1

Research Ethics for the Applied Economist

CONTENTS

1.1 Introduction

We were both still graduate students when we attended one of our first academic conferences, the annual meeting of the Agricultural and Applied Economics Association (AAEA), held in Minneapolis in July of 2014. That year, the keynote address for the conference was given by Brian Wansink, John S. Dyson Endowed Chair in the Dyson School of Applied Economics at Cornell University, Director of the Cornell Food and Brand Lab, Co-Director of the Cornell Center for Behavioral Economics in Child Nutrition Programs, and Co-Founder of the Smarter Lunchrooms Movement. Wansink was the author of a bestselling book, had given a TED Talk, and was a frequent commentator on national broadcast news and in print media. He was known for his research

on consumer behavior and the ways that people's environments influence their behavior beyond the neoclassical rational-actor model. His research was at the nexus of economics, psychology, marketing, and public policy, integrating innovations from each field into new insights into why people do what they do. As applied economists just starting our own research, Wansink had a career one could aspire to.

A few years later, in November of 2016, Wansink posted to his blog something that, in his conception, was designed to promote the hard work of an unpaid PhD student. The post "The Grad Student Who Never Said No" discussed how he had given data from a failed study (conducted at an all-you-can-eat Italian buffet) to the PhD student and the ways in which she worked to "make hay while the sun shines." Wansink highlighted her devotion and hard work in the post:

> Every day she came back with puzzling new results, and every day we would scratch our heads, ask "Why," and come up with another way to reanalyze the data with yet another set of plausible hypotheses. Eventually we started discovering solutions that held up regardless of how we pressure-tested them.

Wansink concluded the post by congratulating the student for her hard work and for getting five papers published during her time at his lab. "Most of us will never remember what we read or posted on Twitter or Facebook yesterday. In the meantime, this [student]'s resume will always have the five papers."[1]

However, what people took away from this blog post was not the hard work of the student, but rather the *method* of that work. Wansink discussed how he and the student re-analyzed his "failed study" with "null results" until they began "discovering solutions that held up." The post inadvertently shed light on Wansink's method of work, seemingly based on finding something - anything! - significant, rather than a hypothesis-driven test of theory. A group of PhD students and early career researchers, including Tim van der Zee, Jordan Anaya, and Nicholas Brown, began to try and replicate the four papers Wansink and his various co-authors had published from that single "failed study." They quickly uncovered numerous errors and statistical anomalies.

The discovery of issues in the Italian buffet study triggered a crowd-sourced re-analysis of nearly all of Wansink's published papers. As more and more issues came to light, Cornell University opened an investigation, and media outlets, who formerly provided favorable coverage for Wansink's "discoveries," began to cover the rapid unraveling of his research. Many of Wansink's emails to those in his lab further revealed his unethical approach to statistical analysis. He told one student to "work hard, squeeze some blood out of this rock" and another to try and find results that would "go virally big time"

[1] Wansink's blog has since been deleted. It exists, at this time, only in the Internet archives: https://web.archive.org/web/20170312041524/http:/www.brianwansink.com/phd-advice/the-grad-student-who-never-said-no.

(Lee, 2018). For one study, in which the results were significant at $p = 0.06$, Wansink wrote, "It seems to me it should be lower. Do you want to take a look at it and see what you think. If you can get the data, and it needs some tweeking, it would be good to get that one value below .05" (Lee, 2018). Kristin Sainani, a professor at Stanford, described Wansink's methods as "p-hacking on steroids" (Lee, 2018).

A series of corrections and retractions followed. In total, 40 papers with Wansink as a co-author were corrected or retracted. In September of 2018, Cornell concluded its investigation, finding that "Wansink committed academic misconduct in his research and scholarship, including misreporting of research data, problematic statistical techniques, failure to properly document and preserve research results, and inappropriate authorship" (Kotlikoff, 2018). With the threat of being fired, Wansink tendered his resignation.

And the unpaid PhD student? All five of her papers with Wansink have either been corrected or retracted. The opposite of Wansink's projection that she would "always" have the five papers.

1.2 Motivation

It was the revelations about Brian Wansink's research practices that first led us to consider the role ethics play in applied economic research - our own and field as a whole. Ethical considerations are every present in how we conduct ourselves and our research in the profession. Ethics are present when interacting with colleagues at conferences or students in a classroom. They are present when we search for new research questions and when we collect, manage, and analyze data to answer those questions. Ethics play a role in how we present and publish our research to other economists, to policymakers, to journalists, and to the general public. HBut, despite all the ways in which ethical concerns continually confront the researcher in applied economics, discussions of ethics in the profession have typically been relegated to one of two arenas.

The first arena is that of ethical obligations, or the lack thereof, that economists should adhere to when publishing research that impacts policy. The discussion in this arena tends to focus on the ethics of using economic models, such as efficient markets, or economic tools, such as marginal analysis, to investigate actions by real humans. The criticism is often two-fold: (1) models are gross simplifications based on implausible assumptions that cannot capture the richness of human interactions and (2) the focus on monetary outcomes, particularly the primacy of efficiency, reduces decision-making to a mercenary endeavor. The rebuttal to these criticisms is often the claim that economics is merely a positive science, not a normative one. Economists simply use models and modes of analysis to describe the world; it is up to those in other disciplines or in politics to decide how to use the information. Work in

the arena of ethics in economics include DeMartino (2011), Rodrik (2015), Wight (2015), DeMartino and McCloskey (2016), among others.

The second arena is the set of rules and duties that institutions, primarily Institutional Review Boards (IRBs), impose on economists and other social scientists who engage in human subjects research. The discussion in this arena tends to focus on the ethics of applying rules and regulations, developed in response to ethical violations in the medical sciences, to social science researchers. Here also the criticism is two-fold: (1) the rules and regulations governing medical research are a poor match for the ethical issues faced by social scientists working with research participants, particularly in developing countries and (2) institutions like IRBs are often more focused on legal compliance than actual ethical behavior. Rebuttals emphasize the need for efficiency in process and claims that universal standards simply form a basis or starting point for ethical review, not a final judgment. Work in the arena of institutional ethical review include Beauchamp (2005), Schrag (2010), Holland (2016), Kara (2018), Schroeder et al. (2019), and others.

Beyond these two arenas, ethics in economics has generally been ignored. Most economics programs teach research methods as part of the curriculum, but few touch on ethics beyond cursory admonitions against fraud or falsification or research findings (Josephson and Michler, 2018). The purpose of this book is to fulfill that gap by examining ethical considerations that arise throughout the research process, from initial idea to the (hopefully) long legacy of one's published research. We believe that research and ethics are intrinsically linked: doing rigorous research requires doing ethical research and vice versa. Ethics is not just a sub-topic to be touched on in a seminar on research methods. Rather, ethical considerations are present in and throughout every stage of research and we should be thinking of them and addressing them throughout the research life cycle.

That research, or science as a broad field of inquiry, is intrinsically linked to ethics is not a new idea. It originates with Aristotle, regarded as the father of science and a father of ethics. Aristotle scrutinized the natural world and, in doing so, was perhaps the first to formalize the importance of empirical measurement and research through the application of the scientific method. As scientists and researchers, we continue to apply the scientific method today. To many, the scientific method may be rote, but its importance makes it worth repeating: we observe something - a phenomenon, an experience, an occurrence - in the real world, develop a theory about why that thing might be happening, and then generate a hypothesis and testable predictions that link our theory to the original observed thing. Upon this foundation, we actually set about testing those predictions, through collecting data, making observations, and undertaking structured investigations. The outcomes of this labor will be some answer or deeper understanding of the thing we observed, or at the very least, an answer to our developed hypothesis.

This, however, is an ideal. In the real world (where we live and work and research) science does not necessarily proceed in this way. Importantly, the

process of scientific investigation is intersected throughout with the standards and norms of ethics. This book focuses specifically on these intersections and interactions and how we, as researchers, can practice and undertake ethical research in the process of scientific investigation. When people talk about research ethics they frequently focus on oaths or codes of conduct that codify established norms into a set of rules or duties. But conducting ethical research involves more than just adherence to a code of conduct. It involves the outcomes and consequences of one's decision-making during the research process. It also requires coming to believe or embodying the norms amd virtues one should aspire to. As Merton (1947) writes, norms are "binding, not only because they are procedurally efficient, but because they are believed to be right and good. They are moral as well as technical prescriptions." Understanding these various ethical frameworks and how they can compliment each other is an important place to start any work on research ethics. For, as DeMartino and McCloskey (2016) observe, ethics is not a set of rules and restrictions, "it is a conversation rather than a constraint, a dance rather than a pose."

