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Beyond the IRB: Towards a typology of research ethics in applied economics*

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Abstract

Conversations about ethics often appeal to those responsible for the ethical behavior, encouraging adoption of "better," more ethical conduct. In this paper, we consider an alternative frame: a typology of ethical misconduct, focusing on who are the victims of various types of unethical behavior. The typology is constructed around 1) who may be harmed and 2) by what mechanism an individual or party is harmed. Building a typology helps to identify times in the life cycle of a research idea where differences exist between who is potentially harmed and who the existing ethical norms protect. We discuss ethical practices including IRB approvals, which focuses almost entirely on risks to subjects; pre-analysis plans and conflict of interest disclosures, which encourage transparency so as to not mislead editors, reviewers, and readers; and self-plagiarism, which has become increasing common as authors slice their research ever more thinly, causing congestion in journals at the expense of others.

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1 Introduction

Ethical judgments are derived from individual convictions, but groups of people often agree about what is good and bad. Among moral philosophers as diverse as Rawls (1971), Nozick (1974), Scanlon (2000), and Parfit (2013) there are deep divisions, but also broad agreement about what constitutes ethical behavior, even though their reasons for those judgments may differ. When institutions such as universities and governments codify ethical norms into rules, they often look for shared principles that their diverse constituencies will find acceptable, despite underlying differences in personal values or beliefs.

This paper aims to spark discussion among applied economists about the ethical principles we might share, beyond existing rules that our institutions apply, such as the protection of human subjects through Internal Review Boards (IRBs), conflict-of-interest disclosure and replication policies at journals, or professional codes of conduct. Our exploration seeks to identify a wider array of ethical questions in our profession, such as selection of research topics and research collaborators.

The method we use to identify areas of ethical agreement (or disagreement) is to describe the life cycle of research activities, and at every stage ask: "Who is affected by this research, and how might the choices of the principal investigator (PI) help or harm those individuals or institutions?" This allows us to develop a typology of ethical misconduct based on who is affected by the activity, including a wider array of potential impacts than those considered by existing rules. We then use this typology to reexamine the institutions that govern the research process, in pursuit of agreement around criteria that might provide necessary and sufficient protection for potential victims of research misconduct.

Explicit discussion of research ethics beyond the IRB and other existing institutions is helpful for at least three reasons. One is the value of communication and the commitment to learn about and overcome our individual cognitive biases. The rise of behavioral economics has trained us to look for systematic errors in how other people evaluate their choices, revealing patterns with deep psychological roots such as present bias, availability heuristics, and motivated reasoning. It is instructive to turn that lens inward, and address our own failures to adequately reevaluate our choices in the light of more information. Kuhn (1962) provides an early application of what we now call motivated reasoning to scientific activity, arguing that researchers tend to interpret data within existing paradigmatic structures and fail to pursue or even discard other kinds of data. In economics, many courses start with models of perfect competition in which laissez-faire maximizes economic surplus. Much of the analysis at the introductory undergraduate level remains within this paradigm, and outside the university many incumbent firms have an interest in asserting that this model is sufficient to guide policy. The nuance in more advanced courses is lost or forgotten when students move out into the world. More recently, Ioannidis and Trepanowski (2018) have argued that motivated reasoning extends beyond a researcher's economic interests or social ties to her or his personal lifestyle. In the context of nutrition, they argue that a researcher's food preferences

and food culture can create cognitive bias, causing investigators who have a favorable view about certain types of food to ignore or reject data about negative aspects of that food. Because of this, the authors suggest that researchers in nutrition disclose their own dietary preferences, in addition to any financial conflicts of interest. In this paper we make no attempt to challenge any particular research paradigms, but simply to invite reflection about cognitive biases and their ethical implications for research.

