense of finality and accomplishment, as well as encouraging students and their mentors to review and reflect on their efforts…. The opportunity to be mentored by PhD students and professors working on cancer remedies was remarkable. Giving students the time to honestly reflect on personal interests is a crucial process” (pp.7-8).
Mantis (2012) spoke about his undergraduate research experience and how it convinced him to apply to graduate school (vs. a career in business) saying, “it is only in retrospect that I can fully appreciate how profoundly my undergraduate research experience has influenced my career” (para. 9). Brakke et al. (2009) shared that knowing how to do research is particularly useful to alumni who currently use research skills either as an employee or as a graduate student. “Alumni with undergraduate research experience express significantly higher perceptions of personal and cognitive growth and greater satisfaction with their undergraduate experience” (p. 13). The research on the benefits of UR for students, from both current student and alumni perspectives, has been reviewed, but students are not the only benefactor of undergraduate research. Research also indicated colleges and universities who have undergraduate research programs, and their surrounding communities, benefit as well.

**Institutional and community benefits.** Undergraduate research is consistent with a variety of institutional missions. Additionally, Brakke et al. (2009) noted: “A successful and productive undergraduate research program can enhance the academic reputation of a campus, generate external recognition, and attract external funding for new equipment, facilities, and other purposes” (p. 13). Research indicated a number of institutional benefits from UR, including lower attrition rates, increased admission selectivity, higher job and graduate school placement rates, and increased institutional funding. Lower attrition rates were found to be associated with students in UREs (Nagda et al., 1998.) Kierniesky (2005) found that research-related activities and increased selectivity by university admissions offices were associated with increased emphasis on URG projects.
Research showed UR as a key marketing tool used to recruit prospective students. At Unity College, UR is a large part of the admissions strategy. Their marine biology program inquires increased from 11 to almost 400 when admissions purchased a large fish tank and used it to begin discussions with prospective students regarding UR and the marine biology program (Creaser & Johnson, 2011). Undergraduate research may also provide a benefit to the institution’s local communities by means of service learning. Undergraduate research involving immigrants, for example, may be of interest and benefit to local community agencies (Vogelgesang & O’Byrne, 2003). A longstanding environmental studies undergraduate research project at Alma College assisted with a Superfund site cleanup effort in the local community. Examples of undergraduate research like these help to benefit local communities. Additionally, the idea of “giving back” to a program or a community helps students feel invested (Thomas, & Gillespie, 2008).

**Faculty benefits.** Research on the benefits of undergraduate research for faculty members reflected varying viewpoints. While some research indicated concerns with time, pay, and workload for faculty overseeing UR projects, there was also research indicating faculty benefit from UR (Beckman & Hensel, 2009; Bush et al., 2010; Corley, 2013; Crawford et al., 2008; Crosby et al., 2011; Hernandez Jarvis et al., 2011; Laursen et al., 2012; Schultheis et al., 2011; Stocks, 2009; Thomas & Gillespie, 2007).

Tenure and promotion policies define, set expectations for, and motivate faculty members’ priorities for engagement and development (O’Meara & Rice, 2005). Some research indicated undergraduate research was not appropriately built in to the tenure and promotion process, yet it is expected of faculty. Other research indicated participation in
UR can help faculty with regards to promotion and tenure. At most institutions faculty promotion and tenure are assessed based on three criteria areas: scholarship, teaching, and service. Crosby et al. (2011) argued UR contributes to all three categories. At Stetson University, all students complete a substantial senior research project as a requirement for graduation. To this point, mentoring UR may be classified as both a form of teaching and as scholarly engagement. Participation in UR activities may also be considered a meritorious form of service (Schultheis, 2011). In addition to helping faculty with tenure and promotion, UR can also provide intrinsic value. “Helping a new generation of students discover their own passion for research, and in doing so make important contributions to the ongoing research project and ultimately to the body of knowledge in the field” (Hernandez Jarvis et al., 2011, p. 7).

Faculty can contribute to their field while enhancing teaching. Mentoring undergraduate research can also provide faculty an ongoing opportunity to do research during the academic year (Corley, 2013). Crawford et al. (2008) noted even at undergraduate teaching centered institutions the expectations for tenure and promotion almost always include some element of research. “Consequently, it is wise to think through how to develop a research plan that will successfully involve undergraduates and also to consider how that plan will fit within the department’s infrastructure and research culture” Crawford et al., 2008, p. 14). The benefits of UR have been well researched. Students, institutions, communities, and even faculty can benefit from UR. The literature listed a number of institutional programs that have existed for some time and highlight great examples and best practices for UREs.
Examples of Best Practices for UREs

Undergraduate research has been a part of the institutional culture since 1947 at the College of Wooster when the Independent Study (IS) was introduced as a universal senior capstone experience. All Wooster seniors must complete a year-long project required for graduation. For nearly 60 years the program has invited all students to come to their best in terms of their own talents.

Another great example of a URE is the Adrian Tinsley Program (ATP) for undergraduate research at Bridgewater State University. Brush et al. (2010) stated:

“The intention was to take the undergraduate research movement from a program focused primarily on summer research grants to one that would leverage institutional change through collaboration with other departments and long-term continuity in administrative leadership. Ten years later, UR has become not only part of the cultural fabric of BSU, but the loom itself, weaving the patterns of faculty development and student growth” (p. 11).

Research indicated institutions serving large populations of first generation and/or low-income students need to provide financial support for summer research activities to encourage student participation (Gayle, Klein, & Temple, 2010). Building faculty advocates for undergraduate research programs also encourages first generation and low income students to participate. In 2006, Viterbo, a private university in the liberal arts tradition, began a partnership between institutional advancement and academic affairs to launch an undergraduate research initiative. The partnership increased understanding of UR for grants personnel seeking research funds (Gayle et al., 2010).
Summary of Undergraduate Research

Undergraduate research has been broadly defined, citing how its cultural and contextual significance varies from institution to institution. The history of undergraduate research and the progressive understanding of its benefits to its various constituents have also been covered. It is the purpose of the following section to review institutional review board, their history and significance, and review the role they play in undergraduate research.

Institutional Review Boards

It is the purpose of this section to explore institutional review boards. The history of IRBs, including the historical events leading to the evolution of federal regulations are covered. Institutional review board structures, types, and key issues, and how they affect IRB stakeholders, are also reviewed.

The Evolution of Human Subject Research Public Policy

The Nuremburg Code resulted from the Nuremburg trials. While the Code was not passed in the United States, it got the topic of human subject research on governmental agenda (Office of Human Research Protections, 1993). The National Institutes for Health opened their Clinical Center in 1953. This clinic contributed to the research boom after World War II. In 1961, Stanley Milgram’s study on obedience received national attention. In 1966, the U.S. Surgeon General became involved in the regulation of human subjects by requiring reviews of studies receiving funding from the U.S. Public Health Service. On July 26, 1972, the New York Times broke a story on study in history, the Tuskegee Syphilis experiment. The story was high profile, incredibly political, and quickly spread throughout the country. Federal regulations on human
subject research moved from governmental agenda to decision agenda. It took only two years for the National Research Act to be passed in 1974, requiring all federally funded research to be passed by IRBs (Office of Human Research Protections, 1993). In fact, the National Research Act was passed five years before the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research issued the Belmont Report to guide IRBs and it was not until 1986 that the Applied Research Ethics National Association was formed to provide leadership and information to the IRB community. According to the U.S. Department of Health and Human Services, “In 1991, 14 other Federal Departments and agencies joined the HHS in adopting a uniform set of rules for the protection of human subjects, identical to subpart A of 45 CFR part 46 of the HHS regulations. This uniform set of regulations is the Federal Policy for the Protection of Human Subjects, informally known as the “Common Rule.” (U.S. Department of Health and Human Services, 2016, para 3). Figure 3 below provides a visual illustration of the evolution of federal human subject research public policy that has just been described.
Figure 3. This timeline illustrates the evolution of human subject research public policy including some of the early events, experiments, and research that led up to the adoption of federal human subject research public policy, in 1991, known as the “Common Rule” [Literature review by Hottenstein].

Institutional Review Board Structure

Whicher, Currie, & Taylor (2009) discussed factors that influence commitment of IRB members to their role. They suggested IRB members receiving payment for service were more committed and engaged than their non-paid counterparts. They also indicated group dynamics, group size, impressions of IRB chair, member turnover rate, and ability to have open discussion around ethics, influence engagement. How well IRB members work together and how well the chair facilitates meetings also influenced commitment. Keeping the IRB size under 10 and keeping turnover low were important to engagement and satisfaction. These factors were broken down into domains that effect commitment and were labeled as engagement, compensation and institutional culture.
**Internal vs. external IRBs.** There are internal and external IRBs. Internal IRBs are housed within the institution and their makeup is predominantly institutional employees (i.e. faculty or administrators). External IRBs are external to the institution and typically have MOUs with the institution that allows the institution to rely on the external IRB for review. Essentially, external IRBs are a means in which the institution can outsource the IRB review process. There was little research on whether internal or external IRBs better serve institutions. One case study was found on an internal IRB that adopted external processes to expedite their processes. Positive changes included shorter agendas and meetings, better ethics discussions, and lightened monthly review loads were noted. These changes increased board member satisfaction (Andrews, Moore, Means, & Weinberg, 2012).

**Concerns with Institutional Review Boards**

The literature indicated a number of concerns regarding IRBs (AAUP, 2006; Bosk & De Vries, 2004; Feeley, 2007; Grady, 2010; Howard, 2006; Stark, 2007; & White, 2007). Academic freedom, power and appeal process concerns, and terminology were specifically listed as concerns by the AAUP (American Association of University Professors, 2006). The social and behavioral sciences professors have concerns specific to their areas including cookie cutter bio-med/clinical best practices being implemented for social sciences.

**Institutional review boards and academic freedom.** The 1960s and 1970s afforded federal regulations that protected the rights of human subjects and safeguards for academic freedom. Ironically, the literature showed these two things are now coming head to head in a controversy over whose rights should supersede as some feel that IRBs
not only infringe on academic freedom, but on the very principle of freedom for which America was founded (American Association of University Professors, 2006; Feeley, 2007; Howard, 2006; & Stark, 2007). Malcolm Freeley, in his 2006 AAUP presidential address, sparked great debate over the topic stating that IRBs “represent a failure of law” (American Association of University Professors, 2006, p. 2). This address created momentum, especially in the humanities, for those opposed to IRB regulations. The Oral History Association voted that same year to endorse the AAUP’s report on academic freedom, specifically asking institutions to outright exempt IRB applications “whose methodology consists entirely of collecting data by survey, conducting interviews, or observing behavior in public areas” (Howard, 2006, p.1).

Some equate IRBs to a governmental licensing agent (Feeley, 2007; Stark, 2007). Those with IRB approval are “licensed” to do research, and those without approval, are not. Feeley (2007) believed this governmental sanctioning of research violated freedom of expression and thus the American Constitution. Stark (2007) argued that the regulations aimed to protect the rights of human subjects actually violate the rights of researchers. Grady (2010) stated IRBs are concerned with protecting institutions as much as individuals. This may be a growing truth given that Beasley (2009) noted increased pressure on IRBs due to lawsuits. He stated that plaintiffs can name IRB or individual members. In the early 2000’s, individual IRB members were named as defendants in the Robertson v. McGee lawsuit involving cancer research conducted by Dr. McGee. Suit was also filed against individual IRB members over a lack of informed consent in the Townsend v. University Hospital. The Kennedy Krieger Institute was named as a
defendant in 2001 in *Grimes v. Kennedy Krieger Institute* because the IRB at the institute approved an informed consent that was later brought to question (Beasley, 2009).

**Terminology.** Subjectivity of regulatory terms used to define the scope of practice for institutional review boards was another area of concern in the literature. One example of this was the term risk. According to federal regulations, risk should be assessed based on whether the potential harm to participants is reasonable in relation to the benefits of the research (Hemmings, 2006). This subjectivity requires IRB members to form their own assessment of risk, and then either approve or deny based on their opinions. In a published report on Research on Human Subjects (2006), the AAUP speaks out strongly against this stating, “there could hardly be a more obvious potential threat to academic freedom” (p. 1). Even in the most well thought out equations of cost-benefit ratios there is room for subjectivity. White (2007) noted some IRB members were not qualified to assess risk and often rely on a “no risk” line in the sand.

**Power and appeals process concerns.** IRBs are not advisory boards. They are often viewed as authoritarian in nature and working against, instead of in collaboration with, the researcher, thus violating their freedom (American Association of University Professors, 2006; Feeley, 2007; Howard, 2006; Stark, 2007). The IRB tells the researcher what he or she can and cannot do and there is often no appeal process. Howard (2006) noted that in practice, IRBs may expand their scope past federal regulations, setting mandates at their discretion. Additionally, there is no outside monitoring or assessment to evaluate the board’s performance. Brainard (2006) noted this problem as it relates to IRB members having conflicts of interest with the research being proposed to them. Some IRB members did not disclose when they have financial conflicts with
proposed research. Others did not fully understand the meaning of this conflict, and some even acknowledge voting on proposals where a conflict of interest existed. Some IRB members acknowledged having relationships with companies sponsoring the research, or relationships with competing companies (Brainard, 2006).

**Regulating outside the purview of biomedical models.** Scope of practice was also an area of concern for IRBs. Boards are largely based on biomedical models that use quantitative data. Some of the largest critics of IRBs stem from the social sciences and humanities, who see their research, which is predominately qualitative, as misunderstood by IRB members (Howard, 2006). They argued that in many cases, qualitative methods are outside the IRB’s scope of knowledge, yet still fall within their scope of practice.