1.3 What is Ethics?

The definition, study, and reflection on ethics or morals is its own field of philosophic inquiry. Any time someone in one discipline tries to integrate research and insights from a different discipline, it can be challenging to parse the language and modes of thought. In this section we try to open up the language of ethics and provide a non-specialist introduction to the broad categories and concepts of normative ethics. As in economics, ethics distinguishes between normative (prescriptive) and positive (descriptive). Normative ethics is about how people ought to or should make ethical decisions. Positive ethics is about how people actually make ethical decisions (Wight, 2015).

A brief review of seminal works in modern ethics reveals that definitions of ethics are not in short supply. But, for the purpose of a book on research ethics, a broad and practical definition works well:

> Ethics is the study of one's proper interactions with others: It is the analysis of right and wrong. (Wight, 2015)

Some ethicists and philosophers draw a distinction between ethics, which derives from the Greek, relating to a person's character, and morals, which derives from the Latin, relating to choice or rules (McCloskey, 2006). In this book, we will use morals and ethics as closely aligned synonyms, though we will mostly refer to ethics as that is the more common usage when discussing right and wrong in research.

Most books and papers on research ethics divide ethical approaches into one of three broad categories. These are: outcome-based or consequentialism;

duty- and rule-based or non-consequentialism; and virtue- or character-based. As with any typology, not every ethical approach fits within one of these three categories. And there is often fierce disagreement among ethicists regarding which famous philosopher belongs to which camp. (Was Adam Smith a utilitarian or a virtue ethicist?) In reviewing these broad categories of ethical thought, we are not advocating for the superiority of one over another. In fact, as we discuss at the conclusion of this section, we take a pluralist approach, which is reflected in the content of this book. We see these three approaches to ethics as complements to one another, not substitutes for one another.

1.3.1 Outcome-Based Ethics

Outcome-based ethics relies on consequentialist theories of ethics. Consequentialism, also known as teleological ethics, from the Greek "end," is so called because it maintains that the what determines if an act is ethical is the consequences, outcomes, or end of an action. The character of the actor and the intent of the act do not matter, only the outcome of the action. Thus, an arsonist, who burns down an apartment building under construction, could have committed a morally good act, if the building contractor had used shoddy materials that would have led to the collapse of the structure and the death of individuals once families moved in.

A prominent early proponent of consequentialism was the British Enlightenment philosopher Jeremy Bentham. Bentham viewed the rightness or wrongness of an action in relation to the amount of pleasure or pain it caused. In his *Introduction to the Principles of Morals and Legislation*, Bentham (1780) wrote: "Nature has placed mankind under the guidance of two sovereign masters, *pain* and *pleasure*. It is for them alone to point out what we ought to do, as well as to determine what we shall do." The ethical individual was to consider how an action would affect all others and weigh the potential pleasure and pain caused equally with their own. This idea of radical equality led Bentham to be one of the earliest and most vocal abolitionists in Britain (Wight, 2015). For Bentham, the purpose of government was to maximize the overall welfare of the populace, regardless of gender or race, and thus laws were to be judged as good or bad to the extent that they minimized pain and maximized pleasure.

The immediate problem with a consequentialist approach to ethics should be obvious to an economist: how does one measure an individual's pleasure and pain and then compare it across people? The problem was solved, at least theoretically, by John Stuart Mill who developed the principles of utility and made utilitarianism the best known form of consequentialism (Israel, 2015). Mill formulated the Greatest Happiness Principle, which states that actions should focus on maximizing the net happiness of society, measured in terms of both the quantity and quality of happiness (Mill, 1863). This allows for a distinction between the duration of pleasure/pain and the intensity or magnitude of pleasure/pain. This helps avoid unfortunate outcomes of utili-

tarianism, such as potentially justifying the perpetual torture of one person if it brings a minuscule amount of pleasure to a large number of people.

To anyone who is familiar with microeconomics, consumer theory, and welfare economics, the critiques of the application of utility theory in a consequentialist approach to ethics will come as no surprise. The most trenchant critique is that while utility allows for a theory on how to measure and aggregate happiness, it yields little practical advice on how an individual, policymaker, or government should judge different actions, policies, and laws. Even if one could measure happiness in a way that allowed for comparison across individuals, it is not at all obvious that the aggregate maximization problem would be tractable without the sort of strong assumptions used in consumer theory (e.g., separability, continuity, homogeneity).

1.3.2 Duty- and Rule-Based Ethics

Duty- and rule-based ethics is non-consequentialist, meaning it is not concerned with the outcome or end result of an action. Rather, non-consequentialism, also known as deontological ethics, from the Greek "duty," is so called because it maintains that what determines if an act is ethical is whether it conforms to some "proper" characteristic. The character of the actor and the outcome of the action do no matter, only the intent of the act. An arsonist who burns down an apartment building under construction, has committed an immoral act because destruction of property is wrong, even if burning down the building averts the eventual the collapse of the structure and the death of individuals, once families move in.

One dominant version of the non-consequentialist approach to ethics was developed by the German philosopher Immanuel Kant. Kant argued that human reason provided a means for discerning moral law, an Enlightenment version of the rules or duties present in religious systems of belief, such as the Torah, the Bible, and the Koran (Wight, 2015). In Kant's *Groundwork of the Metaphysics of Morals*, he formulates what is known as the categorical imperative: "act only according to that maxim whereby you can at the same time will that it should become a universal law" (Kant, 1785). The categorical imperative asks us to imagine a world in which everyone acted as "I" act. This differs in three important ways from the Golden Rule, "do unto others as you would have them do unto you," in three important ways (Israel, 2015; Wight, 2015). First, the categorical imperative is broader than the Golden Rule in that it asks one to consider a world in which everyone did the same thing to all others, not just to you. Second, the categorical imperative starts from a rational principle while the Golden Rule bases its morality on a tit-for-tat strategy. Third, the categorical imperative provides guidance on how one should treat oneself, while the Golden Rule is silent on this point. As Israel (2015) points out, the categorical imperative suggests that one has a moral duty to not commit suicide, because if this became a universal law it

would extinguish humanity. One cannot draw conclusions about the morality of suicide from the Golden Rule.

The challenge of a non-consequentialist approach to ethics has always been, who decides, what the moral rules are that humans are duty-bound to fulfill? For Christians, this would be the Bible and its various interpretations by Orthodox, Catholic, or Protestant theologians. For Muslims, this would be the Koran and its various interpretations by Sunni and Shiite imam. For Jews, this would be the Torah and the various Talmudic traditions. For Kant, moral rules could be discerned by reason. These and other traditions create overlapping but contradictory understandings of what is moral. Modern ethics and political philosophy has been dominated by thinkers such as John Rawls (1971), Robert Nozick (1974), T.M. Scanlon (2000), and Derek Parfit (2013). While most if not all of these philosophers would reject the non-consequentialist label, they all have worked to formulate a source or definition for the rules one should follow.

Critics of a non-consequentialist approach to ethics frequently focus on the challenge of determining the where and what of the moral rules. Related to uncertainty regarding what are the moral rules is, what does one do when duties conflict? If "do not lie" is a moral rule, then what does one do when one promises confidentiality to an acquaintance, only to learn that the acquaintance has committed a crime and one is asked to identify the acquaintance in a police line-up? For Kant, moral rules are unchangeable and absolute but he does not provide a way through conflicting situations. One may consider such hypotheticals as pedantic or nit-picking but a theory of absolutes, such as Kant's, demands to be judged by its own rules. If the system cannot provide clear answers for all situations, then its foundation may not be as strong as it claims.

1.3.3 Virtue- or Character-Based Ethics

Virtue- or character-based ethics is also non-consequentialist but differs from deontological ethics in that it is not concerned about one's duty or following rules like the categorical imperative. Rather, virtue ethics is concerned with having an excellent character that does the right thing, despite obstacles or personal costs. What matters is the character of the actor, not the outcome of the action, or the intent of the act. An arsonist who desires to burns down an apartment building under construction is immoral because they lack excellence in character, even if they fail to burn down the building or if their failure alerted building inspectors to the imminent collapse of the structure, averting the death of individuals once families move in.