A second reason why research ethics merits further discussion is that the research environment for applied economics is changing rapidly. We collect vastly more data than ever before and advances in computing power allows for easier data dredging. Researchers are increasingly rewarded for attracting media attention, and have an ever-wider array of outlets to reach popular audiences and policymakers or communicate among ourselves using social media and other platforms. New arrangements for scholarly publishing have sharply altered how research is disseminated, and new institutions, such as public-private partnerships, alter how it is funded. As Josephson and Michler (2018) observe, new ethical dilemmas have already begun to be met by new ethical solutions, creating a need for these solutions to be critically evaluated, discussed, and debated.

A final reason why research ethics remains important is the diversity of societal demands being met by research, and the need for researchers to serve multiple masters. This is particularly true for applied economists, who frequently conduct research within institutions designed to serve a specific interest group within society, and within a profession that aims to take account of many other interest groups as well. For example, professors whose research is funded by industry may have students who seek careers in environmental organizations or consumer protection. A central challenge is how to be both mission-driven, responsive to one particular clientele, be they farmers, business owners, or governments, and also true to ourselves and others in society. Increases in transparency and social media coverage of academic life, as well as reliance on funding sources that demand highly visible impacts, creates more opportunity for real or perceived conflicts among our various constituencies. The choice of where to stand, given where we sit, is very difficult and offers no easy solutions.

2 Who may be harmed: The life cycle of research

As a way to reexamine the effectiveness of existing institutions in governing research ethics we develop a typology of ethics around who may be harmed by each kind of ethical lapse and the mechanism by which the victims are harmed. In order to do this, we start by laying out the life cycle of a research idea (see Figure 1). We divide the life cycle into five stages, which may at times overlap. After the genesis of the initial idea, the first stage of the life cycle is project development. This is followed by data collection, data analysis, and dissemination. The final stage of the life cycle is the impact that the research idea may have and this can extend far into the future, long after the researcher has moved on to other ideas. Obviously, our life cycle is a stylized rendering of

the research process and any given research project need not map exactly to this structure.

The life cycle begins with the germ of an idea. The researcher, or principle investigator (PI), seeks to develop this germ into actionable research. In order to do this, the researcher works to develop the idea into a project. This involves articulating the idea as a research question with testable hypotheses, bringing on collaborators to assist on the project, and seeking external funding to allow the researcher and her growing team to work on the project. In this project development stage, the actions of the researcher directly affect her collaborators, who may be colleagues or students, and primarily causes harm through the theft of ideas.[1] Though data on the theft of intellectual property (IP) is hard to come by, Wilcox (1998) charts the rise of authorship disputes in the 1990s. Using data from the Ombuds Office for Harvard Medical School, Dental School, and School of Public Health, Wilcox records a rise from two percent to 11 percent in queries relating to authorship as a share of total complaints. The researcher may steal ideas from members not part of her research team, thereby damaging the reputations of her research team members. In the case of students, such IP theft may have lasting consequences on the student's ability to obtain a research position upon graduation. Alternatively, the researcher may steal IP from her students or colleagues and present this idea solely as her own. A professor stealing a student's idea is a depressingly common thread on graduate student discussion boards and in advice columns (Woolston, 2002; Kelsky, 2014).

The researcher's actions also directly affect funding agencies, from whom the researcher seeks to receive money. Here the harm is done through the mis-use of research funding. This mis-use may be because the researcher 1) stole someone else's idea in order to obtain funding, 2) hyped or misrepresented a bad research idea as a good idea in order to obtain funding, or 3) mismanaged research funds on a good idea, such that the researcher was unable to deliver on the promised outputs. In all three of these cases, the funding agency is directly harmed because they allocated scarce resources to an inappropriate project. The reputation of the funding agency may also be harmed if it came to light that they had awarded money to a project based on stolen IP. Finally, the researcher's actions indirectly harm competitors for funding, by capturing scarce resources for her project that should have been allocated to better projects.

