

Three Papers on the Moral Perceptions of Scientific Misconduct

by

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Dissertation submitted in partial fulfillment of  
the requirements for the degree of Doctor  
of Philosophy in the Department of  
Sociology in the Graduate School  
of Duke University

2023

ABSTRACT

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## **Abstract**

This dissertation investigates the moral perceptions of scientific misconduct on three different dimensions. Chapter 1 investigates how the signal of a retraction as a moral breach affects co-authors and those tangentially related to those at fault.

Characterizing retractions as scandalous events, I examine the extent of stigma spillover in the network. Chapter 1 uses large-scale data collected from OpenAlex.com, an open-source database that aims to unify Microsoft Academic Graph, Crossref, Web of Science, and PubMed. Using future retractions as a proxy for stigma, I find that those directly related to a retraction are more likely to experience retractions in the future. I find no support for stigma spillover to coworkers in the network that are not directly associated with a retraction.

Chapters 2 and 3 use original survey data to explore differences in perceptions of scientific misconduct along multiple dimensions. Chapter 2 presents a novel vignette survey experiment that measures moral reactions to different kinds of academic misconduct. The findings show a clear ranking in perceptions of morality, with data fabrication being the worst, plagiarism being slightly less bad, mistakes being highly forgivable, and honest and accurate research seen as highly moral.

Chapter 3 uses a similar survey design as Chapter 2 to measure whether moral perceptions of plagiarism are based in cultural expectations about the profession

engaging in plagiarism or are reactions to a transgression of the authenticity of the product. By asking participants a) how frequently they believe different professions to engage in plagiarism and b) how immoral they think the behavior is, we find that impressions of frequency are due to beliefs of cultural meanings of an occupation, and that immorality is better explained by violations of creativity and authenticity.

## **Dedication**

To my family, who is very proud of me for completing this dissertation but will never read a single word of it. I love you all.

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# I. Introduction

Scientific misconduct is assumed to be a moral breach in the scientific community, with retractions—public notices that a manuscript contains misleading information—being the main institution through which misconduct is made publicly visible. The patterns and rates of retractions has been a growing area of study over the past decade (Hesselmann, Schmidt, & Reinhart, 2017). The literature tends to largely focus on documenting incidences of retractions and other “stigmatizing effects” such as loss of future citations and loss of grant funding (Bar-Ilan & Halevi, 2018; Hesselmann, et al., 2017). Although most scientific output is produced by teams, only a few studies have begun to examine the network dynamics of retracted articles (Azoulay, Bonatti, & Krieger, 2017; Lu, Jin, Uzzi, & Jones, 2013).

Chapter 1 of this dissertation focuses on the distribution of retracted articles and examines how authors might be implicated and brought under scrutiny through their co-authorship associations. By assuming that retractions make a moral breach visible and hard to deny, we can make predictions about who might experience retractions based on a sociological theory of scandal. In particular, I examine whether having a previous retraction, or having co-authored with someone who has experienced a retraction, increases the likelihood of having a retraction in the future. Although I find an increase in likelihood of retraction only for those who have authored a retracted paper in the past, this chapter provides an important perspective for analyzing how

retractions might diffuse through networks. The findings suggest that co-authorship networks are either robust against the transferring of bad methods that might result in retractions, or that co-authors are not at risk for higher scrutiny. This chapter provides insights and ideas for future research on the spread of stigma throughout scientific networks.

Chapter 1 shares in a predominant but typically implicit view in the research on retractions: that scientific misconduct is at its heart a *moral* breach. However, scientific misconduct is a broad category that contains many behaviors. Some are deemed worse than others, and some whose acceptability is a matter of debate (e.g., selective reporting) (Pickett & Roche, 2018). Although previous research catalogues the rate of different kinds of misconduct, few studies have examined individual perceptions of types of misconduct amongst experts or the general public. Chapter 2 of this dissertation aims to fill this gap and provide moral impressions from the public about different kinds of common misconduct. Since misconduct is not the only way erroneous or misleading results can manifest in a research project, we also survey the public about moral perceptions of honest mistakes in science. By including examples of behavior where 1) results are distorted and there was intent to deceive (data falsification), or 2) results are not distorted but there is still an intent to deceive (plagiarism), or 3) results are distorted with no intent to deceive (mistakes), we are able to distinguish whether the attribution of immorality is due to the intent to deceive, on the one hand, or a failure to do accurate

scientific work, on the other.. In line with previous research on the extent of future citation penalties, we find that data fabrication is judged as the most immoral sort of action, closely followed by plagiarism. Interestingly, these results do not significantly vary across demographic and political categories. This chapter provides novel information about public opinions of specific kinds of scientific misconduct.

Though interest in scientific misconduct has grown throughout the past decade, there have been few if any comparisons of scientific misconduct to misconduct in other industries. Researchers have noted that specific cases of misconduct also reduce public confidence in the value of scientific research in general, and may diminish the credibility of entire branches of research, as can be seen in recent public concern over the validity of published results in Psychology (Fang, Steen, & Casadevall, 2012; Stricker & Günther, 2019). However, there has been no investigation as to whether moralized perceptions of scientific misconduct are due to specific cultural expectations about scientists, or derive from more general ideas about an obligation to be authentic which may be shared across many kinds of occupational activity. For instance, certain forms of scientific misconduct, such as plagiarism, are not unique to the scientific field. Chapter 3 focuses on understanding differences in moral impressions for similar behaviors (varieties of plagiarism, or potentially suspicious copying) across different industries. Using a formal model of person-behavior expectations from social-psychology (Affect Control Theory), we first generate predictions about which occupations are the most unexpected to

engage in deceit. Previous research has linked expectedness and commonness to morality, leading to predictions that the most unexpected behavior will be the most immoral (Lindström, Jangard, Selbing, & Olsson, 2018; Ochoa, 2022). However, research about authenticity and consumer reactions to transgressions of authenticity emphasizes that products that are closely linked to a creative process will be perceived as being the most immoral to misrepresent. After employing a vignette survey describing different professions (scientists, artists, and farmers) misrepresenting the originality of their product, we find that moral impressions are more closely linked to expectations about creativity and authentic ownership, rather than cultural expectations attaching to occupations. However, we still find the measure of expectedness in our survey data to be consistent with the predictions given by Affect Control Theory. These findings suggest further investigation is needed to understand the link between expectedness and morality.

# 1. Retractions and the Contagion of Stigma

Retractions—public notices that a manuscript contained errors or evidence of misconduct—can trigger scandalous events in the scientific community, affecting the direction of whole scientific fields as well as the career trajectories of individual scholars (Azoulay, Furman, & Murray 2015; Azoulay, Bonatti, & Krieger 2017). The retraction literature largely focuses on citation rates of retracted works and of their author’s bibliographies (Azoulay, et al. 2017; Lu, Jin, Uzzi, Jones 2013; Bar-Ilan & Halevi 2018; Bar-Ilan & Halevi 2017). Many studies note that most retractions come from few authors, but the phenomenon of repeat offenders is largely ignored in the literature (Azoulay et al. 2017; Hesselmann, Grad, Schmidt, & Reinhart 2017; Grieneisen & Zhang, 2012). Adut’s (2005) definition of scandal provides a useful lens to understand the stigmatizing dynamics of retractions. Adut notes that not all transgressions are scandals, only transgressions that have been publicized. Until publicized, transgressions may remain well known and the deviant actor unpenalized. Once made public, there is more pressure for members of the community to actively shun the offender, and their associates become at risk for stigmatization. In attempt to avoid stigma by association, known connections of the stigmatized other will move to distance themselves and dissolve relationships that may have otherwise remained intact. In the following analysis, I use Adut’s theory of scandal to model the effects of retraction, focusing on the retraction event as a stigma. I argue that retractions follow this model because they meet



the requirements of scandal as outlined by Adut (2005). Namely, that retractions are the public notice of deviant behavior, after which the author's prior work and associates are brought under higher scrutiny (Lu, et al., 2013; Jin, Jones, Lu, Uzzi 2013). Journals and other colleagues put in active effort to shun and distance themselves from the retracted author by investigating and ultimately retracting more of the author's prior work.