Virtue ethics has a long tradition in both Western and Eastern thought. The Chinese philosopher Confucius extolled the value of virtues like benevolence and righteousness and the Buddha taught that suffering is overcome through the cultivation of virtues that free one from desire (Wight, 2015). In the Western tradition, virtue ethics begin with Aristotle, who in the *Nico-*

machean Ethics asks "what kind of person should we want to be?" and "what sorts of lives should we try to pursue?" (Aristotle, 2019). For Aristotle, virtue was not something one was born with, but something that one was taught or learned through observed behavior over a lifetime. The goal of life was *eudaimonia*, or human flourishing, which was achieved through the cultivation of the four cardinal virtues: temperance, courage, prudence, and justice. This is a positivist approach, in Greek *cataphatic* and in Latin the *via positiva*. This approach is mirrored by the teachings of the Buddha, which focuses on the Four Nobel Truths, or a path of expiation (emptying). This can be seen as a negativist approach, in Greek *apophatic* and in Latin the *via negativa*.

Virtue ethics dominated Western thought until Kant. This was mainly because of the writings of Augustine of Hippo and Thomas Aquinas that wedded virtue ethics to the Western Christian Tradition. However, with the Enlightenment, virtue ethics fell out of favor, as it was perceived to lack a rational basis for the definition of ethics. In the Twentieth Century, virtue ethics has seen a resurgence with books by the philosophers Philippa Foot (1973) and Alasdair MacIntyre (1984). Adherence to virtue ethics is common among critics of Institutional Review Boards (IRBs) and other institutions that govern research ethics using a rules-based approach. These critics point to anecdotal evidence that when vulnerable populations are asked to participate in studies, the group's relationship with the researcher - their personal beliefs in the virtue or character of the researcher - is much more salient than the promised rule-based protection of IRBs (Israel, 2015). Research ethicists like Henry Beecher (1966) and Bruce Macfarlane (2009) have argued for the cultivation of Aristotelian-type virtues by researchers, such as courage, respectfulness, resoluteness, sincerity, humility, and reflexivity. They also argue that a rule-based approach to research ethics has caused harm to vulnerable populations.

As with all approaches to ethics, virtue- or character-based ethics has its critics. The most common criticism is that virtue ethicists cannot agree on what character is, let alone the set of virtues one should cultivate in order to achieve excellence of character. As Wight (2015) points out, a virtue ethics has a troubling history, with many proponents ascribing to explicitly racial or gendered views of the world. Maybe the most infamous virtue ethicist was Thomas Carlyle, who first called economics a "dismal science" because economists like John Stuart Mill argued for abolition of slavery and equality before the law, regardless of race. For Carlyle, Africans inherently lacked virtue, and thus their enslavement was a good thing because it created an opportunity for Africans to learn virtues from their enslavers.

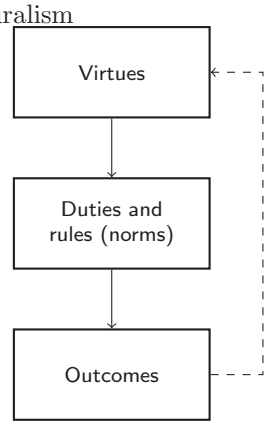
1.3.4 Ethical Pluralism

In ethics, as in economics, hard lines can be drawn between schools or branches of thought. Kant disagreed with Aristotle's approach to ethics and Bentham disagreed with Kant. Mill fiercely disagreed with Carlyle. More recently Noz-

ick's (1974) work is a direct response to that of Rawls (1971). That is not to say that ethicists are always disputatious, but it frequently can appear that this is the case, if adherence to one ethical framework means one must reject all other frameworks.

As applied economists who seek to apply ethics to research, we, personally, are pluralists when it comes to different schools of ethical thought. We consider the three approaches to ethics described above as complements to one another and not substitutes for one another. In Wight's (2015) phrase, they "do not so much *compete* with each other as *complete* each other." Figure 1.1 lays out a vision of ethical pluralism, in which the multiple ethical frameworks help explain the behavior and choices of economic actors in the real world. Ethical pluralism builds on ideas laid out by Adam Smith (1759) in *The Theory of Moral Sentiments*. Smith believed that emotions and feelings, like the special sympathy one feels towards one's children, were the source of the moral sentiments that form our set of virtues. These individual moral sentiments are then aggregated in a community to form institutions that define the norms of acceptable behavior or establish the rules of the community. The moral duties or ethical norms established by these institutions direct people's actions so as to produce good outcomes. For Smith, these good outcomes, such as greater trust in trade, reduce transaction costs and lead to greater wealth. Increased wealth allows for more leisure for developing virtuous habits and more investment in education to learn virtue (Smith, 1759). Thus, good outcomes create a positive feedback loop: a virtuous cycle.

FIGURE 1.1 Ethical Pluralism



Note: Virtues are needed for carrying out duties or adhering to norms. Adhering to norms creates a well functioning environment that leads to good outcomes. Good outcomes spur moral development that feeds back into virtues. Adapted, with permission, from Wight (2014).

A pluralistic approach to ethics is particularly applicable when thinking about research ethics. Research economists are engaged in a "marketplace of

ideas" in which they sell their research to other economists, to policymakers, and to the public. As Paul Samuelson is quoted as saying, payment to economists for the research that they sell comes in "the only coin worth having - our own applause" (Coase, 1994). To the extent that economists, like other agents in our economic models, are motivated by self-interest, they will produce ethical and rigorous research as long as the benefits outweigh the costs. However, as Wight (2015) notes, there are many reasons to believe that the market for economic research is not one of perfect competition. Asymmetric information exists. The researcher knows much more about the details of the research, and the decisions made throughout the research process, than those consuming the research. Additionally, the prestige that accrues to publications in what are considered the Top Five journals in economics creates a moral hazard problem.[2] Researchers have much to gain from a hit paper published in a top journal and little to lose, given the low probability of the discovery of fraud. Systematic efforts to replicate published research would raise the probability of uncovering fraud. But, replication remains a public good and, as such, it is under-provisioned in the absense of an explicit incentive structure to reward replicators (Christensen et al., 2019).

Given that the marketplace of ideas lacks the competitive structure to strongly incentivize ethical research, the field has generally relied on institutions to define a moral code or establish norms to govern behavior. University of Chicago professor Frank Knight, whose students included future Nobel Laureates Milton Friedman, George Stigler, and James Buchanan, wrote:

> Now scientific inquiry has, and rests upon, a moral code, or in sheer fact a "religion"; and it is supremely important that scientists recognize this fact... The basic tenet of scientific research - truth or objectivity - is essentially a moral principle, in opposition to any form of self-interest. (Knight, 1947)

For Knight, the benefits to be gained in the market were insufficient to ensure rigorous and ethical research. What was necessary was for researchers to adhere to a moral code, as if to a religion, that placed the objective search for truth above the achievement of outcomes, like the applause from one's peers. In the next section, we will discuss four of these norms that make up a moral code of scientists.

It is important to note that these institutional norms were, historically, unwritten or not codified into a code of conduct, as they are in medicine, law, psychology, or other disciplines that license practitioners. This has left, and continues to leave, institutions in the economics profession with little power to police or enforce adherence to a well-defined set of rules. In recent years, this has begun to change, with professional associations, including the

[2]The Top Five economics journals, informally measured in terms of prestige, citations, and perceived rigor are the *American Economic Review*, *Econometrica*, the *Journal of Political Economy*, the *Quarterly Journal of Economics*, and the *Review of Economic Studies*.

American Economic Association (AEA) and the Agricultural and Applied Economics Association (AAEA), establishing written codes of conduct (AEA, 2018; AAEA, 2019). This extends to the journals published by these associations, which have begun to adopt written codes regarding conflicts of interest (COI), pre-specification of experimental designs, and data and code availability (AEA, 2012, 2020; AJAE, nd).

Claiming that there are moral codes or institutional norms that govern behavior leaves an open question regarding the source of the content of these codes or how these institutions were formed. How institutions form is a question long studied by economists, such as Nobel Laureate Douglass North and likely future Laureate Daron Acemoglu. For Aristotle; the source was *eudaimonia*, for Aquinas it was the Incarnation of God in human form; for Adam Smith, it was the moral sentiments an individual learned by being sympathetic. Regardless of the source, throughout history, society, both broadly and narrowly defined, has governed itself by agreeing on a set of institutions to enforce moral codes that reflect a set of virtues or ethics closely held by individuals within that society. Frequently, power violates these moral codes and usurps these institutions, but the fundamental process of community formation remains.

Adherence to just one ethical framework or another can lead researchers to make very different choices when faced with the same ethical consideration. If a researcher follows the norms of modern best practices in econometric analysis but finds the results to be morally repugnant, is it ethical for the researcher to abandon the research and file it in their desk draw? Or does the researcher owe it to the scientific community to publish the results, regardless of how its findings are exploited by politicians? One's answer will depend on if one adheres to a consequentialist or non-consequentialist approach to ethics. As Israel (2015) points out, that different ethical frameworks lead to different choices is a chronic problem for anyone trying to make ethical decisions while conducting research. Hence, our reliance throughout this book on the pragmatic approach of ethical pluralism.