Social scientists deal with IRB expectations that all research questions, questionnaires, and the like, be presented to the IRB up front. Oral historians, for example, who have recently been under IRB scrutiny, conduct interviews and much of what is asked of the subjects is based on their answers to previous questions. The nature of oral historian research is very interactive and open-ended. Because IRBs like to see set questionnaires during the review process, often research of this nature is frowned upon or delayed (Jaschik, 2008).

Some IRBs wanted historians to delete tapes and shred transcripts instead of archiving them for future use. These regulations were being passed down despite the fact that according to the government’s definitions, oral-history interviews do not qualify as research. Oral historians fought to make their concerns heard, and, as a result, the Office of Human Research and Protection (OHRP) granted an exclusion status in 2003 to most oral history research (White, 2007).
Consistency. There are approximately 5,500 IRB’s nationwide. In addition to the sheer number of IRBs is the rotation and appointment of their members. Feeley (2007) listed three arguments against the current IRB appointment process used at many institutions. First, he stated ongoing turnover leads to a lack of institutional memory and consistency. Stark (2007) however argued just the opposite, noting local precedents that may form cause problems with multisite research studies evaluated by different boards. Feeley (2007) asserted that self-appointed protectors of ethics will gravitate toward these self-appointed positions. In conjunction with this second point, Feeley concluded by stating IRBs confirm role theory in that when a censor roll is created and someone is appointed to it, they will most likely fulfill that role.

Mission drift. Early initiatives such as the Belmont Report and other regulations were specific to federally funded research. Over the past several decades regulations have been applied to non-funded research, research in the social sciences, and have branched out over areas, which many argue, they were not initially intended. Grady (2010) said over time IRBs have shifted to protect institutions as much as individual subjects. The literature referred to this phenomenon as mission drift, or mission creep (White, 2007). White (2007) defined mission drift as “the process of co-opting a successful and well-conceived process, then gradually and mindlessly expanding it until it is no longer capable of performing its original function” (p. 548). The mission of IRBs is to protect human subjects. The Federal Code of Regulations listed “protecting the rights and welfare of human subjects of research” as a fundamental aspect to assuring regulation compliance (U.S. Department of Health and Human Services, 2009, p. 5). Many believe over time the mission of IRBs has drifted to protect institutions as much as human
subjects. From a societal context this fits with the cultural shift from individual to collective responsibility over the past several decades.

**Summary of Institutional Review Boards**

The history of institutional review boards and human subject research public policy has been reviewed. Institutional review board structure types, including internal and external IRBs have been covered. Concerns with IRBs including academic freedom, power and appeals processes, consistency, and mission drift have been reviewed. The following section highlights literature on public policy theory.

**Public Policy Theory**

This study focuses on the implementation of the Common Rule, a Federal protective regulatory public policy. According to Kilpatrick (2000) “Public policy can be generally defined as a system of laws, regulatory measures, courses of action and funding priorities, concerning a given topic promulgated by a governmental entity of its representatives” (para 1). Public policy is the way in which the government handles a public issue or problem by instituting laws, regulations, decisions, or actions, related to the problem (Salman Jalal, 2000). Human subject research public policy was generated to protect various facets of society from harm during research. The public policy process involves a number of different, complex, interwoven, elements. These elements include numerous actors, time spans of a decade or more, varying policy domains, policy debates, and disputes involving values and interests (Sabatier, 2010) Ripley (2010) noted that “the policy process is complicated, and the analyst must seek to simplify it” (p. 51).

There are a number of different public policy theory types noted in the literature, from agenda setting theories to implementation theories (deleon & deLeon, 2002;
Elmore, 1980; Hill & Hupe, 2002; Kingdon, 2010; Mazmanian & Sabatier, 1983; Nilsen, 2015; Pulzl & Trieb, 2007; Ripley, 2010; Sabitier, 2010). According to Salman Jalal (2002) “there are almost as many models of policy process as there are public policy theorists, all deriving to some extent from Lasswell (1971)” (para, 6). Anderson (1984) identifies five stages to the public policy process: problem identification and agenda formation, policy formation, policy adoption, policy implementation, and policy evaluation. Figure 4 below illustrates these five stages.

*Figure 4.* Illustration the 5 stages of the public policy process according to Anderson (1984) (ThisNation.com, 2016).

Each of these different stages have different types of public policy theories tied to them. While this study focuses on the implementation of a public policy theory, it is important to also understand the context from which public policy can be formed. The following section covers public policy theory as it relates to agenda setting. Then, public policy implementation theory we be reviewed.

**Kingdon’s multiple streams theory.** John W. Kingdon is one of the leading researchers in public policy. Kingdon’s work focused on agenda setting. In the foreword of his book, *Agendas, Alternatives, and Public Policies* (2010) Kingdon stated:
“Understanding the complexity and dynamics of how the national agenda is set is essential to an explanation of the policy-making process in the United States” (p. vii). Kingdon’s Multiple Streams theory is based on the premise that three, independently flowing streams of actors and processes, may converge at any point to create a policy. If the right combination of problems, policies, and politics come together, government takes action and policies are formed (Kingdon, 2010). Figure 5 below illustrates the three independent streams in Kingdon’s theory coming together at what he refers to as a “policy window” to create governmental public policy agenda.

Figure 5. Kingdon’s Multiple Streams Theory for public policy creation based on three, independent streams converging during a policy window to create public policy agenda.

The following sections specifically tie each of Kingdon’s three streams to the agenda setting of federal human subject research public policy. Then, the policy window for the formation of federal human subject research public policy will be reviewed.

**The problem stream.** Problem recognition is critical to agenda setting. Large magnitude events or change such as disasters or crisis catch officials’ attention and can draw their attention to some items more than others. Kindgon noted the difference between conditions and problems and how conditions can become problems when they
violate important values. He used the following example. A lack of public transportation can be viewed as a transportation problem or a civil rights problem, and he noted that the treatment of the subject varies greatly based on how the problem is classified (Kingdon, 2010). In the same way, human subject research can be viewed as a research problem, or a human rights problem.

The policy stream. The policy stream is where a variety of different policy versions are developed. Kingdon (2010) referred to this as the “policy primeval soup” (p.35) where ideas float around, change, reform, combine, and await implementation. Special interests groups tend to drive this stream. At the institutional level this could be IRBs, faculty, undergraduate research advisors, honors colleges or institutes, legal council, or human resources. It is in this stream that IRB policies and procedures are created, discovered, reformed, and await implementation.

The politics stream. The political stream refers to the willingness and ability of the politicians or actors to implement a policy change. Kingdon (2010) discussed how powerful changes in administration or shifts in national mood are to agenda or policy setting. The past three decades have seen additional and revised regulations be placed on human subject research at the federal level. A shift in national mood is one of the ways political streams change. It may be possible our national mood and culture has shifted to collective responsibility and has begun to assess risk and liability differently, ultimately placing more emphasis on accountability.

The policy window. The policy window refers to the convergence of the above streams. The Tuskegee Syphilis experiment provided just that window for human subject research public policy. At the time the Tuskegee experiment became public, some human
subject research regulations had already been implemented, while others remained floating in the policy soup. The national mood was shifting toward collective responsibility and government was pressing the idea of accountability. A condition became a problem as the result of a highly publicized research experiment, which then became a human rights problem on the national agenda. While Kingdon’s research focused on the creation of public policy, the following section will focus on public policy implementation theory.

Policy Implementation Theory

Nilsen (2015) stated: “Implementation science has progressed towards increased use of theoretical approaches to provide better understanding and explanation of how and why implementation succeeds or fails,” (p. 1). According to deLeon and deLeon (2002), public policy implementation was one of the earliest topics addressed by policy analysts. Harold Lasswell (1956) (as cited in deLeon & deLeon, 2002) argued the implementation stage was one of many necessary steps in the policy process. The implementation of policy, a key activity in the bureaucracy is not a uniform process, but depends on the policy type, each type possessing a different degree of implementation difficulty. Although regulatory policies may seek harmony, an entity affected by the policy can be contentious. Many believe the influence of government should be limited. They may see the world as having boundless resources and resiliency, and restrictions imposed by the government may seem unjust. (Ostrom, 1990 as cited in Chaelkian, 2014).

Mazmanian and Sabatier (1983) defined policy implementation as:

“…the carrying out of a basic policy decision, usually incorporated in a statute but which can also take the form of important executive orders or court decisions.
Ideally, that decision identifies the problem(s) to be addressed, stipulates the objective(s) to be pursued, and, in a variety of ways, structures the implementation process. The process normally runs through a number of stages beginning with passage of the basic statute, followed by the policy outputs (decisions) of the implementing agencies, the compliance of target groups with those decisions, the actual impacts of agency decisions, and, finally, important revisions (or attempted revisions) the basic statute” (pp. 20-21).

Policy implementation theories can be broadly categorized into three groups: top-down theories, bottom-up theories, and hybrid theories. Figure 6 below illustrates these three categorizes and identifies key theorists associated with each of the categories.

Figure 6. Illustrates the three main categories of policy implementation theories: top-down, bottom-up, and hybrid theories and identifies key theorists in associated with each category (Pulzl & Trieb, 2007, p. 91).
**Top-down theories.** Top-down approaches are based on the premise that implementation of policy begins with a decision made by government. According to Pulzl and Trieb (2007) top-down theories disregard the impact of implementers. More specifically,

“Implementation therefore implied establishment of adequate bureaucratic procedures to ensure that policies are executed as accurately as possible. To this end, implementing agencies should have sufficient resources at their disposal, and there needs to be a system of clear responsibilities and hierarchical control to supervise the actions of implementers,” (Pulzl & Trieb, 2007, p. 91).

Sabatier and Mazmanian (1979) (as cited in Pulzl & Trieb, 2007) discuss a clear separation between policy formation and policy implementation and note six criteria for effective implementation:

- Policy objectives are clear and consistent
- The program is based on a valid causal theory
- The implementation process is structured adequately
- Implementing officials are committed to the program’s goals
- Interest groups and sovereigns are supportive
- There are no detrimental changes in the socioeconomic framework conditions

**Bottom-up theories.** Bottom-up approaches take a counter approach to policy implementation, emphasizing the role of local actors in the policy implementation process, noting the importance of those actually involved with delivering the policy. Bottom-up approaches emphasize the importance of discretion in policy delivery (Pulzl & Trieb, 2007). Bottom-up theorists suggest policy implementation is successful when
those primarily affected are involved in the planning and implementation of programs and policies (deLeon & deLeon, 2002).

Pulzl and Trieb (2007) compared the two approaches by saying:

“Top-downers typically start from a policy decision reached at the top of a political system and work their way down to the implementers. Bottom-uppers, in contrast, start out with the identification of actors involved in concrete policy delivery at the bottom of the politico-administration system,” (p. 93).

**Hybrid theories.** As researchers developed and analyzed the pros and cons of top-down and bottom-up approaches, hybrid theories of implementation began to form. Top-down and bottom-up scholars agreed policy implementation is “a continuum located between central guidance and local autonomy” (Pulzl & Trieb, 2007, p. 100). Hybrid models mold the relevant aspects of both approaches into a middle ground. Hybrid models understand the importance of top-down aspects such as centrally defined policy decision, but also appreciated and value the need to involve lower-level actors.

**Ripley’s Model of the Policy Process.** Randall Ripley is public policy theorist, whose research focuses on a hybrid approach to public policy implementation. Much like Anderson (1984), Ripley (2010) ascribed to a multiple stages process for public policy with the first of stage being agenda setting, the second stage being public policy formation, and third stage being program implementation. Ripley is known for his hybrid approach which highlights the connections between the environment, governmental policy activity, social policy activity, and the political actors’ perceptions of the environment. Ripley’s General Model for Policy Process is illustrated in Figure 7 below.
Hill and Hupe (2002), spoke of Ripley and Franklin’s early work (in 1982) saying, “Ripley and Franklin may be seen as amongst the writers who have sought to inject a political realism into the top-down approach, without at the same time embracing a bottom-up perspective.” (p. 62).

**Conclusion**

This literature reviewed highlights the extensive research on undergraduate research, institutional review boards, and public policy theory. It also highlights a research gap as to how institutions are implementing human subject research public policy at the undergraduate level. Given the importance of undergraduate research to students, faculty, and institutions, understanding how human subject research public policy is being implemented will be beneficial. Additionally, understanding the role and function of the IRB chair, arguably one of the important policy actors at the institutional level, is key to understanding public policy implementation at the institutional level.
First, understanding the role and function of IRB chairs in the public policy implementation process at undergraduate research institutions will help institutions to strengthen their ability to examine IRB practices and assist in shaping and implementing best practices. In particular, this research study will help institutions better understand how human subject research public policy can be implemented at the undergraduate level to benefit its multiple constituents, including students, the institution, and the community.

Second, previous research indicates many feel IRBs not only infringe of academic freedom but impede it unnecessarily. A better understanding of how IRBs are implementing public policy is beneficial to researchers, institutions, and IRBs. This study will help institutions to explain and further justify to researchers the need for this level of IRB oversight.