An illustrative example of a highly publicized misconduct case, that of Diederik Stapel, will highlight the specific aspects of the theory of scandal I will test in this chapter to see if they apply across authors with retractions in psychology. Stapel was a well-known social psychologist on the faculty at Tilburg University, in The Netherlands. Around 2010, serious concerns emerged about his work. The case exemplifies three aspects in the theory of scandal: *prior awareness*, *increased scrutiny*, and *suspicion of associates* (Tilburg University 2011; Verfaellie & McGwin, 2011). In October 2011, Tilburg University, the University of Amsterdam, and the University of Groningen published the results of a joint investigation into Stapel who, as it turned out, had been faking experimental data for years (Tilburg University, 2011). The investigation concluded that many of Stapel's papers, as well as work by people he had collaborated with, with were based on fake data. It took two months after the report was published for the first of Stapel's papers to be officially retracted. In the following 6 months, he had one retraction per month. In the proceeding 6 months, he averaged 5 retractions per month for a current total of 58 retractions. The slow and then steady increase in the rate of retractions

suggests an endogenous diffusion curve where journals moved to retract this author's papers by following the lead of other journals. We might think of this as an application of the Matthew Effect, where to those who have much (negative) attention, more (negative) attention will be given (Merton, 1968).

Also in line with theory on scandal, there is evidence that Stapel's bad behavior was known about amongst the community of graduate students at Tilburg, whom he often collaborated with. The report cites that three prior attempts to report Stapel's behavior were made by various groups of graduate students before the university undertook an investigation. Besides attempts to report, there were also accounts of suspicion, with peers in the field suggesting that his data was "too good to be true...[but] none of these earlier reports were acted upon" (Tilburg University 2011, p. 9). It was not until retractions started pouring in that Stapel faced consequences from his employer, and ultimately from government authorities. He was eventually suspended from his university position, criminally prosecuted, and left unable to hold subsequent jobs for long.

Stapel's transgressions were severe and were, in the end, severely punished. Our focus, however, is also on the network effects of his bad actions. Not only did the results of the investigation and retractions affect Stapel, but his coauthors were also implicated. While the report concluded that Stapel had no co-conspirators in faking data, at least ten graduate students' unknowingly based parts of their dissertations on his fake data

(Tillburg University 2011, p. 25–28, 33). Many of these new researchers and other authors also had papers retracted as collateral damage from Stapel's fraud. While a retraction is always a negative event for a scholar at any career stage, a single retraction represents a much higher proportion of a graduate student's or recent PhD's research output. A retraction as a junior author paired with a more senior author is especially harmful to the junior authors, as their academic reputation is still in the process of being formed (Jin, Jones, Lu, Uzzi 2013).

While the report concluded his graduate students not to be culpable, it recommended creating a list of "tainted" multi-authored papers so implicated co-authors can be identified (Tillburg University 2011, p. 15). In the case of Stapel, there was ultimately no evidence of transfer of fraudulent or unethical methods. However, his associates were still investigated, consistent with the theory and a necessary element to have a retraction. Though his co-authors have been cleared of fraud, they have been criticized for not being more vigilant during their research with Stapel (Enserink 2012). Stapel also brought stigma to the larger community of psychology; his misconduct sparked international coverage that criticizes psychology's research practice norms and calls for systematic improvements (Wicherts 2021; Bhattacharjee 2013; Simmons, Nelson, Simonsohn 2011).

The case of Stapel demonstrates how a retraction leads to more retractions as it is a public signal of transgression, and that other actors (journals, universities, and

individual scholars) should denounce the author and their works. Not only should the stigmatized author be subject to discipline, but their colleagues should be investigated for evidence of transgressions too. Although absent in Stapel's case, if colleagues had learned dubious methods that permeated into their own work, they would also be subject to retractions since their work is under higher scrutiny from their associations with the initial retracted author. Since diffusion of substantive topics and methodological choices between senior faculty and junior faculty is well documented, we might expect to see authors associated with a retracted author be at an increased risk for retractions themselves (Azoulay, Zivin, & Sampat 2011; Azoulay & Graff-Zivin 2012).

### **1.1 Motivation**

Scientific articles continue to be retracted at increasing rates plausibly due to several reasons: namely pressure to publish as well as increased research transparency and access to the methods behind the papers (Steen, Casadevall, & Fang, 2016; Fanelli, 2010). Previous research has documented how the academic publication and funding incentive structure may encourage researchers to choose bad methods that give false-positive findings because null results are difficult to publish and early career researchers face raising standards of publication records needed to be competitive on the job market (Smaldino & McElreath, 2016; Fanelli, 2010). Second, in an era of Open Science and easier communication, with many journals now formally requiring replication packages,

or in fields with norms about making work public on sites like GitHub, it has become easier for scholars to detect errors and attempt to reproduce their peers' results (Clark, Honeycutt, & Jussim, 2022; Nosek, Hardwicke, Moshontz, Allard, Corker, Dreber, & Vazire, 2022). Whether the actual rate of inaccurate publications is increasing, or scientific communities have gotten more interested in investigating published findings, retractions are a way to signal outdated, inaccurate work, implement accountability, and advance the field by making visible inadequate practices and untrustworthy findings.

While retractions may signal and improve scientific rigor for the field as a whole, individual scientists have strong incentives to avoid having a retraction (Stern, Casadevall, Steen & Fang, 2014). There is ample evidence that retractions have a negative reputational career effect. After a retraction, an author's previous work may be called into question and examined with more scrutiny. Citations of articles published by an author who has had work retracted decrease after the retraction event, even when previous papers have not been retracted themselves (Lu, et al., 2013, Azoulay, et al., 2017). While evidence of intention—whether it is clear that the author knowingly engaged in questionable research practices—does seem to mediate some effects, retractions from an innocent error to intentional misconduct penalize future citations of previous, un-retracted work, especially in less eminent scholars (Lu, et. Al 2013; Azoulay et al., 2017; Jin, Jones, Lu, Uzzi 2013).

Retractions are scandalous events in the scientific community, and previous research on retractions is consistent with Adut's (2005) theory of scandal. In his theoretical conceptualization, he repeatedly emphasizes that publicity is a necessary element for a scandal (Adut 2005, p. 218–220, 222). Previous literature demonstrates how publicity of the retraction mediates some effects: the higher publicity and the stronger negative effects. For instance, some retracted papers continue to be cited, especially when pre-prints are available before publication and then not updated with a retraction notice after the published version has been withdrawn (Bornemann-Cimenti, Szilagyi, & Sandner-Kiesling 2016). Additionally, one study suggests retracted papers continue to garner citations mostly from academics outside of the paper's subfield, suggesting that the visibility of retraction is highest in the author's own research community (Azoulay, Furman, & Murray, 2015; Bar-Ilan & Halevi, 2018; Bar-Ilan & Halevi 2017; Bornemann-Cimenti et al., 2016). Even Stapel's work continues to be cited (Bouma 2022).

The publicity and formal reprimand of scandal are a crucial distinction from unpublicized but well-known transgressions (Adut, 2005, p. 218). In academia, we can observe whisper networks about dubious research and work practices of specific faculty. Unfortunately, data capture of true face to face gossip and rumor spread is near impossible. However, we can look to sociology as an example, where some evidence and specific examples of such whisper networks can be found on the website [www.socjobrumors.com](http://www.socjobrumors.com). Although this site, like many others of anonymous public-

forum format, has not survived over time, its early days were trafficked by many active users who posted unsubstantiated gossip and rumors. While this website is a public forum, its anonymous nature and own dubious reputation means that discussions about a researcher's research practices do not have the reach, institutional backing, or career effects as a retraction from a journal or similar institution. Doubt about a scholar's research practices may circulate while they are still a prolific and widely accepted researcher. Once the retraction labeling event has taken place, it brings the paper and author(s) into the public eye where they can be deemed morally dubious with the backing of an official finding. The initial, public label of misconduct results in further public and personal ostracism, especially from closer, more visible, third parties who have a higher pressure to confirm their own integrity (Grattet, 2011; Adut, 2005). Journals with higher impact factors, a proxy for status and visibility, are more likely to have written misconduct policies, negatively correlating journal status with toleration of deviance (Resnik, Patrone, & Peddada, 2010).

