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Authentic Leadership, Research Integrity, and Institutions of Higher Learning: Why Focusing on Departmental Leadership Is Critical for Preserving the Sanctity of Science

Katherine I Echols

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Authentic leadership, research integrity, and institutions of higher learning: Why focusing on departmental leadership is critical for preserving the sanctity of science

By
Katherine I. Echols

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Authentic leadership, research integrity, and institutions of higher learning: Why focusing on departmental leadership is critical for preserving the sanctity of science

By

Katherine I. Echols

Approved:

______________________________
Gerald A. Emison
(Major Professor)

______________________________
P. Edward French
(Committee Member)

______________________________
Brian D. Shoup
(Committee Member)

______________________________
Christine L. Rush
(Committee Member)

______________________________
Rick Travis
Dean
College of Arts & Sciences
One of the most overlooked and complex problems that universities and colleges face nationwide is how to reduce and eliminate research misconduct. Because of the confidential nature of allegations of research misconduct and the high rate of underreporting, administrators at scholarly institutions struggle with understanding the cause of such behavior. Without a clear picture of the prevalence of misconduct or the barriers to reporting, leaders at institutions of higher learning find themselves at a disadvantage when dealing with these problems. This uncertainty coupled with a growing regulatory emphasis from federal funding agencies, results in a reactionary approach while questionable practices go unchecked.

In the early 2000s, federal funding agencies began requiring colleges and universities to provide training in the responsible conduct of research prior to receiving funding. The Responsible Conduct of Research (RCR) training covers research misconduct (falsification of data, fabricating data, and plagiarism) as well as other topics related to research misbehaviors (mentoring, peer review, data management, authorship,
etc). This emphasis on training, while well intended, has not had a significant impact on faculty and student knowledge about misconduct.

Authentic Leadership Theory is based on Aristotle’s concept of authenticity and has gained attention over the last decade. It is comprised of four main components: Balanced processing, internalized moral perspective, relational transparency, and self-awareness. These types of leaders focus on moral standards and values and that is what guides his or her leadership.

This study evaluates the impact authentic leaders have on shaping the ethical attitudes of faculty when they are placed in direct departmental supervisory positions. A survey of faculty from 15 Mississippi colleges and universities was conducted. Results indicate that the self-awareness and relational transparency constructs of authentic leadership influence faculty attitudes towards objective research integrity issues, but the direction of influence conflicts with each of the constructs. Additional variables failed to reach a level of significance suggesting that other variables, not historically associated with organizational leadership and research integrity, are influencing faculty’s ethical perceptions. Additional attention is focused on barriers to effective leadership caused by the compliance focused culture of institutions of higher learning.
DEDICATION

“Let us run with perseverance the race marked out for us, fixing our eyes on Jesus, the author and perfecter of our faith.” Hebrews 12:1b-2a. This work, and all to come after it, is dedicated to my Lord, Jesus Christ, who has loved and blessed me beyond what I deserve.

This dissertation would not have been possible had it not been for the unfailing love of my husband and children. Jeff, you have supported and encouraged me as I chased a dream I did not even know I had. You are the one whom my soul loves and I owe so much to you! There is no way to quantify the respect and adoration I have for you and the example you set with your humble spirit and uncompromising integrity. Melanie and Andrew, you both have gone on this journey with me from the very beginning and have constantly inspired me to keep working and never quit. I pray you also know how capable you are of setting your own goals and seeing them through to the end. You are both so uniquely gifted and I hope you always know that I am your biggest cheerleader, just like you have been mine. I love you both more than life itself!

I could never have finished this without the support of a colleague who deserves more than a thanks. Sandy, your faith and support have been so precious to me. You have championed me in a way I can never repay and will never forget. You have often been the encouraging voice to shut down the others (often my own) and I owe you so much.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>I.  INTRODUCTION: POLICY, PREVALENCE, AND PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>History of Research Misconduct Policy</td>
<td>1</td>
</tr>
<tr>
<td>Prevalence of Research Misconduct</td>
<td>8</td>
</tr>
<tr>
<td>Institutions of Higher Learning and Research Misconduct</td>
<td>10</td>
</tr>
<tr>
<td>Responsible Conduct of Research Training</td>
<td>13</td>
</tr>
<tr>
<td>Research Overview</td>
<td>14</td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE: FACULTY, ORGANIZATIONS &amp; MISC:</td>
<td>16</td>
</tr>
<tr>
<td>Universities and Faculty as a Unique Population</td>
<td>16</td>
</tr>
<tr>
<td>Contributing Factors of Research Misconduct</td>
<td>21</td>
</tr>
<tr>
<td>Failure to Report</td>
<td>24</td>
</tr>
<tr>
<td>Organizational Culture, Climate, and Leadership</td>
<td>26</td>
</tr>
<tr>
<td>Organizational Culture</td>
<td>27</td>
</tr>
<tr>
<td>Organizational Climate</td>
<td>29</td>
</tr>
<tr>
<td>Organizational Leadership</td>
<td>32</td>
</tr>
<tr>
<td>Social Learning Theory</td>
<td>35</td>
</tr>
<tr>
<td>Authentic Leadership Theory</td>
<td>37</td>
</tr>
<tr>
<td>III. THEORETICAL FRAMEWORK: AUTHENTIC LEADERSHIP AS A DEFENSE AGAINST RESEARCH MISCONDUCT</td>
<td>43</td>
</tr>
<tr>
<td>Structural Influences on Faculty</td>
<td>49</td>
</tr>
<tr>
<td>Institutional Size</td>
<td>50</td>
</tr>
<tr>
<td>Departmental Size</td>
<td>51</td>
</tr>
<tr>
<td>Faculty Rank</td>
<td>51</td>
</tr>
<tr>
<td>Research Enterprise</td>
<td>52</td>
</tr>
</tbody>
</table>
IV. METHODOLOGY AND RESULTS ..............................................................55
  Research Questions ...........................................................................55
  Research Hypotheses .......................................................................56
  Population .........................................................................................57
  Sample ..............................................................................................58
  Time Frame .......................................................................................62
  Survey Design ....................................................................................62
  Procedure ..........................................................................................64
  Statistical Testing ..............................................................................65
  Limitations .........................................................................................67

V. RESULTS ..............................................................................................69
  Descriptive Statistics .......................................................................69
    Research Integrity Factors ..............................................................70
    Authentic Leadership Constructs ....................................................71
  Bivariate Analysis of the Dependent Variable ..................................72
    Authentic Leadership .......................................................................72
    Institutional Size ............................................................................74
    Departmental Size ..........................................................................74
    Research Enterprise .........................................................................75
    Respondent Faculty Rank ...............................................................75
  Multivariate Analysis of the Dependent Variable ............................76
    Authentic Leadership Constructs ....................................................76
    Tests of Hypotheses .......................................................................78
      Tests of the Hypotheses using the Research Integrity Index ............78
      Tests of the Hypotheses Using the Research Integrity Factors ........80
        Authentic Leadership Index .........................................................80
        Authentic Leadership Constructs ..............................................82
  Overview of Findings from Hypothesis Testing ...............................84
    Hypothesis One: Authentic Leadership ..........................................84
    Hypothesis Two: Institutional Size .................................................84
    Hypothesis Three: Departmental Size ............................................85
    Hypothesis Four: Research Enterprise ...........................................85
    Hypothesis Five: Faculty Rank .......................................................85

VI. CONCLUSION ......................................................................................86
  Discussion of Findings .....................................................................86
    Findings of Statistical Significance ................................................87
      Self-Awareness in Departmental Leadership ...................................87
      Relational Transparency in Departmental Leadership ....................88
      A Counteracting Relationship between Two Authentic Leadership Constructs ........................................89
    Findings of Non-Statistical Significance and Faculty Autonomy ........92
LIST OF TABLES

4.1 Institutional characteristics of survey respondents ........................................60
4.2 Departmental leadership characteristics of survey respondents .....................61
4.3 Individual characteristics of survey respondents ...........................................62
4.4 Survey variables and source ........................................................................64
4.5 Survey questions that correspond with the four constructs of Authentic Leadership Theory ........................................................................66
5.1 Summary statistics of the dependent and independent variables .....................70
5.2 Summary statistics for the research integrity factors .....................................71
5.3 Summary statistics for the four constructs of authentic leadership ...............72
5.4 Regression analysis of the research integrity and authentic leadership indices ........................................................................................................73
5.5 Regression analysis of the objective research integrity factor and the authentic leadership index ........................................................................73
5.6 Regression analysis of the subjective research integrity factor and the authentic leadership index ........................................................................73
5.7 Regression analysis of research integrity index and institutional size .............74
5.8 Regression analysis of research integrity index and departmental size ..........75
5.9 Regression analysis of research integrity index and institutional research enterprise .....................................................................................................75
5.10 Regression analysis of research integrity index and faculty rank .................76
5.11 Tests of the authentic leadership constructs on the research integrity index ........................................................................................................77
5.12 Tests of the authentic leadership constructs on the objective RI factor .........78
5.13 Regression analysis of the dependent and independent variables .................79
5.14 Regression analysis of the dependent and independent variables using the constructs of authentic leadership..................................................80
5.15 Regression analysis of the dependent variable, as represented by Obj RI factor, and the independent variables, utilizing the AL index.................................................................81
5.16 Regression analysis of the dependent variable, as represented by Subj RI factor, and the independent variables, utilizing the AL index..................................................................................82
5.17 Regression analysis of the dependent variable as represented by the Obj RI factor, and the independent variables, utilizing the AL constructs ..................................................................................83
5.18 Regression analysis of the dependent variable as represented by the Subj RI factor, and the independent variables, utilizing the AL constructs ..................................................................................83
A.1 Part 1 of the study’s questionnaire: Departmental Leadership...............114
A.2 Part 2 of the study’s questionnaire: Research Practices......................115
A.3 Part 3 of the study’s questionnaire: Institutional and Departmental Information ..................................................................................116
A.4 Part 4 of the study’s questionnaire: Biographical Information...............116
LIST OF FIGURES

3.1 Average reported cases of misconduct per institution by NIH funding rank. ..........................................................53

4.1 Categories of institutions recruited for participation in the study (15 Institutions). .........................................................59
CHAPTER I

INTRODUCTION: POLICY, PREVALENCE, AND PROBLEM

One of the most overlooked and complex problems that universities and colleges face nation-wide is how to reduce and eliminate research misconduct. Because of the confidential nature of allegations of misconduct and the high rate of underreporting, administrators at scholarly institutions struggle with understanding the cause of such behavior as well as how best to address them. Today, research misconduct is defined by federal policy as “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research results.” It does not include honest error or differences of opinions (“Definition of Research Misconduct | ORI - The Office of Research Integrity,” n.d.). This chapter will review the brief history of policies related to research integrity, the limited information about the prevalence of misconduct, and the responsibility and response of institutions towards the responsible conduct of research.

History of Research Misconduct Policy

It is not every day that a politician brings up the topic of research integrity as a policy that needs to be addressed, but that is exactly what happened in 1981 when then-Representative Al Gore (D-TN) began holding hearings titled “Fraud in Biomedical Research” (National Academy of Sciences, National Academy of Engineering, & Institute of Medicine, 1993). Rep. Gore was serving as the chairman of the Investigations and Oversight Subcommittee of the House of Representative’s Science and Technology
Committee when four high-profile cases of research fraud occurred in a short period of time causing Congress to question the ability of science to self-regulate (National Academy of Sciences et al., 1993).

This was neither the first nor the last time that the federal government would seek to address issues surrounding the responsible conduct of research. By the mid-twentieth century, human experiments had become common, but little effort was put into the exploration of the ethical responsibility toward those subjects (Shamoo & Resnik, 2009). Following the horrific atrocities committed in World War II, many German physicians faced judgment during the Nuremberg Trials (1945-1949) for the inhumane manner in which they carried out experiments involving human subjects. The Doctor’s Trial (1947), as it became known, was presided over by American judges and produced the Nuremberg Code. This was the first well-established code of ethics for human subjects research that was internationally recognized (Shamoo & Resnik, 2009). The code addressed the ethical standard for research and identified ten principles that protected the fundamental rights of the participants in research projects, the core of which is Informed Consent (Shuster, 1997).

While the Nuremberg Code was critical to research integrity policy, it was no more sufficient at eliminating unethical behavior than the Hippocratic Oath was sufficient to prevent WWII crimes by doctors. Scientific experimentations continued in the U.S. without compliance to the standards identified and the lessons learned from the Holocaust (Shamoo & Resnik, 2009). In the early 1900s, 600 African American males from Macon County, Alabama were recruited to participate in the biomedical study in order to allow researchers to examine the effects of late stage latent untreated syphilis (Reverby, 2009).
The study had nothing to do with the effects of various treatment methods (Jones, 1981), lacked the transparency required, and failed to adhere to the code of ethical conduct of research laid out by the Nuremberg Code. The physicians did not see themselves as experimental scientists but rather ecological biologists who were interested in documenting events that occur naturally in “the wild” (Pence, 2004). Study participants were recruited by offering medical care, burial insurance, and various other incentives all while having treatment withheld in order to track the disease till death (Reverby, 2009). It was not until the late 1960s that the ethics of the study were called into question and the study was finally ended in 1972 (“Tuskegee Study Timeline,” 2016).

The Tuskegee experiment did not just destroy public trust in biomedical research, it also damaged the willingness of minorities to participate in research, creating issues with the applicability of research findings to general populations (Corbie-Smith, 1999; J. L. Davis, Green, & Katz, 2012; Poythress, Epstein, Stiles, & Edens, 2011). Again, we see the manipulation of disadvantaged groups for the purpose of high risk, low reward research and a scientific environment that is not policing itself as it should. The issue of informed consent became front and center again, and the study’s failures would eventually help shape new guidelines on the issue of human subject research.

In 1974, the National Commission for the Protection of Human Subjects of Biomedical and Behavior Research was created in part due to the Tuskegee scandal. The Commission was the result of the National Research Act (Pub. L 93-348) and was tasked with identifying basic ethical principles for research involving human subjects. The Commission held a four-day conference in 1976 at the Smithsonian’s Belmont Conference Center to discuss the basic ethical principles that should guide research
conduct when human subjects are involved. The 1976 conference and the following deliberations produced a set of agreed upon principles and guidelines for responsible human subjects research known as the Belmont Report. The report was published in the Federal Register and made available to scientists, Institutional Review Boards and other federal employees (Office for Human Research Protections, 2010).

The research integrity issues that sparked Congressional attention in 1981, however, did not involve issues of informed consent. Instead, four cases highlighted additional forms of unethical research behavior including data fabrication and plagiarism. With Federal agencies and research institutions appearing to inadequately deal with these issues, Congress passed the Health Research Extension Act of 1985 adding Section 493 to the Public Health Service (PHS) Act authorizing the Secretary of Health and Human Services (HHS) to require research institutions that receive HHS funding to establish a mechanism to review, investigate, and report allegations of scientific fraud “which appears substantial.” (Office of Research Integrity, n.d.-a). While the research institution is primarily responsible for investigating allegations of scientific fraud, the legislation also provides authority for HHS to further investigate and sanction individuals involved in research misconduct. By 1989, the Office of Scientific Integrity (OSI) was created at the National Institutes of Health (NIH) and the Office of Scientific Integrity Review (OSIR) in the Office of the Assistant Secretary for Health (OASH). The main charge for these two offices was to deal with research misconduct and hold the individual researcher and institution, not the funding agency, responsible for unethical behavior (Office of Research Integrity, n.d.-a).
Two separate offices were excessive for dealing with misconduct, so OSI and OSIR were merged into a single office in 1992. President Bill Clinton officially established the Office of Research Integrity (ORI) as an independent entity within the Department of Health and Human Services when he signed the NIH Revitalization Act of 1993. At this time, the term research misconduct replaced the term scientific misconduct and the Commission on Research Integrity was created. The Ryan Commission, as it was informally referred to, was mandated to review systematic protections against unethical research conduct and provided 33 recommendations to the Secretary of Health and Human Services in 1995 that addressed issues related to whistleblower protections and the establishment of responsible conduct of research (RCR) training programs at funded institutions (Office of Research Integrity, n.d.-a).

In 1999, HHS adopted the National Science and Technology Council’s definition of research misconduct. ORI was charged with conducting oversight on all investigations while the Office of the Inspector General at HHS was responsible for any fact-finding investigation. Final decision-making regarding findings of misconduct remained with the Assistant Secretary for Health. The responsibility for promoting research integrity rests with ORI. Today, ORI fulfills its mission through providing education and institutional oversight (Office of Research Integrity, n.d.-a).

In December of 2000, the PHS Policy on Instruction in the Responsible Conduct of Research was published in the Federal Register. The federal definition of research misconduct was defined as, “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research results.” Misconduct did not include honest error and could only be found if there was a significant departure from “accepted practices of the
relevant research community,” it was committed “intentionally, or knowingly, or recklessly,” and the allegation was “proven true by a preponderance of the evidence.” (Office of Science and Technology Policy, 2000). This policy also required all extramural research institutions to provide RCR training to research staff. This training would be mandatory for any individual involved in PHS-funded research. The policy was suspended in 2001 and is still pending review of “substance and status” as policy instead of a regulation (Office of Research Integrity, n.d.-a). However, it is still the referred to guidelines for research misconduct today.

The ORI provides a number of programs for institutions to address research integrity issues. The Research on Research Integrity (RRI) Program and the Research Conference on Research Integrity are both mechanisms to help aid the research community in expanding the knowledge about research integrity issues. The Rapid Response for Technical Assistance program aids institutions in research misconduct allegation investigations. The RCR Resource Development Program, the RCR Program for Academic Societies, the RCR Program for Graduate Schools, and the RCR Program for Postdocs, are all intended to expand RCR training and knowledge within the academic community. Training is also provided by ORI for institution research integrity officers (RIOs) (Office of Research Integrity, n.d.-a).