Understanding how IRB chairs perceive their role and function may help to shape future policy on the issue. More specifically, a better understanding of IRB mission, as it relates to public policy implementation, may spark future research on the scope of practice exercised by IRBs, and the model of policy implantation used at the institutional level. Many criticisms surrounding IRB mission drift focus on the board’s lack of knowledge on non-biomedical research and qualitative methods research. Additional research on how IRBs are implementing human subject research public policy may help to clarify IRB scope of practice. Finally, no research argued against the original mission of IRBs; to protect human subjects. If a better understanding of IRB policy implementation practices can be gathered, it can be utilized and applied to better educate researchers on ethical practices. In the following chapter, the methodology of this single
case study looking at human subject research public policy implementation will be discussed.
Chapter 3

Methodology

In this chapter, the purpose of the study, its significance, the research method, the theoretical framework, and the research sample are covered. Creswell (1998) recommended focusing the study on a single overarching question. The purpose of this case study was to determine how one Council on Undergraduate Research institution has implemented human subject research public policy to benefit its students.

Kuh (2008) listed undergraduate research as one of ten high-impact educational practices beneficial to students. Lopatto (2006) discussed how undergraduate research engages students in active learning, provides academic challenge, and creates student-faculty interaction in ways that meet student engagement benchmarks reflected in the National Survey on Student Engagement (NSSE). Undergraduate research also benefits faculty. Dotterer (2002) called undergraduate research “the pedagogy of the 21st century” (p. 81).

According to Sanders & Ballengee-Morris (2008) there were more than 5,500 IRBs nationwide by 2008 that provided oversight to any federally funded project, and a large amount of unfunded research. Stark (2007) argued that the regulations aimed to protect the rights of human subjects actually violate the rights of researchers. Chadwick and Dunn (2000) summed up the last 50 years of IRB evolution by saying, “Like many highway projects, the IRB system was sound when it was designed, but became out-of-date and overloaded almost from the start” (p. 21).

Hyman (2007) noted a lack of empirical evidence that IRBs provide a benefit to human subject protection. In a systematic review of IRB studies, Abbott and Grady
(2011) acknowledged they found no study on the impact IRBs had on the protection of human subjects.

A significant amount of research was reviewed on the benefits of undergraduate research to institutions, students, and faculty. There was a great deal of literature acknowledging the history of IRBs (Sanders & Ballengee-Morris, 2008). The hindrances of mission drift and how it affects academic freedom is also a widely researched topic (Hemmings, 2006; Howard, 2006; Jaschik, 2008; Sanders & Ballengee-Morris, 2008). There was also research as to the causality of mission drift (Feeley, 2007; Hemmings, 2006). Liability appeared to be one factor in IRB mission drift (Stalcup, 2004).

Despite the research noted above, there is still a great deal to be learned about institutional review boards and their role in undergraduate research. Additionally, how human subject research public policy is being implemented at the undergraduate level to benefit students has yet to be looked at. This study is guided by this research gap identified in the literature. Given the amount of literature on the benefits of undergraduate research to students, faculty, and institutions, understanding how a CUR institution is implementing human subject research public policy in a way that benefits its students appears to be a significant gap in the existing research.

**Purpose of the Study**

The purpose of this case study is to determine how one CUR institution has implemented human subject research public policy to benefit its students.

**Research Question**

How has this CUR institution implemented human subject research public policy on its campus?
Research Method

The researcher considered various methods of inquiry, both quantitative and qualitative, ultimately deciding on a qualitative design.

According to Creswell (2008):

“Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant’s setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The final written report has a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation” (p. 4).

Given the researcher’s desire to seek an in-depth understanding as to how the institution is supporting undergraduate research on its campus, a qualitative inquiry method, specifically a case study, was selected.

Qualitative case study methodology allowed the researcher to study complex phenomena within its context (Baxter & Jack, 2008). According to Merriam (1988) case studies are prevalent in the education field. “A qualitative case study is an intensive, holistic description and analysis of a single instance, phenomenon, or social unit” (Merriam, 1988, p. 21). This definition focuses on the case as a unit that can be defined by boundaries. Merriam noted that “an innovative program may be a case” (p. 192). For the purpose of this study, a selective, Midwestern, CUR affiliated college’s
undergraduate research program was the innovative program. Merriam goes on to say that a case may be “selected because it is an instance of some concern, issue, or hypothesis” (p. 192). Adelman, Jenkins, and Kemmis (1983) refer to a case as “an instance drawn from a class” (p. 3). For the purposes of this study, colleges with undergraduate research programs was the class. This class was then further defined by their CUR affiliation. While there were hundreds of institutional CUR members, this selective, Midwestern, CUR affiliated college appeared to have a robust UR program where undergraduate research was a significant part of the undergraduate experience, which led the researcher to select it for this case study.

This case study was descriptive in nature. According to Merriam (1988) “a descriptive case study in education is one that presents a detailed account of the phenomenon under study” (p. 197). In this case, the phenomenon was how a selective, Midwestern, CUR affiliated institution implements federal human subject research public policy on its campus. Descriptive case studies are useful in presenting basic information about areas of education where little research has been conducted. Innovative programs such as this case study college’s undergraduate research program, are often the focus of descriptive case studies.

**Interviews.** Data collection took place using semi-structured open ended interviews. Semi-structured interviews may not offer the same reliability as a structured interview, but the goal was to create an interview environment where the interviewees were provided with conditions that allowed them to feel comfortable speaking about a controversial and critical issue in higher education and invoked ownership of the topic.
Nine semi-structured interviews were conducted with participants holding one or more of the following roles:

- The IRB chair
- IRB member
- Undergraduate research advisors/faculty
- Honors/Institute chair
- Undergraduate researcher/student
- CUR representation
- Summer research program director
- College controller

Each participant was interviewed formally once, with follow-up happening in a variety of different formats. Figure 8 below illustrates interviewees, their role(s), length of interview, and method(s) used for member checking.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Role(s)</th>
<th>Length of Interview</th>
<th>Member checking occurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>IRB chair/faculty member</td>
<td>55:20</td>
<td>• Follow face to face meeting (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Email exchanges (10)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Follow up phone calls (2)</td>
</tr>
<tr>
<td>#2</td>
<td>College controller</td>
<td>17:45</td>
<td>• Follow up phone call (1)</td>
</tr>
<tr>
<td>#3</td>
<td>IRB member/faculty member/UR mentor</td>
<td>36:23</td>
<td>• Follow up face to face</td>
</tr>
<tr>
<td>#4</td>
<td>UR student</td>
<td>18:49</td>
<td>• Attempted to contact</td>
</tr>
<tr>
<td>#5</td>
<td>IRB member (outside community representative)</td>
<td>27:43</td>
<td>• Unavailable for review</td>
</tr>
<tr>
<td>#6</td>
<td>Faculty/UR mentor</td>
<td>27:15</td>
<td></td>
</tr>
<tr>
<td>#7</td>
<td>UR student</td>
<td>32:05</td>
<td>• Follow up face to face</td>
</tr>
<tr>
<td>#8</td>
<td>IRB member/faculty member/UR mentor</td>
<td>29:01</td>
<td>• Unavailable for review</td>
</tr>
<tr>
<td>#9</td>
<td>Summer Research Director/Faculty member/CUR representation</td>
<td>39:03</td>
<td>• Email exchanges (2)</td>
</tr>
</tbody>
</table>

*Figure 8.* Figure 8 outlines the various role(s) the interview participants hold at the college as well as the length of each interview, and the method(s) used for member checking.

Moustakas (1994) suggested beginning with a set of questions that guide the interview. The interview should be fluid, allowing the researcher to ask follow up questions when and where they are applicable to gain the best insight from the interviewee. According to Chase (1995) stories are better than reporting in interviews. Telling stories allows the interviewee to take responsibility for making the importance of the story known, where reporting is usually more a function of the researcher. Researchers get the interviewee to tell stories versus report by the types of questions they ask. Sociological questions push the interviewee toward the researcher’s interests.
Questions need to be asked in a way that extract the interviewees own real life experiences. Chase stated this can often be done by shifting the responsibility for the “import of the talk” (p. 234) to the interviewee. She went on to say our task as interviewers was to:

“provide the interactional and discursive conditions that will arouse desire {in the interviewee} to embrace that responsibility. We are most likely to succeed when we orient our questions directly and simply to life experiences that the other seeks to make sense of and to communicate” (p. 234).

Figure 9 lists the questions used to guide interviews during this case study. Follow up questions were based around the interviewees responses.
## Participant Interview Questions

<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td>Would you be kind enough to talk to me about your role as a Council on Undergraduate Research College?</td>
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</tr>
<tr>
<td>Please describe your undergraduate research environment.</td>
<td></td>
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<tr>
<td>Would you describe the human subjects policies that exist on campus?</td>
<td></td>
</tr>
<tr>
<td>How are your human subject policies implemented?</td>
<td></td>
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<tr>
<td>Could you tell me about a specific time or undergraduate research project where these polices were implemented?</td>
<td></td>
</tr>
<tr>
<td>Could you give me examples of how the IRB functions in implementing these policies?</td>
<td></td>
</tr>
<tr>
<td>Would you describe how you work with undergraduate research advisors and their students?</td>
<td></td>
</tr>
<tr>
<td>Would you describe for me how the human subject policies influence the different academic discipline research projects on campus?</td>
<td></td>
</tr>
<tr>
<td>What would you say are the most positive qualities of your IRB?</td>
<td></td>
</tr>
<tr>
<td>What impact has working with human subjects policy and the IRB experience had on you?</td>
<td></td>
</tr>
<tr>
<td>How has the IRB affected student and faculty relationships?</td>
<td></td>
</tr>
<tr>
<td>How has undergraduate research advising been improved by IRB practices and policies?</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 9. Questions used to guide the interviews.*

The creation and wording of these questions were guided by my desire to allow the interviewee to tell their own story about the undergraduate research environment and policy implementation process at the College. I intentionally used open-ended questions with words and phrases such as “would you describe”, “give me examples,” and “tell me about a specific time”, in the hope of creating an interview environment where the interviewee would begin to take responsibility for telling the pieces of a story that they believed to be important.

**Methodological triangulation.** According to Denzin (1989) methodological triangulation occurs when the researcher uses more than one method. Denzin compared triangulation to a kaleidoscope saying:
“each method implies a different line of action toward reality- and hence each will reveal different aspects about it.…Methods are like a kaleidoscope, depending on how they are approached, held, and acted toward, different observations are revealed” (p. 319).

It was the intent of the researcher to use methodological triangulation to further validate interview findings.

A review of the institution’s IRB policies, procedures, handbooks, manuals, and IRB meeting minutes took place wherever possible, including before, during and after the campus visits. Case study researchers try to get as close to the case as possible through direct observation in the natural setting. (Bromley, 1986). It was for this reason I did three campus visits over the course of three weeks where I was able to tour the campus and the research facilities, as well as attend summer research program presentations. Member checking took place during follow up visits, as well as through follow up emails and phone calls to ensure that the data communicated during interviews was accurate. For example, the summer research program director verbally communicated proposal numbers during our interview, and, I later followed up via email to ensure the numbers we discussed were accurate. Member checking took place whenever possible, however, there was some snowballing effect during the interviewing process, so while all interviewees did sign informed consent, not all provided follow-up contact information. For example, as I was interviewing the IRB chair and she offered to show me one of the research facilities. Once there, she introduced me to a student, and after a short conversation, the student agreed to be interviewed. Figure 10 is a Venn diagram that illustrates the multiple triangulation used in this research study.
Theoretical Framework

This study examines the implementation of a Federal protective regulatory policy at the institutional level, specifically, federal human subject research public policy as defined in the Code of Federal Regulations, Title 45, Part 46.

I examined dozens and dozens of policy theories and theorists in the early stages of this work. Out of all the theories and models I examined, I found Ripley’s work as the best fit with this research for three reasons:

1. In his early work with Franklin (1982), Ripley further defined Lowi’s categories of public policy (distributive, redistributive, constituent and regulatory) specifically defining regulatory policies as either protective regulatory or competitive regulatory. Much of public policy involving higher education is distributive impacting spending within higher education. Ripley and Franklin’s

Figure 10. Illustration of the methodological triangulation used by the researcher.
early work helped to define the type of policy I was analyzing as protective regulatory.

2. Once the policy type and process stage (implementation at the institutional level) was defined, I next had to look at what type of implementation theory (top-down, bottom-up or hybrid) fit best. Different models satisfy different situations (Lane, 1983). It is possible that the various models of policy-making and of the implementation of policy satisfy different situations, which may occur at different times and at different places. Ripley and Franklin (1982) distinguish between policy types and argue that each policy type involves different groups of stakeholders as well as different types and levels of conflict in implementation. Ripley’s general model is a hybrid approach incorporating aspects of both top-down and bottom up approaches. This fit well with the implementation style I found to be occurring during my research.

3. Lastly, as I was trying to perfectly fit my research within a framework, Ripley’s model helped clarify that it was likely that I would not find a framework where my research fit perfectly into the boxes or circles of a Venn diagram created by a previous theorist, but that in fact, public policy theory is an art and a science, and according to Ripley (1985), “at best, such maps…. lend some clarity to the observer as he or she grapples with a complicated and sometimes murky set of interactions and processes” (Ripley, 1985, in McCool, 1995, p. 157).

After a thorough review of policy literature I chose Randall Ripley’s model to guide my research. Ripley’s model illustrates how the policy actors’ perceptions of the environment impact social policy activity, and, how the social policy activity impacts the
policy actors’ perceptions of environment. The IRB chair is one of the most important policy actors at the institutional level. Ripley (2010) goes on to say:

“policy actors move on the basis of their own perceptions… these perceptions include some of the environmental factors that analysts determine to be important. But the perceptions may also be of events, trends, and factors that analysts cannot find systematically important but, in the day-to-day decisions by influential actors that shape outcomes in detail, are quite important” (pp. 52-53).