Previous research on the effects of retractions focus on citation and readership patterns (Lu, et. Al 2013; Azoulay, et. Al, 2017; Bar-Ilan & Halevi, 2018; Yand, Qi, Diao, & Ajiferuke, 2022). Azoulay, Bonatti, and Krieger (2017) models the effects of retraction as a Bayesian process in which the scientific community processes negative reputational information (the retraction), discounts the author as being mediocre all along, and stops rewarding the author with citations to any publications, retracted or not. However, a

penalty or punishment is distinct from the cessation of rewards. The spread of citations follows a superstar distribution, where most citations are concentrated amongst relatively few authors and most authors have few citations (Azoulay, Graff Zivin, & Wang, 2010). Most scholars will not be highly rewarded with citations over their lifetime. But this does not mean they are stigmatized in the research community.

Instead, I argue that multiple retractions are a better signal of stigmatization. Once a scandal breaks, “polluted or provoked third parties [are] provoked into showing extraordinary zeal vis-à-vis the offender, to signal rectitude or resolve” (Adut 2005, p. 216). The effort to investigate and report a reason for a retraction indicates the motivation is now focused on signaling bad work to others as compared to not citing the retracted author. As far as a retraction is scandalous, attracting public attention, we would expect to see the retracted author suffer multiple retractions. Prior research has tended not to explore or explain the reason for or effects of multiple retractions. While many papers note that retractions follow a Poisson distribution, this is mainly in the context of showing that the article’s focal measures are robust to whether the first or multiple retractions are considered (Azoulay et al., 2017; Hesselmann, Grad, Schmidt, & Reinhart, 2017).

Given that we have now outlined how retraction events are consistent with the theory of scandal, we can make specific hypotheses about what might happen following a retraction. In particular, the theory predicts that the scientific community first looks to



other work by the retracted author to see if there is evidence of misconduct. Thus, we should see further stigmatization of a retracted author in the form of further retractions.

*Hypothesis I:* A retraction event leads to an increase in the probability of future retractions.

Well documented in the literature on deviance and scandal, the stigma that arises from a scandal does not only affect the offender, but also spreads to associates of the deviant (Adut 2005). Colleagues and peers may distance themselves from the retraction by ceasing to cite it and even moving away from that area of study, especially when misconduct is mentioned (Azoulay, Furman, & Murray, 2015). Distancing oneself from a retracted author after the retraction may not be enough to avoid stigma by previous association. Pontikes, Negro, & Rao (2010) demonstrate this process in the film industry, where actors' employment opportunities were likely to decrease if they had once worked with an actor that was deemed a communist, even if the labeling event happened after the actors had worked together.

Given that most scientific papers are co-authored, and that team structure is integral to scientific production, it follows that we should examine how stigma affects collaborators when a co-author has suffered a retraction. A key part of the spreading of the stigma is the belief on the part of the public that it is likely that those who worked

with the offender either colluded, knew about the misconduct and did nothing, or learned from the offender unethical or imperfect methods, which would affect their work outside of the relationship with the offender themselves. Within the scientific discipline, it is reasonable to believe that onlookers would have this perception both because of the structural relationship of advisees learning from advisors and because of the ideal of true collaboration—that is equal investment, participation, and ownership—in scientific production, resulting in questions of how co-authors could not have known about the misconduct (Macfarlane 2017; Birnholtz 2006; Claxton 2005). Even though collaboration often takes the form of division of labor with differing members having ownership over different parts of the paper (analysis, conducting the experiment, writing), the scientific norm that being an author indicates you take “responsibility to a certain piece of work” (Johann and Mayer 2019:176). Evidence from a similar structural mechanism—the death of a prominent author supports this associational belief of learning and dependence on prolific authors. Azoulay et. al (2010) demonstrate that when a high-profile scholar dies prematurely, and thus ceases all research and publications, their coauthors also suffer a decrease in their rate of publications.

Thus, we might expect to see authors who have worked with a retracted author be subject to a higher rate of retractions for two reasons: (a) heightened scrutiny from association with a stigmatized member of the community due to the belief that b) they were responsible, aware of, or learned normalized unethical research practices. When

relying on summary observational data on retraction events, is not possible to distinguish these two mechanisms in practice.

*Hypothesis II:* An author who has once worked with a colleague who has a retracted paper is more likely to experience a retraction event themselves in the future.

## **1.2 Data and Methods**

Retractions are relatively rare. They account for about 0.02% of all publications (Yang, et al., 2022). The frequency of retraction is relatively correlated with how “hard” a science is, with medical and physical sciences at one end and arts and humanities on the other. The rate of retractions in the social sciences’ is on the rise seemingly due to recent shifts towards more systematic and open science practices that have uncovered problems reproducing work (Lu et al, 2013). The importance of scientific methods and the recent increase in rate of retractions make psychology a suitable setting as our focal field. Filtering to a single subfield also helps account for disciplinary differences in patterns of co-authorship. While it is common in psychology and especially in more lab-based life sciences to have many authors on a paper, fields such as economics and philosophy place single-authorship in high esteem. Given that one of our hypotheses

concerns the transmission of retraction through collaboration, we need to examine a field where collaboration is common.

The data come from two main sources: OpenAlex.org and RetractionWatch.com. RetractionWatch.com is a blog and database created by Adam Marcus and Ivan Oransky aimed at making scientific research “more transparent” by making retracted articles more visible to others who were unaware they might be using flawed or erroneous research papers in their own research. As of 2021, there are over 36,000 retractions in the database and over 110 papers that cite Retraction Watch itself. OpenAlex.org is an open research infrastructure containing data from but not limited to Microsoft Academic Graph (MAG), Crossref, ORCID, and PubMed (Priem, Piwowar, & Orr, 2022). OpenAlex was created to address the retirement of MAG and aims to standardize metadata relationships of scholarly entities. OpenAlex currently contains about 210 million scholarly documents such as journal articles, books, datasets, and theses, adding about 50,000 records daily. Compared to other datasets commonly used in the retraction literature, such as Web of Science (WoS) and Scopus, OpenAlex contains far more records, citation links, and better coverage of computer science, social sciences, and humanities (Martín-Martín, Thelwall, Orduna-Malea & Delgado López-Cózar, 2021).

I initiated my sample by identifying all records in RetractionWatch.com that have least one topic indicator matching the string “psychology”. This yielded a total of 543 papers published between 1950 and 2022. I then collected the entire bibliography of

all authors on each retracted paper from OpenAlex. From bibliography of each retracted author, I identify all coauthors and collect data on all their published works. To allow for comparison with authors who have never had a retraction, I defined a control sample by identifying a non-retracted paper from the same journal published on the same day or the next available day. I then followed the same steps to collect data on all papers written by the initial authors in the sample, identifying all their coauthors, and collecting data on their coauthor's publications. The final dataset is composed of 9,216,556 papers and 10,839,500 authors, 1,466 of whom have experienced at least one retraction. Some papers were filtered from the dataset. In their documentation, OpenAlex describes having high confidence in whether the paper is retracted or not, but low confidence in data on retraction dates. Because the analysis depends on comparing retraction rates based on time of exposure to a previous retraction event, I excluded 3,419 papers that were listed as retracted in OpenAlex, but not listed in RetractionWatch.

Table 1 presents descriptive statistics of authorship and papers. All distributions are extremely right skewed. The vast majority of authors have zero retractions. Of those with any, very few have more than one. Consistent with prior work on scholarly productivity, we see that the majority of authors write just a few papers. The majority of papers have one or two authors. A very small minority of each have many publications and many authors, respectively. Given that our interest is at the skewed end of the distribution, I hand-checked observations with extreme values. The papers authored by

the very largest teams are a result of collaborations between two large research firms, where all members are considered an author on the paper. Although these papers are rare, it seems that the authorship data is accurate and thus I keep the data in my analysis. To account for the shape of these distributions, I use an inverse hyperbolic sine transformation on all independent variables before estimating the regression. Results are robust to both the transformed and raw versions.