The cases that involved misconduct associated with clinical trials were the initial spark that ignited the legislative attention on issues of research integrity. As a result, much of the early regulatory action occurs within the Department of Health and Human Services. However, misconduct involving human subjects is not the only threat to the scientific record that exists. Plagiarism and data fabrication/falsification also occur in
research that does not involve direct contact with human subjects. In fact, the number one misconduct issue as reported by ORI is falsifying research data. Ignoring human subjects requirements came in second. What’s more, issues related to human subjects research only accounted for two of the top sixteen research misbehaviors (Martinson, Anderson, & de Vries, 2005). In 2010, the National Science Foundation (NSF) instituted its own policy that required research institutions to provide training in the responsible conduct of research. The NSF policy required the institutional plan for training in all proposal submissions that include students or postdoctoral scholars. Unlike the ORI policy, the NSF allows the research institutions to determine the details of the training, whereas ORI requires nine core-training areas be covered (DuBois & Dueker, 2009). Most institutions use the guidelines provided by ORI to fulfill their NSF requirements (CHPS Consulting, 2000). Today, most institutional RCR programs cover the following ORI topic requirements:

1. Data Acquisition, management, sharing, and ownership
2. Mentor/trainee responsibilities
3. Publication practices and authorship
4. Peer review
5. Collaborative science
6. Human subjects
7. Animal research
8. Research misconduct
9. Conflict of interest and commitment
Prevalence of Research Misconduct

Despite all of the emphasis at the federal level on ethical research conduct, the number of research misconduct issues is still relatively frequent, and estimates of unreported cases are alarmingly high (Wells, 2008). Because of the nature of academic research and the autonomy of researchers, it is difficult to identify who is behaving unethically and how often it happens. Before institutions can adequately address the institutional stumbling blocks for ethical research behavior, it must first understand its prevalence. This has proven to be more complicated than one might originally expect.

According to a study conducted by the Gallup Organization, it is estimated that more than 2,300 incidents of possible research misconduct occur each year (Wells, 2008). Between 1990 and 2002, the Office of the Inspector General at NSF investigated 800 allegations of research misconduct (Columbia University, 2003). That constitutes an average of fewer than 62 cases per year. The Office of Research Integrity opened an investigation in an average of 34 cases between 1994 and 2003, for a total of 340 cases over the ten year period (Wells, 2008). Data estimates indicate the numbers of reported incidences of research misconduct are 100 times lower than actual occurrences (Columbia University, 2003). This is consistent with the opinions expressed by the National Science Foundation’s associate inspector general who believes the number of reported cases of misconduct is not a true representation of actual instances of misconduct because universities are not reporting them despite federal requirements to do so (Columbia University, 2003).

The gap between estimated incidences and actual allegations makes dealing with this issue rather difficult. Not only do institutions find themselves dealing with perceived
issues that lead to acts of misconduct, but they also struggle with how to ensure individuals are willing to report misconduct to the appropriate individual(s). Institutions offer up anonymity as a means to eliminate the threat felt by individuals who would have knowledge to report misconduct; however, there is little evidence that would indicate that anonymity is successful in ensuring research misconduct is reported. The Office of Research Integrity (ORI) funded two separate studies which appear to be in conflict with one another. In 1998, Alan R. Price published *Anonymity and Pseudonymity in Whistleblowing* to the U.S. Office of Research Integrity in Academic Medicine. Dr. Price’s study concluded that the number of anonymous complainants in allegations of misconduct was minimal and the number of those allegations that resulted in ORI findings of misconduct was almost non-existent between 1989 and 1997. Between these years, ORI reviewed 13 formal cases with anonymous complainants with only one case (8%) resulting in a finding of misconduct compared to 91 cases (29%) with known complainants. The case analysis notes that many of the anonymous allegations contain too little information to result in ORI pursuing an investigation into the misconduct (Price, 1998).

In 2006, Sandra L. Titus, James A. Wells, and Lawrence J. Rhoades conducted a survey of scientists with NIH funding to determine a more accurate rate of occurrence of scientific misconduct in research institutions. In 2008, these researchers published a commentary in *Nature* (2008) titled *Repairing Research Integrity*. As part of their findings, Titus et al. determined that scientists would be more likely to report misconduct if institutions and the federal government increased protection for whistle-blowers (Titus, Wells, & Rhoades, 2008). With anonymity available through the ORI, one would expect
to see high rates of anonymous reporting, however, Titus and her colleagues found that 57.7% of cases where responders were aware of scientific misconduct were reported by either the responder or another person and not anonymously (Titus et al., 2008). In a study conducted by the Research Triangle Institute on the consequences of whistleblowing, Lawrence Rhoades found that one in ten complainants contacted were unaware that they had been a “whistleblower” in the past. It was speculated by Rhoades that the act of blowing the whistle was so inconsequential, that the individuals did not even consider themselves a whistleblower (Lubalin, Ardini, & Matheson, 1995). The apathy toward the reporting could suggest that the individual would not have found added value in the offering of anonymity.

This breakdown of anonymous versus known complainants is consistent with my own observations of research misconduct reporting at the institutional level. A small percentage of cases reviewed by the research ethics officer at Mississippi State University (MSU) have come from anonymous complainants. In 2012, one of six allegations of research misconduct that year was reported from an anonymous source. This has been the only instance of anonymous reporting since July 2007. A similar experience was expressed from the research integrity administration at Jackson State University in 2013.

**Institutions of Higher Learning and Research Misconduct**

Peer review is the primary means by which academic institutions ensure standards of research integrity are upheld. Unfortunately, it was the mismanagement by universities and hospitals of the numerous breaches of ethical scientific conduct that drew attention and ultimately government involvement (LaFollette, 1994). As the public became more aware of the increasing number of ethical violations and the failure of institutions to hold
individuals accountable for their behaviors, the appearance of a growing crisis grew resulting in calls for government intervention.

It has become essential for institutions of higher learning to actively address research integrity if they hope to maintain the autonomy of the profession (Hamilton, 2006). Without a consistent, visible response, they risk appearing unconcerned about individuals acting in their own self-interest.

Without a clear picture of the prevalence of misconduct or the barriers to reporting, leaders at institutions of higher learning have found themselves at a disadvantage when trying to deal with these problems. This uncertainty coupled with a growing regulatory emphasis from federal funding agencies results in an institutional approach toward misconduct that is regulatory (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002). The organization focuses on compliance while other proactive practices that emphasize ethical conduct fall by the wayside. The side effect of this type of approach is an unintentional ‘don’t-ask, don’t-tell’ culture that does not emphasize responsibility but only compliance (Yarborough, Fryer-Edwards, Geller, & Sharp, 2009). This results in questionable conduct going unchecked.

But, eventually the inevitable happens, and someone does something reckless landing the institution on the front page of the Washington Post or New York Times. Administrators are thrust into damage control mode and left asking themselves, “How did this happen?” Meanwhile, practices and habits continue in a way that fails to reinforce ethical responsibility. While this focusing event causes leaders to pay attention (Smith,
2006), eventually the incident fades from the spotlight, and the institution returns to business as usual.

Institutions of higher learning have an obligation to ensure that research misconduct is being identified and addressed in order to protect the sanctity of science. In 2006, Chris Pascal of the Office of Research Integrity stated that it is the institution’s responsibility to investigate allegations and reach a fair resolution. It is not, nor should it be, the role of the federal government to govern the ethical behaviors of faculty (Pascal, 2006). But, if this is the case, and institutions are dealing with misconduct in-house, research on the institutional response is not capturing the number of incidences or the outcomes. It is unclear how many cases of misconduct are dealt with at the local level compared to cases that end up being addressed by a federal agency.

The idea of institutional responsibility was also expressed by Sandra Titus, James Wells, and Lawrence Rhoades who said, “Individuals and institutions, not the federal government, are the guardians of research integrity.” It was their opinion that the real issue exists in the institutions’ failures to foster a culture of integrity (Titus et al., 2008). But, institutions sometimes have a conflict of interest when it comes to addressing misconduct. While the misbehavior of a single researcher does not necessarily indicate a problem with the entire institution that employs him or her, there is still a threat to the university’s reputation. Addressing the failures of a faculty member would be consistent with the value of protecting the integrity of science as a whole, however, to openly investigate the incident would put the autonomy of the institution and ultimately the profession at risk should it be perceived as a crisis across the profession (Smith, 2006).
Major violation of the ethical standards of research can have far-reaching impacts on the scientific community, the public trust in science, and the credibility of the institution where the research occurred. For example, in 1998, British gastroenterologist, Andrew Wakefield, published a study in which he claimed a linkage between autism in children and the MMR vaccine. Eventually, the data in the study was proven to be fraudulent, but not before starting the anti-vaccination movement in the U.S. (Ziv, 2015) that led to the erosion of public trust in vaccinations, health care professionals, and state policy makers (Flaherty, 2011). While Wakefield was eventually disbarred, the study retracted, and no other study able to identify the vaccine as the catalyst for the disease, roughly ten percent of Americans still believe the MMR vaccine to be unsafe (Frizell, 2015). The scientific fraud resulted in a destroyed research career, an institution’s tarnished reputation, and a distrust of public policy and the scientific community.

**Responsible Conduct of Research Training**

Following the implementation of the federal responsible conduct of research (RCR) training policy, many institutions focused their attention on this method as their primary approach to combating research integrity violations. Unfortunately, the active and reflexive processes for decision-making and the impact it has on moral judgment can create barriers for institutions that currently address research integrity through traditional training methods (Steinbauer, Renn, Taylor, & Njoroge, 2014). When individuals are faced with a moral decision, cognitive processes work to sort the information and compare it to previously stored patterns. If previous situations have been experienced and validated through environmental feedback, the individual will react instinctively. Unfamiliar situations are evaluated through a multi-step process. Actions are stored along
with feedback and over time will create immediate responses when similar situations are experienced (Steinbauer et al., 2014). This reinforces the importance of punishments and rewards for behaviors. Other employees who observe these consequences will create patterns through social learning, and their judgments on what they perceive will eventually result in instinctual reactions (Avolio, Gardner, Walumbwa, Luthans, & May, 2004; Mayer, Aquino, Greenbaum, & Kuenzi, 2012). These reactions cannot be changed through formal ethical training and can only be changed, over time, with feedback from the environment (Steinbauer et al., 2014).

Today more than 150 institutions require graduate students and research associates to be trained in the ethical conduct of research (CHPS Consulting, 2000). The Responsible Conduct of Research (RCR) training covers research misconduct (falsification of data, fabricating data, and plagiarism) as well as other topics related to research misbehaviors (mentoring, peer review, data management, and authorship). This emphasis on training, while well intended, has not had a significant impact on faculty and student knowledge about misconduct (Bonito et al., 2010) and does not impact attitudes toward research integrity (Powell, Allison, & Kalichman, 2007). Despite the implementation of training, a survey of students conducted by the Association of American Colleges and Universities in 2008 found that only 30% of the respondents strongly agreed that their institutions emphasized ethical and moral reasoning (Wasley, 2008).

Research Overview:

The erosion of science through public skepticism due to scandals will require leadership capable of restoring confidence, enhancing meaning, and preserving integrity
in the profession. It is not sufficient to know that the problem needs to be addressed. When dealing with issues that are based on fundamental values and morality, a leader is not likely to evoke substantive change and influence others if they do not first know themselves and what motivates their own actions. To make a significant impact in the area of research integrity, the following must be clear:

- Violations of research integrity are likely to be underreported and pose a serious threat to the protection of the autonomy of faculty in academia.
- Faculty are unique in their nature and operate within the organization in a distinctive way making it difficult to influence ethical attitudes using traditional methods.
- The organization’s culture and climate influence a member’s attitude and behavior and set the norms for ethical behavior.
- Leadership, particularly authentic leadership is necessary to create and maintain an ethical climate that will influence faculty research integrity attitudes and ultimately behavior.

This study first looks to the literature on organizational culture, climate, and leadership to develop an approach to ethical leadership for higher education. The theory of authentic leadership is explored as a means to shape the departmental sub-cultures towards the underpinning values of ethical research. Next, data is gathered and analyzed to assess the impact front line academic supervisors have on follower attitudes towards research integrity. Some strategies for addressing research integrity have been suggested, paying particular attention to departmental leadership and addressing findings of misconduct. The need for further research is also addressed with clear recommendations.
CHAPTER II
REVIEW OF THE LITERATURE: FACULTY, ORGANIZATIONS & MISCONDUCT

Universities and Faculty as a Unique Population

Much of the organizational leadership literature has emerged out of the management discipline. A quick scan through Barnes and Nobel’s selection on leadership will produce hundreds of books written by the CEO of a Fortune 500 company promising to help you be a successful leader. While these individuals and books are likely extremely helpful in places consistent with the author’s expertise, they are not likely to be from organizations comparable to institutions of higher learning. Universities and the faculty that inhabits them operate in a culture and climate that is unique compared to more traditional for-profit or even government organizations. As you will see in a later chapter, this uniqueness requires a fresh approach when addressing the method for providing effective leadership.

What makes academia so unique compared to other institutions is that it is built on the foundation of professional autonomy (Hamilton, 2006). This professional autonomy is what allows for academic researchers to pursue topics of interest without an external entity interfering. As part of the social contract between science and society, scientists are granted autonomy with the agreement that they will pursue knowledge for the benefit of society and not in pursuit of their own self-interest (Hamilton, 2006).
Faculty highly value and protect their autonomy (Clark, 2012; Cohen & March, 2012; Dill, 2012a; Hamilton, 2006; Knight & Auster, 1999; Trow, 1990). This has led to a culture within these institutions where autonomy is emphasized above all other collegial norms and attracts individuals who desire the autonomy available in the field (Hamilton, 2006).

Professional autonomy is the dominant career anchor for faculty (Unal & Gizir, 2014). It is because of the value placed on autonomy that leads faculty to dislike managerialism (Trow, 1990), not seek out communication with administration (Dill, 2012a), and have decreased organizational attachment (Clark, 2012; Dill, 2012b; Duryea, 2012; Gizir, 2014; Knight & Auster, 1999; Tabaghdehi, Leila, & Mohammad, 2015). Because of the desire to protect individual autonomy, the role of effective peer review has inadvertently been minimized, which opens the door for deviations from acceptable research practices (Hamilton, 2006).

The various influences on academic institutions require different types of governing approaches to occur in tandem. These institutions operate with a layer of bureaucratic, collegium, and political control (Baldridge, Curtis, Ecker, & Riley, 2012). One of the unique components of academia is the use of peer review as a means for self-governance. Faculty view leadership as a support for their own endeavors and so want to be led by other faculty members and not career administrators (Dill, 2012a). However, this is not the major reason institutions engage in self-governance. As mentioned earlier, part of the social contract that exists between academia and society requires that faculty regulate their own profession. This was believed to be the best protection for science from external political control (Birnbaum, 2012; Hamilton, 2006). Similar to autonomy,
Faculty value their decision-making authority and the separation of powers between academic and non-academic decisions (Dill, 2012a).

Self-governance in academic institutions typically involves a faculty senate. This normative organization structure serves a latent function and is essential to the organization. These latent functions include symbolic functions, providing status, absorb irrelevant problems and sort out solutions, provide attention cues, act as a screening device for incoming faculty, serve as an organizational conservator, provide stability through rituals, and even act as a scapegoat when necessary (Birnbaum, 2012).

Sometimes faculty wish to discuss certain issues at great length and not have any sense of urgency to achieve resolution. In such cases, faculty senates can allow for these topics to be discussed ad nauseam without obstructing the efficiency of the college or university (Birnbaum, 2012). Through involvement with faculty senates, some faculty (not all) are able to fulfill their feelings of self-importance while simultaneously freeing themselves to be apathetic in exercising their ability to govern (Birnbaum, 2012).

While administrative positions in these institutions have traditionally been filled by individuals that have moved up from the faculty ranks, the types of leadership that occur in the faculty senate have not always transferred well to academic leadership at the executive level of the institution (Trow, 1990). Deans and department chairs were faculty experts in their scientific fields and not necessarily trained managers. In recent decades, however, academic institutions have seen a greater number of career managers filling positions in administration creating larger gaps between leadership and faculty. These gaps have resulted in increased disengagement of faculty from their institutions (Macfarlane, 2005).
Another unique characteristic of faculty and universities is the extent to which specialization occurs based on discipline. There is a tendency to categorize scientific fields into broad categories – engineering, social science, natural science, humanities. Many colleges and universities have departments that are even more narrow – chemical engineering, computer engineering, mechanical engineering (Lattuca, Terenzini, Harper, & Yin, 2010). Even if the decision to subdivide faculty into discipline specific units was intentional on the part of the institution’s leadership, it would have naturally occurred due to the fact that faculty have greater identity with their specialized discipline (Baldridge et al., 2012; Clark, 2012; Dill, 2012b; Duryea, 2012; Gizir, 2014; Hamilton, 2006; Knight & Auster, 1999; Mendoza, 2008). In fact, these institutional departments are often further subdivided based on the specialization that occurs within the broader field – fluid dynamics, materials science, nanotechnology, petroleum engineering, polymer science (Lattuca et al., 2010). Researchers strongly identify with their discipline, and so authority is more heavily concentrated in the academic departments (Baldridge et al., 2012). However, research has validated that studies which only focus on the broader disciplines are failing to capture the differences that exist amongst faculty at even the most narrow sub-discipline level (Lattuca et al., 2010).

Because of the emphasis on specialization, studies on faculty characteristics have found that faculty will align with the ideology of their profession before aligning with the rules of the organization (Dill, 2012b; Knight & Auster, 1999). They see themselves as scientists first and members of the university second. They perceive their discipline to be superior to other disciplines, and so have greater association with it than they do with their current institution (Duryea, 2012; Gizir, 2014). Over time, the increased
specialization of faculty within a university have resulted in a larger number of individuals hired to perform functions that were once completed by faculty as part of their service commitment. This specialization combined with rapid growth of colleges and universities resulted in departments that act as independent organizations, only loosely coupled to the university as a whole (Dill, 2012b; Duryea, 2012).

Faculty socialization is an important part of passing on institutional values to new members of the university and the profession. Socialization toward the profession begins during the individual’s time in graduate school, and organizational socialization occurs once they join the faculty ranks of their newly affiliated institutions (Mendoza, 2008). It is through this socialization process that cultural norms are inflicted on the faculty member while he or she inflicts changes back on the institution (Mendoza, 2008). Through this process, faculty encounter experiences that contradict their assumptions and sense-making occurs. This shapes their perspective of the environment and the profession (Mendoza, 2008).

Universities are now comprised of diverse subunits made up of faculty that value their specialization and autonomy and cluster around values specific to their discipline. They are no longer connected to their communities, as in the past, but rather are connected to their field (Clark, 2012; Dill, 2012b; Knight & Auster, 1999). The greater specialization and rapid growth of IHLs have resulted in a weakening of professional traditions. This growth combined with greater specialization, increased emphasis on disciplinary success, and greater opportunity to engage in entrepreneurship, has fragmented the profession and made socialization less effective (Hamilton, 2006).
The heightened specialization among faculty has resulted in a greater self-interest (Hamilton, 2006). This is combined with the intense focus on protecting autonomy, job security, and personal reputation while simultaneously neglecting to advance the values and mission of the institution to new members, particularly when those values are in direct conflict with their own (Dill, 2012b; Hamilton, 2006). The increased focus on self-interests and decreased organizational attachment runs the risk of inducing greater bureaucratic control resulting in institutions that are simply holding companies for the faculty (Clark, 2012).