What does ethical pluralism look like for the applied economist engage in research? As Wight (2015) writes, "A *virtuous* scientist has the motive and the self-control to adhere to *duties* of honesty to others in the community, which will produce beneficial *outcomes* for that community and the wider society." Throughout this book, we focus on the norms or duties, and the outcomes, of ethical considerations that arise when conducting applied economic or any quantitative social science researchers. Ultimately, in the conclusion of this book, we circle around returning to the idea of virtue ethics, and present four virtues that we have personally found essential in conducting ethical research.

1.4 What is Ethical Research?

Much of the discussion of ethical research in science focuses on interactions with research participants, including human participants and animal subjects. There are certainly ethical concerns when interacting with research participants (which we will discuss in chapters 4 and 5), but this is by no means the only place where ethical issues arise in research.

Our obligations as scientists go far beyond simply complying with Institutional Review Board (IRB) requirements for working with research participants. They include obligations to the individuals among and communities within which a researcher exists, which includes research participants, as well as our own academic or research coterie and society at large. As Israel (2015) writes:

> Ethical behaviour helps protect individuals, communities and environments, and offers the potential to increase the sum of good in the world. As social scientists trying to make the world a better place we should avoid [or at least minimize] doing long-term, systematic harm to those individuals, communities and environments... By caring about ethics and by acting on that concern we promote the integrity of research.

To fulfill these obligations, we draw on a set of norms for researchers and scientists discussed in Christensen et al. (2019) but originally put forward by Robert K. Merton (1947) in his article "A Note on Science and Democracy."

Merton, a sociologist, viewed scientists as embedded within a community defined by social structures. These social structures are manifested in what Merton called an ethos of science - its characteristic spirit or nature. What is valuable about this ethos is that it incentivizes individual behavior, through rewards for adherence and punishments for violation by the community. Individuals internalize these norms by buying into the ethos and making it their own. Merton (1947) writes:

> The ethos of science is that affectively toned complex of values and norms which is held to be binding on the [person] of science. The norms are expressed in the form of prescriptions, proscriptions and permissions. These are legitimized in terms of institutional values. These imperatives, transmitted by precept and example and reenforced by sanctions, are in varying degrees internalized by the scientist, thus fashioning [their] 'scientific conscience.'

Most graduate programs in applied economics, economics, or other quantitative social sciences do not provide any formal training on research ethics or on the ethos of science. Rather, students tend to pick up the ethos, and other ideas about what is and is not ethical conduct in research, by learning from

others or learning from doing. But not every student has or had ethically conscious advisors who taught or modeled ethical research practices. In fact, as Christensen et al. (2019) write, "...negative lessons can be passed along this way as well."

In defining the ethos or characteristic spirit of science, Merton (1947) starts by stating the institutional goal of the scientific community: "the extension of certified knowledge." What Merton means by certified knowledge is knowledge that is logically consistent and empirically confirmed. Logically consistency requires a set of theories to explain empirical observations and then make testable predictions from that theory. Empirical confirmation requires a set of techniques that can consistently observe, measure, and validate empirical evidence and reject or fail to reject the predictions of theory. The core values of the ethos of science that have come to be called "Mertonian norms" have a methodologic rationale in that they help researchers achieve the institutional goal of the scientific community. But, Merton (1947) argues, these norms "are binding, not because they are procedurally efficient, but because they are believed right and good." One could find a different set of norms that might be more efficient in guiding researchers to achieving their goal, but Merton's norms are not just methodologically rational, they are ethically or morally right.

Merton's norms or duties are (1) universalism, (2) communality, (3) disinterestedness, and (4) organized skepticism. Conducting one's research in line with these norms brings researchers and scientists closer towards ensuring the work is rigorous, ethical, and done with integrity.

1.4.1 Universalism

The first norm is the concept of universalism; or the principle that the acceptance (or rejection) of claims does not depend on the attributes and traits of researchers or investigators themselves (Merton, 1947). Universalism is the idea that the process of research is inherently impersonal. In an econometric sense, the researcher's identity is orthogonal or exogenous to the discovery. Regardless of who is doing the research, the laws, theories, and principles of science do not vary or change. And, by extension, the laws, theories, and principles of science are sound, regardless of who may have discovered them.

Universalism suggests a sort of egalitarianism, in which science cannot be corrupted by power. It envisions science to be an egalitarian space in which anyone with training and opportunity can advance science (Christensen et al., 2019). Scholarly contributions come from achievement in making those contributions, rather than one's social origins. The natural extension of these two definitions of universalism is that by taking all achievements and findings, regardless of who discovered them, science is able to advance more quickly. Science not only benefits from the diverse backgrounds, perspectives, and history of researchers, but simply having many hands in the fields can make light work.

An example of the triumph of universalism is the story of Srinivasa Ramanujan, an Indian mathematician. Almost completely without formal training, Ramanujan did most of his research alone (Kanigel, 1991). Only in 1913, when he began a correspondence with University of Cambridge professor and mathematician G.H. Hardy, was his genius fully appreciated, at least by the Western world. Hardy wrote that Ramanujan's work "defeated me completely; I had never seen anything in the least like them before" (Hardy, 1940). Ramanujan moved to England in 1914, where he spent five years, earning a Bachelor of Arts by Research, as well as being elected to the London Mathematical Society, a Fellow of the Royal Society, and a Fellow of Trinity College. He completed no further degrees, but during his life, Ramanujan compiled nearly 4,000 results, opening new areas of work and inspiring scores of future research and pathways of investigation. Unfortunately, Ramanujan passed away at the age of 32, from (likely treatable) amoebiasis, which resulted from untreated amoebic dysentery (Young, 1994). Even in these mere three decades, he contributed enormously to the advancement of mathematics and science, at large.[3] A journal exists in his name, dedicated to advancements on his works. His contributions to science are enormous and demonstrate - almost ideally - the norm of universalism.

However, even a passing familiarity with Ramanujan's life shows how precarious universalism can be as an operating norm within the scientific community. Universalism exists as much as an ideal as a practiced value. Throughout history, there are numerous cases of individuals or types of people excluded from science, or with their contributions to science entirely overlooked. The world is fortunate that G.H. Hardy adhered to universalism as a norm, providing space and an arena for Ramanujan to do his best work. But not everyone holds as strongly to universalism. Consider the life of Rosalind Franklin, a chemist and X-ray crystallographer whose work was integral to the discovery of DNA - but whose contribution was not credited when Francis Crick and James Watson published this discovery (Maddox, 2003). One need not look into the distant past to discover examples of the lack of universalism. Presently, one need look no further for evidence of this than citation counts: scholars of color and women scholars are less frequently cited. They are also more likely to have their findings attributed to their white, male colleagues (Kwon, 2022).

Though many of us may hold to universalism in science, we continue to fall short of equity in opportunity. We have a long way to go, but can only achieve

[3] A favorite contribution of ours is the Hardy-Ramanujan number 1729. The story goes that Hardy was visiting Ramanujan at the hospital. Hardy remarked that his taxicab number (1729) seemed a rather "dull one" and he hoped it was "not an unfavorable omen." Ramanujan replied that in fact, 1729 as a very interesting number: "it is the smallest number expressible as the sum of two cubes in two different ways." The two different ways are: $1729 = 1^3 + 12^3 = 9^3 + 10^3$. This has given rise to the idea of the "taxicab number," of which only six are known.

ethical research by continuing to work towards universalism and promoting the norm within our own work, citations, and practice.

1.4.2 Communality

The next norm is communality, which Merton (1947) actually termed "communism"; or the idea that scientific progress involves the entire community of researchers through a process of open exchange and discussion. Merton (1947) argues that true advancements in science are (1) the product of social collaboration and (2) the scientific achievements are "assigned to the community." The motivation behind the first component of communality is the idea that science is inherently collaborative, an idea we will discuss in chapter 3. The second component of communality is that the "property rights" to a discovery are claimed by the entire scientific community, not an individual researcher. The only "property right" an individual researcher may claim is the recognition and esteem of their peers for the discovery, Samuelson's "con of the realm".

Sharing of information is inherent to the advancement and improvement of science. After all, publication of one's findings is usually the final step in a research project. Because of this, most scientists and researchers probably believe, reflexively, that they practice and value communality. Yet, as we will discuss in chapters 6 and 7, few actually promote what could be considered "radical" communality, through adherence to the principles of open science, including the sharing of all data and code for their work. Sharing data and code with the related paper is necessary for true communality, as this openness allows others to review those findings and build on that work. If one does not share their work with the scientific community, then time and money may be wasted reproducing existing work or investigating uninteresting, unimportant, or already studied areas. Sharing one's work encourages the widespread improvement of science, by allowing the field to advance step-by-step, building on others' work and experiences.