Once a research idea has been developed into a project and funding has been secured, the next stage in the life cycle is the collection of data to test the research hypothesis. Here the researcher primarily interacts with her research subjects. These subjects may be students in an experimental lab, domestic farmers, business owners, households in developing countries, or numerous other individual or corporate entities. The innumerable types of research subjects reflects the breadth of research in the field of applied economics. It also reflects the innumerable ways in which those subjects can be harmed by the researcher's actions. Two of the most discussed ways in which research subjects can be harmed are exposure to risk and violation of privacy. Research subjects

[1] In this paper we focus on research ethics and ignore other ethical issues that may arise in interpersonal relationships, such as harassment and discrimination.

have been harmed in many ways including tangible damage to their health resulting in death (Germany, 1949; Brandt, 1978; Steinbrook, 2002) as well as less tangible damage to their reputations (Foulks, 1989). However, subjects may be harmed in other ways as well: in a randomized control trial (RCT) they may be exposed to production risk as part of a study on the impact of new technology for crop production; they may be exposed to health risks through lax hygiene in a nutrition study that collects biometric data; students may experience risk to their educational attainment, and future income, as part of a study on new teaching techniques. Besides these potential sources of risk, research subjects may also be harmed by having private information made public. Violation of privacy may involve exposing corporate cost structures, personal income, personal health status, student grades, or the exact GIS locations of individuals.

In addition to her interaction with research subjects, the researcher also directly interacts with her home research institution. This interaction takes the form of using institutional resources to conduct research as well as acting as a representative of the institution. In cases where the researcher harms her subjects, the home institution may be harmed through lawsuits, external or internal sanctions, loss of external funding, and loss of reputation. There is a history of IRBs settling litigation, after alleged misconduct of researchers. Past litigation dictates that delinquent IRBs and affiliated universities and hospitals can be joined in litigation for the tort of negligence (Onixt and Sterling, 2009). In these cases, the hosting institution is responsible for fines or other damages, but IRB members can be named as individuals in suits, in which case they may have to pay out of their own pockets, if ordered by a court or as part of a settlement (Onixt and Sterling, 2009).

Once data has been collected, the researcher and her team must engage in analysis, with the goal of testing the hypothesis laid out in the project development stage. Here the primary unethical activity is p-hacking or data dredging, which is the practice of combing through data to uncover patterns that can be presented as statistically significant, without first devising a specific hypothesis as to the underlying causality (Josephson and Michler, 2018). With the rapid advancement in computing power, p-hacking has become exceedingly easy to do. How prevalent the practice is though is difficult to determine. Olken (2015) suggests that the occurrence of data manipulation is rare, at least in top tier journals. However, Brodeur et al. (2016) found that among papers published between 2005 and 2011 in the *American Economic Review*, the *Journal of Political Economy*, and the *Quarterly Journal of Economics*, 10 to 20 percent of all tests that produced p-values were inflated. Relatedly, Camerer et al. (2016) was only able to replicate between 68 and 71 percent of results from experimental studies published in the *American Economic Review* and the *Quarterly Journal of Economics* between 2011 and 2014.

When the researcher engages in p-hacking or, as in the case of the retracted study by LaCour and Green (2014), wholesale data fabrication, harm is done to the other members of the research team, particularly students. In the short run (i.e., during the data analysis process), students are

harmed because instead of being trained in the rigors of the scientific process they are taught that p-hacking or data dredging is an acceptable way to arrive at results. This is a failure of mentorship and training even if the research misconduct is never uncovered. In the long run (i.e., after misconduct is discovered), students may lose out on jobs and other opportunities because of a damaged reputation arising from their association with the researcher. Recent news coverage on the continuing fall-out from the retractions of 17 studies by Brian Wansink is a recent example (Rosenberg and Wong, 2018).[2] Similar reputational damage can accrue to colleagues and co-authors.