In summary, because of the ambiguous nature of universities, highly specialized, autonomous workers, environmental influences, multiple points of authority, and weak organizational commitment among members and the universities, the decision processes of these organizations are different from other institutions (Baldrige et al., 2012).

**Contributing Factors of Research Misconduct**

A review of the relevant literature would not be complete without a brief discussion of the contributing factors of research misconduct. It is important to point out that while researchers have explored this topic at length, identifying consistent causes of misconduct has been nearly unattainable. This section will explore some of the, at times conflicting, theories on why people choose to commit research misconduct specifically.

Assistant professors, graduate students, and postdoctoral fellows all have a lot at stake in the research “game.” The pressure exists for young faculty to produce groundbreaking research while managing the challenges often found in both personal and professional lives can be daunting. Graduate students are focusing on concluding their degree and begin to focus on what comes next. There is great pressure to produce notable
research while in graduate school in order to guarantee themselves a better position as either a postdoc or assistant professor. Around the time that young faculty or graduate students are focusing on the next stage, they often begin to start their families. Many will get married, have children, buy a house, and so start dealing with the challenges of a rapidly changing life. These situational variables have been thought to impact an individual’s ethical decision-making ability (Mumford & Helton, 2002). The consequences of the promotion and tenure process elevate the stress and fear leading to unethical behavior. These temptations are worsened when faculty are placed in organizations with low cohesion and high conflict (Mumford & Helton, 2002). Increased competition for funding and decreased resource availability only intensify the situation making ethical conduct less of a concern for the faculty member and the organization. This unethical byproduct is intensified when research is highly valued, teaching oversight is low, and faculty rewards are centered on research productivity (Kelley & Chang, 2007). When faculty or students feel like they are incapable of working harder to achieve a particular metric of success they are more likely to make an unethical choice (Heitman, 2000; Perry, Kane, Bernesser, & Spicker, 1990). This lays the trap where faculty convince themselves that all that is required to get ahead in the competitive system is to outperform one’s colleague. This increased competitive environment can lead to unethical, and even criminal, behavior (Maher, 2010).

While there are many that are convinced that the competitive nature of academia that is created by the “publish or perish” environment is to blame, not everyone is convinced that is what pushes faculty to behave unethically. John Long, a former researcher who engaged in data fabrication, testified before a Congressional
Subcommittee in the 1980s and spoke about his own opinion on the role that the organization’s tenure structure played in his decision to behave unethically.

“I do not believe that the environment in which I work was responsible for what I have done. Competition for limited research funds among research investigators is a necessary part of federally funded scientific work. Neither this nor competition for major awards in science can be implicated as an important factor in my particular instance. An honest investigator should be able to deal effectively with the traditional ‘publish or perish’ pressures… The loss of my ability to be an objective scientist… cannot… be linked to defects in the system under which I worked (quoted in [4])” (M. S. Davis, Riske-Morris, & Diaz, 2007).

Dr. Long is not alone in his assertion that the structures of the academic institution are not to blame for faculty behaving unethically. Mark Davis has suggested that the idea of the competitive ‘publish or perish’ pressure is simply an excuse to defend an unethical act (M. S. Davis et al., 2007). In his view, one could expect the rank and tenure of a faculty member to be related to the frequency of misconduct. Instead, Davis posits that there are seven clusters of misconduct causes that commingle to produce a particular outcome. While organizational climate factors are one of those clusters, so are personal and professional stressors (job stress, lack of support, personal issues), job insecurities (poor supervisor, competition), rationalizations involving a lack of environmental controls, personal inhibitions, rationalizations that revolve around fear or restoring equity, and personal factors such as character flaws (M. S. Davis et al., 2007).

The attitude of the researcher can play a role in how he or she responds when facing the temptation to engage in misconduct. As we have discussed earlier, when a
faculty member and a university are not strongly coupled, faculty are less likely to be committed to the institution (Tabaghdehi et al., 2015) and less likely to focus their efforts in areas that benefit the entire organization (Gizir, 2014). A person with a strong moral identity would be expected to behave ethically regardless of the strength of their attachment to their institution (Mayer et al., 2012). Some have suggested that research misconduct has arisen out of a ‘messianic complex’ where a researcher believes in their own superior level of expertise on a subject matter, and therefore there is less of a need to go through the actual steps of research (M. S. Davis et al., 2007). Ego, vanity, and self-aggrandizement can also serve as a personal influence on unethical behaviors.

**Failure to Report**

It is the willingness to report issues of misconduct to the appropriate individuals that enables administrators to act. Communication is critical for ensuring reporting (Geller, Boyce, Ford, & Sugarman, 2010) and enhancing awareness of issues so that individuals will recognize unethical behavior and seek advice instead of allowing issues to remain hidden and unresolved (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002). Unfortunately, a large number of researchers are still not comfortable making allegations of research misconduct. In a mid-1990 survey, 53% of respondents feared retaliation for reporting misconduct (Anderson, Louis, & Earle, 1994). Despite growing protections for whistleblowers, there are still barriers to reporting misconduct.

The strength of loyalty of a member of an organization will likely determine his or her response to issues of misconduct or dissatisfaction. Individuals will chose to either exit the organization or voice their dissent with particular actions based on the strength of
loyalty they feel (Hirschman, 1970). This theory was later built on to add the neglect response (Farrell, 1983). This additional response results in a member that neither attempts to deal with the issue or remove themselves from the organization. Instead, they simply keep their head down and ignore the issue at hand. The Exit-Voice-Loyalty-Neglect (EVLN) model of behavior can explain what happens at universities when individuals encounter misconduct. In many cases, individuals will find a way to either live with or disconnect from the negative behaviors occurring with regard to research conduct.

In Daniel Ellsberg’s discussion of his experience with releasing the Pentagon Papers in 1971, he identified the fear of being excluded from the group as being a strong deterrent for whistleblowing. The fear of the natural retaliations of losing friends, careers, and respect is enough to keep people participating in behaviors they would otherwise strongly object. In addition to this fear of expulsion, he states that it goes against the individual’s feelings of loyalty to an institution or a person. The whistleblower must battle the conflict that arises from the loyalty to the institution and the moral conflict with the behavior that also endangers the institution (Ellsberg, 2010).

Motivated blindness can also be another reason why faculty are not reporting misconduct. This occurs when an individual is so loyal to the organization that they are blind to the seriousness of the misconduct (Bartlett, 2011). When individuals become aware of something unethical or illegal, they believe that if they pass that information on to someone in the chain of command they somehow become less culpable (Bartlett, 2011). Anne E Tenbrunsel said in her book “as long as I can pass it along and make it somebody else’s responsibility, I no longer own that.” (Bartlett, 2011).
There is a lot that can be said for the experience of faculty members that have been in the research fields for extended periods of time. They have developed knowledge about scientific practices, and they have watched the successes and failures of colleagues over the years. These faculty members are more likely to be confided in and mentor more junior faculty members. A study conducted by Jonathan Knight and Carol Auster from Franklin and Marshall College researched the ethical activism of faculty in scientific research. The study concluded that age and rank were factors in both becoming aware of misconduct and reporting it to administrative officials. Knight and Auster argued that senior faculty members had fewer fears and reservations about talking with their colleagues about their research integrity where junior faculty might be concerned that doing so would endanger their career (Knight & Auster, 1999). In a study focused on determining the characteristics of whistleblowers, academic rank was consistent with Knight and Auster’s findings. Professors were the group with the highest self-reported rate of blowing the whistle on misconduct (Lubalin et al., 1995).

**Organizational Culture, Climate, and Leadership**

There is sparse research in the literature that seeks to explain the impact of the organization on employee conduct as it relates to non-clinical research conduct. However, there is a large body of literature that evaluates the effects of organization’s culture, climate and leadership on employee conduct in more traditional for-profit organizations. It is from this body of literature that we gain insight into the impact of leadership on follower attitudes and behaviors as this study seeks to apply it to institutions of higher learning and research integrity.
Organizational Culture

The culture of an institution, of any kind, is highly influential when it comes to organizational effectiveness and organizational change (Zabid Abdul Rashid, Murali Sambasivan, & Azmawani Abdul Rahman, 2004; Zheng, Yang, & McLean, 2010). Organizational culture is defined by Edgar Schein (1993) as “a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.” While many want to identify concrete aspects of an organization’s culture, those elements are often so deeply embedded in the institution that most researchers are only capable of observing its outcomes (Martin, 2002). Culture is the underlying values, beliefs, and meaning of an institution. These elements are deeply embedded in the organization and give it a unique character from which its members can derive meaning (Kezar, 2013; Peterson & Spencer, 1990; Tierney, 1988).

Cultures within institutions are relatively stable and typically deeply engrained in the organization (Peterson & Spencer, 1990; Schein, 1993). There is not one single element that defines the culture of an institution. Instead, it is sculpted by group norms, regular behaviors, formal policies and procedures, unspoken values and standards, climate, personal interactions, shared cognitive frames, shared meaning, and how individuals perceive themselves within the group (Schein, 1993). The culture of the institution guides the behaviors of individuals within the organization as well as the organization as a whole (Giberson et al., 2009; Peterson & Spencer, 1990). Over time, the
stable, longstanding culture becomes ingrained in the members of the organization (Downe, Cowell, & Morgan, 2016).

Members of an organization operate daily within that culture and bring their own moral values with them as they do so (Shin, 2012). A strong organizational culture can result in members who solidly identify with the organization. When this happens, followers are personally driven to act in a way that promotes the organization and are capable of adapting to changing conditions (Leroy, Palanski, & Simons, 2012). An ethical culture is capable of fostering the development of behaviors amongst followers that are also ethical (Zhu, Avolio, Riggio, & Sosik, 2011). Just as organizational members are influenced by the organizational culture, they are also able to influence the culture as well. Motivated members are able to produce a strong, influencing culture that contributes to the shaping of the organization (Siddique, Aslam, Khan, & Fatima, 2011). When the culture of an institution lacks a set of shared assumptions, then the mixing of new and old members results in a creative process that works to build a new more stable culture (Schein, 1993).

Seeing as organizational culture tends to be stable and less malleable than other aspects of the organization (Schein, 1993), it is difficult to perceive how any one individual can have a significant influence on their institution’s culture. However, cultures are created in part by the leaders within the organization (Schein, 1993). In fact, it was Edgar Schein (1993) who said, “Culture and leadership are two sides of the same coin.” Just like other organizational members, leaders within institutions do not leave their own moral values at the door (Shin, 2012). Studies have shown that leaders have a significant impact on how organizations’ cultures are defined and their external
reputations (Downe et al., 2016; Giberson et al., 2009; Langvardt, 2012; Schein, 1993). Leaders are responsible for maintaining positive, stable cultures or, at times, destroying cultures and building new ones. Any drastic changes to an organization’s culture are typically the result of some form of focusing event (Peterson & Spencer, 1990). Without clear awareness of their organization’s culture, leaders will find themselves being run by it (Schein, 1993).

**Organizational Climate**

Culture and climate are linked and often confused with each other. Where the culture is the manifestation of a diverse number of elements within an organization (Schein, 1993), climate is the common patterns of important dimensions of the organization and contributes to the overall culture (Peterson & Spencer, 1990). Climate is defined locally (Dickson, Smith, Grojean, & Ehrhart, 2001) and is centered on the perceptions and attitudes of the individual that is derived from the dimensions (Peterson & Spencer, 1990). Climate produces a psychological unity amongst members of an organization that produces a means for which they have reference for what is appropriate behavior (Schneider, 1975; Schneider & Reichers, 1983). It is the climate that tells members what is valued by the organization and how they should conduct themselves within it (Mayer, Kuenzi, & Greenbaum, 2010). It is the shared perception of the organization’s member that provide the basis for determining the climate (Dickson et al., 2001).

Where culture is typically stable (Peterson & Spencer, 1990; Schein, 1993), climate is much more malleable (Peterson & Spencer, 1990). Organizational climate is made up of seven categories: institutional goals and functioning, governance and decision
patterns, teaching and learning processes, participant behaviors, effort, interaction patterns, and work patterns or workplace dynamics (Peterson & Spencer, 1990). Changes in any one of these categories can result in shifts in the organizational climate. Like culture, climate has four dimensions to it: strength, congruence, clarity and consensus (Peterson & Spencer, 1990). These dimensions can also change within the institution based on changes in the climate categories. For example, when a leader in an organization communicates often regarding the norms on moral issues, the overall climate is a stronger ethical climate (Bartels, Harrick, Martell, & Strickland, 1998). As climate strength intensifies, so does the relationship between the climate and follower behaviors (Shin, 2012). Ethical climates were found to affect group and individual level outcomes like performance, cohesion, and morale (Dickson et al., 2001). The stronger this type of climate the less serious ethical problems the organization faced (Bartels et al., 1998). Confusion within the organization regarding norms or values can weaken the climate (Dickson et al., 2001). As changes are made to the norms of the organization or a situation arises that creates confusion in organizational values or processes, the climate can be altered (Dickson et al., 2001).

Understanding climate is important in the study of organizational leadership and follower behavior. Often, it is the organizational climate that mediates the influences of one group on another (Mayer et al., 2010). Because organizational members are exposed to the same objective structural characteristics of the organization and socially interact with one another, this leads to shared understanding of the climate of the organization (Schneider & Reichers, 1983). It becomes the vehicle through which followers can be impacted. For example, when employees operate in a climate defined by ethical norms,
they are less likely to engage in various types of misconduct (Mayer et al., 2010). When
the climate for the organization is defined by competition and conflict, employees will be
more concerned with competitive success and more likely to engage in questionable
behavior (Anderson et al., 1994).

The climate within an organization can also influence which members choose to
enter the organization, which choose to stay, and which choose to leave (Schneider &
Reichers, 1983). As the reputation of the organization becomes more well-known, it will
attract members that personally align with its values (Dickson et al., 2001; Schneider &
Reichers, 1983). As existing members that continue to feel well aligned with the
organization’s climate stick around and new members enter the organization with similar
views, the climate of the organization will continue to get stronger and individuals that do
not feel a sense of cohesion with the organization will choose to leave (Dickson et al.,
2001). This filtering in of like-minded new members and the attrition of members that do
not align with the organization leads to an organization that is homogenous. This
homogeneity will inevitably alter, in some way, the organizational climate (Dickson et
al., 2001).

Studies have found that organizational climate is one area of an institution’s
culture where leadership plays a major role in how it is shaped. It is the day-in and day-
out leadership that has been found to be the most important determinant of an
organization’s climate (Stringer, 2001). The leadership of the organization’s top official
is a direct link to the climate of an organization (Shin, 2012). When he or she leads in an
ethical fashion, employees are more likely to see the climate of the entire organization as
being ethical, which is key for promoting ethical behavior (Shin, 2012). Senior leadership
was also found to set the tone for the organization that trickled from the top down to the member level (Brown & Treviño, 2006). It is the leader’s behavior that is the most critical determinant of particular types of climates (Dickson et al., 2001; Shin, 2012). The behavior of the leader becomes the accepted standard for achievement that leads members to believe that type of behavior is the way to advance in the organization (Brown & Treviño, 2006; Shin, 2012).

Any organization, especially larger ones, are likely to have a number of subclimates that exist within the unit. These subclimates can weaken the overall climate of the institution if leaders do not work together and send members mixed messages regarding the institution (Downe et al., 2016; Grojean, Resick, Dickson, & Smith, 2004). Socialization of new members into the organization is also important for maintaining stable climates (M. S. Davis et al., 2007). It is the factors that differ from the norms of the organization that will be most obvious to members (Dickson et al., 2001) and can create disturbances in the strength and cohesion of the climate.

**Organizational Leadership**

Organizational leadership theories are not new to the study of management. Researchers have spent decades trying to understand how to better influence teams and individuals towards a more efficient organization (Blake, Shepard, & Mouton, 2003; French Jr. & Raven, 1959; Herzberg, 2003; Maslow, 1943; McGregor, 2003; Mechanic, 1962; Porter, Lawler III, & Hackman, 1975; Roethlisberger, 2013). A review of the leadership literature can illustrate the impact that leader can have on followers within the organization, particularly when it comes to issues of integrity.
Leaders in any type of institution do not walk into their organization empty handed. Instead, they bring with them their own personal moral values (Brown & Treviño, 2006; Shin, 2012). A leader’s moral identity outside the organization is often reflective of how he or she will behave when inside the organization (Mayer et al., 2012). When evaluating ethical, transformational, and positive leaders, the literature reveals characteristics of leaders seem to be common between these leadership styles.

The effective leaders exhibit many positive characteristics (Mayer et al., 2010) which include attending to, constantly reevaluating, and acting consistently with their own moral values (Brown & Treviño, 2006; Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002; Dickson et al., 2001; Mayer et al., 2012, 2010; Piccolo, Greenbaum, Hartog, & Folger, 2010). The introspection of these leaders results in individuals that actively consider the consequences of their actions (Brown & Treviño, 2006), think about the example they are setting (Langvardt, 2012), are genuine (Avolio, Reichard, Hannah, Walumbwa, & Chan, 2009), and maintain a sense of humility (Langvardt, 2012). These leaders encourage their followers to attend to their own moral compass (Dickson et al., 2001; Piccolo et al., 2010), shape the standards of organizational conduct (Downe et al., 2016; Mayer et al., 2010; Piccolo et al., 2010) and hold followers accountable for actions that can deviate from the moral standard established within the organization (Brown & Treviño, 2006; Dill, 2012a; Steinbauer et al., 2014). Part of holding followers accountable means that effective, ethical leaders will reward ethical, pro-organization behaviors while also punishing the unethical conduct (Downe et al., 2016; Mayer et al., 2012; Piccolo et al., 2010). However, it is part of the leadership practice of positive leaders to attempt to
anticipate ethical issues and mitigate them before becoming problematic (Downe et al., 2016).

The effective leader does not attempt to concentrate power. Instead, he or she promotes the sharing of power in decision-making (Piccolo et al., 2010) and provides a psychologically safe environment so that individuals feel comfortable speaking up and sharing their opinions (Walumbwa & Schaubroeck, 2009). The ethical leader uses inclusive communication patterns (Piccolo et al., 2010), promote ethical standards (Brown & Treviño, 2006), and emphasizes how these decisions impact the organization and society altogether (Walumbwa et al., 2011), leading members of the organization to think about their work in a larger context. These leaders show care and concern for others, and so maintain positive relationships with their subordinates (Brown & Treviño, 2006). The consequence of these leadership traits is a stronger coupling of the individual to the institution (A. L. Davis & Rothstein, 2006; Walumbwa et al., 2011).