**Table 1: Descriptive Statistics of Papers, Authors, and Retractions**

Data	Mean	Median	Standard Deviation	Min	Max	Total
Papers Per Author	5.51	1	23.26	1	893	10809760
Authors Per Paper	6.45	5	7.91	1	570	9215633
Retractions Per Author	0.00	0	0.02	0	56	543

### 1.2.1.1 Analytic Strategy and Variable Specification

The model I employ is a logistic regression predicting whether a paper is retracted or not based on the profile of its authors' previous exposure to retraction. One explanatory variable counts how many authors on the paper have had a previous retraction. The next explanatory variable of interest counts the number of authors on the paper that have worked with a retracted author but have not experienced a retraction

themselves. This measures exposure to the stigmatizing event and risk by association. Previous literature notes different ways in which blame for retraction is characterized. On teams where misconduct is found, blame is often concentrated on one person in the team, while blame in retractions for errors is left ambiguous and distributed across the team (Azoulay et. al, 2017). Because retraction notices offer varying degrees of specificity and consistency, I consider all authors to have experienced the retraction equally. Previous research estimates up to 82% of retractions in psychology are due to misconduct including data fabrication, data falsification, and plagiarism (Stricker & Günther, 2019; Fang, Steen, & Casadevall, 2012). If that is the rate I should assign the retraction event to a single author on multi-authored papers, I am over-counting the number of authors who spread the risk of being associated with a retraction. Over-counting those who have retraction stigma would suppress the actual effect of retraction stigma on future retractions, resulting in a conservative estimate.

I also control for time since publication, for two main reasons. First, papers are typically not retracted without a reason, and reasons take time to find. Older papers have had more time to be investigated and have been exposed to the risk of retraction longer than recent papers. Second, there are secular trends in the rate of retractions that I cannot model directly given the data. Across fields, it appears that the rate of retractions has risen over time. Specifically in psychology, there was a period of significantly increased retractions as the field struggled with the “replication crisis” (Craig, et al.,

2020). In order to isolate the effects of time, I control for months since publication in the analysis, following previous literature that focuses on temporal dynamics of retractions (Steen, et al. 2016).

### **1.3 Results and Discussion**

Table 2 presents results from two models predicting a paper's retraction status. In both models, the effect of having a previous retraction is positive and significant, supporting Hypothesis I. Having an author with a previous retraction increases the likelihood that the paper will be retracted in both models. However, Hypothesis II is unsupported in both models. Though decreasing to below the 0.1 significance level when controlling for months since publication, the coefficient indicates the opposite effect of what we expect given the theory of stigma. How should we interpret this finding? As previously mentioned, the stigma of a retraction might only be applied to one person on a multi-authored paper. By considering all authors on a retracted paper spread stigma, and thus making the estimate more conservative, its true effect may be muted. There is a high degree of overlap between scholarly networks and the team structure on most papers. This might lead to a high correlation between the chances of having a paper retracted in the past and working with an author who has also had a retracted paper. However, all variance inflation factors (VIF) scores are below 2, suggesting that multicollinearity is not a threat to interpreting the results. We do have



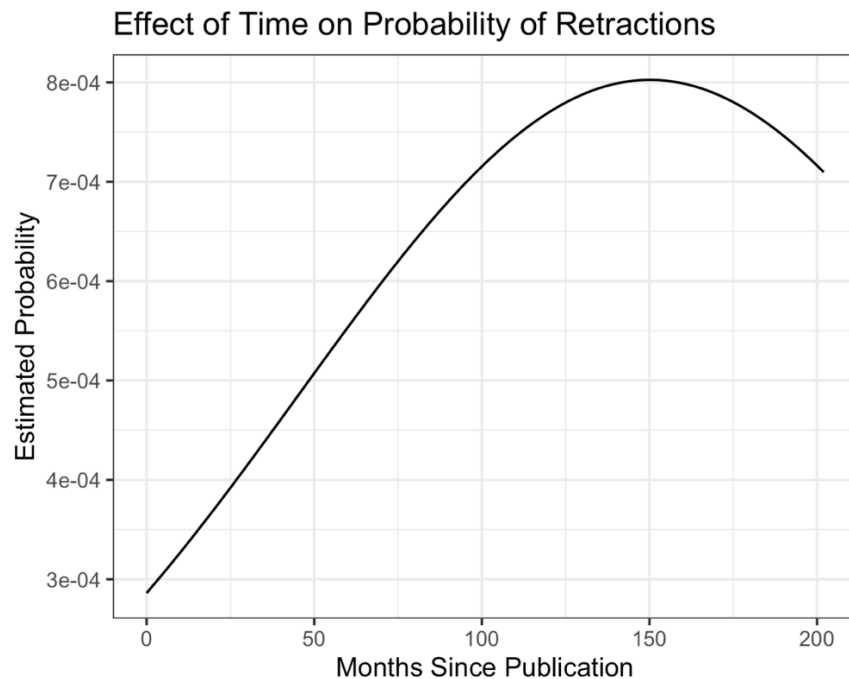
support for the idea that retraction are stigmatizing because Hypothesis I is supported. If the measure is to be trusted, the null result might be interpretable. The most morally dubious and therefore most scandalous reasons for retractions, data fabrication and falsification, are less likely to be taught and transferred to coauthors, as they are hidden for good reason. When coauthors are still scrutinized—as the theory of scandal would predict—there may end up being no substantive reason to retract their papers. Future research could leverage interactional dynamics to further detangle the mechanisms of stigma. As peers move to distance themselves from the stigmatized author, we might see fewer repeat collaborations for retracted authors.

**Table 2: Regression Results Modeling Paper Retractions**

	Paper is Retracted	
	Model A	Model B
Authors' Prior Retractions	0.525*** (0.000)	0.507*** (0.091)
Authors' Coauthors' Retractions	-0.359*** (0.090)	-0.155* (0.092)
Months Since Publication	-0.002*** (0.0005)	0.013*** (0.002)
Months Since Publication <sup>2</sup>		-0.0001*** (0.000)
Constant	-9.364***	-10.342*** (0.151)

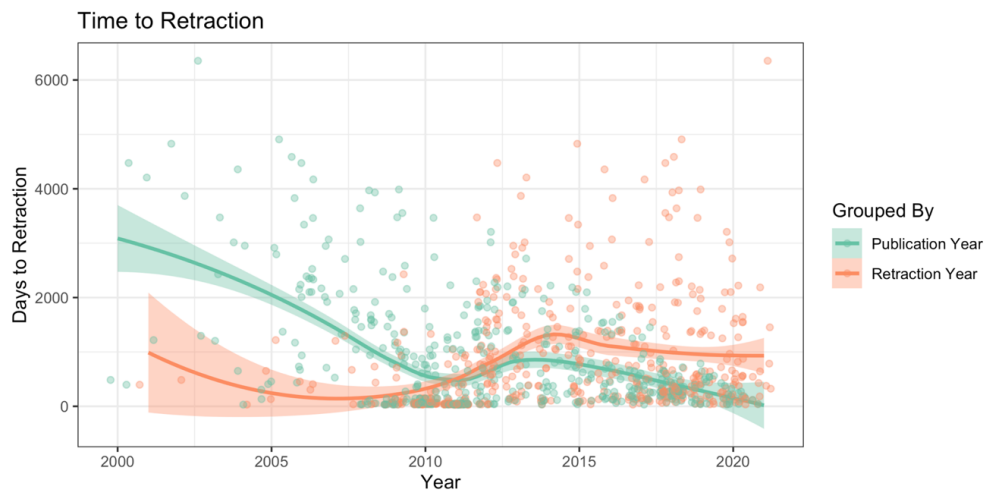
*Note: \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$   
Standard Errors shown in parentheses*

A second finding to explore is the association between time and the likelihood of retraction. Illustrated in Figure 1, the regression results show that papers that are too new or too old have decreasing probabilities of retraction. The median time to retraction is 6.5 years. This is substantially longer than previous studies that report the average time to retraction to be around 2 years (Hesselmann et al., 2017). Prior research has noted that it takes time to retract papers, but also that we are less likely to see retractions from very old papers. However, they have not explained why older papers are at lower risk for retraction (Bar-Ilan & Halevi, 2018).



**Figure 1: Effect of Time on Probability of Retraction**

Steen et al. (2016) explored whether recent rises in retractions are due to higher incidences of misconduct, or a rise in scrutiny and higher rate of reasons for retractions. They argue that if transgressions are becoming more common, the average time-to-retraction would not be affected when evaluated by year of retraction. If detection of misconduct has gotten more frequent or easier, we should see a decrease when evaluating time-to-retraction as a function of year of publication. In line with this approach, I examine time-to-retraction after 2000 and find that it increases when evaluated by year of retraction and decreases when evaluated by publication year. The results are shown in Figure 2.