The fourth stage in the life cycle of a research idea, dissemination, frequently begins when analysis is ongoing. Initial results can be presented at conferences, seminars, and workshops where feedback is sought to improve the analysis. Revisions requested by reviewers and editors can require additional analyses. While analysis and dissemination can overlap in time, those individuals and parties with whom the researcher comes in contact are distinct. In disseminating her research, the PI's actions can have a direct impact on her collaborators, conference reviewers and participants, journal editors, reviewers, and readers, and her home research institution. In the case of reviewers and editor, these individuals can be harmed by having wasted their time on a paper based on stolen IP or manipulated data. These gatekeepers may discover the research misconduct and reject the paper, in which case only their time is lost. However, if they fail to discover the misconduct and the paper is published and subsequently retracted, then the editors and the journal itself might suffer loss through a damaged reputation. Similarly, this reputational damage can harm the researcher's collaborators and home research institution. Finally, conference participants and journal readers, as well as the entire scientific community, are harmed by the replacement of real knowledge with fake. The information presented as true may be totally false, as in the case of the retracted LaCour and Green (2014) study, or it may be presented fraudulently, in the case of stolen IP. In either case, the researcher is deceiving the audience by disseminating a fraudulent idea.

While numerous individuals may be harmed directly during the process of research dissemination, the greatest harm may occur indirectly to competitors for scarce space at conferences and in journals. This scarce space need not be taken by research based on a stolen idea or in which p-hacking occurred for harm to be done to other researchers. Harm may be done through self-plagiarism by PIs who slice their research so thinly that each paper contributes little to the scientific record while causing congestion at conferences and in journals at the expense of editors, other authors, and readers. Additionally, as Besancenot et al. (2014) show in a lab experiment, congestion can result in editors rejecting good papers or accepting papers that make little to no contribution.

The last stage of the life cycle of a research idea is the impact it has on researchers and media, government, policymakers, and industry, and, finally, laypeople. Generally, this impact begins with fellow researchers and the scientific community during the process of dissemination. In recent years,

[2]The 17 retractions were as of 5 December 2018.

the media plays an increasingly important role in disseminating research and amplifying impacts. Similar to colleagues, the media can be negatively impacted by the researcher by internalizing and disseminating fraudulent research. Media outlets can suffer harm through a damaged reputation that results from spreading misleading or false research results. Recent examples include reporting on the false link between vaccines and autism or the hyping of Wansink's misleading nutrition studies.

While it is possible for media outlets to suffer reputational damage from uncritical reporting of fraudulent or misleading research, this rarely happens. It is more likely that harm will accrue to governments, industry, and policymakers who set agendas, develop business plans, and design policy based on incomplete data, faulty analysis, or inaccurate results due to cognitive bias or explicit bias arising from material conflicts of interest. Classic examples of faulty research that impacted public policy include the Phillips Curve, the butter-margarine controversy, the ban on GM crops in a number of European and African countries, the misreported iron content in spinach, the false link between vaccines and autism, and skepticism regarding climate change. Government and industry are harmed by bad policy through the mis-allocation of scarce resources. While scientific research rarely has a direct impact on laypeople, the population at large can be harmed as a result of policy based on inaccurate research. Here the indirect effects are innumerable and range from lost wages, ill health, and limited opportunities.

In the early stages of a research idea's life cycle, the researcher has a number of opportunities to act in ways that directly harm individuals or institutions. We have primarily focused on examples in which the researcher deliberately chooses an action that is privately beneficial but creates externalities resulting in negative consequences for others. In the later stages of the life cycle, the researcher's actions typically create victims indirectly. In many cases, the action, such as self-plagiarism or promoting research based on incomplete data or faulty analysis, may not even be unethical in a deontological sense. But from a consequentialist perspective, these actions cause harm and therefore are unethical.

3 A Typology of Research Ethics

In the previous section, we used the life cycle of a research idea to structure our discussion of the individuals and institutions that a PI comes in contact with during a research project. We now use that discussion to develop a typology of research ethics. We categorize victims as being harmed in one of four ways. First, the researcher may cause harm through the theft of ideas. Second, she may cause harm by creating unnecessary risk. Third, she may cause harm by manipulating data. Finally, the researcher may cause harm through the corruption of the scientific record. This typology allows us to examine how individuals and institutions may be harmed in the research process and to evaluate the effectiveness of the institutions that currently exist to govern the research process.

3.1 Harm Through the Theft of Ideas

The first type of victim is one whom the researcher harms through the theft of ideas. This typically occurs during the first stage of the research life cycle and can harm colleagues, students, funding agencies, and competitors for funding. When the researcher steals an idea from a colleague or student the harm is direct and encompasses damaged reputations and lost opportunities.