Using Ripley’s (2010) conceptual model, I identified the environment as the institution, the policy actors as the IRB chair, IRB members, and undergraduate research advisors/mentors, the governmental policy activity as the federal policy to protect human subjects, and the social policy activity as undergraduate research. Figure 11 below illustrates how Ripley’s model can be adapted to inform the implementation of human subject research public policy at this case study institution.
Figure 11. Illustration of how Ripley’s model was applied by the researcher to analyze human subject research public policy implementation at this case study institution (Adapted from Ripley’s General Model, 2010).

Case

The Council on Undergraduate Research (CUR) consists of over 650 institutional members and over 7,000 individual and affiliate members. The mission of CUR is to “support and promote high-quality undergraduate student-faculty collaborative research and scholarship” (Council on Undergraduate Research, para 1). CUR serves as a resource for institutions, students, faculty, and others on undergraduate research. It hosts conferences, publishes materials, and provides updates on government regulations and legislation pertinent to undergraduate research. CUR believes that undergraduate research is important to both student and faculty development. According to the CUR website:
“The Council on Undergraduate Research (CUR) and its affiliated colleges, universities, and individuals share a focus on providing undergraduate research opportunities for faculty and students at all institutions serving undergraduate students. CUR believes that faculty members enhance their teaching and contribution to society by remaining active in research and by involving undergraduates in research” (Council on Undergraduate Research, para 2).

Purposeful sampling was used by the researcher to select a CUR institution for a case study analysis. A selective, Midwestern, CUR affiliated college was selected. It is a member of CUR and has a strong undergraduate research program where undergraduate research is a significant portion of the undergraduate experience.

The selective, Midwestern, CUR affiliated college. A small, private college that values undergraduate research was selected for this case study. Some scripters have been modified in an attempt to provide anonymity the institution. For the purposes of anonymity, the selected institution will be referred to throughout the remainder of this document by the pseudonym, MRC.

MRC is located in a small community with a population of less than 10,000. It has an enrollment under 1,500 students. MRC is a traditional four-year liberal arts school offering both a Bachelor of Arts degree and a Bachelor of Fine Arts degree and is accredited by the appropriate regional accrediting agency. Full-time faculty total just over 100 and MRC has a low student to faculty ratio. All MRC’s tenured or tenure-track faculty members hold a Ph.D. or the appropriate professional degree in their field. MRC ranks highly in publications such as U.S. News & World Report, Fiske Guide to Colleges, and The Princeton Review.
**Undergraduate research at MRC.** MRC has a summer research program. During the program, students pair up with faculty mentors to develop and carry out research and other creative projects in a variety of disciplines. For more than two decades, MRC has held an annual research symposium highlighting excellent student research, scholarship, and creative activity. The participants are nominated by their faculty sponsors after having participated in independent research that results in the significant synthesis of new knowledge. The research must have been performed under the direct supervision of a college faculty member, or in a college-approved off-campus program. Over the past 25 years, the college’s faculty have received research and equipment grants from several notable foundations and organizations and the college boasts a history of prominent alumni in national research leadership roles.

**MRC’s IRB.** A thorough examination of institutional documents validated that it has an IRB committee. MRC’s IRB is made up of ten voting members (nine faculty and one community member), one non-voting member, and an alternate. I had the opportunity to speak with the IRB chair prior to conducting the study, and she graciously agreed to allow me to conduct my research at the college.

The IRB categorizes IRB research proposals involving human participants as either a monitored review, expedited review, or a full review (also known as C1, C2, and C3). Research activities subject to IRB review include: faculty research, administrative/staff research, and student research (e.g., independent studies, thesis research, student-designed research for courses).
Analysis

Interviews were recorded and then transcribed verbatim. Analysis of the transcripts were executed using a qualitative software package. Qualitative research software helps researchers to organize and analyze unstructured information. Three qualitative software packages were contemplated as possibilities in this study: NVivo, MAXQDA, and ATLAS.ti. All three packages offered similar capabilities with regards to qualitative data analysis, organization, and coding. All three were also similar in price, reviews, and customer service support (“Atlasti,” 2014; “Maxqda,” 2014; “QSR International,” 2014).

I attended an NVivo software webinar presentation and found it to be user friendly. NVivo software provides an analysis tool for unstructured qualitative research that assisted the researcher in collecting, organizing, and analyzing qualitative data from interviews. The software has query tools that analyze data and detected trends (QSR International, 2014). I selected NVivo as my qualitative analysis software. After selecting NVivo as my software tool, I attended an additional training session to better familiarize myself with it. I found the software to be user friendly and beneficial in the reduction of data.

Strengths

According to Sanders (1981) qualitative case study research is “a means of investigating complex social units with multiple variables” (p. 199). Qualitative case study research has proven effective for studying educational innovations, for evaluating programs, and for informing policy. Collins and Noblit (1978) noted the strengths of this type of research for policy analysis saying it “better captures situations and settings
which are more amenable to policy and program intervention that are accumulated individual attributes”….and are “better able to assess social change than more positivistic designs, and change is often what policy is addressing” (p. 26).

**Limitations**

The generalizability of the study was a limitation. Specifically, internal generalizability was of concern. Through the use of multiple triangulation, it was the goal of the researcher to minimize these concerns. Additionally, Maxwell (1992) argued that the in-depth understanding gained through qualitative research takes precedence over the ability to generalize findings outside the case study.

The choice to use semi-structured open-ended interviews was made in the hope of creating a comfortable opportunity for the interviewee to speak, however this interviewing method may lack reliability and cause a concern to internal validity. It was the goal of the researcher to minimize descriptive validity concerns through the use of tape recordings, verbatim transcriptions and NVivo software.

Results are limited by the researcher’s integrity and bias, however it is the hope that through member checking and multiple triangulation researcher bias can be limited.

**Summary**

A selective, Midwestern, CUR affiliated college was selected for this case study analysis. The methodology was qualitative research, consisting of semi-structured interviews and methodological triangulation were used to gather data which was then be analyzed using NVivo qualitative software. While the literature review covered undergraduate research and IRBs respectively, a significant gap in the research exists as to how human subject research federal regulations are being implemented at the
undergraduate level. The purpose of this case study was to determine how one CUR institution has implemented human subject research public policy to benefit its students. Taking an in-depth look at how an IRB at a CUR institution where undergraduate research significant portion of the undergraduate experience is implementing human subject research public policy has helped us to better understand this connection. In the following chapter, the findings of this case study are presented.
Chapter Four

Findings

Introduction

The purpose of this case study was to determine how one Council on Undergraduate Research institution has implemented human subject research public policy to benefit its students. Qualitative case study methodology allowed me to study complex phenomena within its context (Baxter & Jack, 2008). Given my desire to seek an in-depth understanding as to how MRC was supporting undergraduate research on its campus, a qualitative inquiry method, specifically a case study, was selected. The research question examined how this CUR institution implemented human subject research public policy on its campus.

In this chapter, the findings are presented. This qualitative single case study collected multiple sources of data over the course of three weeks, from June 24, 2015 to July 14, 2015. I visited the campus on three occasions over the course of these three weeks. During my visits I conducted nine interviews, attended student research presentations, went on two guided tours of the student research areas, and completed one campus wide self-tour via a campus map guide. Figure 12 below summarizes my visits to the institution and highlights how I spent my time.
<table>
<thead>
<tr>
<th>Visit 1 - Duration 6 hours</th>
<th>Visit 2 - Duration 8 hours</th>
<th>Visit 3 - 4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Interviews (3)</td>
<td>✓ Interviews (3)</td>
<td>✓ Interviews (3)</td>
</tr>
<tr>
<td>✓ Self-guided campus tour/town</td>
<td>✓ Guided tour of social science facility</td>
<td>✓ Follow up with student interviewee</td>
</tr>
<tr>
<td>✓ Guided tour of physical science facility</td>
<td>✓ Attended student research presentations (3)</td>
<td>✓ Acquired hard copies of data, policies, etc. necessary for my research that was not available via email or the web.</td>
</tr>
<tr>
<td>✓ Attended student research presentations (3)</td>
<td>✓ Photographed social science laboratories</td>
<td>✓ Follow up with student interviewee</td>
</tr>
<tr>
<td>✓ Photographed science laboratories, equipment and donor plaques</td>
<td>✓ Follow up meeting with IRB chair</td>
<td>✓ Acquired hard copies of data, policies, etc. necessary for my research that was not available via email or the web.</td>
</tr>
<tr>
<td>✓ Met and observed summer research students in the labs</td>
<td>✓ Photographed social science research posters in the hallways</td>
<td>✓ Follow up conversation with IRB member previously interviewed.</td>
</tr>
</tbody>
</table>

Figure 12. Breakdown of the campus visits conducted during this research study.

The analysis of nine interview transcripts, field notes, 14 photographs of student research projects, spaces, and labs, policies, procedures, and guidelines relating to undergraduate research and/or the institutional review board, and data on student research participation was analyzed.

Interview participants fell into four main categories: students, faculty research advisors, administrators, and IRB members. Some participants fell into more than one category. For example, some IRB members also served as faculty research advisors. Interviewees also served as the IRB chairs, CUR representative, and summer research program director. The findings, and more specifically, the four main themes that emerged, answered the study’s research question: how does a selective, Midwestern, CUR affiliated college support undergraduate research on its campus.
Data Analysis Process

The intention of the follow section is to provide the reader with a step by step narrative description of the data analysis process. Figure 13 provides a visual illustration of the process I used to analyze the data. Data analysis was broken down into four major steps:

- Step 1- Explore source (transcript)
- Step 2- Explore broad themes
- Step 3- Review a theme node
- Step 4- Code on

Data analysis began on site as I interviewed subjects and toured the institution over the course of three weeks. I kept a field journal noting key words and phrases that were repetitive. For example, I noted that the institution’s commitment to undergraduate research was repeated by almost everyone I spoke with.

Step 1- Explore source (transcript). Once interviews and onsite visits were complete, interviews were transcribed verbatim. Prior to the use of NVivo 11, all data sources, including transcripts were read for initial impressions and then read a second time to identify key words and phrases that would be used with NVivo 11 to detect trends. My initial impressions were that the institution was very committed to undergraduate research and was committed to protecting the teaching and learning environment at the college.

Coding types. NVivo outlines two approaches to coding, broad brush coding using queries, and manual coding in sources. Broad brush coding automatically codes sources based on the words or phrases they contain. This can be done using word
frequency searches or text search queries. According to NVivo’s website help feature, this can be a helpful starting point when reviewing data (QSR International, 2014). Manual coding involves working within a source (a transcript for example) to select content and then code it.

**Step 2- Explore broad themes.** I first used the broad brush approach, running multiple keyword and word frequency searches. For example, I ran keyword searches for “commitment to undergraduate research” and “student mentoring”. Based on these types of searches, NVivo 11 software produced 236 references throughout the transcript texts for me to further review.

**Step 3- Review a theme node.** These 236 references were broken down into 17 different nodes. According to NVivo’s website, “a node is a collection of references about a specific theme, case, or relationship” (About nodes, para, 2). Nodes are important to working with NVivo because they allow the researcher to deposit similar data in one place so you can look for emerging patterns and ideas. According to NVivo, “You can create and organize theme nodes and case nodes” (About nodes, para 1).

**Step 4- Code on.** Next, a process called “coding on” was used. This process is done manually. According to NVivo’s website, “when you open a node, you can explore the references gathered there. As you make new discoveries, you may want to [manually] code the content at other nodes—this is called 'coding on” (About coding, para, 9). For example, within the theme node “commitment to undergraduate research” I coded on to a finer theme of “financial commitment”. Figure 13 below is a visual representation of the process I used to analyze and code the data.
Figure 13. A visual representation of the process I used to analyze and code the data. The above example illustrates the coding and “coding on” for the node Commitment to UR.

I next began organizing my nodes into themes and sub-themes. Figure 14 below is an example of how I began organizing my nodes by themes and sub-themes. Following Figure 14 is a narrative description of how I identified themes, in particular, the criteria I used to identify them.
<table>
<thead>
<tr>
<th>Node</th>
<th>Sources (# of Interviewees)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment to UR</td>
<td>8</td>
<td>37</td>
</tr>
<tr>
<td>CUR</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Financial commitment</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Summer research program</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Role as URI</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Tenure</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>IRB Mission</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>IRB mission</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>IRB Policies and Procedures</td>
<td>6</td>
<td>32</td>
</tr>
<tr>
<td>Board cohesion</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>IRB Chair</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>IRB challenges</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>IRB positive attributes</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Proposal types</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mentoring Students</td>
<td>9</td>
<td>42</td>
</tr>
<tr>
<td>Person background</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Student Learning Outcomes</td>
<td>5</td>
<td>14</td>
</tr>
</tbody>
</table>

*Figure 14*. An example of how nodes were exported from NVivo 11 software and organized into themes and sub-themes.

Themes were identified from nodes based on a number of different factors, including quantity, intent of statement, and connection through multiple triangulation and/or member checking.

**Quantity.** Some items elevated to the level of theme or sub-theme based on the number of times a key word or phrase appeared in the transcripts. For example, the phrase “commitment to undergraduate research” was referenced verbatim 37 different times in the interview transcripts by eight different subjects. Figure below is an example of a theme based on quantity. Figure 15 below is a screen shot of interview transcripts that illustrates a theme based on the quantity of a verbatim reference in the text.
Figure 15. Figure 15 is an example of a verbatim node picked up by NVivo 11 software within the interview transcripts.
Intent of statement. While some themes and sub-themes were not referenced verbatim with high frequency, their intent was similar and was thus elevated to a theme or sub-theme status. For example, “IRB mission,” while only referenced eight times in the transcripts, elevated to a theme because analysis of the transcripts, member checking, and multiple triangulation revealed a number of statements that tied to IRB mission (e.g.- “IRB purpose” or “IRB goal”).