**Figure 2: Time to Retraction Evaluated by Year**

By Steen et al.'s (2016) argument, this suggests not only that retractions are happening more quickly, but also that the incidence of misconduct has risen. Steen et al.

(2016) use all retractions in the PubMed database, whereas the present study focuses only on those in psychology. The behavior of time-to-retraction by publication and retraction year implies a disruptive period in psychology (Wicherts, 2011). Increasing for a period of uncertainty, time-to-retraction returns to being unchanged when evaluated by retraction year, and continues to decrease when evaluated by publication year. The increase in time-to-retraction could be explained by the “retraction epidemic” in psychology, where a new reason for retractions was established: the failure to replicate. Retractions in psychology for non-replication then increased as papers then were evaluated by this standard (Craig, Cox, Tourish, & Thorpe, 2020). Finally, the return to decreasing time-to-retractions by publication year suggests that the process of detection is better codified after some time and that the rate of misconduct is not increasing, but standards of scientific rigor are. It is important to note an immediate limitation of this analysis is that not all of the articles published in recent years that will end up being retracted have been retracted at the time of the analysis. This might well eventually move up the time-to-retraction for “recent” articles (i.e., recent from the point of view of the analysis).

This study offers a novel contribution to our understanding of trends and patterns in retractions. By examining retractions through the lens of stigma, we can explore the social dynamics of repeat offenders, a phenomenon that has been neglected in the literature (Hesselmann, 2017; Grieneisen & Zhanag, 2012). Future research could

improve on this study by identifying the authors held to be at-fault on multi-authored papers, thus disentangling the extent to which stigma diffuses to the “blame free” authors of a retracted paper. Since author eminence and citation count is protective against retraction, a better model could control for author eminence at time of publication. Going beyond the scope of this study, we might measure other outcomes we would expect to be affected by scandal, such as the number repeat collaborations or the number of graduate students assigned to the stigmatized author.

## 2. Moral Perceptions of Misconduct in Science

There are many ways that the process of scientific work can produce untrustworthy results—. Results can be distorted by anything from honest mistakes to intentional malfeasance. Even within the broad category of scientific misconduct, some behaviors are much more morally unacceptable than others. Data *falsification* is the intentional manipulation of existing data in a way that affects results but without reporting this manipulation in the research record. Data *fabrication* is the creation of entirely fake data. Together they are the two main kinds of data *fraud*, often described as the gravest form of scientific misconduct. Data fraud is a violation of the “sanctity of data in the value system of science” (Bedeian, Taylor, & Miller, 2010; Dalton, 2002, p. 728; Rubbo, Helmann, Bilynkievycz dos Santos, & Pilatti, 2019; Fanelli, 2009). Of all the sins and errors researchers can commit, data fraud is consistently punished the most harshly, resulting in the largest losses of future citations for authors and in severe cases even loss of employment and the initiation of legal prosecution (Bar-Ilan & Halevi, 2018; O’Leary, 2015). However, although data falsification and fabrication are considered science’s cardinal sins, a survey of researchers reveals that scholars themselves are most concerned about the threat of plagiarism, due to its potential negative effects on the ability to publish the articles and books crucial for scientists’ career advancement (Faria, 2015, p. 42). However, not all forms of plagiarism are deemed morally dubious. There is debate within the scientific community over the moral severity of “self-plagiarism,” and

disputes about what exactly constitutes plagiarism in the first place, such as using ideas from another author's publication without crediting the source (Yi, Nemery, & Dierickx, 2020).

Previous research has examined the empirical incidence of plagiarism and other forms of misconduct but has not explicitly examined variation in the moral impressions created by different, questionable research behaviors and, in particular, how these impressions compare to each other. While fraud—both fabrication and falsification—have been deemed immoral in previous work, little to no attention has been given to the morality of other forms of misconduct, most notably plagiarism. Even the one notable exception, a study by Pickett & Roche (2018), only focused on the moral impressions of two types of questionable research practices: data fabrication and selective reporting.

Further, although work on morality and moral judgments often focus on issues of harm—consequences of one's behavior that negatively impact others or a valued good—there are research practices which, while not immoral, are nevertheless harmful in that they 'pollute' the research knowledge base. These honest mistakes have not been investigated in comparison to intentional misconduct.

This chapter aims to fill that gap. It provides comparative data on moral impressions of data fraud, plagiarism, and mistakes amongst one of science's biggest stakeholders: the public. The scientific community has shown increasing interest in understanding public opinion of science. Research in this area typically focuses on the

public confidence in the scientific community, the willingness to trust findings and defer to experts, and how opinions differ along partisan lines (Blank & Shaw, 2015; Sushaty & Druckman 2015). However, studies on moral impressions of scientific misconduct, and specifically plagiarism, are missing from the literature.

## **2.1 Motivation**

Scientific misconduct is one of the principal threats to scientific trust and credibility (Fang, Steen, & Casadevall, 2012; Craig, Cox, Tourish, & Thorpe, 2020; Jamieson, McNutt, Kiermer, & Sever, 2019). Misconduct can engender changes in entire research fields, cause public scandal, and even result in threats to public safety (Azoulay, Furman, & Murray, 2015; Michalek et al., 2010). Broadly, scientific misconduct violates the presumption of “competence, integrity, and benevolence” understood by both members of the scientific field and the public broadly to be central to the scientific enterprise (Jamieson, et al., 2019, p. 19231-2). In terms of specific actions, there is no universally agreed upon definition of misconduct, something that has plagued efforts to rigorously document and analyze rates of its incidence and prevalence. Many previous papers cite the US Office of Research Integrity (ORI), which defines misconduct as “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research or in reporting research results... committed intentionally, knowingly, or recklessly...” (US Department of Health and Human Services, 2005).



Though there is some disagreement on the full spectrum of actions that can constitute misconduct, most definitions highlight practices that intentionally distort results or lead to incorrect information about contributions of research (Hofmann, Helgesson, Juth, & Holm, 2015; Resnik, Neal, Raymond, & Kissling, 2015; Stricker and Gunter, 2019).

Data falsification and fabrication are consistently viewed as the most serious transgressions. Various studies estimate that data fraud wastes millions of dollars of government funds and presents substantial risk to public health (Gammon & Franzini 2013; O'Leary, 2015; Michalek et al., 2010; Stern et al., 2014). Many scholars describe such behavior as morally wrong and some even advocate for criminalization of data fraud (Bülow, Helgesson, & Jussin, 2022; O'Leary, 2015). Bülow et al., (2022) argue that data fabrication and falsification are particularly criminal as they are “wrongful and potentially harmful,” possibly leading to risks in patient safety or undermining public trust in science.

While it is established that data fabrication and falsification are seen as immoral both in the scientific community and in the public, moral judgement of other forms of misconduct is less clear-cut (Hesselmann, Grad, Schmidt, & Reinhart, 2017; Pickett & Roche 2018). Many previous research papers do not distinguish between different kinds of misconduct, either because retraction notices (the correction mechanism for all kinds of misconduct) are often ambiguous, or such distinctions are outside the scope of the analysis (Craig, et al., 2020; Fanelli, Costas, & Larivière, 2015; Hesselmann, et al., 2017).

Of the papers that catalogue rates of different types of misconduct, plagiarism is consistently in the top three most frequent forms of misconduct (Hesselmann, et al. 2017).

Previous research estimates plagiarism to be the cause of about fifteen to forty percent of retractions in the PubMed database (Steen, 2011; Stretton et al., 2012). Other research leverages automated-text analysis tools and surveys to estimate the rate of plagiarism in different academic fields, rather than in retracted articles only. Previous research based on these methods estimates the incidence of plagiarism, or “problematic amounts of recycled text” to be between 12% to 25%, with rates being significantly higher in psychology and economics as opposed to biochemistry and history (Horbach & Halfman, 2019; Pupovac, 2021). Surveys estimate self-reports of plagiarism to be between 1.7 and 2%, a similar rate to self-reported data falsification and fabrication (Horbach & Halfman, 2019; Pupovac & Fanelli, 2014; Fanelli, 2009). While the self-report rate for plagiarism is similar to that for data fabrication, some studies report a much higher rate of faculty members being aware that their fellow colleagues engage in plagiarism. One survey reports that over 70% of faculty members claimed to be aware of colleagues who engaged in plagiarism (Bedeian, et al., 2010). Although plagiarism is identified as one of the most common forms of misconduct, there is little research on its moral perceptions. When surveying the literature, research on perceptions of plagiarism focus on which specific acts are considered plagiarism rather than moral perceptions of

plagiarism as such (Yi, Nemery, & Dierickx, 2020; Yi, Nemery, & Dierickx, 2022).