Two institutions exist to protect the victims of IP theft. First is the legal code that governs IP and the second are the social norms that govern professional conduct. When it comes to protecting ideas, IP law is not particularly effective, as the legal requirements to prove ownership of an idea are onerous. Regarding social norms, their effectiveness in protecting victims of IP theft is debatable. While most researchers would not want to get a bad reputation as someone who steals the ideas of others, it may be difficult to define how much of an idea really belongs to someone. Vogel (2013) writes, "The question to ponder: is the use of someone else's ideas theft or just streamlined knowledge transfer and exchange?" If the profession is uncertain about the extent of individual ownership of a research idea, then strong social norms cannot form to protect those who view themselves as victims of IP theft.

Increasingly, blockchain-like tracking helps verify who wrote an idea down first. Researchers can use directories with a storage service that provides versioning or includes a license file in the directory. Yet, these protections are only effective if the profession is in agreement on the extent to which researchers own their ideas and if researchers are in a position to broadcast the theft. For students, this latter criteria may not hold. The power dynamics within a lab or in the university are rigid, and a student may feel unable to speak openly about an advisor or mentor who has stolen their idea.

The theft of ideas can impact students beyond simply having their own idea stolen. Working with a professor who has stolen your idea results in lost learning opportunities in the present, as well as lost job opportunities in the future. The student suffers educational loss by failing to be able to develop their own research idea and by being taught unethical research practices. The student can suffer lost job opportunities through being unable to enter the job market with their own idea and through reputational damage, if it becomes known that their advisor has stolen other people's research ideas. In theory, professional social norms as well as a university's institutions, including the Dean of Students and the Office of the Ombudsman, should protect students in these situations. However, the power dynamic within a university may limit a student's willingness to report his or her professor, for fear of retaliation.

The theft of ideas also harms funding agencies through the mis-allocation of monies and through reputational damage to the agency. The two primary institutions that protect against harm are the funding agency's own review and auditing system and the legal code. These include external review in the pre-award stage and outside evaluation, as well as periodic reporting in the post-award stage. In the best case scenario, the funding agency will identify that a researcher is seeking to fund an

idea she stole from someone else and reject the proposal. If this occurs, the funding agency (more likely external reviewers) will only be harmed by wasting their time. In the worst case scenario, the agency will fund the idea and only later find out that they have been a party to IP theft. While Mandal et al. (2012) notes that "the responsibility for ensuring that funds and resources are utilized optimally without any misconduct rests on the shoulders of the researchers," some responsibility is also attributable to the funding agencies and home institution. This worst case scenario motivates the screening of research ideas prior to funding and the monitoring of researchers after funds are allocated, by the agency.

However, documenting that the agency has been defrauded by funding a stolen research idea is only as effective as the legal system that provides redress. Under current law, this is quite difficult. Schneider (2015) suggests that there is little hope for funding agencies trying to recover misused or mismanaged monies: "The fractions awarded as direct salaries to PIs are either too small or legally hardly accessible for such damage claims... Lab heads rarely keep their funding stashed in a bank account waiting to be raided by the furious grant giver. Instead, the money is already invested and consumed in the institutional research and part of the institutional budget." While difficult, fund recovery is not impossible. A rare case of a funding agency recovering its money is that of Christian Schunn, a professor at the University of Pittsburgh, who in 2018 agreed to pay the United States $132,027 to resolve allegations that he violated the False Claims Act by submitting false documents to the National Science Foundation (NSF) in order to obtain federal grants to fund his research (U.S. Department of Justice, 2018).

The final victims of the theft of ideas are competitors for grants, who lose out on funding opportunities to the researcher misrepresenting her idea. Victims are harmed indirectly and thus the only institution to protect them is the due diligence performed by the funding agency. Of course, due diligence may still result in the funding of bad, impossible, or fraudulently proposed ideas, which may result in good ideas not being funded. Hopefully such scenarios are rare and the competition for scarce research funds is between ideas that have been ethically obtained.