Multiple triangulation. An example of a sub-theme that was validated using multiple triangulation is “financial commitment”. While only mentioned eight times verbatim in the transcripts, by only three interviewees, interviewees did speak to the institution’s financial commitment to undergraduate research in other ways. A review of budgets reports and tours of the research facilities further validated the institution’s fiscal commitment to undergraduate research. Figure 16 below is a screen shot example from transcripts that highlights how financial commitment was discussed by one interviewee and determined to be significant despite the fact that the verbatim phrase “financial commitment” was not used.
Figure 16. Figure 16 is an example from the transcripts that highlights a sub-theme based on multiple triangulation and review of transcripts. While the interviewee is providing information on how the institution is fiscally committed to undergraduate research, they do so without using the key phrase “financial commitment”.

Sure. I would say really generously. The student I have not only is she getting a stipend for the summer, it’s probably minimum wage, but it’s a 40-hour week stipend. She also got $500 to pay people to take her survey. So we—because of the way— I don’t know if you’ve ever used Amazon Mechanical Turk, but you can—basically people do small jobs for very small amounts of money and they just do a lot of them and they can earn extra money. So you can get a fairly representative sample of the U.S., or there’s a lot of people who participate in India and a lot of people in China as well. So you can get international samples for very small amounts of money. So for instance, $500 when you pay people a $1.50 to do a 30 minute survey and within the span of two hours we have 300 participants— but for a person that does survey research like me it’s really easy to get funding. I can get that kind of funding as a faculty member through the Faculty Development Committee. So you can get a large grant I think of up to $3,000 or $4,000, small grants, I got a grant to go to a workshop in Kalamazoo for a few hundred dollars, and it was really an easy process. And I know that— I have colleagues that do real science in the chemistry department and bio where they need to buy equipment and all that stuff, and they can do that with multiple large grants as well as other funding, and their students get grants.

extensive than I would have expected, even (?) going in— doing research for the job interview or whatever.

Reference 2 - 12.38% Coverage

Sure. I would say really generously. The student I have not only is she getting a stipend for the summer, it’s probably minimum wage, but it’s a 40-hour week stipend. She also got $500 to pay people to take her survey. So we—because of the way— I don’t know if you’ve ever used Amazon Mechanical Turk, but you can—basically people do small jobs for very small amounts of money and they just do a lot of them and they can earn extra money. So you can get a fairly representative sample of the U.S., or there’s a lot of people who participate in India and a lot of people in China as well. So you can get international samples for very small amounts of money. So for instance, $500 when you pay people a $1.50 to do a 30 minute survey and within the span of two hours we have 300 participants— but for a person that does survey research like me it’s really easy to get funding. I can get that kind of funding as a faculty member through the Faculty Development Committee. So you can get a large grant I think of up to $3,000 or $4,000, small grants, I got a grant to go to a workshop in Kalamazoo for a few hundred dollars, and it was really an easy process. And I know that— I have colleagues that do real science in the chemistry department and bio where they need to buy equipment and all that stuff, and they can do that with multiple large grants as well as other funding, and their students get grants.
As nodes were further analyzed using multiple triangulation and member checking, four main themes (with various sub-themes) emerged from the data to support the research question:

- **Theme 1.** The institution is committed to undergraduate research.
- **Theme 2.** Mentoring undergraduate research has been institutionalized.
- **Theme 3.** The mission of the IRB is clear to all constituents.
- **Theme 4.** The IRB operates using efficient procedures and communications.

**Data Analysis Themes**

**Theme 1. The institution is committed to undergraduate research.** The findings indicated a number of different ways MRC is committed to undergraduate research. Subthemes for commitment to undergraduate research included: the institution’s CUR membership; the institution’s commitment to research programs and grants including the summer research program, the student research partners program and the student research symposium; and the institution’s fiscal commitment to undergraduate research.

**Sub theme 1a membership in the Council of Undergraduate Research.** The Council on Undergraduate Research (CUR) consists of over 650 institutional members and over 7,000 individual and affiliate members. The mission of CUR is to “support and promote high-quality undergraduate student-faculty collaborative research and scholarship” (Council on Undergraduate Research, para 1). CUR serves as a resource for institutions, students, faculty, and others on undergraduate research. It hosts conferences, publishes materials, and provides updates on government regulations and legislation.
pertinent to undergraduate research. CUR believes that undergraduate research is important to both student and faculty development.

Maintaining membership in CUR was one way MRC shows its commitment to undergraduate research. MRC’s summer research program director serves as a CUR national counselor for the arts and humanities. A CUR national counselor attends national business meetings and conferences. This provides MRC a national perspective on undergraduate research. The importance of membership in an advocacy organization like CUR was noted in multiple interviews. The importance was noted by one interviewee stating, “…people at small colleges can write grants where they can include working with undergraduates and then having them know that we’ve got some advocacy (at the national level) that says this is an important thing” (Personal communication, July 8, 2015). CUR membership also allows students an opportunity to attend conferences. Some departments are very involved and send their students to CUR conferences every year, while others choose more discipline specific conference opportunities. For example, in the psychology department, if students do a thesis project, the faculty encourage them to submit applications to the American Psychological Science Conference or the Association for Psychological Science. It was noted that the month prior to my visit, psychology students traveled to New York and presented their work at an annual psychology conference.

**Sub theme 1b commitment to research programs and grants.** MRC’s commitment to undergraduate research was described as institutionalized. Research opportunities begin freshman year in classes. One faculty noted “It’s always with our students. Every project we do is with our students.... So all in all, the undergraduate
research environment is awesome here” (Personal communication, June 25, 2015). One student noted, “…As an undergraduate, the research environment here is amazing” (Personal communication, June 25, 2015).

MRC’s commitment to undergraduate research was evident in poster presentations that lined the halls of many academic buildings. I did keep a field research notebook during my visits documenting observations and photographs. In an effort to protect the college’s anonymity, I have not included the photographs in this research study.

Faculty are excited to begin working with students on undergraduate research, as illustrated in the following quote: “the minute we find someone who is intriguèd by the research or if they come to see us, we get them involved right away” (Personal communication, June 25, 2015). Students are encouraged to do a thesis project, participate in conferences, and submit applications to annual conferences. MRC demonstrates its commitment to undergraduate research in a number of different research programs and grant opportunities outlined below.

The summer research program. The summer research program was established to support and promote undergraduate research at the MRC. Prior to the summer research program, undergraduate research and its subsequent funding was located in departmental pockets across the institution. MRC decided to pool all those funds together and create the Summer Research Program in 1999. The creation of the Summer Research Program streamlined processes and allowed undergraduate research at MRC to be cross-disciplinary or disciplinary blind. Figure 17 below illustrates the volume of all summer grant applications by division.
Having a hub where undergraduate research is centrally located has institutionalized undergraduate research, streamlined donations to undergraduate research, and helped the MRC create an institutional culture supportive of undergraduate research. According to the summer research program director, approximately 50% of the budget for the summer research program is supported by an endowment. This was further validated during a conversation with the College controller. The summer research program is coordinated by a faculty appointed director. The faculty member gets a stipend for serving as director. It is a three-year term of appointment. Primary responsibilities of the director include working with the summer research advisory committee and the summer research coordinator to organize the application and review process for summer research.

Figure 17. Illustrates summer grant applications by division submitted to the summer research program form 2012-2015 for consideration.
propose, as well as managing the summer research program budget. According to the
director, “[undergraduate research] has been institutionalized in a way that it isn’t if
there’s just donors giving to departments to work with students, so it really helped the
college create a culture, an institutional culture, of supporting undergraduate research”
(Personal communication, July 8, 2015).

Faculty referred to the summer research program as a “really wonderful program
where the students get to conduct their own research but get a lot of guidance from an
advisor” (Personal communication, June 25, 2015). One student interviewed spoke of
her summer research experience, saying, “I like doing [the summer research program] a
lot. Photography is expensive. Just my wet collodion kit itself cost $350, and that’s just
for 100 pictures. [The summer research program] helps me to be able to conduct my
research” (Personal communication, July 8, 2015).

During the summer, research students must present their research during one of
several Thursday afternoon summer research program seminars. I had the opportunity to
attend six student research presentations. Topics ranged from photography research to
biochemistry, to public policy analysis. Between 40 and 65 proposal requests are
submitted to the summer research program director each year. Student proposals then go
through a two-round selection process. In the first round, proposals are either accepted,
rejected, or revisions are requested. During the second round, revised proposals are either
accepted or rejected. According to the director, proposal rejections are pretty rare
because the faculty members working with the students serve as mentors who help
students along the way. He noted that even the proposal process is a mentoring
opportunity. Figure 18 below illustrates a three year history of first round proposal status of summer research program proposals.

![Pie charts showing proposal status over three years](image)

*Figure 18. Three year history of the status of first round proposal submitted for the summer research program.*

*Student research symposium.* The Student Research Symposium is an annual event highlighting student research. Student researchers are nominated by faculty to present during the day-long symposium. Faculty write a letter indicating their support for the research project. Letters often include a rationale as to why this is original research or creative activity and how it will contribute to the field. The event is highly advertised on campus. Student’s families are encouraged to attend.

*Student research partners program.* While other programs at MRC are aimed at students working on their own projects with faculty mentorship, the Student Research Partners Program is aimed at introducing students to the lab setting and working with faculty in the hope of moving them on to more independent research projects later. The Student Research Partners program allows students, even freshman, to interview and apply to work in different labs. This was best evidenced in the following quote from the summer research program director:
“[Student Research Partners is] aimed at incoming students who will work with a faculty member on the faculty member’s research. All the other things the students are doing are supposed to be their own projects even if they’re related to what the faculty members are doing. But the Student Research Partners, they’re really research assistants, and it’s kind of aimed at getting them introduced to the lab and working with faculty so that they can take steps later on to do large projects” (Personal communication, July 8, 2015).

**Sub theme 1c fiscal commitment to undergraduate research.** In addition to the above undergraduate research initiatives, there are semester grants of $500 or $600 for supplies and expenses and travel for student research projects. Conference grants in the amount of $500 are also available for students to go present their work at conferences. The institution’s financial commitment to undergraduate research was validated using multiple triangulation. During tours of the student research labs, it was apparent that a significant amount of funding had been invested into research laboratories, both in the hard and social sciences. One of the science faculty providing the tour commented on not only the large financial investment in the research labs, but the large financial investment associated with upkeep of the labs. This was also confirmed during several of the interviews with faculty. The institution has not only made a commitment to the building and remodeling of labs, but maintains an appropriate maintenance budget for the labs as well. Photographs of the research laboratories and equipment were included in my field journal.

MRC’s financial commitment to undergraduate research was further supported by budget reports. The College has a strong donor base for student research labs. An
example of this is an analytical lab, made possible by a donation from a large science foundation. While the photograph is excluded from this document for confidentiality reasons, a large plaque hangs on the wall near the entrance of the lab recognizing the donation made by the foundation.

In addition to a strong donor base, approximately half of the undergraduate research budget is supported by an endowment. Faculty and administrators spoke of the institution’s support behind the summer research program and undergraduate research in general. The following quote is indicative of the majority of comments made by faculty and administrators: “there’s a lot of funding…the students get funding…[undergraduate research] it’s part of MRC’s stitch, our selling point. It’s an institutional priority” (Personal communication, July 8, 2015). The overall budget for undergraduate research projects this year was $342,000.00. Additional lines in the budget also allotted $94,000.00 for faculty research mentors, $27,000.00 in management salaries, and $143,000.00 in student wages.

**Sub theme 1d faculty tenure and promotion.** Faculty tenure and promotion at MRC is tied to involvement in undergraduate research and student mentoring. According to the faculty handbook at this institution, there are four criteria for faculty evaluation. Two of the four criteria directly speak to how serving as a role model or mentor for students is part of the tenure evaluation criteria. During campus interviews, faculty noted expectations to do research with undergraduates and commented on the importance of taking their mentoring role seriously. It was assumed that mentoring undergraduate research was part of their job.
Theme 2. Mentoring undergraduate research has been institutionalized.

Findings indicated student mentoring as it relates to undergraduate research has been institutionalized. This was evident in the tenure and promotion criteria in the faculty handbook. It was also evident in the institution’s budget, which dedicated significant funds to both undergraduate research and faculty mentorship opportunities. Findings also showed student mentoring has been institutionalized in a number of other ways.

Sub theme 2a Faculty mentorship for undergraduate research. Faculty noted learning outcomes for students they were mentoring. For example, the process of submitting a research proposal was itself a learning opportunity for students. Faculty in the psychology department actually utilize a departmental level IRB to prepare students for the institutional IRB. Students are briefed on the history of IRBs and federal regulations as they relate to high profile cases such as Tuskegee and Stanford Prison Project.

Sub theme 2b IRB committee mentorship for undergraduate research. The primary mission of the IRB was clear. A secondary mission of providing mentorship to students throughout the IRB process was also a function of the committee. Going through the IRB process affords students the opportunity to “practice the process” and understand the need to protect participants’ rights. The IRB chair has often met with a student who does not quite understand the process and walk them through it. Members of the IRB stated they have gotten feedback that their approach is working. Students do not feel like they are being punished for mistakes during the IRB process, but rather that it is a learning experience. Multiple interviewees commented on the IRB’s willingness to
meet one on one with students who needed additional assistance to move through the IRB process.