Although the prevalence of plagiarism rivals that of both fraud and error, there is little known about either the public or expert perceptions and moral judgments of plagiarism.

To help clarify perceptions of the morality of plagiarism, the current study focuses on impressions from the public. Although the public does not possess detailed knowledge about scientific methods or publishing incentives, they are able to make immediate moral judgements based on moral intuitions (Pickett & Roche, 2018; Haidt & Joseph, 2004). Individuals experience immediate feelings about how wrong an act is and develop a moral judgment even though they might not be able to articulate clear principles for their reaction (Haidt 2001; 2012; Vaisey, 2009). Although morality is a multidimensional space partially made up of perceived harm and social cooperation, it is outside the scope of this study to detangle the reasons for moral judgements (Baumard, André, & Sperber, 2013; Haidt, 2012). Instead, we will focus on the relative moral reception of different forms of scientific transgression. Although there has been growing interest in public opinion about science, few studies have explored public attitudes towards scientific misconduct, with one notable exception that focuses on moral ratings of data fraud and selective reporting (Pickett & Roche, 2018; Sushaty & Druckman, 2015).

Data is the backbone of scientific claims (Resnik 2014). Plagiarism is distinct from other forms of misconduct involving the manipulation of data in that it does not

necessarily lead to erroneous scientific conclusions and information. Although it distorts who made the contribution, which is explicit in some definitions of misconduct, it does not “distort scientific knowledge” (Fanelli, 2009). If competence, integrity, and benevolence are the dimensions on which the trustworthiness of science are measured, plagiarism and data fabrication are arguably similar violations. Both actions indicate an intent to deceive, a crucial element in the identification of misconduct. (Honig & Bedi 2012; Karabag & Berggen 2012). While a mistake would breach the expected norm of competence, an honest error is not a moral breach (ORI, 2009). Since data fraud is the most harshly punished by expert community members (as measured in terms of citation reductions and loss of future funding), we predict plagiarism will be judged as less immoral than data fabrication. Since an error implies no intention to deceive, but is still a breach of competence, we predict it will be judged as less immoral than plagiarism. Meanwhile, it is unclear if an error will be judged as more or less immoral than accurate and honest work.

While honest mistakes in academic research do not indicate any intent to deceive readers, the sheer fact of making a mistake can easily be seen as a kind of moral failure that ought to be punished. This might of course be simply unfair (why should an honest failure be punished but an honest success be rewarded?), but it is possible to see why greater care in research might be rewarded if it leads to fewer errors. Mistakes, even honest mistakes, can still contaminate the body of scientific knowledge in a similar

manner to data fraud, and take just as long to correct. We have very little prior evidence of how people view mistakes which are consequential for findings in comparison to intentional research misconduct—both plagiarism and fraud. We consider mistakes in addition to fraud in order to understand the difference in the ‘ethical’ dimension and the ‘incorrect’ dimension. That is, plagiarism is unethical but typically correct in terms of its consequences for the research, fraud is both unethical and incorrect, and mistakes are ethical but incorrect. We compare these three types of behaviors to ideal scientific behavior: no fraud, plagiarism, or mistakes.

## ***2.2 Data and Methods***

In order to measure moral impressions of scientific misconduct in the public, we administer a within-person vignette experiment to a convenience sample of US adults. Participants were recruited on the Prolific platform. Prolific is an online crowdsourcing site that allows researchers to connect with participants. This platform has advantages over other online crowdsourcing platforms common in research, notably MTurk. Prolific focuses on data quality and has a replenishing pool of participants (Peer, Brandimarte, Samat & Acquisti, 2017). In total, we collected responses from 225 people.

A link was posted to our Qualtrics survey on the Prolific platform. As with all surveys posted on Prolific, participants were offered a small monetary incentive to participate. We paid participants \$1.50 after survey completion. We chose this amount

based on an implied hourly rate consistent with a livable wage. We estimated that our survey would take 5 -7 minutes to complete. We limited participation to respondents who were at least 18 years old and live in the United States.

We first collected demographic information on the respondents including age, gender, race, ethnicity, level of education, and political affiliation. Then, the respondents were asked to read four vignettes and answer questions about each before moving onto the next. Each vignette presented a two-sentence description of a scientist working at a university who has recently published a paper. The vignettes describe the scientist either engaging in plagiarism, making a mistake, falsifying data, or accurately presenting their results. The order of vignettes was randomized across participants in an attempt to reduce anchoring moral assessments based on the previous vignette (Pickett & Roche, 2018). All vignettes were original and developed specifically for this study. In developing the survey, we consulted with outside experts who took early versions of the survey and offered guidance and interpretation. We were careful to avoid suggestiveness in wording, such words like “fraud” which may imply similarity to other criminalized activity. We also tried to keep vignettes jargon-free, as previous research demonstrates that jargon may lead to decreased perceptions of trustworthiness and morality (Markowitz, Kouchaki, Hancock, & Gino, 2021). The full survey with all vignettes is included in Appendix A.

The main outcome variable of interest measures participants' perceptions of morality (coded: very moral, somewhat moral, neither moral nor immoral = 0, somewhat immoral, very immoral = 1). In an effort to validate our data, we also asked respondents how often they believe scientists engage in the different kinds of behavior (coded: never, very rarely, rarely, and occasionally = 0, frequently, very frequently, and always = 1). Research in psychology has found that people use perceptions of how frequent a behavior is to judge how morally acceptable it is (Eriksson, Strimling, & Coutlas, 2015; Lindström, Jangard, Selbing, & Olsson, 2018; Eriksson, Vartanova, Ornstein, & Strimling, 2021). Because we do not expect the public to have detailed knowledge about the incidence rate of each type of behavior, we expect that moral impressions and the belief of how frequently the behavior takes place will be strongly correlated. Behaviors that are rated as highly immoral, such as data fraud, should be thought of as being very rare.

We also collected demographic information as prior research indicates that opinions, and especially trust, of science tend to vary by both education level and political affiliation (Blank & Shaw, 2015; Suhay & Druckman, 2015). Descriptive results of demographic information are presented in Table 3. As with other respondent pools collected on online recruitment platforms, our sample tends to be more liberal than conservative, younger than older, and have more white respondents than any other racial category.

**Table 3: Demographic Distributions of Respondents**

	N	Percent
<b>Age</b>		
18-30	71	0.316
31-45	86	0.382
46-60	41	0.182
61 or older	27	0.120
<b>Gender</b>		
Man	122	0.54
Woman	97	0.431
Transgender and Non-Binary	6	0.027
<b>Race</b>		
Asian	15	0.067
Black or African American	17	0.076
Multiple	12	0.053
White	181	0.804
<b>Education</b>		
Less than a high school degree	3	0.013
High school degree or equivalent	29	0.129
Some college, no degree	47	0.209
Associate degree (e.g. AA, AS)	22	0.098
Bachelor’s Degree (e.g. BA, BS)	88	0.391
Master’s Degree (e.g. MA, MS, Med)	27	0.120
Professional Degree (e.g. MD, DDS, DVM)	5	0.022
Doctorate (e.g. PhD, EdD)	4	0.018
<b>Political</b>		
Very Conservative	8	0.036
Conservative	16	0.071
Somewhat Conservative	27	0.120
Moderate—neither Liberal nor Conservative	38	0.169
Liberal	63	0.280
Somewhat Liberal	27	0.120
Very Liberal	46	0.204



### **2.2.1.1 Analytic Strategy**

We employ a logistic regression for each variable, predicting the outcome on vignette condition and individual demographics. Results are robust to analysis using each demographic's full ordinal scale, and to dichotomized versions of education and political affiliation. The dependent variables (moral impressions and frequency impressions) are regressed on the primary independent variable: condition, which is a factor corresponding to the vignette being rated: ethical, plagiarism, mistake, and fraud. Ethical is the baseline in all models being presented. To check for robustness and account for the repeated measures from a single individual due to the within-person design, we also ran a model with fixed-effects for individuals. Although exact estimates vary slightly, all results are unchanged in sign and significance across both models. Because we are interested in heterogeneity of responses by demographic information, we present the non-fixed effects model below.