While the above are not a comprehensive list of the characteristics of good leaders, it does illustrate the introspective and caring nature of effective leaders. Leadership of this kind is linked to a number of positive outcomes for both the follower and the organization as a whole. One of the most relevant outcomes to the purpose of this study is the connection between ethical leaders and ethical followers. Multiple studies have found that when a leader promotes ethical behaviors, lives by those behaviors, and promotes ethical conduct within the organization, followers will also and increase their own ethical conduct and performance (Bartels et al., 1998; Brown & Treviño, 2006; Dickson et al., 2001; Dill, 2012a; Mayer et al., 2012, 2010; Nielsen, 1989; Piccolo et al., 2010; Shin, 2012; Steinbauer et al., 2014; Walumbwa et al., 2011). The ethical leader is
an effective leader (Mayer et al., 2012; Yukl, Mahsud, Prussia, & Hassan, 2013) and has been found to be positively associated with follower’s task significance, job autonomy (Piccolo et al., 2010), self-efficacy (Walumbwa et al., 2011), job satisfaction (A. L. Davis & Rothstein, 2006; Piccolo et al., 2010), willingness to speak up (Walumbwa & Schaubroeck, 2009), overall performance (Piccolo et al., 2010) and strengthens the organizational commitment and identification (Walumbwa et al., 2011).

When leaders exhibit moral behavior that is seen by followers (Brown & Treviño, 2006; Dickson et al., 2001; Langvardt, 2012; Nielsen, 1989; Piccolo et al., 2010; Walumbwa & Schaubroeck, 2009) and is perceived to be genuine (Avolio et al., 2009; Zhu et al., 2004) and intentional (Dickson et al., 2001), they set the ethical tone for the organizations and are better equipped to create and sustain an environment that values ethical standards and communicates those standards clearly (Brown, Treviño, & Harrison, 2005; Mayer et al., 2012, 2010). These organizations will find greater success when dealing with ethical issues of any kind (Bartels et al., 1998).

**Social Learning Theory**

In order to understand how leadership impacts followers’ performance and attitudes, it is important to understand Social Learning Theory and its central assumptions. Albert Bandura posited the Social Learning Theory (SLT) in the early 1970s after frustration with traditional theories that only identified internal forces for explaining human behavior (Bandura, 1977). Bandura theorized that behavior was influenced by both internal and environmental forces. A major component of SLT that differs from traditional theories was that learning does not only occur through our own experiences, but it can also occur vicariously through the experiences of others (Brown &
Treviño, 2006). By viewing the consequences of an individual engaging in fearful and defensive behavior these types of behaviors can be demotivated (Bandura, 1977).

Effective leaders have to constantly be aware of their behavior and the message that it sends to their followers (Langvardt, 2012). If there is inconsistency between what a leader says and what he or she does, the followers will observe that inconsistency and be left with the idea that it is acceptable within the organization to say one thing and do another (Mayer et al., 2012). Modeling is a critical component of the Social Learning Theory. If learning only occurred for individuals who experience something directly, there would be a large number of individuals running around making the exact same mistakes and suffering the same negative consequences. SLT points out that other’s behaviors within an organizational structure make it easier for individuals to learn about desired expectations and discouraged behavior (Bandura, 1977). When behavior is modeled for the individual within the organization, those experiences are moved through regulatory processes before resulting in a response (Bandura, 1977). Depending on the individual’s disposition toward the modeled behavior, that response could be conformity or resistance (Bandura, 1977).

It is no wonder that it is the leaders that serve as the role model for followers to pattern their behavior after (Joseph L. Badaracco & Webb, 1995; Nielsen, 1989). According to SLT, followers look to legitimate and “attractive” individuals for their cues on appropriate organizational behaviors (Brown et al., 2005). In order to be seen as legitimate, these role models must appear to followers to have the support of the upper levels of the organization (May, Chan, Hodges, & Avolio, 2003). Role models that are seen as attractive tend to demonstrate care and concern for others, treat people fairly, use
their power for the benefit of others, do not attempt to coerce or manipulate followers (Brown & Treviño, 2006), and have high levels of moral identity (Mayer et al., 2012). If the leader is an ethical one, he or she will act in a way that is consistent with his or her ethical values, and the follower will adopt similar behavior.

It is important to point out that when a situation arises, and the potential for harm is great, followers will be hyper aware of the leadership of the decision maker. How he or she responds can significantly impact the way followers perceive the leader (Brown & Treviño, 2006). The leader will set the example for how similar situations will be dealt with in the future (Dickson et al., 2001). Just like the followers, leaders will also learn from their own role models under SLT (Brown & Treviño, 2006) and they will pay close attention to those individuals’ leadership behaviors as well.

Under Social Learning Theory, reinforcements serve an informative and incentive functions and are more effective when the individual is aware of them. When reinforcements are used, the follower sees them as an indication of what type of behavior is desired by the organization and what will result in negative consequences. (Bandura, 1977). Followers are attentive to how other members are rewarded or disciplined, and they will regulate their behavior as result (Brown & Treviño, 2006). When the consequences and reinforcements within the institution are consistent with the modeled behavior, individuals learn that the modeled behavior produces certain desirable outcomes that reinforce those behaviors among the followers (Bandura, 1977).

**Authentic Leadership Theory**

After having reviewed the literature surrounding the unique nature of universities and faculty and moving through the various elements of the organization including
leadership, we now move to a discussion of a specific leadership theory that this study seeks to explore in the context of higher education research conduct.

Authentic Leadership Theory (ALT) is a relatively young theory, but it is based on the concept of authenticity which has been around since Aristotle (Harter, 2002). While there was some discussion of authenticity and leadership during the 1980s, ALT has really gained attention and momentum over the last decade and a half (Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Liu, Liao, & Wei, 2015; Peus, Wesche, Streicher, Braun, & Frey, 2012).

Authentic leadership was first defined in 1983 by Hoy and Henderson (Gardner, Cogliser, Davis, & Dickens, 2011). They defined leadership authenticity as “the extent to which subordinates perceive their leader to demonstrate the acceptance of organizational and personal responsibility for actions, outcomes, and mistakes; to be not manipulating of subordinates; and to exhibit salience of self-overall” (Hoy & Henderson, 1983). In 1993, Fred Luthans and Bruce Avolio reignited the interest in further developing the theoretical components of Authentic Leadership (Gardner et al., 2011). They define authentic leadership in organizations as “a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviors on the part of leaders and associates, fostering positive self-development. The authentic leader is confident, hopeful, optimistic, resilient, transparent, moral/ethical future-oriented, and gives priority to developing associates into leaders themselves. The authentic leader does not try to coerce or even rationally persuade associates, but rather the leader's authentic values, beliefs, and behaviors serve to model the development of associates.” (Luthans & Avolio, 2003).
To Luthans and Avolio, ALT draws on positive organizational behavior (POB), transformational/full range leadership, and the ethical leadership theories (Luthans & Avolio, 2003).

In 2005, research on the theoretical base of authentic leadership was at its highest, and by 2010 the majority of authentic leadership literature was focused on empirical testing of the theory (Gardner et al., 2011). The evolution of ALT research has gone through three stages; 1. Introduction of the concept and elaboration, 2. Evaluation and augmentation, and 3. Consolidated and accommodations (Gardner et al., 2011).

In 2008, Fred Walumbwa and colleagues tested and validated the four components of authentic leadership and provided one of the most cited definitions of authentic leadership (Gardner et al., 2011). Authentic leadership is “a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development.” (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). At its very core, the authentic leader’s behavior will be consistent with what they say. To behave in contradiction to their espoused beliefs would undermine their moral authority and signal to followers that they do not really agree with their own words.

Authentic Leadership Theory includes four components that define the authentic leader. The fist component is self-awareness. To be considered authentic, leaders must demonstrate behaviors that indicate they are aware of their personal needs, preferences, motivations, and wants (Avolio et al., 2004; Brown & Treviño, 2006; May et al., 2003;
Walumbwa et al., 2008). The second component of the authentic leader is balance processing. Balanced processing involves the ability of the leader to analyze relevant data before making decisions. They will solicit opposing views and are willing to change their minds (Avolio & Gardner, 2005; Brown & Treviño, 2006; May et al., 2003; Walumbwa et al., 2008). Relational transparency is the third component of authentic leaders. Authentic leaders present their real self to their followers and are not afraid to engage with them. They are honest about their strengths and weaknesses and encourage their followers to do the same. This builds significant trust between the leader and the follower (Avolio & Gardner, 2005; Avolio et al., 2004; May et al., 2003; Walumbwa et al., 2008). The final component of authentic leaders is the Internalize moral perspective. It is this component that highlights the leader’s ability to self-regulate. These leaders are guided by internal moral standards, and their behaviors are consistent with these values (Avolio & Gardner, 2005; Brown & Treviño, 2006; May et al., 2003; Mayer et al., 2012; Walumbwa et al., 2008). To be any different would cause them to feel inauthentic (Brown & Treviño, 2006; Mayer et al., 2012).

These components of authentic leadership result in leaders who act according to their sound moral convictions even in the face of pressures and opposition (Avolio et al., 2004; May et al., 2003) and behave consistently over time giving followers trust and a sense of reliability (Avolio et al., 2004; Brown & Treviño, 2006; Gardner et al., 2011; Liu et al., 2015; Mayer et al., 2012; Nichols & Erakovich, 2013; Peus et al., 2012). A leader is only capable of achieving the status of Authentic Leader when he or she has an impact on the perceptions of his or her followers (Avolio et al., 2004; Brown & Treviño,
2006; Gardner et al., 2011; Nichols & Erakovich, 2013; Peus et al., 2012; Walumbwa et al., 2008).

There is a growing amount of empirical evidence available on the relationship between the authentic leader and followers’ behaviors, though not specific to research conduct. The literature has identified a number of positive outcomes including, followers’ intrinsic motivation, self-esteem, trust, engagement, citizenship behaviors and performance, creativity, job satisfaction, organizational commitment, and even improved health (Avolio et al., 2004; Kark & Shamir, 2013; Leroy et al., 2012; Liu et al., 2015; Peus et al., 2012).

Authentic leaders ultimately help followers become authentic themselves (May et al., 2003). Leadership that displays a high level of authenticity strengthens followers’ ability to withstand temptation (Cianci, Hannah, Roberts, & Tsakumis, 2014). When this happens, it reduces the risk that an individual will disengage from their moral identity. Disengagement increases the likelihood that an individual will choose an unethical response and gradually experience less and less guilt over time (Cianci et al., 2014).

Unlike other leadership theories that believe anyone can play the part of a leader, authentic leaders cannot be created through training programs (Avolio & Gardner, 2005). Instead, the best development process for an authentic leader is life itself (Luthans & Avolio, 2003). Individuals with the foundational characteristics of authenticity can be developed through positive modeling as displayed by the follower’s own authentic leader (Gardner et al., 2005). Any development program for leader’s displaying these fundamental characteristics should emphasize moral capacity, moral courage, and moral resiliency (May et al., 2003). Overall, if organizations want to promote authentic
leadership, they must select motivated leaders, support authentic leadership at all administrative levels, and base performance metrics on authentic leadership components (May et al., 2003).
CHAPTER III
THEORETICAL FRAMEWORK: AUTHENTIC LEADERSHIP AS A DEFENSE AGAINST RESEARCH MISCONDUCT

There is a growing need for academic institutions to address the threat that research misconduct places on the scientific enterprise as a whole. However, as Neil Hamilton once wrote, “[The] tradition of faculty autonomy in the peer review of professional competence and ethical conduct is the linchpin of academic freedom in the United States.” (Hamilton, 2006). Institutions addressing the deviance from responsible research while maintaining, or even elevating, the responsibility that comes with autonomy and peer-review is of utmost importance. This chapter will provide the theoretical frameworks posited in this study to strike a balance through leadership that provides a scientific culture that values, promotes, and enforces research integrity.

As mentioned in Chapter Two, faculty and institutions of higher learning are founded on the idea that IHLs should be free from political influence and so should be granted a level of autonomy that is protected through self-governance (Hamilton, 2006). As a result, faculty operate within the university structure in a way that is different than individuals in for-profit organizations that traditional leadership research is centered around. Faculty’s protection of peer-review and professional autonomy create a relationship with the academic institution that is relatively weak. The loose coupling of
the faculty member and the organization are barriers to a more traditional means of influencing behavior. Many are of the opinion that in order for an organization to be successful it must be adaptable which is only achieved through the coupling of individual members to their institutions (Harrison, 1994).

Whereas, many individuals would see autonomy as a threat to the organization’s sustainability, to remove autonomy from the scientific profession would be tantamount to destroying the fundamental structure for which the entire system is built. The independent, autonomous nature of scientific discoveries is what has allowed cutting-edge and transformational research to take place. Society benefits from the lack of micromanagement that would otherwise occur if autonomy was removed. However, this protection of science also leads to a vulnerability for research misconduct. The isolated culture of researchers from the general public creates a greater risk for social and professional norms to be ignored without any real accountability. This cultural isolation also prevents scientists from seeing any ethical problems with their research practices (Freidenfelds & Brandt, 1996). In order to effectively influence researchers at institutions of higher learning, a method must occur in which autonomy and self-governance is protected while successfully promoting and emphasizing the values that underpin research integrity and existing regulations.

In order to effectively refocus researchers on the values of research integrity, institutions of higher learning will need to take an intentional, active role in affecting the leadership, climate, and ultimately culture of the organization. Research has shown that the culture of the institution is a guiding influence on the individual members and the organization as a whole (Giberson et al., 2009; Peterson & Spencer, 1990). The culture of
the institution should reinforce research integrity as normative behavior that is not just required, but is part of the scientific responsibility to society (Gino & Margolis, 2011). Unfortunately, many colleges and universities have approached research integrity from a regulatory perspective. This approach, while perhaps simple, has significant drawbacks as has been found to result in institutions getting lost in the details of the regulation and not focusing on the underpinning values that the regulations are built upon (Geller et al., 2010). The increased regulatory nature that was further perpetuated following the implementation of the required responsible conduct of research education programs resulted in researchers that see ethics policies and procedures as being a necessity for receiving funding or earning a publication (Geller et al., 2010). They do not see the human subjects or the societal benefit, and so, trust breaks down between the researchers and the people participating or benefitting from the discoveries (Bridges, 2007). Ultimately, a focus on adhering to research regulations instead of promoting integrity as social responsibility will prove to be ineffective for the development of an ethical research culture (Geller et al., 2010).

In order to change the culture of an institution, which is typically rather stable, organizations need to start with making changes that will immediately influence the climate. While the climate of the entire organization should be influenced, research has shown that the department climate has a stronger influence on overall misconduct (not specific to research integrity) of faculty (Anderson et al., 1994). Because of the number of subdivisions at an institution of higher learning, this influence is not surprising. Because faculty will align with the ideology of their profession first and the organization second (Dill, 2012b; Knight & Auster, 1999), it would make sense that the climate within
these academic departments would be stronger and ultimately filter up to the institution as a whole. At present, the specialization that occurs both formally (departments) and informally (subdivision within departments) has resulted in climates that emphasize self-interest over social good (Dill, 2012b; Hamilton, 2006).

Like the organizational culture, when the climate of the department is built on the idea that research integrity is part of the social responsibility of science, faculty will be more likely to engage in responsible research (Mayer et al., 2010). Research has found the climate variable to be the sole predictor of research misconduct (Louis, Anderson, & Rosenberg, 1995) making the need for organizations to focus on ethical departmental climate a necessity. This climate can only be achieved when scientists perceive research integrity to take priority over all other institutional priorities (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002).

As discussed in Chapter Two, it is the day-to-day leadership of an organization that determines the overall climate (Stringer, 2001). While this places a heavy burden on the department leadership, it does provide a starting place for universities to focus when working to ensure the development of an ethical research institution. The Authentic Leader as defined by the Authentic Leadership Theory is the ideal type of ethical leader that should prove to be successful in creating and maintaining an organization focused on the responsible conduct of research.

While there is little research that directly connects authentic leaders to research integrity outcomes, there is evidence that indicates that followers are more engaged, have greater job satisfaction, stronger commitment to the organization, more positive work
attitudes, and find greater meaning in their work (Avolio et al., 2004), it would stand to reason, that these leaders are also capable of producing a positive influence on research integrity attitudes.

Authentic leaders have multiple characteristics that have been shown to promote ethical behavior amongst his or her followers. Of most importance, is the emphasis these types of leaders have on creating environments for their followers where they are empowered to attend to the development of their own authentic selves (Algera & Lips-Wiersma, 2012; Avolio & Gardner, 2005; Avolio et al., 2004; May et al., 2003). Because these leaders are aware of the moral standards and values they strongly relate to, are consistent in their behaviors as it relates to these values, and are transparent in their strengths, weaknesses, and decision-making processes, followers will align themselves through social learning to behave in a similar manner (May et al., 2003; Mayer et al., 2012; Walumbwa et al., 2008). These leaders increase follower’s social identification by creating an environment where followers create a deeper sense of high moral values.

High authentic leadership has also been found to strengthen followers to withstand temptations, making them less likely to disengage from their moral identity (Cianci et al., 2014). As individuals morally disengage, they are more likely to experience less guilt when making an unethical choice. Any guilt they do experience is lessened over time making it easier for them to choose an unethical path in the future.

Institutional administration can focus entirely on the elimination of unethical temptations, and they will never be successful at removing them. There will always be some ethical dilemmas that faculty and even leaders will face but, authentic leaders can work to
prevent the moral disengagement that can lead to greater unethical behavior when faculty do face these temptations.

In order for an authentic leader to be successful, open communication is essential (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002). Since faculty are not likely to seek out communication with leaders (Dill, 2012a), department chairs must purposefully communicate with faculty on a regular basis, not only about things that concern them directly, but also reinforcing the importance of ethical behavior as it relates to their social responsibility. Productive communication can increase trust between the leader and follower. This is important for discouraging research misconduct and is an important component for encouraging individuals to report research integrity violations when they occur (Geller et al., 2010). A recent study found that 53% of respondents feared reporting misconduct due to concerns about retaliation (Anderson et al., 1994). These fears can be minimized when authentic leaders communicate research integrity as the number one priority for the organization. This is further communicated through consistent actions by leadership.