A shining example of communality is the golden age of theoretical and experimental physics that occurred between the end of World War I and the start of World War II (Rhodes, 1986). In 1919, Ernest Rutherford first split the atom, allowing researchers the first opportunity to study its nucleus. Over the next 23 years, a constellation of theorists and empiricists worked in international collaboration (and in competition) to theorize about the properties and powers of the atom and to build machines to test those theories. In 1929, American Ernest Lawrence designed and built the cyclotron, the first particle accelerator, necessary for observing the nucleus of an atom. In 1932, British James Chadwick, discovered the neutron, a previously unknown subatomic particle. In 1933, Hungarian Leo Szilard first theorized the possibility of a nuclear chain reaction. In 1938, Germans Lise Meitner and Otto Frisch were able to artificially start the process of nuclear fission. And in 1942, Italian Enrico Fermi built the first self-sustaining nuclear chain reaction, the first nuclear re-

actor, under the stands of the football stadium at the University of Chicago. As each discovery occurred, the physicists would write up a brief letter to the journals *Nature* or *Science*, sharing their discoveries. These letters were often written up the same night as the discovery and mailed the next day. After publication, other researchers would immediately begin to replicate the experiment or re-prove the theory, jump-starting the race to the next major advancement. In a case extreme only for its incredible speed, on the morning of 13 September 1933 Leo Szilard read an article in *The Times of London* quoting Rutherford's description of Chadwick's discovery of the neutron. That same day Szilard conceived of the idea of a self-sustaining nuclear chain reaction (Rhodes, 1986). The openness in sharing of these discoveries, though not the international collaborative nature of them, ended abruptly with the start of World War II and the creation of the Manhattan Project to build the atomic bomb.

While researchers continue today to advocate for communality and push for open science, the research landscape today looks very different than it did in the 1920s and 1930s. Today, most research universities have campus offices whose sole purpose is to patent new discoveries and then sell those patents or spin them off into potentially lucrative start-ups. Academic researchers have learned that retaining property rights to their ideas can be much more profitable than publishing their findings in a journal. Nowhere is this shift against communality more prominent than the pull of Silicon Valley (Christensen et al., 2019). Consider the case of Elizabeth Holmes and her company Theranos (Carreyrou, 2018). Holmes left a promising academic career while an undergraduate student at Stanford University to pursue the privatization and monetization of her idea for a new way to do blood tests. Over the life of her company, she was able to attract numerous academics who traded the ability to publish their research for higher salaries. Even among Silicon Valley start-ups, Theranos was extremely secretive. In fact, it was an article by John Ioannidies in the *Journal of the American Medical Association*, noting that no peer reviewed papers had been published by Theranos scientists, that, in part, lead to John Carreyrou's exposure of fraud at Theranos (Carreyrou, 2018).

While communality may no longer be a norm universally held by researchers, there are those pushing back against the commodification of science. These include movements to promote open access publication, open source software and engineering, and open science. A leader in this cause is the Center for Open Science (COS), which works to create incentives for researchers to commit themselves to make the process, content, and outcomes of research more open and accessible (COS, nd).

1.4.3 Disinterestedness

The third norm is the concept of disinterestedness; or the idea that demands the work of scientists is and should be remain uncorrupted by self-interested motivations (Merton, 1947). Disinterestedness should not be confused with a

lack of passion or a concern for humanity. Most researchers got involved in their field because of a passion for knowledge or a keen interest in helping improve the world through scientific discovery. These altruistic motivating factors are important for spurring on rigorous research. What disinterestedness entails is that a researcher must report findings simply as they are, even if this goes against general wisdom, one's own beliefs, or self-interest in some other way.

Disinterestedness is easily connected to the value of universalism: anyone can contribute to science and contributions can be of any sort, as long as they are founded within ethical and disciplined work. And, like universalism, disinterestedness can be difficult to maintain, given that researchers are human beings and - despite our best efforts - personal considerations and emotions often enter the research process. There are multitudes of situations in which one's personal, professional, moral, or religious tenants or convictions might intersect with one's research. After all, we tend to select topics for research which are interesting and close to us. It can be personally challenging when the outcome of one's research does not comport with one's closely held prior beliefs about what the outcome *should* be. In chapter 2 we discuss the challenge of being too interested or too close to a research topic. And in chapter 3 we discuss how researchers can use pre-analysis plans and hypothesis registries to pre-commit themselves to releasing results regardless of findings.

Examples of disinterestedness can be hard to come by, as the norm typically applies during the research process. But in 2021, evolutionary biologist Ken Thompson, a fellow at Stanford University, exemplified disinterestedness when he called for the retraction of one of his own papers (Enserink, 2021). As an undergraduate, Thompson had been the lead author on a paper with Steven Newmaster, a distinguished professor at the University of Guelph, who had generated over $7 million in funding. Thompson's paper compared two different ways of identifying plant species: traditional morphological distinction or extracting DNA and using barcodes. The paper was published in *Biodiversity and Conservation* (Thompson and Newmaster, 2014). Despite the journal's replication policy, the data used in the paper (which was Newmaster's) was never made public. After pressing for publication of the data, it was finally posted in 2020. However, when Thompson re-examined the data, he discovered he could no longer replicate the results in his paper and that the data appeared to be a slightly altered version of publicly available data from a different lab. As Enserink (2021) recounts, Thompson contacted the University of Guelph, pressing for an investigation of the paper. The University began an "initial inquiry" but nothing came of it. Thompson also asked the editor of *Biodiversity and Conservation* to retract the paper, but he was told that the journal would only issue a retraction if Guelph concluded there was misconduct. Unfortunately, a spokesperson at Guelph stated that "details and outcomes of specific allegations are confidential." Eventually Thompson went public and spoke with reporters, leading to the editor of *Biodiversity and Conservation* granting the requested retraction. The retraction note states that Newmaster

"has not responded to any correspondence from the Editor or publisher about this retraction" (Thompson and Newmaster, 2021).

A spirit of disinterestedness is difficult to maintain. After having made a few contributes to a specific area, it can be hard not to want all of one's work to confirm what has come before, particularly what one themselves may have contributed before. An investigation in *Science* recently alleged just such a failure in disinterestedness by a leading researcher in Alzheimer's disease may have affected the entire field of research on the disease for decades (Piller, 2022). Sylvain Lesné, a researcher at the University of Minnesota, was the lead author on a paper published in *Nature* that purported to discover a connection between memory loss and a previously unknown protein, amyloid beta star 56 (Aβ*56) (Lesné et al., 2006). The amyloid hypothesis of Alzheimer's holds that build-up of Aβ proteins in brain tissue inhibit health function, causing the disease. Lesné et al. (2006) was the first to show that a specific type of Aβ, when injected into mice, caused memory impairment. The paper, which is the fifth most cited paper in basic Alzheimer's research since 2006, led to a tenure track faculty position for Lesné, an R01 grant from the National Institutes of Health (NIH), and numerous other publications on Aβ*56, with Lesné as either lead author or senior author. As Piller (2022) reports, several researchers, operating independently, have called into question 10 of Lesné's papers, identifying tampering and duplication of images purporting to show the presence of Aβ*56. Almost no other lab, outside of Lesné's, has ever published a paper that detects Aβ*56, and at least two papers have been published about failure to detect Aβ*56 when it was supposed to be present (Piller, 2022). It now appears that Lesné, having made a name for himself in a paper claiming a link between Aβ*56 and memory loss, has engaged in research misconduct in order to maintain his original claim and advance his career (Piller, 2022).

For science to be accepted and held to be true, it is essential for researchers to be disinterested. Even if one's findings do not align with expectations, it is important to disseminate the work for the wider community. As Christensen et al. (2019) write: "for social science to be credible, researchers must be committed to making result public regardless of their perceived implications. Otherwise, those who would dismiss social science findings as ideologically biased have a point." To protect science and to ensure it is not perceived as slanted or biased, we must value and promote disinterestedness.

1.4.4 Organized Skepticism

The last norm is organized skepticism; or the idea that one must suspend judgment until all the facts are in (Merton, 1947). That is, one should not believe everything one hears or reads and should not simply take things at face value. There are more idioms that one could use to describe organized skepticism, but they all coalesce around the idea that one should question results with a detached scrutiny. To some extent, this is inherently a part of science:

we complete proofs; we test and retest theories; we replicate and reproduce experiments. We do not just take someone at their word that something is. Part of science is testing to ensure that it really is.