3.2 Harm Through the Creation of Unnecessary Risk

The second type of victim is one whom the researcher harms by exposing them to unnecessary risk. Harm can be physical, economic, or emotional and accrues to the research subject. Additionally harm can accrue to a researcher's home institution in the form of reputational damage when the researcher generates unnecessary risk for her research subjects. Among the types of harm a PI can inflict during the life cycle of an idea, the harm to research subjects is likely to be the most serious. As such, research subjects have some of strictest institutional protections, in the form of ethical review boards. IRBs are distinct among institutions that protect victims of unethical research in that they are ex-ante gatekeepers, providing a license to conduct each research project one at a time. They are akin to licensing airplane takeoffs, one flightplan at a time. Generally, only the most

dangerous events and processes are so regulated. Usually institutions use less costly mechanisms, such as issuing blanket licenses for a whole category of activity or punishing wrong-doers if they get caught.

While IRBs create strict regulations on the research process, the effectiveness of these regulations in protecting research subjects is an open question. Bhutta (2004) notes that review boards tend to be more focused on documenting that a certain process was followed, rather than ensuring subject participation is truly voluntary and risks are actually minimized. Further, Hyman (2007) argues that, in addition to their focus on paperwork and bureaucratic compliance, "the available evidence indicates that there are substantial direct and indirect costs associated with IRB oversight of research." A sense, among some behavioral scientists, is that IRBs exist primarily to provide legal coverage for the research institution. But this perspective, along with any perspective on the effectiveness of IRBs, lacks empirical support. Grady (2010) writes, "To date, no published study of which I am aware has evaluated the effectiveness of IRBs in protecting research participants and few have investigated the nature, quality, or thoroughness of IRB deliberations." Hyman (2007) similarly observes: "despite their prevalence, there is no empirical evidence that IRB oversight has any benefit whatsoever - let alone benefit that exceeds the cost."

The lack of empirical evidence on the effectiveness of IRB should be of concern to all researchers, but especially applied economists. When so much of our work is focused on identification of causal relationships, it is surprising that no evidence exists identifying the impacts of IRB. However, even with these concerns, it is probable that IRB prevents some abuses. Or, at least, lays down a clear ethical code that researchers obey in doing research. A relevant question, given the lack of evidence, is "how optimistic must we be regarding IRB's effectiveness in order to justify the costs of compliance?" The answer to this question will differ based on the researcher's area of focus. In clinical, laboratory, or health research in the field, it may be the case that even a low level of effectiveness in limiting the risk of physical harm justifies the costs of IRB. For many social scientists, IRB may need to be perfectly effective in order to justify the burden that it places on the research process. Questions about time requirements and ultimate effectiveness support the increasingly popular position that IRBs should lower existing hurdles to researchers seeking to exempt studies. But, without better evidence on the impact IRB has on both the researcher and her subjects, few concrete recommendations can be made to reform the IRB process.

3.3 Harm Through the Manipulation of Data

Manipulation of data ranges from wholesale fabrication as in the retracted LaCour and Green (2014), to p-hacking as in the retracted Wansink et al. (2012), to the selective presentation of results. In this sub-section we focus exclusively on data manipulation, not the dissemination of research relying on manipulated data. With that focus, the harm done by the researcher accrues primarily to the students who work with her on the project. The harm takes the form of lost educational and

job opportunities. When students are told by their advisor to p-hack or manipulate data in such a way as to arrive at pre-determined results, the opportunity to learn how to do good empirical research is taken from those students. Further, recent news articles highlight that damage to one researcher's reputation can also harm the reputations and job opportunities of students (Bartlett, 2017; Lee, 2018; Newburger, 2018).

As in the case of IP theft, students have little recourse when they find themselves as collaborators with a researcher engaged in data manipulation. The institutions that exist to protect students, such as the Dean of Students or the Ombuds Office, are organized to address a wide variety of complaints. They may not have the skills to address or recognize issues like the appropriate approach to data analysis. Further, students may not report misconduct out of concerns for their career or because they are worried about retaliation by the researcher.