When issues of misconduct arise, authentic leaders who value ethical research will act consistently with those values and standards that promote research integrity above all other organizational outputs. To behave any different would cause the leader to feel inauthentic (Mayer et al., 2012). To achieve the climate that sets research integrity as a priority, leaders will sanction violations of that integrity in a consistently applied manner with open communication and follow through (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002).
When findings of misconduct are concealed within the scientific community, it suggests to others with even partial information that the institution is willing to turn a blind eye. If the perpetrator is allowed to move on to another institution, they are able to continue polluting the integrity of science and its findings (Gunsalus, 1993). For the authentic leader, this would be seen as an unacceptable threat to the social responsibility of all scientists, and they would be compelled to ensure appropriate sanctions.

A criticism of the Authentic Leadership Theory is that it does not reinforce conformity due to the increased authenticity of the followers (Algera & Lips-Wiersma, 2012). This is an issue for organizations that rely on followers conforming to a predetermined set of goals (for-profit organizations). The broad mission of institutions of higher learning – to create and disseminate new knowledge – minimizes the negative consequences of followers that are less likely to conform. In contrast, the heightened level of autonomy produced by authentic leadership provides intrinsic motivation that is found to be most effective to faculty and is capable of overcoming limitations in structural factors within the institution (Knight & Auster, 1999; Schweitzer, 1989; Siddique et al., 2011). Instead, authentic leadership provides the climate that encourages researchers to attend to their own moral identity, develop commitment to the norms and standards that are foundational to the profession that they are more strongly committed to, while providing and protecting the autonomy which is critical for the success of the faculty’s’ scientific pursuits and ultimately the institutional success as a whole.

**Structural Influences on Faculty**

The influence of the authentic leader does not occur in a bubble within the institution. Other factors are capable of impacting the strength of the leader-follower
relationship. Some of the factors that can strengthen or weaken the authentic leader’s influence include the size of both the department and the institution as a whole, the strength of the research enterprise within the entire organization, and the rank of the faculty member. While many of these variables have not been directly tested, inferences are made from connecting multiple studies.

**Institutional Size**

A study of the impact of institutional size on faculty autonomy found that the larger, complex institutions were more specialized and faculty were afforded with great autonomy overall (Baldridge, Curtis, Ecker, & Riley, 1973). This autonomy does not necessarily, by itself, predict the strength of the relationship between the authentic leader and the follower. Faculty need academic freedom (Siddique et al., 2011), but an effective leader can provide ethical influence while still respecting and encouraging that professional autonomy.

In larger institutions, faculty believed their department operated with greater autonomy than did smaller schools (Baldridge et al., 1973). This is important because departments are the primary unit of the university (Anderson et al., 1994) and within these units department leadership set the tone for the ethical climate (Bland, Center, Finstad, Risbey, & Staples, 2005; Bland, Seaquist, Pacala, Center, & Finstad, 2002). It also results in greater variances between subgroups and these variances can be quite substantial (Schein, 1993) making it difficult for leaders to influence the institutional culture.

Larger institutions are also somewhat protected from pressures external to the institution. These larger institutions afford faculty a “place to hide” from directly dealing
with these influences (Baldridge et al., 1973). Larger organizations overall tend to have more serious ethical problems (Bartels et al., 1998), but are more responsive to transformational leadership (Vaccaro, Jansen, Van Den Bosch, & Volberda, 2012).

**Departmental Size**

The department is a quasi-organization within the larger university system. It is the unit where faculty reside and provide direct input in the decision-making process. The decentralization of academic departments within larger institutions requires departmental leadership that is strong and effective at managing the subunit (Baldridge et al., 1973). As this sub-unit grows in size, leaders can find it harder to provide the personal attention that is necessary (Mullen, Symons, Hu, & Salas, 1989). This results in less collaborative leadership and less satisfied subordinates. It also weakens the relationship between the leader and follower (Leroy et al., 2012). Effective, authentic leadership creates a relationship with the follower that communicates respect (Walumbwa et al., 2011). The weakening of this relationship jeopardizes the leader’s effectiveness.

**Faculty Rank**

Like many other areas of research integrity scholarship, there is little by way of empirical evidence that evaluates the relationship between faculty rank and research integrity. Constant attempts to quantify the prevalence of research misconduct have provided some insights worth mentioning.

The socialization process begins at the graduate level but continues through to the tenure-track faculty’s institution (Mendoza, 2008). During the initial socialization process, individuals are bombarded with environmental signals about appropriate
behaviors (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002). During this socialization process, faculty encounter experience where sense-making occurs, which ultimately shapes their perspective of the environment (Mendoza, 2008). Over time, these understandings of the organization become more solid and faculty, who are by nature resistant to change (Birnbaum, 2012), become less malleable. In a study on RCR training, early faculty perceived a need for ethical training to be required by all members of an organization, themselves included (Mayer, Kuenzi, Greenbaum, Bardes, & Salvador, 2009). They still perceived themselves as having something to learn. This was not the case with senior faculty members. A study on graduate students found that the longer the student was at the institution, the more likely they were to observe misconduct and less likely to report it (Anderson et al., 1994). This would indicate that the length of time within the organization is a variable that should be considered.

**Research Enterprise**

There is surprisingly little research evidence addressing the correlation between research funding and research misconduct. The ORI, however, does keep statistics on research misconduct allegations and outcomes. Of all of the institutions reporting some form or misconduct over a ten year period, 61% were from institutions of higher learning (Rhoades, 2004). This is of significant note because IHLs only make up around 26% of the institutions with active assurances on file with NIH (Office of Research Integrity, n.d.-b). Since an active assurance is a document provided when an institution engages in NIH funded, non-exempt, human subjects research (National Institutes of Health, 2016),
this would suggest that universities as a group are engaging in a disproportionate amount of misconduct, indicating an issue within the culture of institutions.

Before making the assumption that the problem is cultural, the laws of probability could explain the increased reporting if there is also a disproportionate amount of funding going to IHLs as well. A review of the average number of reported misconduct cases broken down by NIH funding rank shows a potential correlation between funding and misconduct frequency (See Figure 3.1). It is important to note here that funding ranking is likely to be correlated to the size of the institution since larger numbers of researchers are capable of conducting a higher volume of funded research.

![Figure 3.1](image)

**Figure 3.1**  Average reported cases of misconduct per institution by NIH funding rank.

Source: (Rhoades, 2004)
There are other issues related to the research enterprise that could provide some insight into the strength of the influence of leadership. The competitive research environment can create behavioral norms that present challenges for the authentic leader. One study found that individuals with high “competitive achievement striving” were at an increased risk for unethical behavior when in a highly competitive environment (Heitman, 2000; Perry et al., 1990). The influences on research productivity can create the perception that it is essential for professional success. When career advancement only comes because of research funding and publications, unethical behavior is likely to exist (National Academy of Sciences et al., 1993) due to the highly competitive nature of the institution. Without balancing these values with clear commitments to research integrity, the rewards for productivity will result in faculty that have learned that the institution values success at any cost (National Academy of Sciences et al., 1993). Mitigating these structural barriers can sometimes be out of reach for the authentic leader.
CHAPTER IV
METHODOLOGY AND RESULTS

Chapter four will review the study design and procedures. In an attempt to obtain a greater understanding of the various influences on research integrity at institutions of higher learning, this study seeks to identify the role (if any) that departmental leadership plays. An existing instrument for measuring authentic leadership is combined with questions designed to measure ethical attitudes towards research integrity. Tenure/tenure-track faculty (or equivalent) at all of Mississippi’s public and private four-year institutions of higher learning are the focus of this study, however medical schools and seminaries are excluded.

Research Questions

Two main questions guide the research design and hypothesis. These questions are as follows:

• Faculty face pressures from a variety of different sources over the course of their research careers. Many of these pressures may tempt researchers and weaken their sensitivity to unethical research practices. Can authentic departmental leadership positively influence faculty attitudes toward research integrity?

• The types of pressures faculty face vary depending on the type and size of the institution and department as well as the faculty rank and research enterprise. If authentic departmental leadership does positively influence faculty attitudes, is that influence weakened by any of these organizational factors?
Research Hypotheses

As noted in Chapter 2, there are a number of hypothesized influences on a researcher’s ethical behavior. These studies have provided some guidance towards the development of a theoretical model that will guide this research.

Faculty research integrity attitudes = f(authentic leadership behaviors + institution size + department size + institutional research enterprise + faculty rank)  (4.1)

The dependent variable is the faculty attitudes about research integrity. Departmental Authentic Leadership ratings, department size, research enterprise, and faculty rank are all independent variables. The following are my hypotheses:

H1: Faculty will have more positive attitudes toward research integrity when they perceive their departmental leadership to be authentic.

H2: Authentic leaders in smaller universities will have a weaker influence on faculty’s attitudes toward research integrity.

H3: Authentic leaders in small academic departments will have a stronger influence on the attitudes towards research integrity of faculty.

H4: Authentic leaders will have a weaker influence on the attitudes towards research integrity of faculty at institutions with a larger research enterprise.

H5: Authentic leaders will have a weaker influence on the attitudes towards research integrity of faculty who have achieved a higher rank.

The dependent variable in this study, faculty attitudes towards research integrity, is measured by Likert-style responses on the developed survey. Information about the independent variables related to size (institutional and department) are provided by the
respondent and coded into categories based on faculty population at the institutional and departmental level.

The independent variable related to the institutional research enterprise is evaluated using the institution’s Carnegie classification. Every five years, the Carnegie Classification of Institutions of Higher Education evaluates institutions based on a number of factors and classifies them accordingly. Institutions that confer four-year or higher degrees as their main focus are broken out into four main groups. Each group is categorized based on the types and number of degrees awarded annually. Institutions that confer more than 20 research doctorates are further divided into three segments based on a research index developed by the Indiana University Center for postsecondary Research. This index takes multiple research related factors into consideration (PhDs awarded, STEM, humanities, social sciences, and professional degrees, postdocs, instructional faculty, research faculty, etc.) (“Basic Classification Methodology,” n.d.). The most recent Carnegie classifications were released in Fall 2015.

The measure for the independent variable for faculty rank were obtained from the respondents self-reported current faculty rank. Responses are categorized into the equivalent of assistant professor, associate professor, full professor, professor emeritus.

Population

This study focuses on tenure/ tenure-track (or equivalent) at both public and private, four-year, degree-granting institutions of higher learning in the state of Mississippi. Of specific interest are faculty that engage in research activities as part of a requirement for employment at their institution.
Sample

In order to select faculty for participation in this study, the list of institutions of higher learning in the state was assessed, and two-year institutions were excluded since the mission for faculty at these institutions are primarily teaching-focused. These faculty are not likely to engage in research practices or know faculty that do and so could potentially skew any findings. There will be little need for leadership to promote research integrity to faculty who do not regularly engage in research.

Three of Mississippi’s IHLs are theological seminaries. While it is possible that faculty from these institutions engage in research practices, the mission of the institutions as a whole is greatly different from the other colleges and universities in the state. Religion and morality are the driving cultures of these institutions making their faculty less representative of faculty from other research and liberal arts schools. As a result, researchers were concerned that the inclusion of responses from these institutions could further skew the overall results of the study.

Finally, the state’s only medical school is also excluded from the study. Because of the heightened legal and ethical scrutiny applied to clinical trials and medical research, faculty at a medical school are surrounded by reminders of research integrity and constraints on human subjects research that are not seen at non-medical institutions. For this reason, faculty at medical institutions were not included in the sample population.

The exclusion of two-year institutions, seminaries, and medical schools resulted in fifteen (15) institutions in the state where the survey was provided for distribution. These institutions can be classified as public research, public teaching, and private liberal
arts institutions. Figure 3.1 shows the breakdown of institutions that were recruited for participation in the study.

![Pie chart showing the breakdown of institutions](image)

**Figure 4.1** Categories of institutions recruited for participation in the study (15 Institutions).

While private institutions composed 46% of the institutions recruited for participation, they provide less than 3% of the state’s research expenditures (“NCSES Higher Education Research and Development: Fiscal Year 2015,” 2017). Of the more than 5,000 faculty employed at Mississippi’s institutions of higher learning, less than 14% reside at private institutions, therefore, it is not surprising that the overwhelming majority of survey respondents are from public institutions.

Respondents were not asked to identify their institution by name and were only asked to provide a series of responses to questions that seek to gather general information about the size and nature of their institution. As a result, it is not possible to identify
exactly which institutions of the 175 respondents participated in the study. Table 4.1 provides a summary of the institutional characteristics of the survey respondents.

Table 4.1 Institutional characteristics of survey respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Institution</td>
<td>162</td>
<td>99.39</td>
</tr>
<tr>
<td>Student Enrollment &lt;1000</td>
<td>5</td>
<td>3.05</td>
</tr>
<tr>
<td>Student Enrollment 1000-9000</td>
<td>19</td>
<td>11.59</td>
</tr>
<tr>
<td>Student Enrollment &gt;9000</td>
<td>140</td>
<td>85.37</td>
</tr>
<tr>
<td>Faculty Employed &lt;500</td>
<td>48</td>
<td>30.97</td>
</tr>
<tr>
<td>Faculty Employed 500-1000</td>
<td>51</td>
<td>32.90</td>
</tr>
<tr>
<td>Faculty Employed &gt;1000</td>
<td>56</td>
<td>36.13</td>
</tr>
<tr>
<td>PhD Granting</td>
<td>153</td>
<td>93.29</td>
</tr>
<tr>
<td>Carnegie Classification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baccalaureate/Master’s</td>
<td>14</td>
<td>9.40</td>
</tr>
<tr>
<td>Doctoral: Higher Research Activity</td>
<td>88</td>
<td>59.06</td>
</tr>
<tr>
<td>Doctoral: Highest Research Activity</td>
<td>47</td>
<td>31.54</td>
</tr>
</tbody>
</table>

The responses to the survey were provided primarily from faculty at public institutions within the state (99.4%, n=163) that were identified as Ph.D. granting (93.3%). More than 85% of responses were from faculty at institutions with more than 9,000 students while only 3% had a student population of less than 1000 students. Thirty-two percent of the responses were from faculty at the highest research category of the Carnegie classification. Fifty-nine percent of respondents were from the Carnegie classification labeled as Doctoral University: Higher Research Activity. Less than 1% of respondents were from institutions that were not classified as either a Master’s College or Doctoral University. Table 4.2 provides details on the departmental leadership characteristic.
Table 4.2  Departmental leadership characteristics of survey respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>133</td>
<td>82.10</td>
</tr>
<tr>
<td>Female</td>
<td>29</td>
<td>17.90</td>
</tr>
<tr>
<td>Full Professor</td>
<td>147</td>
<td>90.18</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>13</td>
<td>7.98</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>1</td>
<td>0.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (range 35-85)</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>160</td>
<td>56.09</td>
<td>8.05</td>
</tr>
</tbody>
</table>

Respondents were asked to provide their current academic rank at their institution. Faculty listed at the rank of professor accounted for 37% of the population while associate professors and assistant professors were 25% and 26% respectively. Twelve percent of respondents fell within the “other” category. Respondents were split evenly between tenured (51%) and non-tenured (49%) faculty. Males made up the majority of the survey respondents at 65%, the average age was 51 years old. While years at the institution ranged from one to 46 years, the average respondent had been employed for 13.3 years.

Survey questions also asked for information on the individual respondent’s research activities. These questions focused on the number of peer-reviewed research papers published and the number of grants awarded as PI/Co-PI in the last three years. Responses ranged from zero to 73 with the average respondent having published almost seven peer-reviewed papers and been awarded three grants as PI/Co-PI in the last three years.
Table 4.3  Individual characteristics of survey respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>102</td>
<td>64.97</td>
</tr>
<tr>
<td>Female</td>
<td>55</td>
<td>35.03</td>
</tr>
<tr>
<td>Full Professor</td>
<td>60</td>
<td>37.04</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>40</td>
<td>24.69</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>42</td>
<td>25.93</td>
</tr>
<tr>
<td>Tenured</td>
<td>83</td>
<td>50.92</td>
</tr>
<tr>
<td>Untenured</td>
<td>80</td>
<td>49.08</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (range 26-84)</td>
<td>160</td>
<td>50.67</td>
<td>11.40</td>
</tr>
<tr>
<td>Years at Institution (range 1-46)</td>
<td>161</td>
<td>13.29</td>
<td>9.741</td>
</tr>
<tr>
<td>Peer-Reviewed Papers (range 0-72)</td>
<td>161</td>
<td>6.79</td>
<td>8.192</td>
</tr>
<tr>
<td>No. PI/Co-PI Awards (range 0-73)</td>
<td>160</td>
<td>3.44</td>
<td>7.962</td>
</tr>
</tbody>
</table>

Survey question for peer-reviewed papers and number of PI/Co-PI awards was limited to the last three years.

**Time Frame**

The survey was distributed to faculty across all sample institutions during the months of June, July, & August 2017. The survey remained available for approximately eight weeks. Email reminders were sent out by institutional administrators encouraging faculty to complete the survey. Data analysis occurred during August and September 2017.

**Survey Design**

Linda Neider and Chester Schriesheim, as a method for assessing the strength of authentic leadership displayed by managers, developed the Authentic Leadership Inventory (ALI) in 2011. Building on the four constructs of authentic leadership developed by Walumbwa and colleagues (2008), the instrument evaluates a leader’s self-awareness, relational transparency, balanced processing, and internalized moral perspective (Nider & Schriesheim, 2011) by measuring the perceptions of those the
leader directly supervises. Answers to the fourteen (14)-question instrument are provided via a five-point Likert-type scale with responses ranging from Disagree Strongly (1) to Agree Strongly (5).

The Authentic Leadership Inventory was combined with seven questions used to gauge the attitudes of faculty towards topics related to research integrity practices and behaviors. These questions were developed from the *Professional Principles of Research Integrity* found in (Tabaghdehi et al., 2015) Brock, Sutter & Selwitz (2001). These principles are centered on the topics of peer review, research management, data access, commitment to credibility, supervisory relationships, authorship, publication practices, and responsibilities to colleagues and peers (Brock, Sutter, & Selwitz, 2002). Like the ALI, answers to the seven (7)-question instrument were provided via a five-point Likert-type scale with responses ranging from Disagree Strongly (1) to Agree Strongly (5).

In addition to the ALI and questions on research integrity, a basic set of biographical questions was used to gather demographic information regarding the researcher, institution, and departmental leadership. These questions included information on age, rank, area of study, gender, tenure status, and research outcomes.