Organized skepticism, and the value of questioning in general, is inherent to the process of science - and even more important in the process of ethical science. Skepticism involves not only questioning the work of others but preparing for one's own work to be questioned. In chapter 5 we discuss preparing replication packages to allow for one's work to be examined and replicated by other researchers. Merton (1947), though, extends organized skepticism beyond just the close examination of how research was conducted. He writes that in our role as investigators, we should be skeptical of *all* things. In particular, we should not restrict ourselves to topics which are socially acceptable, trendy, or promoted by those in power. As Christensen et al. (2019) simply state: "the ideal is to critically examine everything."

An example of organized skepticism is the long history of Fermat's Last Theorem. Pierre de Fermat was a French mathematician who contributed to several fields in mathematics, most prominently number theory. In the margin of his copy of *Arithmetica* by the Greek mathematician Diophantus, Fermat wrote:

> It is impossible to separate a cube into two cubes, or a fourth power into two fourth powers, or in general, any power higher than the second, into two like powers. I have discovered a truly marvelous proof of this, which this margin is too narrow to contain. (Singh, 1997)

Essentially, the equation $a^n + b^n = c^n$ has no solution when $n > 2$. The conjecture was published in 1670 by Fermat's son (Singh, 1997). For 350 years mathematicians remained skeptical that Fermat had indeed proven his theorem, and, as hundreds of claimed proofs were shown to be false, the search for a proof became one of the great unsolved math problems in history. Finally, in 1993, Andrew Wiles claimed to have successfully completed a proof, presenting his findings at a conference. While many assumed Wiles' proof was likely to be correct, it was not blindly accepted as such (Singh, 1997). In fact, as mathematicians examined the proof, a flaw was found, requiring Wiles and a former student, Richard Taylor, to spend more than a year trying to repair the proof. Finally, in 1995, *Annals of Mathematics* dedicated an entire issue to the original Wiles proof and the Taylor-Wiles repair (Wiles, 1995; Taylor and Wiles, 1995).

While skepticism may seem like second nature to research-minded individuals, it is all too easy to be lulled into naive acceptance of the dominant paradigm in one's field of study. A classic example of this is what Stephen Jay Gould and Richard Lewontin call the Panglossian paradigm (Gould and Lewontin, 1979). Dr. Pangloss is a character in Voltaire's comic novel *Candide* who, when confronted with anything pleasant or unpleasant, claims "things cannot be other than they are" (Voltaire, 1759). In discussing the Lisbon earthquake of 1755, which killed 50,000 people, Dr. Pangloss says, "all is for

the best, for there is a volcano at Lisbon, it could not be anywhere else. For it is impossible for things not to be where they are, because everything is for the best" Voltaire (1759). Gould and Lewontin (1979) use Dr. Pangloss to criticize a school of thought in evolutionary biology that assumes every trait of every plant and animal must be an efficient adaptation, optimally designed by natural selection. Adherence to this school of thought, Gould and Lewontin (1979) claim is characterized by "a lack of suspicion that a different kind of explanation might be required." Some adherents of this school, as quoted by Gould and Lewontin (1979), write that the results of their study are consistent with their prior theory, "as we presume any careful study would [be]." Gould and Lewontin (1979) point out that a theory that cannot fail in careful study is not a particularly useful theory. In a particularly piquant metaphor, Gould and Lewontin (1979) claim that many in evolutionary biology have mistaken the spandrels of San Marco Cathedral in Venice as existing for the purpose of containing painted images of the Christian faith as opposed to existing as the architecturally necessary feature of round domes supported by a square base. Spandrels exist as a necessary by-product of the architectural design, and once they exist, they are put to use. In economic terms, those that Gould and Lewontin (1979) criticize have reversed the causality, thinking that if spandrels are painted they must exist for that purpose. Dr. Pangloss and his followers fail to exert sufficient skepticism, accepting that "everything is made for the best purpose" (Voltaire, 1759).

Organized skepticism should be an integral part of the research process. It requires proof and verification of that proof, before a fact is accepted as such. It requires challenging the status quo, which involves challenging positions of power, and that can be difficult for those not protected by institutional guards, like tenure at universities. Any time power is involved, there are ethical issues at stake. Ensuring that others can practice and undertake challenges to the status quo is integral to the exercise of ethics in applied economics, both for ensuring the value of organized skepticism, but also for encouraging adoption of the virtues of universalism, communality, and disinterestedness, as well.

1.5 The Role of Ethics in Economics

Good research should be ethical. And ethical research should adhere to the four Mertonian Norms discussed above. However, just because we as individuals may hold to these norms, that does not mean that other researchers will. Making economics an ethical science is a collective action problem. An individual may hold their research to high ethical standards, but another individual may, in the interests of career advancement, forgo these norms, refraining from sharing their data and code and falsifying their results in order to place papers in better journals. If the economics community fails to identify and punish the

unethical researcher - i.e., fails to exert the norms of science on the members of the community - then the incentives for other researchers to conduct ethical research are diminished. This could result in a low-level equilibrium, where unethical individuals and their research dominate the field.

Ethical failures in economics are well documented (Ferguson, 2010b; DeMartino, 2011; Wight, 2015; DeMartino and McCloskey, 2016; Searing and Searing, 2016b; Christensen et al., 2019; Lee, 2018). ANd we will discuss many of these failures throughout this book. Yet, it is difficult to know just how pervasive unethical research is in economics because (1) it is difficult to determine the probability of getting caught and so determine the overall rate of unethical conduct (Becker, 1968), and (2) it is difficult to distinguish between unethical research and sloppy research (Ioannidis, 2005). One way to, at least tangentially, determine how pervasive research misconduct is, is to ask researchers directly about their beliefs and practices, in terms of their own behavior and their perceptions regarding the behavior of others.

Anderson et al. (2007) report results of a survey they conducted of U.S.-based researchers and Mertonian norms. The survey of 3,247 researchers is based on representative sample of researchers who have received funding by the the NIH. The sample is split into early career researchers and mid-career researchers, the later defined as those who had received R01 funding for their lab. The survey collected information about the four Mertonian norms plus four counter-norms: particularism (counter to universalism), secrecy (counter to communality), self-interestedness (counter to disinterestedness), and organized dogmatism (counter to organized skepticism).[4] Table 1.1 presents definitions of these counter-norms along with the already discussed norms.

In the survey, Anderson et al. (2007) asked respondents to rate their support of each norm and each counter-norm in terms of (1) their own subscription, (2) enactment, and (3) perception of other's typical behavior. For subscription, respondents were asked "for each item [norm or counter-norm], please indicated the extent to which you personally feel it *should* represent behavior of scientists." For enactment, respondents were asked "please indicate the extent to which it represents *your own* behavior." And for the assessment of others, respondents were asked "please indicated the extent to which you feel that it *actually does* represent *the typical behavior of scientists*." Respondents could choose: too a great extent (2), to some extent (1), or very little or not at all (0). Anderson et al. (2007) sum up the scores for all the norms and than compare them to the same individual's sum of scores for the counter-norms.

Figure 1.2 summarizes the main results in Anderson et al. (2007), with findings divided by if the respondent was early or mid-career. The figure shows the percentage of respondents whose norm scores are higher than, equal to, or lower than their counter-norm scores. The top two bars compare early and

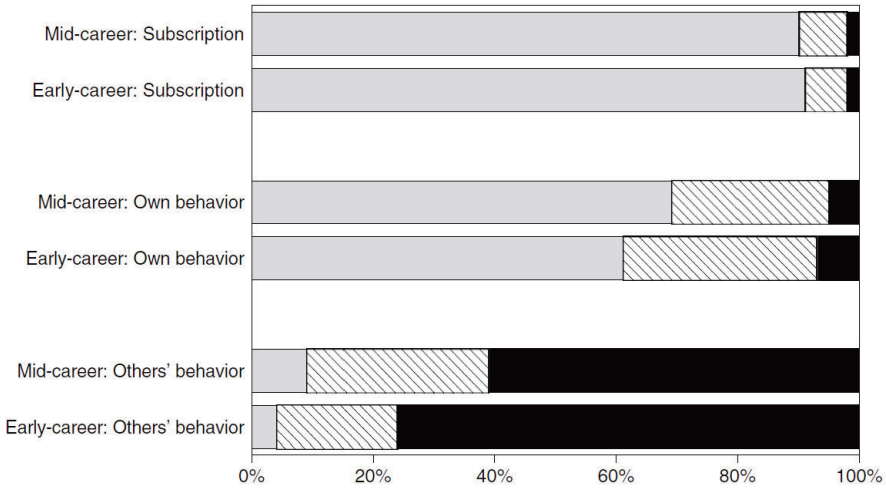
[4] Anderson et al. (2007) add to their survey two additional norms (with counter-norms): governance (administration) and quality (quantity). Christensen et al. (2019) discuss these in more detail.