Outside of formal channels, students can protect themselves from harm by staying current on recent advances in economics, probability, and statistics. This can help them combat or account for data mining. These include pre-registration or pre-analysis plans (Casey et al., 2012), split-sample methods for conducting pre-analysis (Anderson and Magruder, 2017; Fafchamps and Labonne, 2017), hypothesis registries (Coffman and Niederle, 2015), corrections for testing multiple hypotheses (Romano and Wolf, 2010; List et al., 2016), loss functions to penalize incorrect predictions (Simonsohn et al., 2015; Harvey et al., 2016), and the ability to submit registered reports at journals like the *Review of Financial Studies* or the *Journal for Development Economics*. These advancements have occurred only recently and many experienced researchers in applied economics remain unaware of them (Josephson and Michler, 2018). By familiarizing himself or herself with these and future research trends, a student may be able to pro-actively steer the PI away from outdated or unethical approaches to data analysis. Unfortunately, this is far from a perfect solution. But, until pre-analysis plans, registered reports, or sealed-envelope-submissions (Dufwenberg and Martinsson, 2014) become standard at all journals, there is little a student can do to protect against harm to them through the manipulation of data.

3.4 Harm Through Corruption of the Scientific Record

The final type of victim is one whom the research harms by corrupting the scientific record. It occurs when research based on stolen ideas, abused subjects, or manipulated data is disseminated to the scientific community and the world at large. Victims include the researcher's colleagues, reviewers, editors, home institution, governments, businesses, and the general public. Of all the types of harm, this is the most esoteric, because many of the victims never come in contact directly with the researcher – or are even aware of the research.

When the PI disseminates inaccurate research she harms her colleagues, particularly reviewers, by wasting their time. An editor's ability to desk reject a paper is the only institution that exists to protect reviewers from this potential harm. This is a weak institution, but the level of harm is

also minor. In fact, reviewers might not even be perceive themselves as harmed if the inaccurate research helps them form better ideas.

Of greater importance is the congestion caused at journals through the dissemination of inaccurate research or self-plagiarized research. Congestion can result in editors rejecting good papers or accepting bad papers, thereby harming the reputations of editors and journals. Congestion also harms other researchers, by taking away time at conferences or space in journals that could have gone to ethically conducted research. Traditionally, editorial and peer review were the institutions that protected against this type of harm, rejecting inaccurate or derivative research. However, the recent seismic shift in academic publishing from the old model, where institutional subscribers pay for journals, to open access, where the researcher's project pays, has shifted publishers' and editors' incentives towards acceptance and post-publication assessment. Publishers and editors used to accept articles only up to the limits of a journal's physical size in number of pages. Now there is a tendency is to accept everything that looks passably okay, even in journals that are obviously not "predatory." The first big lowering of the bar to publication came when PLOS One lowered their official criteria for publication, admonishing reviewers to stop looking for originality or importance and to judge papers only on their technical accuracy (see PLOS One's "Criteria for Publication"). The shift towards open access aims primarily for assessment to occur post-publication, via citation rates and, potentially, replication. This increases the chance for the publication of inaccurate or self-plagiarized research.

Besides causing harm to colleagues within the scientific community, the corruption of the scientific record can harm the reputation of the home institution, news outlets, or anyone else involved in the dissemination of incorrect information. There may also be financial repercussions from such misconduct. The recent case of Mani Pavuluri at University of Illinois at Chicago is illustrative (Cohen, 2018). Pavuluri gave children younger than 13 lithium, failed to alert parents of the risks associated with the study, and falsified data to cover up the misconduct. The National Institute of Mental Health (NIMH) investigated and ultimately determined that both the IRB and the university administration failed to adequately disclose the misconduct, even after they had been made aware of it. In December 2017, NIMH demanded that UI at Chicago pay back all $3.1 million of the previously awarded grant. The cost of Pavuluri's misconduct, and the university's failure to act against it, effected researchers across the university system.