## **2.3 Results**

Model results are presented in Tables 4 and 5. Table 4 describes the effect of fraud, mistake, and plagiarism on the likelihood of judging the act as 'Somewhat Immoral' or 'Very Immoral'. In line with previous findings, respondents are significantly more likely to judge fraud as immoral (Pickett & Roche, 2018). Because the regression uses ethical as the reference category, we report marginal effects to illustrate

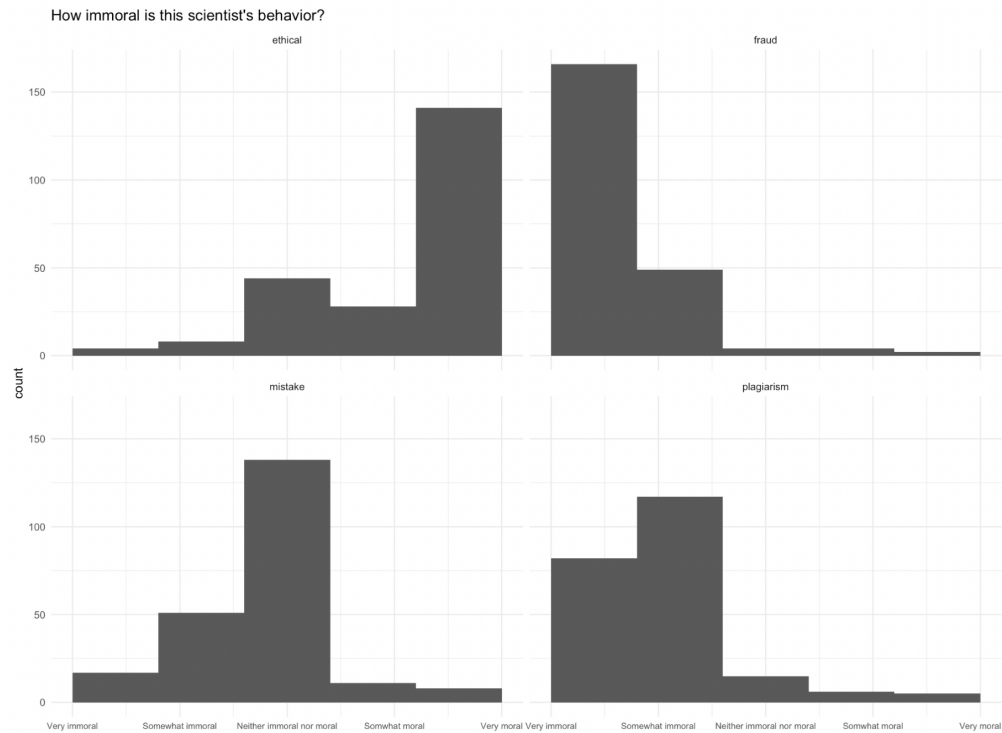
the relative effect of each condition. Marginal effects are presented in Table 5. As we expect, participants are far more likely to judge fraud as immoral as opposed to any other behavior. In contrast, mistakes have a negative effect, meaning they are less likely to be viewed as immoral. However, while the probability of judging ethical behavior as immoral is .036, the probability of judging a mistake as immoral is .229. The distributions of responses are depicted in Figure 3. While the modal response for mistake is neither immoral nor moral, there are some respondents who do view a mistake as immoral. Next, we examine the moral judgement of plagiarism. The effect for plagiarism is positive and significant, but smaller than that of fraud. Using the marginal effects, the probability of viewing plagiarism as immoral is .84. As a comparison, the probability of viewing fraud as immoral is .94. As expected, data fraud is most consistently seen as immoral, with plagiarism distinctly more immoral than ethical behavior or mistakes, and less immoral than data fraud.

**Table 4: Regression Results Modeling Log-Odds of choosing 'Somewhat Immoral' or 'Very Immoral'**

	Estimate	Standard Error	Z Score	P Value
Intercept	-2.927	0.485	-6.035	0.000
<b>Condition</b>				
Fraud	6.024	0.444	13.563	0.000
Mistake	2.050	0.331	6.195	0.000
Plagiarism	4.976	0.367	13.575	0.000
<b>Political Affiliation</b>				
Liberal	0.245	0.443	0.553	0.580
Moderate	-0.074	0.472	-0.158	0.875
Somewhat Conservative	-0.006	0.500	-0.012	0.991
Somewhat Liberal	0.087	0.500	0.174	0.862
Very Conservative	-1.363	0.666	-2.046	0.041
Very Liberal	0.020	0.460	0.044	0.965

**Table 5: Marginal Effects of Condition on Choosing 'Somewhat Immoral' or 'Very Immoral'**

	Estimate	Standard Error	Z Score	P Value
Ethical Effect	-3.263	0.247	-13.207	0.000
Fraud Effect	2.761	0.265	10.433	0.000
Mistake Effect	-1.212	0.165	-7.333	0.000
Plagiarism Effect	1.714	0.197	8.717	0.000



**Figure 3: Distribution of Moral Perceptions by Behavior**

Table 6 presents results on about how frequently respondents believe each behavior to happen and marginal effects of each condition are presented in Table 7. Consistent with the common-is-moral heuristic, ethical behavior is seen as the most frequent and the most moral (Lindström, Jangard, Selbing, & Olsson, 2018). Turning to the marginal effects presented in Table 7, we can see that the probability of choosing frequently or very frequently is .25 when fraud is presented. Interestingly, although mistakes are seen as significantly less immoral, the probability of choosing that mistakes happen frequently or very frequently is .24, an extremely similar rate to fraud. This

suggests that respondents have a high belief in the competency of researchers, and that published scientific findings are not likely to be misleading, consistent with the overall public impression that scientists contribute “a lot of good” to society (Blank & Shaw, 2015, p. 20). In contrast, plagiarism, although seen as more immoral than mistakes, is viewed as more likely to happen. The probability of selecting frequently or very frequently is .30 when plagiarism is selected. Finally, we can see that ethical behavior is strongly believed to happen the most frequently, with a probability of choosing frequently or very frequently of .95. The common-is-moral heuristic is supported by all findings except for mistakes. Mistakes, although seen as largely moral, are perceived to not happen very often.

**Table 6: Regression Results Modeling Log-Odds of Choosing 'Always', 'Frequently', or 'Very Frequently'**

	Estimate	Standard Error	Z Score	P Value
Intercept	3.319	0.376	8.817	0.000
<b>Condition</b>				
Fraud	-4.119	0.304	-13.533	0.000
Mistake	-4.174	0.308	-13.541	0.000
Plagiarism	-3.877	0.289	-13.420	0.000
<b>Political Affiliation</b>				
Liberal	-1.874	0.381	-4.912	0.000
Moderate	-1.920	0.421	-4.564	0.000
Somewhat Conservative	-1.321	0.429	-3.077	0.002
Somewhat Liberal	-1.509	0.438	-3.443	0.001
Very Conservative	-0.492	0.554	-0.888	0.374
Very Liberal	-1.673	0.396	-4.228	0.000

**Table 7: Marginal Effects of Condition on Choosing 'Always', 'Frequently', or 'Very Frequently'**

	Estimate	Standard Error	Z Score	P Value
Ethical Effect	3.034	0.178	17.076	0.000
Fraud Effect	-1.077	0.196	-5.485	0.000
Mistake Effect	-1.131	0.199	-5.678	0.000
Plagiarism Effect	-0.835	0.185	-4.516	0.000

Interestingly, we find little difference in opinions based on political affiliation or any other demographic category. Prior research in the United States documents partisan differences in general attitudes and trust in science, suggesting that Democrats tend to be more pro-science than Republicans (Blank & Shaw, 2015). However, our analysis suggests a strong consensus about moral impressions across all affiliations, which is consistent with past research of moral impressions of data fraud (Pickett & Roche, 2018). However, we do find slight differences along partisan lines in impressions of how frequently each behavior happens. Conservatives and Liberals are respectively slightly more and less likely to choose 'Always', 'Frequently', or 'Very Frequently' across all conditions. This suggests that conservatives are slightly more skeptical about the accuracy of science, and of the rates at which misconduct happens. Although moral judgements may be consistent along partisan lines, our results show support for a slight difference in overall trust of scientific research (Blank & Shaw, 2015; Suhay & Druckman, 2015).