Additional information was gathered regarding the respondents’ institutions as a whole. This information included institution type (public, private), size, Carnegie classification, student population size, number of employed faculty, departmental size, discipline, and presence of research support offices and research integrity officer (RIO) in the organizational.
Table 4.4 identifies the variables, the source of the survey questions, and the number of items used to measure each variable. A copy of the entire survey can be located in Appendix A.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Source</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authentic Leadership</td>
<td>Neider &amp; Schrieshein (2011)</td>
<td>14</td>
</tr>
<tr>
<td>Research Integrity</td>
<td>Brock et al. (2001)</td>
<td>7</td>
</tr>
<tr>
<td>Institutional Data</td>
<td>IPEDS – NCES</td>
<td>14</td>
</tr>
<tr>
<td>Biographical Data</td>
<td>Respondents</td>
<td>8</td>
</tr>
</tbody>
</table>

Procedure

After the appropriate approvals had been obtained from the MSU Institutional Review Board, the survey was published live using an online survey tool, Survey Monkey. The link to the survey was distributed via email to tenure/tenure-track faculty (or equivalent) at all of the institutions included in the sample population through each institutions provost or vice president for research. The first page of the survey explains the research purpose, risks, and benefits before asking individuals to provide consent to participate. Should the individual choose not to participate in the survey, they were able to leave the website at any time. The data collection lasted approximately eight weeks. All responses were anonymous, and no identifiable information was collected. Completed survey responses were returned to the survey program’s system where they were retrieved later for data analysis.
**Statistical Testing**

Responses from the survey served as the data source for this study. Re-coding of certain items that are presented in reverse or negative form was necessary prior to analyzing the data, as were responses to the institutional and biographical portions of the survey. Any responses that were largely incomplete for the questions related to authentic leadership or research integrity were removed. Responses from individuals that were not part of the target population (graduate students, strictly teaching faculty, etc.) were removed so as not to skew the results.

An Authentic Leadership index was created as a summative measure of the responses on the 14 questions related to the individual’s departmental leadership authenticity. Additional variables were created to measure the four constructs of authentic leadership. These variables were created using the summation of the responses to the questions that fell within each of those constructs as developed by previous studies described in the Authentic Leadership Theory literature. The questions in the survey that are associated with each of those four constructs can be found in Table 4.5.

A single Research Integrity (RI) Index was created from the seven questions in the survey that were used to measure overall attitudes towards topics related to research integrity. Like the AL index, the RI index was calculated through the summation of the individual responses to each of the RI questions (Q15-Q21).
Table 4.5  Survey questions that correspond with the four constructs of Authentic Leadership Theory

<table>
<thead>
<tr>
<th>AL Construct</th>
<th>Survey Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-Awareness</strong></td>
<td>Question 4 – My leader describes accurately the way that others view his/her abilities</td>
</tr>
<tr>
<td></td>
<td>Question 7 – My leader shows that he/she understands his/her strengths and weaknesses.</td>
</tr>
<tr>
<td></td>
<td>Question 11 – My leader is clearly aware of the impact he/she has on others.</td>
</tr>
<tr>
<td><strong>Relational</strong></td>
<td>Question 1 – My leader clearly states what he/she means.</td>
</tr>
<tr>
<td><strong>Transparency</strong></td>
<td>Question 8 – My leader openly shares information with others.</td>
</tr>
<tr>
<td></td>
<td>Question 12 – My leader expresses his/her ideas and thoughts clearly to others.</td>
</tr>
<tr>
<td><strong>Balanced</strong></td>
<td>Question 3 – My leader shows consistency between his/her beliefs and actions.</td>
</tr>
<tr>
<td><strong>Processing</strong></td>
<td>Questions 6 – My leader carefully listens to alternative perspectives before reaching a conclusion.</td>
</tr>
<tr>
<td></td>
<td>Question 10 – My leader objectively analyzes relevant data before making a decision.</td>
</tr>
<tr>
<td></td>
<td>Question 14 – My leader encourages others to voice opposing points of view.</td>
</tr>
<tr>
<td><strong>Internalized</strong></td>
<td>Question 2 – My leader shows consistency between his/her beliefs and actions.</td>
</tr>
<tr>
<td><strong>Moral</strong></td>
<td>Question 5 – My leader uses his/her core beliefs to make decisions.</td>
</tr>
<tr>
<td><strong>Perspective</strong></td>
<td>Question 9 – My leader resists pressures on him/her to do things contrary to his/her beliefs</td>
</tr>
<tr>
<td></td>
<td>Question 13 – My leader is guided in his/her actions by internal moral standards</td>
</tr>
</tbody>
</table>

Questions were used pulled from the Authentic Leadership Inventory and grouped according to Neider & Schriesheim, 2011.

A principal component factor analysis was also conducted on the research integrity portion of the survey to determine which measures are sufficiently associated with each other to constitute a reliable tool for measuring the dependent variable at a more granular level. Analysis of eigenvalues and factor loadings identified two factors that sufficiently explain the RI items. These factors have been characterized as Objective RI factor and Subjective RI factor. The Objective RI factor includes items where institutional and federal rules and regulations are typically clear about what is ethical.
These are usually covered by institutional review boards (IRB), federal definitions of misconduct (plagiarism, data fabrication, data falsification), and institutional policies for ethical conduct in scholarly research. The Subjective RI factor includes items where the individual has to rely more heavily on personal, moral judgement to determine what is ethical, such as when to include an individual as an author instead of just providing an acknowledgement. Because of low factor loading, the question on mentoring was not included in either the objective or subjective RI factors.

The re-coded data and the additional variables/indices were then used to test the research questions. Linear regressions were used to measure the influence on research integrity attitudes by departmental leadership, institutional size, departmental size, Carnegie classification, and faculty rank.

**Limitations**

A major limitation of any study surrounding the topic of research integrity is social desirability bias (Krumpal, 2013). People want to believe that they are ethical in all matters, not just research integrity. They certainly do not want others to believe that they are in any way unethical. This is an issue many researchers have faced when attempting to determine how prevalent research misconduct is in today’s scientific community (Fanelli, 2009; John, Loewenstein, & Prelec, 2012). The research design attempts to minimize this bias by providing the survey through an anonymous, self-completion mode. Questions were designed to appear neutral. Statements regarding the lack of a “right answer” were provided prior to the questions. Despite best efforts, it is still highly likely that social desirability bias has skewed the research results towards the positive ethical responses.
In an attempt to keep the survey from being too lengthy, research integrity questions were limited in number. While these questions were based on the research integrity constructs laid out in the literature, they are limited in the thoroughness for which they evaluate the respondents’ attitudes.
CHAPTER V
RESULTS

Data analysis in this study occurred in three major stages, 1) analysis of descriptive statistics for the dependent and independent variables, 2) bivariate analysis of each independent variable to the dependent variable, and 3) multivariate analysis of all independent variables and the dependent variable.

Descriptive Statistics

Initial data analysis of the dependent variable was conducted using the Research Integrity (RI) index. This index was created using composite scores of individual responses to the seven survey questions focused on research integrity attitudes. For this variable, lower RI scores indicate more positive, ethical attitudes, while higher RI scores correspond with less ethical attitudes. The primary independent variable in this study was the perception of authentic leadership by the respondent and was measured using the Authentic Leadership (AL) index. Like the RI index, this variable was obtained using composite scores of the fourteen AL questions in Part 1 of the survey. Unlike the RI index, lower AL scores are correlated with lower perceptions of authentic leadership as expressed by the survey respondents. Individuals with a higher AL index score perceived their departmental leadership to have greater authenticity as defined by the Authentic Leadership Inventory. Table 5.1 provides summary statistics for both the RI and AL indices.
Based on the survey responses, the mean score for research integrity was 6.7 with possible scores ranging from zero to 35. This suggests that faculty who responded displayed, on average, more positive attitudes toward appropriate research integrity factors. While this index had a possible score of 28, only 3 of the 173 respondents scored higher than 15, with the highest (therefore least ethical) score being 20.

The mean score for perceived authentic leadership was 35.31 with possible scores ranging from zero to 56. This would indicate that respondents, on average, perceived their leaders to display characteristics of authentic leadership. The AL index scores were spread out across the entire range of possible scores.

Table 5.1 Summary statistics of the dependent and independent variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Integrity (RI) Index</td>
<td>173</td>
<td>6.68</td>
<td>3.70</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Authentic Leadership (AL) Index</td>
<td>162</td>
<td>35.31</td>
<td>14.37</td>
<td>0</td>
<td>56</td>
</tr>
</tbody>
</table>

RI Index was calculated from the summation of scores from all of the RI survey questions (Q15-Q21). AL Index was calculated from the summation of scores from all of the AL survey questions (Q1-Q14).

Research Integrity Factors

The results of the principal component factoring of the research integrity questions provided two main factors being measured. After the analysis of eigenvalues and factor loadings, these two factors were described as objective RI factors and subjective RI factors. As described earlier, the objective factors dealt with issues where federal and institutional policies provide clear guidelines on what is and is not acceptable research behavior. The issues captured by the subjective RI variable lack these clear guidelines and rely more heavily on the ethical judgement of the researcher. Table 5.2 provides summary statistics for these two research integrity factors.
Table 5.2  Summary statistics for the research integrity factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective RI Factor (Obj RIF)</td>
<td>174</td>
<td>4.03</td>
<td>2.65</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Subjective RI Factor (Subj. RIF)</td>
<td>175</td>
<td>1.95</td>
<td>1.37</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Obj RIF are the summation of scores from survey questions Q16-Q18, and 21. Subj. RIF are the summation of scores from survey questions Q15 and Q20.

The mean score for the respondents’ research integrity scores on the objective factors was 4.03 with a standard deviation of 2.65. The total possible range of scores was zero to 16, yet none of the respondents scored higher than 12. Because lower scores indicate higher integrity attitudes, this suggests that faculty have highly ethical attitudes for the issues that have clear guidelines.

The scores for the subjective research integrity factors are on the ethical side of a scale that had possible scores ranging from zero to eight. For this factor, no respondent scored higher than five. The mean score for the subjective factor was 1.95 with a standard deviation of 1.37 showing primarily ethical attitudes.

**Authentic Leadership Constructs**

Survey questions from the Authentic Leadership Inventory were used to measure the perceived authenticity of departmental leadership. Variables for each of the four constructs of authentic leadership were created using the combined scores from the questions that correspond with each construct as laid out by Neider and Schriesheim (2011). Table 5.3 provides summary statistics for each of the four constructs.

For these authentic leadership variables, higher values indicate higher perceptions of authentic leadership as it relates to each of the constructs. All four variables have mean values that are greater than the midpoint of the scales, indicating that the average
departmental leader is perceived to have higher authenticity as it relates to the specific variables being measured. Of the four constructs, internalized moral perspective was the variable that contained the highest, therefore most authentic, mean score.

Table 5.3  Summary statistics for the four constructs of authentic leadership

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Awareness</td>
<td>172</td>
<td>7.20</td>
<td>3.23</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Relational Transparency</td>
<td>172</td>
<td>7.98</td>
<td>3.47</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Balanced Processing</td>
<td>170</td>
<td>9.35</td>
<td>4.65</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Internalized Moral Persp.</td>
<td>172</td>
<td>10.98</td>
<td>3.81</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

Bivariate Analysis of the Dependent Variable

Bivariate analysis was conducted to determine relationships that exist between the independent variables and the dependent variable—research integrity attitudes. The analysis was conducted first with the research integrity index followed by the objective and subjective research integrity factors.

Authentic Leadership

Hypothesis 1 states, “Faculty will have more positive attitudes toward research integrity when they perceive their departmental leadership to be authentic.” A simple linear regression was used to test this relationship without the presence of other variables. The hypothesis was first tested using the Research Integrity index as the dependent variable and the Authentic Leadership index as the independent variable. The outcome of this analysis failed to reject the null hypothesis and found no statistically significant relationship between the two variables as can be seen in Table 5.4.
Table 5.4  Regression analysis of the research integrity and authentic leadership indices.

| Variable                        | Coef. | Std. Err. | t     | P>|t| |
|---------------------------------|-------|-----------|-------|-----|
| Authentic Leadership Index      | .033  | .019      | 1.71  | 0.089 |

Dependent variable: Research Integrity Index; N=159; R\(^2\)=0.018; Adj R\(^2\)=0.012; F (1, 157) = 2.93; Prob > F = 0.089; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.297

A simple linear regression was then conducted to determine whether the perceived authentic departmental leadership shows a statistical influence on the factors that centers on the objective and subjective research integrity factors (see Table 5.5 and Table 5.6). The outcome of these tests revealed that the AL index score does not produce a statistically significant influence on the objective research integrity attitudes of faculty (β= .011, p<0.45), but does provide a statistically significant influence on the subjective attitudes (β= .021, p<0.01).

Table 5.5  Regression analysis of the objective research integrity factor and the authentic leadership index

| Variable                        | Coef. | Std. Err. | t     | P>|t| |
|---------------------------------|-------|-----------|-------|-----|
| Authentic Leadership Index      | .011  | .014      | 0.75  | 0.453 |

Dependent variable: Obj. RIF; N=160; R\(^2\)=0.004; Adj R\(^2\)= -0.003; F (1, 158) = 0.57; Prob > F = 0.452; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.650

Table 5.6  Regression analysis of the subjective research integrity factor and the authentic leadership index

| Variable                        | Coef. | Std. Err. | t     | P>|t| |
|---------------------------------|-------|-----------|-------|-----|
| Authentic Leadership Index      | .021  | .007      | 2.87  | 0.005 |

Dependent variable: Subj. RIF; N=161; R\(^2\)=0.049; Adj R\(^2\)= 0.043; F (1, 159) = 8.22; Prob > F = 0.005; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.921
Institutional Size

Hypothesis 2 predicts that smaller institutional size will weaken the influence of authentic departmental leaders on faculty’s attitudes regarding research integrity. An initial test of the relationship between the research integrity factor and the institutional size, as measured by the number of faculty at the institution, shows no statistical relationship between the two variables (see Table 5.7). Tests of the influence of the institution’s size on the objective and subjective research integrity factors also produced no statistically significant results.

Table 5.7  Regression analysis of research integrity index and institutional size

| Variable        | Coef. | Std. Err. | t   | P>|t| |
|-----------------|-------|-----------|-----|-----|
| Institutional Size | -.273 | .269      | -1.02 | 0.311 |

Dependent variable: Research Integrity Index; N=152; R²=0.007; Adj R²= 0.000; F (1, 150) = 1.03; Prob > F = 0.311; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.422

Departmental Size

Like institutional size, departmental size was also hypothesized to present an effect on the strength of leadership influence on research integrity attitudes of faculty. Hypothesis 3 states, “Authentic leaders in small academic departments will have a stronger influence on the attitudes towards research integrity of faculty.” The size of academic departments was measured by the number of faculty as self-reported by the respondents. As can be seen in Table 5.8, departmental size did not produce a direct influence on research integrity attitudes using the research integrity index. The objective and subjective research integrity factors also failed to be influenced by departmental size at a statistically significant level.
Table 5.8  Regression analysis of research integrity index and departmental size

| Variable             | Coef. | Std. Err. | t    | P>|t| |
|----------------------|-------|-----------|------|-----|
| Departmental Size    | -.017 | .024      | -0.71| 0.476|

Dependent variable: Research Integrity Index; N=138; R²=0.004; Adj R²= 0.004; F (1, 136) = 0.51; Prob > F = 0.476; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.334

Research Enterprise

Hypothesis 4 assumes that the larger the research enterprise of an institution, the less influence authentic leadership will have on the research integrity attitudes. Carnegie classifications are used to capture this institutional characteristic and included in a simple regression model to test its relationship to research integrity attitudes. As can be seen in Table 5.9, much like the other institutional variables, the research enterprise, as measured by the Carnegie classification, fails to demonstrate a statistical influence on the research integrity index score of the faculty respondents. Simple linear regressions were also conducted to test the influence on the objective and subjective research integrity factors, producing no statistically significant outcomes.

Table 5.9  Regression analysis of research integrity index and institutional research enterprise

| Variable             | Coef. | Std. Err. | t    | P>|t| |
|----------------------|-------|-----------|------|-----|
| Carnegie Classification | -.263 | .317      | -0.83| 0.409|

Dependent variable: Research Integrity Index; N=146; R²=0.005; Adj R²= -0.002; F (1, 144) = 0.69; Prob > F = 0.409; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.457

Respondent Faculty Rank

Finally, the faculty rank of the respondents were tested in a simple linear regression to test its influence on research integrity attitudes, using both the index and the
objective and subjective factors. Like previous variables, the outcomes of these tests failed to provide any statistically significant evidence of influence of faculty rank on research integrity attitudes (see Table 5.10).

Table 5.10 Regression analysis of research integrity index and faculty rank

| Variable | Coef. | Std. Err. | t  | P>|t| |
|----------|-------|-----------|----|------|
| Rank     | .089  | .279      | 0.32| 0.750|

Dependent variable: Research Integrity Index; N=159; R²=0.001; Adj R²= -0.006; F (1, 157) = 0.10; Prob > F = 0.750; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.849

**Multivariate Analysis of the Dependent Variable**

The results of the bivariate analysis resulted in a statistical influence of authentic leadership on the subjective research integrity attitudes, but not the overall RI index nor the objective RI factor. The next phase of analysis will evaluate the relationship between the AL constructs on the RI variables before performing analysis on the study’s hypotheses using multiple linear regression models. The analysis of the hypothesized model will include tests using the four constructs of authentic leadership in addition to the use of the authentic leadership (AL) index.

**Authentic Leadership Constructs**

The results of the bivariate analysis of the AL index and the factors of research integrity (objective and subjective) suggest the influence of AL on research integrity might be occurring at a more granular level than is captured by the indices. To further evaluate the relationship between research integrity and authentic leadership, a multiple linear regression was employed to measure the influence of the four authentic leadership constructs on the research integrity index. In this analysis, two of the four authentic
leadership constructs were found to significantly influence research integrity. In this initial analysis, however, the test for multicollinearity were elevated among some of the AL constructs and as a result, the model was amended to remove the AL balanced processing construct. Table 5.11 displays the results of the tests of the remaining three constructs of AL on the dependent variable, RI index.

Increased self-awareness (β = -0.400, p<0.021) among departmental leadership resulted in a more ethical RI index score among faculty. Conversely, increases in relational transparency (β = 0.498, p<0.004) among departmental leadership led to a less ethical RI index score among faculty. The internal moral perspective variable was not found to have a significant influence on the overall RI index score for faculty. The removal of the balanced processing construct corrected any issues with multicollinearity and heteroscedasticity was not found to be a concern.