TABLE 1.1 Mertonian Norms and Counter-norms

Norm	Counter-norm
Universalism Researchers evaluate research solely on its merits, contexualized by commonly accepted standards in the field.	**Particularism** Researchers assess new knowledge, in the context of the reputation and past productivity of the individual or research group who generated the knowledge.
Communality Researchers share findings with colleagues.	**Secrecy** Researchers protect their newest findings to ensure priority in its dissemination.
Disinterestedness Researchers are driven by the desire for knowledge and discovery, and are not solely motivated by opportunities for personal gain.	**Self-interestedness** Researchers compete with others for funding and recognition.
Organized Skepticism Researchers consider all evidence, hypotheses, theories, and innovations, even those that challenge or are counter to their own work.	**Organized Dogmatism** Researchers invest only in promoting their own most important findings, theories, or innovations.

Note: Table reproduces information from a similar table in Anderson et al. (2007)

FIGURE 1.2 Perceptions of Behavior by Researchers



Note: Percentage of respondents with higher norm scores than counter-norm (norm > counter-norm) are represented with light gray dots. Percentage of respondents with norm scores equal to counter-norm (norm = counter-norm) are represented with striped lines. Percentage of respondents with lower norm scores than counter-norm (norm < counter-norm) are represented with solid black. Figure comes from Anderson et al. (2007).

mid-career researchers and their own subscription to the Mertonian norms. Around 90 percent of researchers, regardless of career stage, claim that the norms *should* represent researcher behavior, with 70 percent rating norms and counter-norms equally, and only 1-2 percent rating counter-norms higher than norms. We begin to see a divergence between early and mid-career researchers when they are asked about the role norms play in their own behavior. For early career researchers, 60 percent enact the norms more than the counter-norms while close to 70 percent of mid-career researchers claim to enact the norms. Fewer early career researchers (27 percent) rate the norms and counter-norms equally in their own behavior compared to mid-career researchers (32 percent). Similar differences exist for those who rate their own behavior as more counter-normative than normative (5 percent for early career compared to 7 percent for mid-career).

The largest differences, what Anderson et al. (2007) term dissonance, occurs when each group is asked about the behavior of others. Nearly 80 percent of early-career researchers believe that counter-norms dominate norms for other researchers and only four percent view the research of others as being dominantly normative. This compares to a (slightly but significantly) rosier outlook for mid-career researchers, where only 60 percent think that counter-norms dominate the behavior of others. Anderson et al. (2007) interpret these results as reflecting a distrust of other researchers, manifesting in dissonance between the beliefs and behavior of respondents. Nearly all researchers subscribe to the norms but, given that a majority think other researchers are behaving unethically, their own behavior is more unethical than their beliefs would dictate. This hints at a low-level equilibrium where individuals believe that everyone else is behaving badly and so they must act similarly. That the dissonance is greatest among early career researchers, still trying to make a name for themselves, provides further evidence of this collective action problem.

Anderson et al. (2007) is based primarily on researchers in health science but, as Christensen et al. (2019) write, there is little reason to think these trends do not also reflect the state of research ethics in economics, sociology, political science, or other quantitative social sciences. Competing interests between researchers over tenure, promotion, publication, funding, etc., create incentives to engage in scientific misconduct, particularly if one believes that others have not internalized an agreed upon set of scientific norms. Addressing these competing interests is not simply a mechanism design problem, where one tries to align incentives in a way that is both acceptable and efficient. This is because the conflicts between researchers create externalities that affect others in the research community as well as the myriad other communities of people that contribute to and are impacted by economic research. This complex web of interactions - much more complex than can be represented by a tractable mechanism design problem - is why we agree with Peterson and Davis (1999), who argue that "there is an unavoidable link between ethics and economic analysis." When our research is based on data the represents people

and when our results are designed to influence decision-making and policy, applied economists must, of necessity, be concerned with, in the words of the philosopher T.M. Scanlon "what we owe each other" (Scanlon, 2000).

In particular, as applied economic researchers we have an obligation to:

- Our fellow researchers, both our colleagues and students and associates who work for us;
- Our research participants, whether or not we personally collected data from them;
- Our students, for those engaged in teaching, training, and education;
- The broader scientific community, to which our research aspires to add true, new knowledge;
- Society as a whole, to which our research aspires to affect and influence.

In chapter 2 we will discuss in more detail what a researcher owes to each of these communities. For now it is sufficient to say that, regardless of what type or mode of ethics one adheres to, and regardless of what individual or which community one is interacting with, there are basic actions that define the role of ethics in economics. These actions are: protect others, minimize harm, and increase good; assure trust; ensure the integrity of work; and satisfy institutional, professional, and industry standards and guidance (Israel, 2015). What these actions look like when faced with a specific ethical issue or dilemma is context dependent. Providing a practical guide to ethically navigating these various contexts is the purpose of this book.

1.6 Guide to this Book: The Research Life Cycle

Ethics is rarely if ever incorporated into teaching or learning about how to do research. It is typically a chapter or a week in a research methods course and often the focus is on IRB. We have designed this book to discuss ethics at all stages of the research process. To facilitate this, we have structured the book to follow a stylized "life cycle" of a research idea, with each chapter representing a new stage or phrase in the process. Figure 1.3 visualizes this life cycle, which we originally developed in Michler et al. (2021).

We divide the life cycle into three stages, which begins with (1) an initial idea, including idea and project development (chapters 2 and 3); moves into (2) data collection, management, and analysis (chapters 4, 5, and 6); and finally concludes with processes of (3) publication and dissemination efforts both inside and beyond the academy (chapters 7 and 8). The life cycle starts with the genesis of an idea, the formulation of a research design, and securing

funding for the work. The second step of the life cycle is project development, in which the researcher builds their research team and develops a plan for the work. This is followed by the collection, management, and analysis of data, and academic dissemination stages, which often involve overlap in the timeline. The final step of the life cycle is dissemination beyond the academy in the hopes that the research has impact on the larger community. This stage can extend far into the future, long after the researcher has moved on to other ideas. The life cycle presented is, of course, a stylized rendering of the research process and any given research project need not map exactly to this structure. We discuss each of these stages in more detail, highlighting some of the ethical considerations in each.

The life cycle of research begins with the germ of an idea. The researcher seeks to develop this germ into actionable research by formulating an appropriate research design. Applied economists select topics to research for a variety of reasons, affected by the economist's interests and incentives. In these early stages of research, it is essential for us to clearly define and delineate our responsibilities as researchers to our research communities, both local and global. Another influential and important component of the early stages of research, which ultimately affects which research ideas grow and which ones fail to flourish, occurs when researchers seek external funding for their ideas. Ideas attract or fail to attract funding for a number of reasons. But, the ability to attract funding often determines what research questions become actual research projects.

Once a research idea has been developed into a project and any necessary funding has been secured, the next stage in the life cycle is the assembling of the research team and detailed planning of the research design. In recent years, applied economists have begun using pre-analysis plans to help guide research design and help ensure ethical, transparent, and reproducible research (Janzen and Michler, 2021). As Angrist and Pischke (2009) suggest, steps taken at this initial stage narrow the range of questions that can be addressed later.

Having finalized the project elements, the researcher begins to interact with research participants. Though there are innumerable types of research participants, due to the breadth of research in the field of applied economics, the process and procedures of these interactions are governed by IRBs. Many view IRB policies as burdensome, a poor fit for much of social science research, and more focused on compliance than the actual ethics of the research (Schrag, 2010; Van Den Hoonaard and Hamilton, 2016; Josephson and Smale, 2021). But, the harms that can come to research participants may not be trivial, even within the social science. Because of the potential harm, IRBs are distinctive in the research life cycle as they serve as ex-ante gatekeepers, providing a license to conduct each research project one at a time, instead of a blanket license to an individual researcher. This is akin to licensing airplane takeoffs, one flight plan at a time, instead of granting a blanket license to an airline.