The IRB chair serves in a mentoring role as well, calling students into her office and working with them on what is necessary to successfully meet IRB requirements. The IRB does not “reject” proposals, but rather asks students for modifications prior to resubmission. Student learning is taking place throughout the IRB process, and while it may not be an assessed goal of the IRB, it is certainly happening. Findings indicated that in addition to the primary mission to protect human subjects, MRC’s IRB process affords different learning outcomes to students. Most notably, students need to understand the mission and purpose of the IRB, but they also learn to navigate the process of writing a proposal to the IRB. There was a consensus among IRB members interviewed that committee members are really teachers. Critiquing student proposals and showing students what needs to be done is part of the learning process for those students. This speaks to the learning outcomes. Several learning outcomes were apparent during the interviews:

- Students need to understand their responsibilities to protect participants’ rights.
- Students need to practice the IRB process for [potential] future research.
- Students need to understand informed consent.

Furthermore, ensuring proper, ethical, research is conducted and ensuring students understand how that is defined, improves the research environment on campus.

*IRB processes improve student/faculty relations.* The IRB process allows for closer interactions between professors and students. Faculty noted the IRB process moves students to the level of a colleague. Working with students outside the classroom can
change the dynamic between faculty and students, making the student more of a colleague and less of a passive learner. The IRB evaluates student proposals and plays a role in facilitating the interaction between the faculty mentor and the student to correct any concerns. Students view the IRB process as a benefit to student/faculty interactions as well as demonstrated in the following student quote:

“He’s [faculty mentor] been extremely helpful, really kind of mostly just keeping me on track, especially with my research. It’s just so many moving pieces I guess when you’re trying to put together this document, and he really kind of helped me organize…he’s kind of there to keep me on track, provide suggestions and criticisms…there’s just so many different things and he helped me figure out a way to organize everything in a way that’s something that’s presentable to someone else (Personal communication, June 25, 2015).”

Theme 3. The mission of the IRB is clear to all constituents. A thorough review of MRC’s policies, procedures, and interview transcripts, as well as on site observations, revealed a clear understanding institutionally of the mission/purpose of the IRB. Students, faculty, and administrators understood the purpose of the IRB. When asked about the mission of the IRB, participants articulated the mission of the IRB in the following ways:

- “To educate the students and to protect the participants’ rights” (Personal communication, June 19, 2015).
- “To ensure that the research is conducted in a responsible manner” (Personal communication, June 25, 2015).
“To protect the welfare of the participants” (Personal communication, June 25, 2015).

“To make sure that research on human subjects is done ethically and with respect for the rights of the subjects” (Personal communication, June 25, 2015).

While each of the above statements is slightly different, the overall understanding of the IRB's purpose was clearly articulated by participants across the institution.

**Theme 4. The IRB operates using efficient procedures and communications.**

Processes and procedures related to the IRB are efficient. IRB internal and external communications are efficient. The IRB handles both faculty and student research. The IRB has an administrative assistant that coordinates paperwork, proposals, and correspondence. Paperwork is received, scanned, and sent to the chair of IRB. Proposals fall into one of three categories: C1, C2, or C3.

C1 proposals are labeled as monitored reviews, and are only used for faculty research. Because the institution feels strongly about the learning process that occurs during the IRB process, all student research is labeled as C2 or C3 so they must go through the process. The student works with their faculty mentor to determine whether their proposal will be submitted as a C2 or a C3. Proposal paperwork requires researchers to describe their research and participant population, describe how confidentiality will be maintained, describe any potential risks and benefits to subjects, and complete an informed consent form. If the IRB determines the level of review necessary for a particular study is higher based on the nature of the protocol, level of potential risk to human participants, or the participant population, the IRB chair relays that information back to the student and their faculty mentor.
C2 proposals are expedited reviews. C2 proposals are assigned to two IRB members. Those two IRB members review and make comments on the proposal and then send it back to the chair. Usually the primary reviewers get their comments back to the chair within a couple days and from there the chair is responsible for corresponding with the researcher about necessary revisions. Once the reviewer has made revisions, the revised proposal goes back to the two original reviewers for another review. In many cases, if revisions are minor the chair will let the researchers know that pending changes the committee approves the proposal.

C3 proposals are full reviews and require the committee to meet. Some semesters do not have any full reviews. Full review proposals involving minors take the longest amount of time to review.

The IRB generally meets once at the beginning of the semester to discuss any issues going on from the past semester. Having electronic communication (compared to face to face meetings) was viewed as a positive attribute of the board by those members interviewed. It is helpful to have everything via email. Furthermore, electronic copies allowed for track changes to be utilized. Most recently, the IRB has gone to a template system available on the website. This allows students to be able to go in and create their proposal using a standardized template. Student and faculty researchers noted the IRB’s polices as clear and easily accessible.

*Sub theme 4a Board cohesion facilitates a positive undergraduate research experience.* Members of the IRB shared a common passion and purpose. The following quote by the community IRB member illustrates the board’s cohesion:
“I know teamwork when I see it and I know people who are trying to blend their different learning philosophies and their different teaching styles into one purpose and one goal and everything. You know, so that's what I appreciate I think most [about the IRB] is the element of getting consensus and reaching the point where we agree that this is something that should go forward and be approved”

(Personal communication, July 8, 2015).

The IRB chair also shares in this sense of passion and purpose as illustrated in the following quote:

“I love my [IRB] committee. I think they are just amazing. And they are so--it’s just so wonderful to work with them. And we just get along really well and it’s, it’s a real--I think everybody’s really quite pleased with how we are able to work-function in this--in this realm. It’s working well….it seems to function pretty well. And they’re really great people and they’re amazing. They’re just really great people and I, I really appreciate and really I feel like I’ve gained from my experience…I think they’re very sincere and want to see the students do well”

(Personal communication, June 19, 2015).

IRB board members feel connected to one another and share a common purpose.

**Sub theme 4b The IRB chair provides clear leadership to the committee.** The chair of the IRB provides clear leadership and direction on matters pertaining to IRB policies and procedures. The IRB chair facilities communications between students and faculty mentors and the IRB committee. The following quote illustrates the chair’s role:

“...I think the chair does an excellent job of working with, with all the departments and all the students in particular as it is a learning process for them, in large part
to teach them what needs to be done and why we need to do these things and why we need to have informed consent in such ways and why things need to be explained in such ways” (Personal communication, June 25, 2015).

**Sub theme 4c The IRB has a positive reputation among constituents.** The IRB takes their work seriously. They address concerns in a positive way. The IRB is viewed positively on campus. The following quotes were used to describe the IRB:

- “It’s accessible, it’s not a big mystery” (Personal communication, June 25, 2015).

- “It’s not this aloof organization” (Personal communication, June 19, 2015).

- “They’re fast. They’re actually quite fast” (Personal communication, June 25, 2015).

- “I actually feel like they’re quite fair” (Personal communication, June 25, 2015).

- “The IRB is pretty consistent” (Personal communication, June 19, 2015).

- “I really appreciate the level of collegiality” (Personal communication, July 9, 2015).

- “They’re really helpful” (Personal communication, June 25, 2015).

- “It is nice to have a kind of a cross section of faculty from different backgrounds on the committee so they can see things with different sets of eyes essentially” (Personal communication, June 25, 2015).
“I think they’re very sincere and want to see the students do well”
(Personal communication, June 25, 2015).

Summary

This purpose of this qualitative case study was to determine how this Council on Undergraduate Research institution has implemented human subject research public policy to benefit its students. This research question was answered by the data collected. Four main themes emerged from the data to answer the above research question. The four themes were:

Theme 1. The institution is committed to undergraduate research.

Theme 2. Mentoring undergraduate research has been institutionalized.

Theme 3. The mission of the IRB is clear to all constituents.

Theme 4. The IRB operates using efficient procedures and communications.

Chapter Five contains a summary of this single case qualitative study and expounds upon how the findings in the four themes identified in this chapter support undergraduate research on MRC’s campus.
Chapter Five

Discussion, Conclusion, and Recommendations

Introduction

The purpose of this case study was to determine how one Council on Undergraduate Research institution implemented human subject research public policy to benefit its students. The case study institution (MRC) was a selective, Midwestern, CUR affiliated institution, intensely focused on undergraduate research. The results of this case study are specific to this case and cannot be generalized to other institutions, but they can be linked back to the literature. The research question that focused this study was how has this CUR institution implemented human subject research public policy on its campus. This chapter includes a discussion of the findings, conclusions, and recommendations.

Federal public policy for research involving human subjects, better known as the Common Rule, impacts higher education institutions by requiring all federally funded research to be passed by an institutional review board. There was a large volume of research showing the benefits of undergraduate research (Bauer & Bennett, 2003; Dolan & Johnson, 2009; Hathaway, et al., 2002; Hernandez Jarvis, et al., 2011; Kardash, 2000; Kuh, 2008; Lopatto, 2006; Summers & Hrabowski, 2006; Ward, et al., 2005). Student benefits include: increases in retention, intellectual gains, skill attainment, graduate school placement and career preparation (Crowe & Brakke, 2008; Hathaway, et al., 2002; Ishiyama, 2002). Faculty benefits include: increased lab assistance, ongoing research opportunities, and assistance with tenure and promotion (Corley, 2013; Schulthesis, 2011; Nagda, et al., 1998). Institutional benefits include: increased admissions selectivity,
increased institutional funding, and lower attrition rates (Kierniesky, 2005; Nagda, et al., 1998). In light of the value of undergraduate research to colleges and universities, I expected to find studies that examined the relationship between the institutional review board and undergraduate research. I was unable to locate any studies about this relationship. The findings of this study erase that research gap.

**Discussion**

During this qualitative single case study, multiple sources of data were collected and analyzed. Four main themes, some with subsequent subthemes, emerged from the data to support the research question. Figure 19 below illustrates the themes and subthemes from Chapter 4.

![Figure 19](image-url)

*Figure 19. Figure 19 is a visual illustration of the findings of Chapter 4 broken down into themes and subthemes.*
The interpretations of my findings discussed below are linked to appropriate literature. A public policy framework will be used to frame these four themes.

Using Ripley’s (2010) conceptual model, I identified the environment as the institution, the policy actors as the IRB chair, IRB members, and undergraduate research advisors/mentors, the governmental policy activity as the federal policy to protect human subjects, and the social policy activity as undergraduate research. Figure 20 below illustrates how I adapted Ripley’s model to specifically inform this case study.

![Figure 20. Illustrates how Ripley’s model can be applied to this Council on Undergraduate research IRB case study (Adapted from Ripley’s General Model, 2010).]

**Implications for federal public policy implementation.** By and large, most public policy implementation theories were created during the 1970’s and 1980’s, over 30 years ago (PulzI & Trieb, 2007) and may be viewed as not applicable or outdated.
While Ripley created his General Model for Policy Process to be broad enough to apply to all stages of the policy process, it can also be applied specifically to any one stage of the process, in this case, the policy implementation stage. I confirmed this with Randall Ripley in an interview. He said,

“I spun out the model to apply broadly to all stages of the policy process, but it certainly can be funneled down specifically to any stage including the implementation stage, and you’ve done that here. It’s a flexible model. From what I read, it comes across clearly that you’ve taken the model and applied it to one stage of the process” (Randall Ripley, Personal communication, March 25, 2016).

Amidst numerous outdated implementation theories, lies a hybrid model for general policy process, that when applied specifically to the implementation stage, can inform and describe policy implementation. The idea that the implementation of human subject research public policy is best done using a hybrid approach may be the most significant finding of the study. What is outlined in the federal regulations and published online is the same for every institution, but every institution is using their own discretion, their own perceptions, their own environmental factors, and their own actors to implement this public policy in a slightly different way. Ripley was right to identify the four major components within his model (governmental policy activity, social policy activity, policy actors, and environment), but what his model is missing, and what this study shows, is that the power of these components are not equal at the implementation stage. Ripley validated this finding during our interview saying,

“The impact of actors and environment on successful or unsuccessful policy implementation is enormous. I found that an administrator at a key agency that
understood the political landscape would get further than someone thrashing around with the federal regulations as they were written…implementation is an adaptive procedure, the feds do their part, but the state and local actors, in this case at the institution, have a large role. This is the local role. You picked up on this well… the interactive nature of the social and institutional context and their preferences. Successful implementation takes place when staff understand their environments and implement with it. I like the way you diagrammatically blend the societal response and the local official response. (Randall Ripley, Personal communication, March 25, 2016).

The implementation of federal human subject research public policy at MRC occurred using a hybrid approach. While human subject research public policy was created using a top-down model from the Federal government, MRC chose to implement federal policy using a hybrid model of implementation that meets federal requirements, while capitalizing on the role the local actors can play in the implementation process. This model has resulted in a student and faculty friendly implementation emphasizing various learning outcomes and student mentoring, all while adhering to federal level requirements.

Ripley’s General Model of Policy Process emphasizes the role of local actors in policy creation and implementation. Ripley spoke to how policy actors and the environment impact each other as well as the policy version created. Ripley (2010) said: “policy actors move on the basis of their own perceptions…these perceptions include some of the environmental factors that analysts determine to be important. But the perceptions may also be of events, trends, and factors that analysts cannot
find systematically important but, in the day-to-day decisions by influential actors that shape outcomes in detail, are quite important.” (pp. 52-53).

This quote describes how federal human subject research public policy is shaped and implemented into IRB policy and practice at MRC to support undergraduate research. Ripley further validated by findings by saying, “they’ve (MRC) implemented it (human subject research public policy) successfully based on the environment and actors and found a middle ground. It makes sense” (Randall Ripley, Personal communication, March 25, 2016).