Table 5.11 Tests of the authentic leadership constructs on the research integrity index

| Variable                        | Coef. | Std. Err. | t     | P>|t| | VIF |
|---------------------------------|-------|-----------|-------|------|-----|
| Constant                        | 5.25  | .842      | 6.24  | 0.000|     |
| Self-Awareness                  | -0.400| .171      | -2.33 | 0.021| 4.01|
| Relational Transparency         | 0.498 | .171      | 2.91  | 0.004| 4.57|
| Internalized Moral Perspective  | 0.035 | .126      | 0.28  | 0.782| 3.05|

Dependent variable: Research Integrity Index; N=163; R²=0.073; Adj R²=0.055; F (3, 159) = 4.15; Prob > F = 0.007; Mean VIF= 3.88; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.302

The influence on the objective and subjective research integrity factors was also tested using the constructs of authentic leadership. Like the previous analysis, the balanced processing construct was removed from the analysis due to multicollinearity. The results of the objective RI factor can be seen in Table 5.12. Like the test on the research integrity index, this analysis found that self-awareness (β = -0.3621, p<0.003) and
relational transparency (β = .3878, p<0.002) constructs were statistically significant influences on the objective RI dependent variable, however they did not result in a significant influence on the subjective RI factor.

Table 5.12  Tests of the authentic leadership constructs on the objective RI factor

| Variable                        | Coef. | Std. Err. | t     | P>|t| | VIF |
|--------------------------------|-------|-----------|-------|------|-----|
| Constant                       | 3.580 | .594      | 6.03  | 0.000|     |
| Self-Awareness                 | -.362 | .120      | -3.01 | 0.003| 3.99|
| Relational Transparency        | .388  | .121      | 3.22  | 0.002| 4.57|
| Internalized Moral Perspective | .002  | .089      | 0.03  | 0.978| 3.04|

Dependent variable: Obj. RIF; N=164; R²=0.075; Adj R²= 0.057; F (3, 160) = 4.30; Prob > F = 0.006; Mean VIF= 3.87; Breusch-Pagan/Cook-Weisberg test for heteroscedasticity: p<0.328

Tests of Hypotheses

In order to test the dependent variable using the study’s hypothesized model, variables related to institutional size, departmental size, Carnegie classification, and faculty rank were added to previous regression models to determine the effect of the independent variables on research integrity attitudes. This analysis occurs in two phases. The first phase analyzes the dependent variable using the research integrity index and the second phase assesses the influence using the objective and subjective research integrity factors.

Tests of the Hypotheses using the Research Integrity Index

A multiple linear regression analysis was conducted using the research integrity index as the dependent variable and included the following independent variables: authentic leadership (AL) index, institutional size, departmental size, Carnegie classification, and respondent rank. Results of this analysis can be found in Table 5.13.
As seen with previous analysis using the RI and AL indices, this regression model results in a failure to detect any significant influence of the independent variables on the RI index score.

Table 5.13  Regression analysis of the dependent and independent variables

| Variable                      | Coef. | Std. Err. | t     | P>|t| | VIF |
|-------------------------------|-------|-----------|-------|-----|-----|
| Constant                      | 8.066 | 2.142     | 3.77  | 0.000 | 1.07|
| Authentic Leadership (AL) Index | .020  | .024      | 0.83  | 0.411 | 1.20|
| Institutional Size            | -.237 | .345      | -0.69 | 0.493 | 1.20|
| Departmental Size             | -.014 | .025      | -0.56 | 0.577 | 1.06|
| Carnegie Classification       | -.203 | .412      | -0.49 | 0.624 | 1.26|
| Faculty Rank                  | .274  | .359      | 0.76  | 0.448 | 1.06|

Dependent variable: Research Integrity Index; N=119; R²=0.030; Adj R²= -0.013; F (5, 113) = 0.70; Prob > F = 0.627; Mean VIF= 1.13; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.876

Based on results of previous analysis, which found a relationship between the components of the AL index with the research integrity attitudes, a multiple linear regression was conducted using the authentic leadership constructs in place of the AL index. Again, due to elevated levels of multicollinearity previously observed, the balanced processing construct was eliminated from the model. The remaining AL constructs, in combination with the variables for institutional size, departmental size, Carnegie classification, and faculty rank, were tested against the RI index with mixed results. The self-awareness (β= -.559, p<0.008) and relational transparency (β=.576, p<0.005) constructs showed statistical significance, however, the overall model resulted in an elevated p-value at 0.064, which can be seen in Table 5.14. The institutional size, departmental size, Carnegie classification, and faculty rank variables did not achieve statistical significance in either of the models tested.
Table 5.14  Regression analysis of the dependent and independent variables using the constructs of authentic leadership

| Variable                      | Coef. | Std. Err. | t     | P>|t|  | VIF  |
|-------------------------------|-------|-----------|-------|------|------|
| Constant                      | 7.018 | 2.17      | 3.24  | 0.002|      |
| Self-Awareness                | -.559 | .206      | -2.71 | 0.008| 4.28 |
| Relational Transparency       | .576  | .201      | 2.87  | 0.005| 4.47 |
| Internalized Moral Perspective| .074  | .157      | 0.47  | 0.641| 3.10 |
| Institutional Size            | -.330 | .338      | -0.98 | 0.331| 1.18 |
| Departmental Size             | -.006 | .025      | -0.23 | 0.815| 1.10 |
| Carnegie Classification       | -.075 | .413      | -0.18 | 0.855| 1.27 |
| Faculty Rank                  | .320  | .366      | 0.88  | 0.383| 1.11 |

Dependent variable: Research Integrity Index; N=123; R²=0.107; Adj R²= 0.053; F (7, 115) = 1.98; Prob > F = 0.064; Mean VIF= 2.36; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p < 0.462

Tests of the Hypotheses Using the Research Integrity Factors

The results of previous tests on the study’s hypotheses lent partial support for the influence of authentic leadership on research integrity, particularly when the relationship was evaluated using the factors of research integrity instead of the research integrity index. As a reminder, in an attempt to identify a more specific point of influence, a principal component factoring was conducted, resulting in the identification of two main factors measured by the questions related to research integrity. These factors were identified as objective research integrity factors and subjective research integrity factors. The second phase of multivariate analysis evaluates the hypothesized model using the research integrity factors instead of the RI index.

Authentic Leadership Index

In this portion of the analysis, the research integrity factors will be evaluated using the authentic leadership index. To begin with, a multiple linear regression analysis was conducted using the objective research integrity factor, the AL index, institutional
size, departmental size, Carnegie classification, and faculty rank. In the analysis of the effects of the independent variables on the dependent variable of objective research integrity factors, the findings, which can be found in Table 5.15, failed to produce results that would lead to a rejection of the null hypotheses. All of the independent variables failed to reach a level of statistical significance, as did the model as a whole.

Table 5.15 Regression analysis of the dependent variable, as represented by Obj RI factor, and the independent variables, utilizing the AL index.

| Variable                      | Coef. | Std. Err. | t     | P>|t| | VIF |
|-------------------------------|-------|-----------|-------|------|-----|
| Constant                      | 6.201 | 1.514     | 4.10  | 0.000 |     |
| Authentic Leadership (AL) Index | .013  | .017      | 0.76  | 0.448 | 1.07|
| Institutional Size            | -.155 | .244      | -0.64 | 0.526 | 1.20|
| Departmental Size             | -.012 | .017      | -0.67 | 0.505 | 1.06|
| Carnegie Classification       | -.350 | .291      | -1.20 | 0.233 | 1.26|
| Faculty Rank                  | .133  | .254      | 0.52  | 0.602 | 1.06|

Dependent variable: Objective RI Factor; N=119; R²=0.043; Adj R²= 0.001; F (5, 113) = 1.02; Prob > F = 0.411; Mean VIF= 1.13; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.325

The analysis of the hypotheses was repeated substituting the objective RI factor with the subjective RI factor. Results of this analysis can be found in Table 5.16 and mimic the findings of the analysis of the objective RI model. No statistically significant influence is observed between any of the independent variables and the subjective RI attitudes of faculty. The overall model also failed to reach any level of statistical significance.
Table 5.16Regression analysis of the dependent variable, as represented by Subj RI factor, and the independent variables, utilizing the AL index.

| Variable                        | Coef. | Std. Err. | t     | P>|t|  | VIF |
|---------------------------------|-------|-----------|-------|------|-----|
| Constant                        | 1.567 | .799      | 1.96  | 0.052| 1.96 |
| Authentic Leadership (AL) Index | .011  | .009      | 1.24  | 0.219| 1.07 |
| Institutional Size              | -.018 | .128      | -0.14 | 0.889| 1.20 |
| Departmental Size               | .004  | .009      | 0.44  | 0.661| 1.05 |
| Carnegie Classification         | -.023 | .154      | -0.15 | 0.883| 1.26 |
| Faculty Rank                    | .190  | .134      | 1.42  | 0.159| 1.06 |

Dependent variable: Subjective RI Factor; N=120; R²=0.039; Adj R²= -0.004; F (5, 114) = 0.92; Prob > F = 0.473; Mean VIF= 1.13; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.392

**Authentic Leadership Constructs**

The final analysis of the study’s hypothesized model includes regressions of the factors of research integrity using the constructs of authentic leadership in addition to the institutional size, departmental size, Carnegie classification, and respondent rank. Again, due to elevated levels of multicollinearity previously observed, the balanced processing construct of AL was eliminated from the model. The results of this regression analysis, which utilized the objective research integrity factor as the dependent variable, can be found in Table 5.17.

The AL constructs of self-awareness (β= -.516, p<0.000) and relational transparency (β= .490, p<0.001) are found to have a statistically significant influence on the objective research integrity attitudes of faculty. Higher levels of self-awareness were found to produce more ethical research integrity attitudes as they relate to the objective factors, while relational transparency worked in the opposite direction. The additional independent variables did not provide any statistically significant relationship to the dependent variables. The overall model also proved to be significant at the 99% level and the test of heteroscedasticity was not determined to be of concern.
Table 5.17  Regression analysis of the dependent variable as represented by the Obj RI factor, and the independent variables, utilizing the AL constructs

| Variable                     | Coef. | Std. Err. | t     | P>|t|  | VIF |
|------------------------------|-------|-----------|-------|------|-----|
| Constant                     | 5.478 | 1.478     | 3.71  | 0.000| 4.28|
| Self-Awareness               | -.516 | .140      | -3.67 | 0.000| 4.47|
| Relational Transparency      | .490  | .137      | 3.57  | 0.001| 3.10|
| Internalized Moral Perspective| .068  | .107      | 0.64  | 0.526| 3.00|
| Institutional Size           | -.279 | .230      | -1.21 | 0.228| 1.18|
| Departmental Size            | -.004 | .017      | -0.23 | 0.820| 1.10|
| Carnegie Classification      | -.232 | .281      | -0.82 | 0.412| 1.27|
| Faculty Rank                 | .214  | .249      | 0.86  | 0.393| 1.11|

Dependent variable: Objective RI Factor; N=123; R\(^2\)=0.164; Adj R\(^2\)= 0.114; F (7, 115) = 3.23; Prob > F = 0.004; Mean VIF= 2.36; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.364

The final regression analysis was conducted with the subjective RI factor as the dependent variable. The independent variables for this analysis include the AL constructs minus balanced processing, institutional size, departmental size, Carnegie classification, and respondent rank. The results of the analysis (see Table 5.18) show no statistically significant relationship between any of the dependent and independent variables. The model also shows no statistical significance.

Table 5.18  Regression analysis of the dependent variable as represented by the Subj RI factor, and the independent variables, utilizing the AL constructs

| Variable                     | Coef. | Std. Err. | t     | P>|t|  | VIF |
|------------------------------|-------|-----------|-------|------|-----|
| Constant                     | 1.482 | .819      | 1.81  | 0.073| 4.24|
| Self-Awareness               | .027  | .077      | 0.35  | 0.727| 4.44|
| Relational Transparency      | .025  | .076      | 0.33  | 0.738| 3.10|
| Internalized Moral Perspective| .011  | .059      | 0.18  | 0.859| 1.18|
| Institutional Size           | .019  | .128      | 0.15  | 0.883| 1.09|
| Departmental Size            | .004  | .009      | 0.42  | 0.675| 1.27|
| Carnegie Classification      | -.050 | .156      | -0.32 | 0.750| 1.11|
| Faculty Rank                 | .147  | .138      | 1.07  | 0.289| 1.11|

Dependent variable: Subjective RI Factor; N=124; R\(^2\)=0.039; Adj R\(^2\)= -0.019; F (7, 116) = 0.68; Prob > F = 0.689; Mean VIF= 2.35; Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity: p<0.469

83
Overview of Findings from Hypothesis Testing

The tests of hypotheses produced interesting results with implications that will be discussed in Chapter 6, and in the end, the relationship between authentic leadership and research integrity attitudes is still very much a mystery. However, the results do indicate that, at least at the more granular level, there is a relationship between two of the components of authentic leadership and faculty attitudes towards research integrity, specifically as it relates to the objective factors. In the end, this study resulted in the following findings as they relate to the specific hypotheses it set out to better understand.

Hypothesis One: Authentic Leadership

Partial support was found for H1 which states, “Faculty will have more positive attitudes toward research integrity when they perceive their departmental leadership to be authentic.” There was support found for the influence of the self-awareness and relational transparency components of authentic leadership on the research integrity items that were part of objective RI factor. There were no findings to support the influence of the internal moral perspective components of authentic leadership on either the RI index or the objective and subjective RI factors, though these constructs work in opposing directions. Due to high values of multicollinearity, the relationship between the AL balanced processing construct was eliminated from the data analysis. This leads to a partial rejection of the null hypothesis for H1.

Hypothesis Two: Institutional Size

Hypothesis 2 states that, “Authentic leaders in smaller universities will have a weaker influence on faculty’s attitudes toward research integrity.” The data analysis
provided no statistical support for this hypothesis in any of the various regression models. As a result, the study fails to reject the null hypothesis.

**Hypothesis Three: Departmental Size**

The outcomes of the data analysis on the independent variable, departmental size, provided no statistical support for Hypothesis 3, which predicted increased departmental size would weaken the influence of authentic leadership on research integrity attitudes. As a result, the study fails to reject the null hypothesis for this variable.

**Hypothesis Four: Research Enterprise**

Hypothesis 4 states, “Authentic leaders will have a weaker influence on the attitudes towards research integrity of faculty at institutions with a larger research enterprise.” This variable was evaluated using the Carnegie classifications for the respondent’s institutions. The findings of the data analysis prove no statistical relationship between research enterprise and RI attitudes as measured by the RI index or the RI factors. As a result, this study fails to reject the null hypothesis.

**Hypothesis Five: Faculty Rank**

Finally, the study’s findings did not produce any statistical evidence to support the fifth and final hypothesis, which states, “Authentic leaders will have a weaker influence on the attitudes towards research integrity of faculty who have achieved a higher rank.” The analysis evaluated the influence of rank on the RI index and RI factors using a combination of AL variables. The lack of significant results leads to a failure to reject the null hypothesis for this variable.
CHAPTER VI

CONCLUSION

The findings from this study have likely created more questions than answers, reinforcing the impression there is still a great deal left to be explored if we are ever to gain a deeper understanding of scientific misconduct in non-clinical, public, research institutions. Nevertheless, the results of this study do point to some key conclusions that can greatly enhance the literature in both the areas of research integrity as well as organizational leadership within academia. Additional areas of research are also more clearly identified as a result of this study and those recommendations discussed later in this chapter. From a more practical standpoint, this study’s findings can help guide individuals in leadership roles at institutions of higher learning. By providing some practical recommendations, these leaders can more strategically work to build and strengthen ethical attitudes in general and research integrity specifically.

Discussion of Findings

This study on the relationship between authentic leadership and research integrity attitudes of faculty resulted in almost all of the independent variables failing to reach levels of statistical significance in their effect on the dependent variable. This outcome, however, still provides valuable insight into the relationship between research integrity and authentic leadership. Before focusing on the conclusions that can be drawn from
these non-significant results, it is necessary to discuss the implications of the elements that did provide a statistically significant relationship.

**Findings of Statistical Significance**

The findings of statistical significance in this study were found between the authentic leadership constructs of self-awareness and relational transparency and their interaction with the objective research integrity dependent variable.

**Self-Awareness in Departmental Leadership**

The first of the two constructs of authentic leadership that proved to exert a statistically significant influence on research integrity attitudes was self-awareness. This construct was found to be significant when tested against the objective RI factor in models that included the AL constructs, both with and without the additional independent variables. It was also found to have a significant relationship to the research integrity index, but the model was only significant when tested with the three AL constructs and was not significant when the additional independent variables were included.

The direction of the relationship for this particular construct is consistent with expectations set out by the Authentic Leadership Theory, which is built on the premise that leaders are self-aware and behave in a way that is consistent with their values. By modeling self-awareness to their followers, these individuals are encouraged to achieve their own heightened self-awareness and become authentic followers (Avolio & Gardner, 2005; Cianci et al., 2014; May et al., 2003). As these followers achieve their own increased levels of self-awareness, moral and ethical attitudes develop and/or are strengthened resulting in increased ethical behaviors (Avolio & Gardner, 2005; Cianci et
The findings of this study reinforce this idea. When faculty members perceived their department leadership to have a higher level of self-awareness, they achieved a more positive response to the research integrity items. The survey questions that were associated with this factor were primarily concerned with behaviors that are explicitly prohibited in federal, state, and institutional policies and regulations.

Relational Transparency in Departmental Leadership

Relational transparency is the construct of Authentic Leadership Theory where leaders represent their authentic selves to others (Walumbwa et al., 2008), promoting trust among followers. The outcome of this transparency and the trust it produces is a more engaged follower who is encouraged to be equally transparent with others (Avolio et al., 2004). This study produced some interesting findings with regards to the influence of the relational transparency construct of authentic leadership on the research integrity attitudes. Like the self-awareness construct, relational transparency was found to have a statistically significant influence on the objective research integrity factor. While the influence was also found on the research integrity index when evaluated using the three AL constructs, the model failed to reach a level of significance when additional variables were included.

What is most interesting about the results of the analysis using the relational transparency construct is the direction of the influence. Unlike the self-awareness construct, relational transparency proved to exert an influence in the opposite direction. As relational transparency increased, the research integrity attitudes moved toward the less-ethical side of the scale. Because the Authentic Leadership Theory asserts that as a result of self-awareness and relationship transparency among leaders, followers are
encouraged to become more self-aware and transparent, ultimately creating an ethical climate and influencing follower ethics (Avolio & Gardner, 2005). This, however, does not appear to be the outcome produced by this study’s findings.