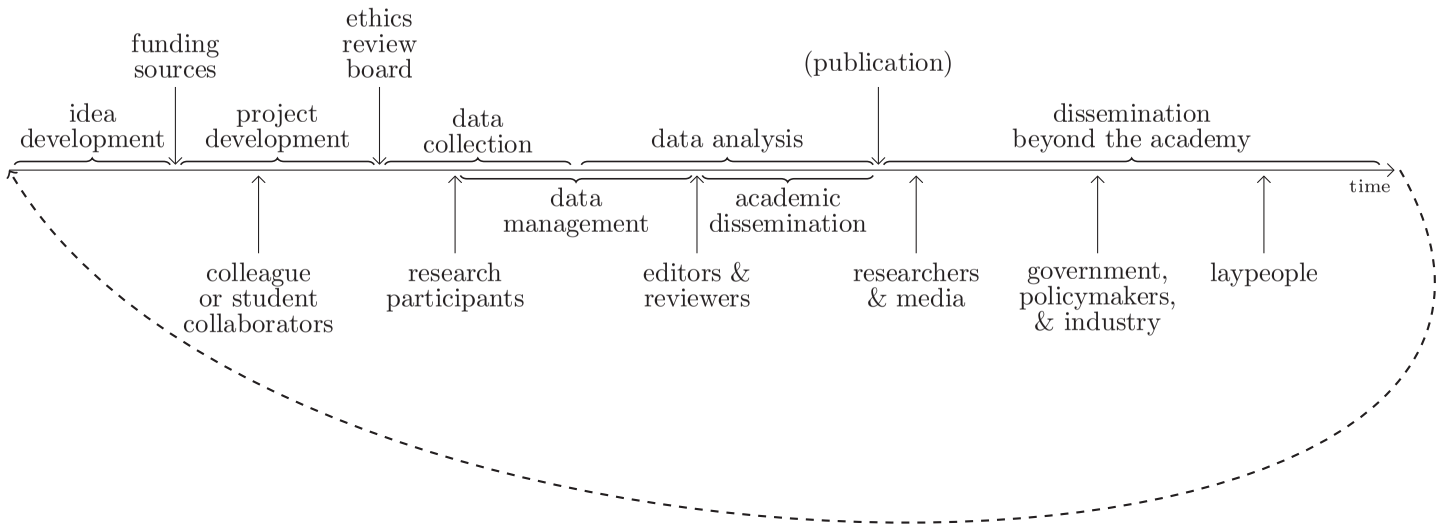
The next two stages in the life cycle of a research idea (data management and data analysis) frequently overlap with the penultimate stage, dissemina-

tion to the academy. Data management is a process that begins with data collection and extends far beyond publication. This is because IRBs typically require maintenance of data for at least six years and the preservation of participant privacy and data confidentiality in perpetuity. In terms of data analysis, initial results are typically presented at conferences, seminars, and workshops where feedback is sought to improve the analysis. During this stage of the life cycle, researchers interact with colleagues at academic events and begin the process of publication. These activities are governed by explicit rules (IRB requirements), codes of conduct (journal or association policies), and implicit expectations in terms of how one analyzes data (Lybbert and Buccola, 2021). Codes of conduct stipulate behavior at institutional and association sponsored events and are more concerned with the ethics of interpersonal interactions than with the ethics of research (AEA, 2018; AAEA, 2019). Additionally, publication policies now define a variety of criteria that must be met for research to be deemed ethical and thus acceptable for publication.

The last stage of the life cycle of a research idea is the impact it has on researchers and media, government, policymakers, industry, and, finally, the public. Generally, this impact begins during the process of dissemination with fellow researchers and the scientific community. In recent years, the media has played an increasingly important role in disseminating research, amplifying findings and influencing the policy which results from research work. Administrators at universities and other institutions have taken notice and begun rewarding researchers who gain fame by appealing directly to the media and policymakers. It may be the case that the push at research institutions for "impact" beyond than scientific contributions is changing how and what research is done.

Within this life cycle, the researcher is required to, at several stages, verify their adherence to explicit ethical criteria. Without IRB approval or signed conflict of statements, research is likely to end prematurely. However, there are many other stages in the research life cycle that are not governed by explicit ethical criteria, though implicit norms within the field exert influence on the researcher. Potentially the most critical stage in the life cycle is the initial one, where ideas are formed and research is designed. Many of the considerations and pitfalls of ethical behavior that a researcher faces during the life cycle arise at this earliest of stages. Throughout this book, we use this life cycle of research as a framework to delve into the components of the life cycle in depth.

FIGURE 1.3 Life Cycle of a Research Idea



Note: Image represents a stylized life cycle of a research idea. Braces represent stages in the life cycle and correspond to the chapters in this book. The arrows represent individuals, communities, or institutions that a researcher interacts with at each stage of the life cycle. Adapted from Michler et al. (2021).

1.7 Conclusion

Throughout this book, we will present a variety of ethical issues and considerations that arise at every stage of the life cycle of a research idea. Some issues, like human subjects research or p-hacking, are well documented and discussed extensively in the existing literature. But many issues, such idea generation or working with the media, are less discussed, at least in the formal academic literature. In many places, we provide our own personal opinion on what constitutes the ethically correct action. In these cases, we are guided by our approach to ethical pluralism and our adherence to Mertonian norms. That said, we do not claim to have the solutions to all the issues raised in this book, nor do we claim to be arbiters of ethical behavior in the profession. We present issues, solutions, and ideas, hoping to serve as a guide for economists struggling with how to conduct their own ethical research. In reading this book, it is useful to remember that ethics is ongoing in any project, changing throughout the course of research and requiring continuous re-examination and re-commitment.

In addressing research ethics, we cover a wide range of issues, but our coverage is far from exhaustive. In particular, we do not discuss ethical issues surrounding workplace or classroom behavior, taking as given that legal, institutional, and professional codes of conduct are definitive in their rejection of discriminatory and harassing behavior (though these codes are far from frequently, fairly, or effectively or equitably enforced). We also do not discuss the ethics of economic models or whether economics is or should be a normative science. We leave that discussion to the numerous books that already exist on the subject.

1.8 Glossary

Positive: A positive statement is one that puts forward a verifiable or testable hypothesis, such as "an increase in the tax rate will increase revenue." The term positive can also be used to describe how one approaches a field of study, such as positive economics or positive ethics.

Normative: A normative statement is one that puts forward a value judgment or makes a claim about what should be or ought to be the case, such as "the tax rate should be lowered." The term can be applied to fields of study to indicate the goal of targeting and improving certain outcomes, as in the case of normative economics and normative ethics.

Categorical imperative: In Kantian ethics, the categorical imperative is

a way for evaluating whether one's motivations are ethical. In its best known form, it states "Act only according to that maxim whereby you can at the same time will that it should become a universal law."

Asymmetric information: When parties to a transaction (buyers and sellers, principals and agents) have different sets of information, then the market is said to suffer from information asymmetries. These asymmetries typically result in sub-optimal outcomes, relative to markets with perfect information.

Moral hazard: A specific type of information asymmetry in which one party has an incentive to take on greater risk because they will not bear the full cost of any loss. Moral hazard results in sub-optimal outcomes, relative to markets without moral hazard.

Consequentialist ethics: A form of ethics that maintains that what determines if an act is ethical is or not is the consequences, outcomes, or end of an action. Outcome-Based or teleological ethics are types of consequentialist ethics.

Non-consequentialist ethics: A form of ethics that maintains that what determines if an act is ethical is whether it conforms to some proper characteristic. Duty- and rule-based or deontological ethics are types of non-consequentialist ethics.

Ethical pluralism: A pragmatic approach to ethics which recognizes that multiple ethical frameworks can help explain the behavior and choices of actors in the real world.

Mertonian norms: A set of norms or values developed by Robert K. Merton to define the ethos, or characteristic spirit, of science. These norms are defined by the scientific community and individual scientists or researchers come to believe or adhere to these norms as scientifically, morally, and ethically right.

Universalism: A Mertonian norm expressing the principle that the acceptance (or rejection) of claims does not depend on the attributes and traits of researchers or investigators themselves. Universalism is the idea that the process of research is inherently impersonal.

Communality: A Mertonian norm expressing the idea that scientific progress involves the entire community of researchers through a process of open exchange and discussion. Communality encompasses two principles: (1) science is inherently collaborative and (2) scientific discoveries are claimed or "owned" by the entire scientific community, not an individual researcher.

Disinterestedness: A Mertonian norm expressing the idea that a researcher should only be interested in identifying the truth, and should thus be unconcerned with professional advancement, pecuniary motivation, or other elements of self-interest. Disinterestedness entails is that a research must report findings simply as they are, even if this goes against general wisdom, one's own beliefs, or self-interest in some other way.

Organized skepticism: A Mertonian norm expressing the idea that one must suspend judgment until all the facts are in and not leap to support or defend one's own preferred or "pet" theories. Organized skepticism involves not only questioning the work of others, but one's own work.