Peer and editorial review at journals, financial disclosures, IRB policies, and replication policies are all institutions designed to reveal inaccurate research before it is disseminated. But, as we have seen, peer and editorial review have changed the focus of their screening. Financial disclosures, the requirement of IRB approval, and replication policies may be effective but as Josephson and Michler (2018) point out, these are far from universal requirements among agricultural and applied economics journals. The case of Pavuluri reveals that internal controls at research institutions may also be inadequate, particularly when the institution stands to lose funding and prestige from

regulation enforcement.

The final victims of the corruption of the scientific record are governments, industries, NGOs, and the populations that they serve. Here harm comes from adopting policies and re-allocating money based on inaccurate or biased research. Institutions such as peer and editorial review, disclosure statements, and due diligence by governments, industries, and NGOs should protect against the allocation of funding to bad policy based upon research that serves a master other than scientific truth. Yet, the changing academic environment has begun to erode the power of some of these traditional gatekeepers. The reduction of state funding at many land grant universities and the elimination of core funding at many CGIAR research centers has given rise to academic freelancing across disciplines, as well as administrators at universities and institutes rewarding researchers who gain fame by appealing directly to the media and policymakers. The push at research institutions for "impact" other than scientific contributions is changing how and what research is done. In the case of Pavuluri, Wansink, and other "rock star" academics, scientific fraud can have as much to do with the pursuit of media attention and policy impact as with the the pursuit of scientific prestige. The ethical point is that allowing academic prestige to be influenced by "impact" in this sense, based on visibility in the media or policy impact via testimony before Congress and temporary government posts, can distort science towards appealing to public opinion and policymakers' interests.

4 Conclusions

In this paper, we aim to spark a conversation among applied economists regarding the ethical principles we might share, beyond existing rules that our institutions apply. We believe that frank and open discussion of research ethics are important to help overcome our individual cognitive biases, adapt to rapidly changing technology, and navigate the need for researchers to serve multiple masters.

Instead of focusing on those responsible for ethical behavior, such as the PI on a research project, we seek to understand who are the victims of research misconduct. In order to do this, we lay out the life cycle of a research idea to define who is harmed by the researcher's actions and how that harm occurs. We then use this to develop a typology of research ethics based on the type of harm done. The typology provides an alternative way to assess the effectiveness of existing institutions designed to guard against research misconduct.

As applied economists, we find it difficult to come to any strong conclusions regarding the effectiveness of existing institutions because there is so little data or empirical research on the topic. Since the release of the Belmont Report and the implementation of the Common Rule, IRBs have become standard at research universities. But their effectiveness at accomplishing their stated goal is uncertain as no data or research exists on this subject. Since the Great Recession, conflict-of-interest disclosures in economic journals have become common, but no evidence exists regarding

their effect on eliminating or revealing biased research. To us, this lack of research on research is a oversight by the profession and should be an important and fruitful avenue for economists' future work.

In our opinion, the people most vulnerable to harm perpetrated by applied economics research are students, research subjects, and the non-economic consumers of our research. Students remain particularly vulnerable given the rigid power structures in the academy. Students can be harmed by researchers who steal their ideas or who teach them that it is okay to p-hack or data dredge one's way to the results. In regards to research subjects, we believe that economic research poses no great threat to them, especially when compared to biomedical or psychological research. However, the existence of IRBs creates a situation where economists can disassociate themselves from their responsibility to provide their subjects with respect, beneficence, and justice. If IRBs worked to protect research subjects, the disassociation might be acceptable. But it appears that IRBs are more focused on bureaucratic procedure and the provision of legal cover for the research institute than on the protection of research subjects. Finally, the push to achieve "impact" other than scientific contributions highlights the need for researchers to serve multiple masters. The rewards for academics who capture media attention and policy impact have created incentives to distort science towards appealing trends. The outcome of these distortions is biased research that is used to justify bad policy that ultimately harms the general public. Again, these conclusions are opinion based, as there is a lack of data from which to form fact-based inferences. But, what is indisputable is that applied economists still have a long way to go to minimzing the harm that our research can do.

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Figure 1: Life cycle of a research idea