The findings of this case study are associated with various components of Ripley’s model. I confirmed that policy actors at MRC, including the IRB members, and most notably the IRB chair, create and carry out policies in conjunction with the institution’s mission and culture. MRC’s policies and processes protect human subjects and support undergraduate research and student learning. Environmental factors such as the institution’s commitment to undergraduate research and the fact that mentoring undergraduate research at MRC has been institutionalized, has, and continues to, impact how the IRB (the actors) implement policies. According to Ripley’s model (2010) the environment and the policy actors are intertwined with regards to policy implementation. They impact each other, and together, they impact both government and social policy activity. I found this to be true at MRC. Figure 21 below illustrates how the findings of this study are categorized as either environment factors, policy actor factors, or both, and their relationship to governmental policy activity and social policy activity.
Figure 21. Illustrates the overlapping of the environment and policy actor pieces of Ripley’s model.

As the IRB members and chair, along with other key political actors, including faculty mentors, the administration, and the summer research program director, carry out the day-to-day decisions, it was clear they do so with best practices for undergraduate research and student learning in mind. For example, the summer research program committee rejects very few applications. A review of summer research program application data provided by the summer research director revealed that from 2013-2015, on average, only 8% of first round applications were outright rejected, while 32% were sent back for revisions. Furthermore, the summer research director, confirmed that he
personally calls or emails the faculty mentors of the students whose proposals need revisions, in order to communicate what is necessary for approval.

The IRB does not outright reject proposals. In fact, if a proposal is not approved as is, the IRB chair personally calls the student researcher into their office and discusses what changes need to be made to move forward. This was confirmed during student and faculty interviews, as well as through an interview with the IRB chair where she stated the following about student proposals, “If it’s clear the student is not understanding [the process], I meet with them and we go over their IRB [proposal]” (Personal communication, June 19, 2015). Additionally, the IRB chair calls the faculty mentor, and makes them aware as well. It was evident during interviews that this personal approach to communicating necessary changes was both appreciated and valued by both students and faculty mentors. One clear-cut example of this was an interview with a faculty member where he said, “I think she [the IRB chair] does an excellent job of working with, with all the departments and all the students in particular as it is a learning process for them, in large part to teach them what needs to be done and why we need to do these things and why we need to have informed consent in such ways and why things need to be explained in such ways” (Personal communication, June 19, 2015).

Every element of my research provided evidence that undergraduate research is woven into the fabric of MRC. In fact, the summer research director at MRC referred to undergraduate research saying… “[undergraduate research] it’s part of MRC’s stitch, our selling point. It’s an institutional priority” (Personal communication, July 8, 2015). While four main themes emerged from the research, it is important to note that these themes are not mutually exclusive. The implementation of IRB policy is intimately intertwined
within the culture that is this undergraduate research focused institution. Many of the ways this college is committed to undergraduate research and the protection of human subjects also help to institutionalize the idea of undergraduate research at the institution. For example, MRC’s day long research symposium not only shows its commitment to undergraduate research but institutionalizes undergraduate research at the college by having a dedicated day of no classes built into the academic calendar so student research can be highlighted. This was confirmed by a review of MRC’s academic calendar.

The literature reviewed for this case study presented arguments for the value of a quality undergraduate research program. From high impact best practices, to the pedagogy of the 21st century, to increased job and graduate school placement rates, the arguments for a quality UR program were abundant. I entered into my field research not only wanting to understand how federal human subject research policies were implemented at a college intensely focused on undergraduate research, but also how an institution can turn the requirements that these policies entail into a positive learning experience for its students.

**Defining and growing undergraduate research at MRC.** When speaking with various constituents at MRC, it was clear that “original research” meant different things to different constituents. Often times, how students defined original research was different than their faculty advisor. Students and faculty both noted that one of the responsibilities of the faculty advisor is to assist the student in defining original research. One student commented on this by saying:

“Originally I was thinking of maybe doing something in terms of studying the economic impact of trails and whatnot, but there’s already been so much research
on that it would just kind of be like just doing the same research but in a different area… so then [my advisor and I] decided to look at it instead from an economic standpoint and a public policy standpoint and how do we move forward with completing these statewide initiatives.” (Personal communication, June 25, 2015).

This finding is consistent with that of Beckman and Hensel (2009) who wrote that the definitions and application of undergraduate research vary greatly. Individual institutions, departments, communities, faculty members, and programs may each define undergraduate research differently.

MRC’s mission embraces the idea that learning can take place outside the classroom, and even off-campus. Research at MRC is executed on and off campus, in a variety of different disciplines, and in a variety of different formats, throughout the year. This finding is congruent with that of Hartmann et al. (2013) who noted undergraduate research can be done on or off campus, or abroad, in any discipline, and can be a simple intellectual exercise or a formal one. Undergraduate research experiences (UREs) can be done during the summer or during the school year; can be part of a highly selective program, or can be open to any student; they can be mentored by graduate assistant or a faculty member. MRC paints undergraduate research with a broad brush, encompassing not just one, but many, of the defining features listed above. It allows students to work with faculty mentors to determine if research ideas are original. Additionally, the IRB members interviewed were clear that it was not within their scope to determine if research proposed to them was original. Their job was to ensure human subject research was being conducted within the proper federal policy regulations. The following quote from an IRB member illustrates this.
“[Students] will come in, in some cases, not fully put together like I would have expected…and I think one of the responsibilities with that is trying to keep from judging the actual research question…So instead of me saying your research question is flawed, which it very well might be, [I’m] instead trying to focus on potential issues with consent or, minors” (Personal communication, June 19, 2015).

While MRC’s summer research program is its largest UR program, the application of UR at MRC goes much further. From poster presentations covering the walls of academic buildings, to symposiums, research conferences, and lab assistantships, MRC is committed to undergraduate research. This was clear during interviews. Eighty eight percent of interviewees directly referenced the institution’s commitment to undergraduate research during their interviews, and they did not just reference it once. As a matter of fact, the phrase “commitment to undergraduate research” was used on average four times per interview. MRC’s commitment to undergraduate research is further evidenced in subtheme 1a, membership in the Council of Undergraduate Research (CUR). CUR’s mission is to “support and promote high-quality undergraduate student-faculty collaborative research and scholarship” (Council on Undergraduate Research, para 1). MRC lives this mission in their holistic commitment to undergraduate research. Their vast variety of research opportunities and grants provide students a number of different ways to become involved in undergraduate research on varying levels. This national affiliation affords the institution a direct pipeline to what is happening nationally with undergraduate research, thus positioning them as poised and ready for whatever is on the UR horizon. This was validated in the following quote from the faculty member,
who also happens to be a nationally elected CUR counselor, “[CUR is] an advocacy organization, which is important. CUR advocates in Washington with things like the NEH and the National Science Foundation so that when--so that people at small colleges can write grants where they can include working with undergraduates and then having them know that we’ve got some advocacy that says this is an important thing” (Personal communication, June 25, 2015).

MRC is a poster child for staying current on these trends and growing their UR programs. This is visible in subtheme 1b, commitment to research programs and grants. At MRC, undergraduate students can apply for up to $500 in grants per semester to support their research. Conference grants of up to $500 are also available for students who are selected to present their research at various conferences. Lastly, MRC’s summer research program grant not only pays student researchers a stipend, but provides a living stipend and research equipment monies as well. These funds prove critical to the students involved in undergraduate research at the College. The following quote from a student interviewed depicts the importance of the financial resources the College provides to undergraduate researchers:

“I like doing [the summer research program] a lot. Photography is expensive. Just my wet collodion kit itself cost $350, and that’s just for 100 pictures...the funding is really, really what’s nice for me…One photo today took me about five hours. So it’s not a quick process, and it’s not a cheap process. So [the summer research program] really allows me to explore that, which I really, really enjoyed. And I have access to these facilities which is also something that’s really difficult
to get outside of the college. And it’s just…it’s really nice” (Personal communication, July 2, 2015).

Several noteworthy findings in the literature support MRC’s efforts to support, grow and improve their undergraduate research efforts. In 1998, Reinventing Undergraduate Education: A Blueprint for America’s Research Universities was published by the Boyer Commission on Educating Undergraduates in the Research University. The report found fault in large research institutions for not engaging in enough undergraduate research (Corley, 2013). The report called for increased involvement of undergraduates in faculty-mentored research experiences. In 2002, The Association of American Colleges and Universities advocated for additional attention on undergraduate research calling it a key means to engage students, and in its 2007 College Learning for the New Global Century report, it recommended undergraduate research as a key focus area. In 2005, NSSE included undergraduate research as an indicator for effective teaching (Corley, 2013).

Trends in undergraduate research. MRC supports and embraces undergraduate research. This was evident in participant interviews and in poster presentations that lined entire hallways of academic buildings. It was further validated in a conversation with MRC’s controller who shared that the institution’s annual budget for undergraduate research is $606,000 (this is exclusive of any maintenance or operational costs for existing labs and equipment). MRC’s support for undergraduate research is consistent with Gesink (2010) who found that liberal arts institutions, much like MRC, have supported, embraced, and even required undergraduate research for quite some time, albeit, more in the STEM fields than the humanities and social sciences.
While MRC is a leader in undergraduate research, Humanities research here faces the same struggles as at other colleges. This is consistent with Gesink (2010) who found that undergraduate research has historically been more strongly associated with the natural sciences, and at many institutions, other disciplines lag behind or use different models of mentoring UR. Undergraduate research has been slower to develop in history and other humanities related disciplines. The National Survey of Student Engagement (NSSE) suggests that humanities students at liberal arts colleges reported less undergraduate research experiences than did students in other disciplines. This proved true at MRC as well. Figure 22 below illustrates the percentage of proposals submitted by discipline to the summer research program from 2012 to 2015 for consideration. The Humanities accounted for the least number of proposals. Based on the summer research program data.

![Percentage of Proposals Submitted by Discipline Type](Figure 22. Illustrates percentage of proposals submitted by discipline to the summer research program from 2012-2015 for consideration.)
Aligning with best practices in undergraduate research. MRC’s undergraduate research practices align with a number of best practices for UR found in the literature, including early involvement, summer research opportunities, and research fairs (Alexander, Foertsch, Daffinrud, & Tapia, 2002; Brush, et al., 2010; Gayle, et al., 2010; Greenwald, 2010; & Ward, et al., 2005). Since 1998, when the Boyer Commission on Educating Undergraduates in the Research University, published a report calling for increased involvement of undergraduates in faculty-mentored research experiences, more and more colleges and universities have taken steps to promote undergraduate research on their campuses. Institutions have created centers for undergraduate research and undergraduate research fairs to encouraged faculty-student collaboration. The following three sections highlight MRC’s alignment with best practices through: early involvement in UR experiences, summer research opportunities, and research fairs.

Early Involvement. MRC’s student research partners program is a great example of how to engage students early in research. This program focuses on first year students serving as lab assistants in the hopes of peaking their research interests for future study. In one interview with an art student she commented on how she first served as a research assistant in a lab (a dark room) and that experience prompted her to go on and do further research the following summer through the summer research program. This finding is in line with Summers and Hrabowski (2006) who list involving students early in research as a best practice for success.

Summer Research Opportunities. The summer research program, described as the hub of the MRC’s research initiatives, was established in 1999 to support and promote undergraduate research at the college. Prior to the summer research program,
undergraduate research and its subsequent funding was located in departmental pockets across the institution. The creation of the summer research program streamlined processes and afforded undergraduate research an official home at the MRC.

MRC’s summer research program provides students an opportunity to work hand in hand with a faculty mentor on a summer research project. I confirmed during interviews with the summer research director and the college controller that student researchers receive funding for their research as well a $320 per week personal stipend. Faculty mentors receive an honorarium. Students are required as part of the summer research program to both present on their research, and well as attend the presentations of other summer research students. In a study by Ward, et al. (2005), 73% of participants reported a greater learning experience during a summer research experience when compared to traditional classroom learning in the subject area. Kardash (2000) reports students in a summer URE gain greater ability to orally communicate, make observations, collect data, and relate their research to the big picture.

**Research Fairs.** MRC’s Student Research Symposium is an annual event highlighting student research. It is the college’s version of a research fair. Student researchers are nominated by faculty to present during the day-long symposium. MRC’s dedication to this symposium, and thus to undergraduate research, is so strong that it is part of the College’s academic calendar. The day is such a priority for the College, that classes are cancelled so faculty and students can attend research presentations. Research indicates that providing students a venue to present their research can not only increase intellectual gain, but can improve written, oral, and communicative skills (Kardash,
2000). Additionally, graduate schools seek applicants with conference and presentation experience (Crowe & Brakke, 2008).

**Constituent benefits.** Undergraduate research benefits a variety of constituents, including the local community, the institution, students, and faculty. The following sections are broken up by constituent type and highlight the benefits of UR.

**Community benefits.** Undergraduate research is consistent with a variety of institutional missions. MRC’s mission speaks directly to being learning-centered, and furthermore, their understanding that learning can take place in and out of the classroom. Their commitment to undergraduate research affords students an opportunity to learn outside the classroom. Recent examples of this include student research on everything from cancer, to city recreation plans, to river microbes. The positive impact of MRC’s undergraduate research program was also noted during my interview with the individual serving as the community representative on the IRB. When asked about how the UR program at the institution has impacted the local community, he said, “Greatly. There’s a very strong connection between the college and the community even more so now [than in the past]…the work is extremely valuable” (Personal communication, July 2, 2015). Work with the local government and within the local schools were noted and praised during that interview as well. There was a sincere appreciation for the research and data that MRC’s undergraduate research program provided to local community organizations.