**A Counteracting Relationship between Two Authentic Leadership Constructs**

It is the belief of the Authentic Leadership Theory that through the four constructs of self-awareness, relational transparency, balanced processing, and internalized moral perspective, leaders will model ethical behaviors and develop group norms that followers will align with through social learning theory (Mayer et al., 2012). In this study, we find the constructs of self-awareness and relational transparency to be working in opposite directions with regards to the ethical attitudes of faculty. The strength of these two constructs, which is relatively even, prevents any measurable gains in ethical attitudes of faculty. This finding, on its surface, leads to the conclusion that, authentic leadership is ineffective in promoting an ethical culture towards research in the departments of academic institutions. While I cannot provide any empirical evidence to refute this finding, I will offer an interpretation that explains the relationship within the context of this study’s findings and existing literature.

Self-awareness among authentic leaders is the result of a consciousness of one’s personal needs, preferences, motivations and wants (Walumbwa et al., 2008). If leaders have increased self-awareness, then the behavior of those leaders will be consistent and model self-awareness for his or her followers (Avolio & Gardner, 2005). The construct of relational transparency suggests that leaders are transparent in conveying their values to their followers and by doing so, their followers are encouraged to do the same (Avolio et al., 2004). Both constructs, in theory, work towards the promotion of a follower who is
also more self-aware and transparent in their interactions and decision making. So, what happens when the authentic leader models a respect for following institutional rules, but has an incomplete understanding of the need for those same rules? If the leader is both promoting and undermining compliance with institutional regulations through authentic leadership, their efforts become self-defeating.

The self-awareness and relational transparency constructs were primarily influential on the variable for the objective research integrity factor. This variable was primarily concerned with principles that are addressed through federal and institutional regulations and policies. As discussed in previous chapters, the primary institutional responses to research misconduct is to focus on compliance with regulations – objective RI factor. When this happens, the institution is not promoting and socializing new faculty to attend to the ethical concepts that underpin the regulations (Geller et al., 2010), instead the ethical norm is framed as compliance with the regulation (Gino & Margolis, 2011). This coupled with increasing institutional focus on outputs and not ethical outcomes (Bridges, 2007), results in an organizational culture that is stronger than the transactional leaders that live within it (Burns, 1978; Langvardt, 2012; Schein, 1993). Not only does this culture influence the likelihood for unethical conduct (Gino & Margolis, 2011), but it causes individuals within the institution to see policy and committees instead of human subjects (Bridges, 2007). In the end, faculty become incapable of recognizing ethical issues that are not covered by regulations when they arise in practice (Geller et al., 2010).

The desire for professional autonomy is intense among faculty in academia (Dill, 2012a; Gizir, 2014; Hamilton, 2006; Piccolo et al., 2010; Siddique et al., 2011; Unal & Gizir, 2014). When this is coupled with a regulatory environment and faculty are not
socialized to recognize and address ethical conflicts, the institutional entities that provide the regulations become perceived as an adversary to the scientific process. Over time, junior faculty move from seeing a need for everyone to receive continuous training in the responsible conduct of research to believing it is unnecessary when they are senior faculty (Geller et al., 2010).

When a faculty member moves into a position of leadership, in this case at the departmental level, the values and ideology that were developed through the socialization process, beginning during the graduate education, are brought with them into their new role (Dill, 2012a; Knight & Auster, 1999; Mendoza, 2008). Through self-awareness, these leaders respect the need for compliance, but do not appreciate the need for the regulation, which they see as arbitrary and ineffective (Whitney et al., 2008). Through relational transparency, these feelings are related to faculty either explicitly or implicitly, further perpetuating the compliance focused culture of the institution.

Where leader self-awareness encourages follower self-awareness in research integrity, relational transparency is further solidifying the cultural norm of compliance and devaluing the ethical constructs underlying the institutional regulations surrounding research integrity. In the end, the institutions of higher education have created a climate through structural characteristics that expose organizational members to the compliance-centered objectives and interactions that result in the development of shared meaning, ultimately creating a homogenous set of leaders to pick from (Schneider & Reichers, 1983). While many of these individuals are actually authentic in their leadership, the lack of understanding of the ethical responsibility of research will consistently create a counteracting effect with regards to these two authentic leadership constructs.
**Findings of Non-Statistical Significance and Faculty Autonomy**

While self-awareness and relational transparency were the only variables that produced significant findings, there is still much that can be uncovered from the other elements when evaluated in light of the nature of faculty and the influences on their ethical attitudes from their departmental leadership. In fact, the inability to provide evidence of influence further strengthens the assumption that faculty are inherently unique in how they are influenced and motivated by organizational leaders within the culture of academia. These non-statistical findings, further reinforces the need for greater insight into the relationship between faculty, their peers, discipline, leaders, and the organizations in which they are affiliated.

The authentic leadership construct of internalized moral perspective is an essential element of the AL theory. The leader’s moral identity is central to their overall self-conception and is directly linked to pro-social behaviors that followers should align with through social learning (Mayer et al., 2012). However, the data analysis failed to result in findings of a statistical relationship between this construct and research integrity attitudes leading to the conclusion that faculty are being significantly influenced through other means in the development of their own moral perspective. The culture of academia emphasizes autonomy above all other collegial norms (Hamilton, 2006) and faculty are typically more tightly coupled with their professional discipline than with their institutions (Clark, 2012; Dill, 2012b; Duryea, 2012; Gizir, 2014; Knight & Auster, 1999). Ultimately, this high level of autonomy and specialization can lead to reduced influence by the departmental leaders, particularly in a regulatory compliance focused institution (Clark, 2012; Gizir, 2014; Hamilton, 2006). This can, potentially, provide an
explanation for the lack of statistical influence between the authentic leadership constructs and research integrity.

The lack of statistical relationship between institutional size, department size, and Carnegie classification further reinforces the idea that profession autonomy is creating an environment where faculty are less influenced by the organization and more influenced by other variables. Autonomy increases alienation and decreasing personal identification with the organization (Gizir, 2014), ultimately weakening the influence of leaders within the institution. In addition, faculty focus more on protecting autonomy, job security, and their personal scientific reputation making factors like institution/department size and research enterprise less influential on the relationships within the organization. Where these types of factors have proven significant in other organizations and even on other outcomes within universities, such as job satisfaction and retention, the influence on development of ethical attitudes was not strong enough to obtain a measurable difference in this study.

**Recommendations**

**Recommendation for Practice**

As long as the structural characteristics and ultimate climate of an institution is built on the infinite protection of faculty autonomy coupled with compliance centered norms, influencing faculty will be a significant challenge. As in the past, influence will be sharpest during crisis management when leaders are in a state of damage-control. It is at this point that faculty will be attentive to the actions of the leaders and process contradictory behaviors in a manner that devalue the strength of the ethical norms. As this is experienced by faculty across the department or institution and sense-making
occurs, the climate is shaped in a way that threatens the validity of the ethical policies (Committee on Assessing Integrity in Research Environments, National Research Council, Institute of Medicine, 2002; Gunsalus, 1993; Mendoza, 2008; Steinbauer et al., 2014). Because the findings of this study suggest influence is more likely to occur on objective research integrity components where a lack of compliance can be directly linked back to job security— an intrinsic motivator for the autonomous faculty member, efforts should be made to ensure that the individuals in leadership support and promote the ethical underpinnings of compliance with research integrity. Departmental leadership should have significant respect for the social responsibility that comes with research and be adequately relating that value to the faculty. Ethical responsibility should be coupled to other compliance-driven processes within the department in order to achieve maximum effect. Opportunities should be taken to use these processes, reinforced through institutional norms, as a vehicle for exploring more substantive attention to research integrity topics.

Departmental leadership that is more heavily influenced by the faculty than the other way around presents some practical barriers for the institution both in areas of research integrity and beyond. Because these leaders have come for the faculty ranks as a result of the value placed on self-governance and peer review (Cohen & March, 2012; Dill, 2012a; Hamilton, 2006), they still think like faculty and not organizational leaders. Faculty view leadership as being there to support their efforts (Dill, 2012a) and department chairs are keenly aware of the power faculty have in the governing process (Cohen & March, 2012). These things can substantively limit the influence and motivation of departmental leadership when trying to make transformational changes.
within an organization. Efforts, for example, to create a cultural focus on research grantsmanship within a department that has traditionally been focused on teaching are unlikely to be successful if the individuals within the department are not fully on board with the shifting focus. If real substantive changes are going to be made in the best interest of the institution, problems within the faculty ranks must be addressed in a method that reinforces the institutional values more broadly. Because socialization occurs both formally and informally, consistency between the institutional values and the institutional responses to those who violate those values is paramount to ensure others perceive those values as non-negotiable, thereby choosing to either conform to the institutional norm or find another professional alternative.

In specific response to issues related to research integrity, the institutional approach of compliance is undermining the efforts for producing research that is at the highest level of integrity. Faculty are not encouraged to regard the social responsibility of their research practices outside of compliance with research regulations mandated from federal, state and institutional entities. Since these individuals are on the front lines of discovery, it is critical that they approach their research endeavors with the belief in their responsibility to protect the public and ensure societal benefit, not harm. To effectively communicate this ethical value, individuals who are found to be violating the social contract of scientific research should not be afforded the anonymity that so often accompanies findings of research misconduct at the institutional level. Their identity and the nature of their misconduct should be made public. As individuals who have been given the public’s trust in their intellectual pursuits, violations of that trust should be made known and individuals should be held accountable. This public accountability
protects both the public and the institution and demonstrates a commitment to a high standard of research integrity. As other faculty are made aware of the consequences of failing to conduct research with honesty and integrity, the institution is further reinforcing the normative behaviors that drive ethical research. Over time, this demonstration of institutional values and the socialization of faculty members to those values will result in a climate where leaders are more effective in reinforcing research integrity attitudes and not just promoting regulatory compliance.

**Recommendations for Future Research**

The results of this study lead to the conclusion that much is still unknown regarding academic faculty influences and research integrity behaviors. To begin closing the gap that exists in this area of research, more attention should be paid to identifying the various influences on faculty at multiple stages within their career. Focus for this area of investigation should not solely attend to the development of research integrity attitudes, but should seek to explain influences in areas where the individual faculty member is required to rely on his or her own judgement. Understanding, with greater clarity, who and what is effectively socializing researchers can help institutions tailor interventions and institute stronger safeguards to protect the culture of scientific research from the behaviors that can ultimately challenge its legitimacy.

The findings of this study consistently resulted in clear evidence that other factors outside of the department leadership, organizational characteristics, and academic rank were influencing the ethical attitudes of faculty. These ghost variables were not found in themes traditionally identified as being influential. The unique nature of faculty working in an environment built on peer-review and professional autonomy is an important
element that can call existing organizational assumptions into question. Without a better understanding of what factors shape the moral processes of an individual with great professional autonomy, there is no way to understand how to better influence, and even predict, what type of factors exert a positive or negative influence.

Additional research efforts should also include the development of an instrument that is capable of teasing out the ethical dispositions of faculty toward research conduct. As mentioned earlier, the objective research integrity factor dealt with topics that are strongly covered in regulatory policies and procedures and could result in respondents providing socially desired responses. An instrument that would more accurately measure the individual’s ethical disposition without specifically discussing the ethical construct would allow researchers to more reliably measure effects of various influences on ethical attitudes.

Finally, this research was built on the assumption that faculty are influenced by departmental leadership. This assumption should be challenged. Due to the self-governing tradition of academic institutions, more attention should be paid to the feedback loop that likely exists between the leader and follower and how that influences the leadership style and effectiveness of the faculty that move into roles as department leaders. There is variation in how institutions chose departmental leaders. In some cases, individuals are chosen to manage the department on a permanent basis while others are chosen from the faculty ranks for a set period of time. This variation has the potential to influence the style and effectiveness of departmental leadership and should be further explored.
Finally Summary

There is a great deal of literature surrounding scientific misconduct in biomedical research. Attention in this area of research integrity is critical to ensure the protection of study participants and the society that ultimately consumes the results of the research findings. Over the last few decades, greater attention has been paid to research misconduct topics outside the traditional clinical environment and more and more people are looking to assess the prevalence and cause of unethical behavior across all types of research. There is also a significant amount of research that has been conducted in the area of organizational leadership focused on the private business sector and government-run, service-oriented, offices. The focus on academic institutions of higher learning has also gained ground within the literature, but often in the context of institutional achievements related to student enrollment, graduation rates, and student affairs metrics. While this is helpful in understanding the unique structure and function of leadership within these institutions of higher learning, it rarely seeks to identify the means for which the ethical attitudes of faculty are influenced.

The current study does not provide any earth-shattering findings for how research integrity attitudes are influenced among faculty, but what it does provide is no less essential for the growth of literature and knowledge in the field of departmental leadership and research integrity. This study adds to the currently sparse literature that combines what we have learned about institutions of higher learning and the influence of leadership on faculty. By exploring the connections between research integrity and departmental leadership, this study provides insight into the strength and weaknesses of that relationship. The findings suggest that there may be additional variables not
accounted for in the existing literature that are influencing faculty, while other variables traditionally believed to be contributing factors in misconduct are not resulting in predicted outcomes.

This study results in a call for further investigation in multiple fields of research that surround the question of how we effectively influence faculty attitudes when those attitudes are based on judgements and not hard and fast rules. The chasm that exists in the research integrity literature as it relates to non-biomedical fields must be filled with the nuggets of knowledge that comes from studies attempting to chip away at the undiscovered influences on faculty.
REFERENCES

Algera, P. M., & Lips-Wiersma, M. (2012). Radical Authentic Leadership: Co-creating the conditions under which all members of the organization can be authentic. The Leadership Quarterly, 23(1), 118–131. https://doi.org/10.1016/j.leaqua.2011.11.010


APPENDIX A

SURVEY QUESTIONNAIRE
Table A.1  Part 1 of the study’s questionnaire: Departmental Leadership

The following items describe statements about your leader (department chair/head). Indicate your agreement or disagreement with the following statements using the following scale:

<table>
<thead>
<tr>
<th>Disagree Strongly</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. My leader clearly states what he/she means.

2. My leader shows consistency between his/her beliefs and actions.

3. My leader asks for ideas that challenge his/her core beliefs.

4. My leader describes accurately the way that others view his/her abilities.

5. My leader uses his/her core beliefs to make decisions.

6. My leader carefully listens to alternative perspectives before reaching a conclusion.

7. My leader shows that he/she understands his/her strengths and weaknesses.

8. My leader openly shares information with others.

9. My leader resists pressures on him/her to do things contrary to his/her beliefs.

10. My leader objectively analyzes relevant data before making a decision.

11. My leader is clearly aware of the impact he/she has on others.

12. My leader expresses his/her ideas and thoughts clearly to others.

13. My leader is guided in his/her actions by internal moral standards.

14. My leader encourages other to voice opposing points of view.
Table A.2  Part 2 of the study’s questionnaire: Research Practices

The following statements describe common hypothetical situations. Indicate your agreement or disagreement with the following statements using the following scale:

<table>
<thead>
<tr>
<th>Disagree Strongly</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: There is no right or wrong answer to any of the statements below. Please respond to all items even if it is a situation you do not typically encounter.

1. While acting as a blind reviewer, I came across some information that will help one of my own projects. The submission was not up to publication standards but I can still use the information to guide my own research.

2. My co-collaborator and I are conducting research using a dataset with sensitive information on it. Because of the risks, the dataset is restricted by IRB to only being stored on hard drives. The dataset belonging to a co-collaborator a few states away was damaged and he needs a new copy. I can temporarily upload it to the cloud long enough for him to download a copy and then remove it.

3. While reading one of the publications written by a colleague (and friend), I find that a small passage has been plagiarized. It was likely an honest error and not my business.

4. While conducting an experiment, I realize my research associate made a procedural error that skewed some of the data. Because I know exactly what she did wrong, I can easily correct the data entries to what they should be without rerunning the experiment, which would be costly.

5. Graduate students are aware of ethical practices in research. As a mentor, it is not something I need to discuss with them on a regular basis.

6. It is important to me to make sure that I contribute significantly to a publication if I am to be listed as an author.

7. It is perfectly acceptable to use my own words from previously published work without citation.
Table A.3  Part 3 of the study’s questionnaire: Institutional and Departmental Information

Please provide the most current information for your institution below. Information regarding your institutional data can be found at:

https://nces.ed.gov/ipeds/datacenter/InstitutionByName.aspx

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is your institution public or private?</td>
<td></td>
</tr>
<tr>
<td>What is the total student enrollment (undergrad &amp; graduate)?</td>
<td></td>
</tr>
<tr>
<td>What is the total number of employees with faculty status?</td>
<td></td>
</tr>
<tr>
<td>Is your institution Ph.D. granting?</td>
<td></td>
</tr>
<tr>
<td>What is your institution’s Carnegie classification?</td>
<td></td>
</tr>
<tr>
<td>How many academic departments does your institution have?</td>
<td></td>
</tr>
<tr>
<td>Does your institution have a sponsored programs office?</td>
<td></td>
</tr>
<tr>
<td>Does your institution have a regulatory compliance office?</td>
<td></td>
</tr>
<tr>
<td>Does your institution have an office to assist faculty with grant writing?</td>
<td></td>
</tr>
<tr>
<td>Does your institution have a research integrity officer (RIO)?</td>
<td></td>
</tr>
<tr>
<td>How many tenure/tenure-track faculty does your department currently have?</td>
<td></td>
</tr>
<tr>
<td>Which of the following best describes your department’s academic discipline?</td>
<td></td>
</tr>
<tr>
<td>What is the gender of your department head/chair?</td>
<td></td>
</tr>
<tr>
<td>What is the approximate age of your department head/chair?</td>
<td></td>
</tr>
<tr>
<td>Which of the following best describes your department head/chair’s faculty rank?</td>
<td></td>
</tr>
</tbody>
</table>

Table A.4  Part 4 of the study’s questionnaire: Biographical Information

This final portion of the survey asks for biographical information about you.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following best describes your rank at your institution?</td>
<td></td>
</tr>
<tr>
<td>Are you a tenured faculty member?</td>
<td></td>
</tr>
<tr>
<td>How many years have you been employed at your current institution?</td>
<td></td>
</tr>
<tr>
<td>In the last three years, how many peer reviewed research papers have you published?</td>
<td></td>
</tr>
<tr>
<td>In the last three years, how many research grants have you been awarded as either a principal investigator (PI), Co-PI, or senior personnel?</td>
<td></td>
</tr>
<tr>
<td>What best describes your graduate institution?</td>
<td></td>
</tr>
<tr>
<td>What best describes your gender?</td>
<td></td>
</tr>
<tr>
<td>What is your age?</td>
<td></td>
</tr>
</tbody>
</table>