MRC and the community work well together to allow students an opportunity to conduct research, while often also providing a benefit to the local community. This was evident during a number of the summer research presentations I attended, as well as in
interviews. One student’s research focused on analyzing and creating a public policy model for the local city to help them take part in a statewide initiative. This allowed her to work hand in hand with policy makers in the city on a project that was not only a great research opportunity, but provided a benefit to the local community. Another great example of this was a student’s research project that created recreation master plan for the city. Finally, one art student’s research was a photographic history of the city. This finding is akin to that of Vogelgesang and O’Byrne (2003) who found that undergraduate research provides a benefit to the institution’s local communities by means of service learning.

Institutional benefits. MRC was the recipient of a major grant from a nationally known chemical company. The grant covered funding for both a laboratory and the equipment inside. I had the opportunity to tour this facility and speak with students working in the lab. Brakke, et al. (2009) noted that a quality undergraduate research program can increase external funding. This was further evidenced in the tours of additional research facilities at MRC, which boasted donor plaques on science laboratories from a number of large foundations, as well as individual donor. It was also evident in the College’s budget which indicates a strong donor base for research, as well as noting that approximately 50% of MRC’s undergraduate research budget of $606,000 is supported by an endowment.

MRC’s recent graduate school placement rates were 100 percent for law school, 96 percent for dental school, and 94 percent for medical schools, including Harvard, Michigan, Columbia, Northwestern, Notre Dame, Vanderbilt, and Wisconsin. More than 40 percent of their graduates go directly to graduate or professional school each year and
virtually everyone seeking immediate employment has found a position within six months of graduation. Within five years of graduation, more than 75 percent of the College’s alumni have enrolled for graduate work. These statistics were taken off the institution’s website and validated by a nationally recognized and reputable source for institutional data. These statistics were consistent with literature from Crowe and Brakke (2008) who noted that graduate schools seek applicants with publications or conference presentations under their belt. Additionally, undergraduate research experiences (UREs) can influence students to pursue advanced degrees and research careers (Floyd-Smith, 2008). Russell (2007) reported 70% of URE participants reported a greater interest in their field of study and 29% of URE students reported a newly found interest in Ph.D attainment in their field. Undergraduate research may also bridge a gap between what is taught and what is expected of competent graduates (i.e. intellectual curiosity, understanding of scientific findings, critical analysis of literature, effectiveness of public speaking, leadership development, and clarity of career goals (Collins, et al., 2010).

**Student benefits.** In speaking with students at MRC, both formally during interviews, and informally as they worked in the student research labs I was touring, it was clear that student mentoring has been institutionalized. Students in the labs were on a first name basis with the faculty members that were touring me. They did not hesitate to ask questions of the faculty members about next steps for their research. On more than one occasion, as I interviewed faculty members during my visit, students would pop into their offices, ask questions, and bounce ideas off them. Interviews with students further revealed the mentorship role faculty play. One student spoke of her mentor staying:
“He’s been extremely helpful, really kind of mostly just keeping me on track, especially with my research there. It’s just so many moving pieces I guess when you’re trying to put together this document, and he really kind of helped me organize…he’s kind of there to keep me on track, provide suggestions and criticisms… There’s just so many different things and he helped me figure out a way to organize everything in a way that’s something that’s presentable to someone else” (Personal communication, June 25, 2015).

Another student spoke of her relationship with her research advisor saying:

“[My research advisor] and I have a really good relationship. We spend a lot of time together. I was I think one of maybe two photo majors when she came in. She came in my sophomore year to replace the previous professor. And I spent that whole year as her darkroom assistant, so we just spent all of our time together pretty much…She’s phenomenally helpful. She knows everything there is to know about photography and IRB and [summer research program] rules…she’s really, really good at what she does” (Personal communication, July 2, 2015).

These findings are consistent with Hartmann, et al. (2013) who found that individually mentored students reported stronger student-faculty relationships. Students in their study reported higher levels of faculty/student interaction and higher levels of student involvement and commitment than students not selected to participate in UR (Hathaway et al., 2002).

**Faculty benefits.** At MRC, mentoring students leads to tenure and promotion. The importance of faculty mentorship to students is also evident in MRC’s tenure and promotion criteria in the faculty handbook. Faculty tenure promotion at the college is tied
to involvement in undergraduate research and student mentoring. Evaluation criteria in the handbook speaks directly to the importance of faculty serving as a role model and mentor for students. According to O’Meara and Rice (2005) tenure and promotion policies define, set expectations for, and motivate faculty members’ priorities for engagement and development. Some research indicates that undergraduate research is not appropriately built in to the tenure and promotion process, yet it is expected of faculty. This was certainly not the case at MRC. During campus interviews, faculty noted expectations to do research with undergraduates and take to the mentoring role seriously. It was assumed that mentoring undergraduate research was part of their job.

**Best practices for IRBs.** The current IRB chair at MRC has held the positon for 7 years, and was involved in the IRB as a general member prior to that. The board is comprised of the chair and ten members. It was evident that the IRB was a close knit group. Those interviewed commented about others using first names. They knew where each other’s offices were, and talked about feeling comfortable just picking up the phone and calling one another. All members interviewed spoke positively of the leadership of the IRB chair. It was clear she was valued not only for her IRB knowledge, but her institutional historical knowledge as well. In return the chair spoke favorably of her experience, commenting about the positive dynamics of the IRB board as well as her. During her interview she stated:

“What I really appreciate and I think they (the IRB) do is they really take it seriously and they can address concerns in a really positive way….they put a lot of thought into their comments about the students…I really appreciate the level of
collegiality that we have on the committee being that we’re all from such different disciplines…there’s trust amongst us” (Personal communication, June 25, 2015).

According to Whicher, et al. (2009) Group dynamics, group size, impressions of IRB chair, member turnover rate, and ability to have open discussion around ethics, influence engagement. How well the members work together and how well the chair facilitates meetings also influence commitment. Keeping the IRB size under 10 and keeping turnover low were important to engagement and satisfaction.

The IRB evaluates student proposals and plays a role in facilitating the interaction between the faculty mentor and the student to correct any concerns. The IRB process at MRC allows for closer interactions between professors and students. Faculty noted the IRB process moves students to the level of a colleague. Working with students outside the classroom can change the dynamic between faculty and students, making the student more of a colleague and less of just a passive learner. These findings were consistent with research reviewed which indicated mentored students indicated stronger student-faculty relationships (Hartmann, et al., 2013 & Russell, 2007).

One phenomenon occurring at MRC that was not found in any previous review of literature was the concept of IRB committee itself mentoring undergraduate research students. Of particular note, was the way the IRB chair at MRC interacted and mentored students. As noted in theme 3, the primary mission of the IRB was clear, however, a secondary mission of providing mentorship to students throughout the IRB process was also a function of the committee.

Going through the IRB process affords students the opportunity “practice the process” and understand the need to protect participants’ rights. The IRB chair meets
with a student who does not quite understand the process and walk them through it. Members of the IRB stated they have gotten feedback that their approach is working. Students do not feel like they are being punished for mistakes during the IRB process, but rather that it is a learning experience. Multiple interviewees commented on the IRB board’s willingness to meet one on one with students who needed additional assistance to pass the IRB process.

It was evident from interviews that the IRB chair serves as the leading mentor, calling students into her office and working with them on what is necessary to successfully meet the requirements. This best practice is consistent with previous research by Hartman, Widner, and Carrick (2013) who found that individually mentored students reported stronger student-faculty relationships. The IRB does not “reject” proposals, but rather asks students for modifications prior to resubmission. Student learning is taking place throughout the IRB process, and while it may not be an assessed goal of the IRB, it is certainly happening. Findings indicate that in addition to the primary mission to protect human subjects, the College’s IRB process affords different learning outcomes to students. Most notably, students need to understand the mission and purpose of the IRB, but they also learn to navigate the process of writing a proposal to the IRB.

There was a consensus among IRB members interviewed that committee members are really teachers. Even the community representative on the IRB understood this as evidenced by the following quote:

“[We] want the students really to understand the value of undergrad work. And that comes from the connectedness to all the different things that you’re working on. So you’re just not sending a proposal because you’re trying to get it as a class
credit...you’re doing it for, a mission and a purpose. And I think that’s one of the major differences” (Personal communication, July 2, 2015).

Critiquing student proposals and showing students what needs to be done is part of the learning process for those students and part of the mentoring role of IRB members. A large part of this may be because undergraduate research at the College is institutionalized. The faculty that serve on the institutional review board are being evaluated for tenure and promotion the same as all others. They too understand the expectation to mentor students, and arguably because of the institutionalized of UR, they have built that mentoring component into their IRB work as well.

**Recommendations**

Institutions that want to have rich undergraduate research experiences should adopt a hybrid approach to public policy implementation that ensures Federal public policy is being adhered to but does so in a way that encourages and embraces student research. Although there is considerable literature and public discussion about the negative aspects of IRBs, if approached in a manner that embraces student learning, the IRB experience can be an extremely beneficial aspect of the institution’s learning environment. Kuh (2008) lists undergraduate research as one of ten high-impact practices that benefit students. The IRB process is a part of that high impact experience. Institutions should be mindful of how human subject research public policy is being implemented given its role in this high-impact best practice. Furthermore, research indicates positive undergraduate research experiences can impact retention in a very positive way (Ishiyama, 2001; Schwartz, 2012).
If an institution desires to have a strong UR program, they need to ensure there are adequate fiscal resources to support it. Fiscal resources need to be in place to not only fund research, but to maintain labs and equipment as well. Additionally, institutions should consider making a financial commitment to those on the IRB, particularly in the form of a stipend. Whicher, Currie, and Taylor (2009) suggested IRB members receiving payment for service were more committed and engaged than their non-paid counterparts. It was clear from interviewing the IRB chair at MRC that she appreciated and felt valued because she were receiving a stipend to serve as chair.

A well trained IRB is critical to protect human subject research participants but also critical to protecting the institution from liability. Clear, well documented IRB procedures is critical to the protection of subjects, and the institution. Lastly, for institutions desiring rich UR programs, membership is the Council of Undergraduate Research is critical. The professional resources and advocacy provided by CUR are abundant and it was clear during my research that MRC was using its membership benefits to enhance and advocate for their UR program.

**Recommendations for future research.** I found Ripley’s general model for policy process applicable specifically to the implementation stage. As Ripley noted, his model was created for broad use and thus many would not consider using his model specifically for implementation. This is unfortunate because I found his model to be very adaptable, and his hybrid approach very informative to my research. My study is a single case study. Additional research to validate Ripley’s model’s usefulness to explain public policy implementation analysis is strongly recommended. I would recommend that other
researchers determine in their own research as to whether or not larger models can be adapted to inform their research.

**What I learned from this case study.** When I began this research, my initial inquiry focused on the mission creep of IRBs that appeared so prevalent in the literature. Through my research I learned that what you may initially be focused on, may not be part of your findings, in fact, you may find the exact opposite of what you thought.

Public policy and how it is implemented depends on the case. It depends on the people implementing it and the environment they are implementing it in. In some cases implementation will occur in a top-down fashion. I have observed and read about institutional IRBs that implement human subject research public policy in a top-down fashion. Their approach is very black and white and proposals that are not black and white are simply rejected. In this case, a hybrid implementation model was used that adheres to the federal requirements, but applies them in a student friendly way. In this case, this hybrid implementation model has enhanced the UR environment. In examining this public policy and various public policy models, different theoretical models could have been used, but I found Ripley’s model to be informative and helpful in the analysis of my research.

I learned that public policy research is both an art and a science. Although the Common Rule is clearly defined as a public policy that addresses a social problem (the protection of human subjects during research) the implementation of the policy at institutions of higher education have indisputably been carried out in a variety of different ways by the policy actors (the faculty, IRB, and administration). This public
policy lends itself to different interpretations, and different policy models and conceptual frameworks can be used to describe and inform how it is implemented.

**What I learned from conducting research.** I learned that qualitative research is much more labor intensive than I had initially thought, especially data reduction. The processes involved in ensuring valid and reliable data are cumbersome. I learned the value of member checking. During one point in my research I contacted the IRB chair for member checking, and we both discovered that information initially given during an interview misrepresented a process for assigning levels to IRB proposals. I was able to correct the statement in the findings, but I learned that checking, rechecking, and cross checking through multiple triangulation is critical to accurate data.

I learned the importance of informed consent. Initially the institution, through signed inform consent from the IRB chair, had agreed to be named. Once the findings of this study were complete and I was in the final stages of writing Chapter 5, I circled back one last time to have the institution review rough draft of my completed dissertation. At this time (some 9 months after the on campus research took place) there had been a change in the College’s administration, and, the new administration were clear that they had a strict policy on not being named in research. I then had to go back and redact all information that may identify the institution.

Lastly, I learned the value of talking one on one with the theorist you are using to guide your research whenever possible. My conversations with Dr. Randall Ripley clarified and validated multiple aspects of my research.
Conclusions

When I began this research, my initial inquiry focused on the mission creep of IRBs that appeared so prevalent in the literature. Chadwick and Dunn (2000) sum up the last 50 years of IRB evolution by saying “Like many highway projects, the IRB system was sound when it was designed, but became out-of-date and overloaded almost from the start” (p. 21). IRBs are often viewed as authoritarian in nature and working against, instead of in collaboration with, the researcher. This was certainly not the case at this institution.

MRC is an excellent example of a Council on Undergraduate Research Institution that has overcome many of the negative stereotypes associated with IRBs. From a public policy theory standpoint, they have implemented federal human subject policy in a way that is institution specific and student and faculty friendly. This College is an excellent example of what a “best practices” undergraduate research college is all about.
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