## ***2.4 Discussion and Conclusion***

Overall, our study suggests the consensus view is that plagiarism and data fraud are immoral behaviors. However, our study is not without limitations. While this study establishes the immoral perceptions of misconduct, future research could further explore the dimensions along which morality is judged. For instance, it might be useful to

question the participants about how harmful they perceive each behavior to be. While harm is not the only aspect on which morality is evaluated, it is highly salient and a foundation of moral judgement. Different behaviors classified as misconduct might also be judged so along different dimensions. For instance, data fraud could reasonably be seen as highly harmful, whereas plagiarism might be seen as a less serious sort of harm. Additionally, future research could intentionally include more conservative respondents to increase power in case small differences could not be detected with our sample size.

This study also describes singular types of plagiarism and data fraud, although there are many specific behaviors that can be considered under these two categories. As previous research has examined the consensus on what constitutes misconduct, data fraud, and plagiarism, future research could investigate which actions the public considers misconduct (Yi, Nemery, & Dierickx, 2020; Yi, Nemery, & Dierickx, 2022). The acceptability of questionable research practices—behaviors that affect a study's conclusion, such as selective reporting or excluding outliers, but are not always considered misconduct, are even more ambiguous among scholars and the extent of wrongfulness could be clarified by studying the public (Pickett & Roche, 2018; Hesselmann, et al., 2017).

We find that the public view the morality of questionable research practices on a continuum anchored on one end by data fraud, which is seen as highly immoral, and ideal scientific behavior on the other, which is perceived as moral. Plagiarism is seen as



immoral but not as severely immoral as fraud, and mistakes are viewed largely neutrally in terms of morality. Impressions of frequency are reversed, with ideal scientific behavior as the most common and fraud the least. In contrast to prior research, plagiarism is viewed as more common than mistakes although less moral. This analysis contributes to our understanding of how the public view scientists, important dimensions of moral judgments, and the link between morality and perceived frequency.

### **3. Moral Perceptions of Misconduct Across Professions**

Perceptions of moral behavior have shown how behaviors can be categorized as immoral based on the violation of a moral foundation: harm, purity, loyalty, fairness, and authority (Haidt, 2012). Frequently, studies that evaluate moral perceptions focus on many behaviors to uncover these bases of moral behavior, to challenge their grouping, or to see how impressions vary by sociodemographics and political affiliation. In the following, we isolate a single immoral behavior—plagiarism—and investigate how varying the occupation of the actors involved in the vignette affects the perceived morality and frequency of those actions. We focus on two primary dimensions of occupations that may be relevant to moral perceptions: the degree to which authenticity and creative control are tied to the industry and the relative degree to which the behavior is culturally expected by that occupation.

Authenticity comes in many conceptual forms, which can have different effects on the experience and judgements of people, products, and experiences (Lehman, O'Connor, & Carroll, 2019; Newman, 2019). In order to compare transgressions of authenticity in science—particularly plagiarism—this study will focus on a single conceptualization, “indexical authenticity”, or the idea that consumers can trust the origin of the product and that it was produced by the parties given credit (Grayson & Martinec, 2004). Clearly, plagiarism in its traditional form—taking work from others without credit but not including self-plagiarism—is a violation of indexical authenticity

(Faria, 2015). However, consumers of science, and especially non-experts, may not be readily able to perceive such a transgression. When plagiarism is revealed, it is consistently judged as immoral (Faria, 2015; Yi, Nemery, & Dierickx, 2020). Previous research shows that plagiarism is an unexpected action from scientists and is seen as immoral.

Plagiarism, which is at its core a misrepresentation of who contributed to the product—is not unique to science. Authenticity has been highly studied in related fields, especially in creative industries. Research has shown that perceptions of authenticity increase consumers' satisfaction of products, influence their choice of what to buy, and affect their trust in individuals (Grayson & Martinec, 2004). However, the research on authenticity typically focuses on ratings and sales, not its effects on morality. In order to better understand the link between authenticity and perceptions of morality, we study transgressions of authenticity in fields that share similar characteristics to science—fields where it is difficult for consumers to immediately assess authenticity yet may play an important role in evaluation of such products. Focusing on science, art, and organic produce, we explore whether moral judgements and perceptions of frequency of the behavior are influenced by perceptions of the product's authenticity (creative control) or the cultural expectations about the behavior of the occupations of the producers (affect control theory). We find evidence for both processes, with a stronger relationship

between moral judgements and creative control and cultural expectations for frequency of the behavior (Faria, 2015).

### **3.1 Motivation**

Plagiarism—copying someone else’s text or ideas without giving proper credit to the source—in the scientific community has been deemed as immoral by both scholars and the public (Yi, Nemery, & Dierickx, 2022; ORI, 2022). Plagiarism is often considered one of the gravest forms of scientific misconduct, akin to data fabrication and falsification (Resnik, Rasmussen, & Kissling, 2015). However, plagiarism is unique in the realm of misconduct as it does not distort scientific results (Fanelli, 2009). Results may remain accurate, but the public is misled about who made the scientific contribution. Although considered a serious offense amongst the scientific community, scholars and the public distinguish plagiarism from other forms of misconduct that do distort results, such as data fabrication. Plagiarism’s main effects are on the careers of scholars due to the importance of publishing (Faria, 2015, p. 42). Plagiarism, while deemed morally dubious, does not have the same potential as data fraud for harm to the public, although it might harm the career of those who were plagiarized (Faria, 2014).

Plagiarism is not unique to scientific disciplines. At its core, plagiarism is a transgression of authenticity. Although it may not be referred to as plagiarism, other cultural industries are also susceptible to transgressions of authenticity. In particular,

*credence goods*—goods where the value is difficult for the average consumer to assess—often need to signal authenticity and be judged by experts in order to increase trust, reach, and value to consumers (Bonroy & Constantatos, 2008). In this paper, we will focus on science, art, and organic food as examples of credence goods, and how consumers morally evaluate a transgression of authenticity and assess their frequency.

Previous research on art markets, science consumption, and organic food argue that consumers rely heavily on expert opinions in order to make decisions on what to trust and buy (Ekelund, Higgins, & Jackson, 2020). In each of these industries, it is difficult for non-experts to establish objective value, even after consumption. In art, people rely on expert-connoisseurs who offer opinions on which buyers make their decisions (Ekelund, Higgins, & Jackson, 2020). Organic and fair-trade foods are often presented as examples of credence goods, and surveys report that consumers are willing to pay a higher price for organic and fair-trade food but are not more likely to purchase such food due to doubt and skepticism (Balineau & Dufeu, 2020; Bonroy & Constantatos, 2008). Scientific findings, though aimed to provide verifiable facts, are often contradictory and based on new knowledge that takes some time to confirm (Dulleck & Kerschbamer, 2006). Furthermore, like art, the public often relies on consensus of experts to determine the validity and value of scientific findings. In some ways, peer review serves as this signal of credence, although peer review is not particularly well-suited to uncovering instances of fraud (Heesen and Bright, 2021). Not only can each of these

industries be categorized as a credence good based on the difficulty to assess value, but authenticity is also at the heart of evaluation.

The link between authenticity and perceptions of morality has been less established than the link between authenticity and consumer appeal. One study argues that status seeking behaviors decrease perceptions of authenticity in moral actors, which in turn decreases the effect of morality on status conferral (Bai, Ho, & Liu, 2020). Other research on authenticity tend to depict it as an “overwhelmingly positive trait”, conflating it as a moral and virtuous quality (Lehman, O'Connor, Kovács & Newman, 2019, p. 22; Grauel, 2016). Others see authenticity as a “pursuit of purity”, a central dimension in one commonly accepted definition of morality (Sgourev & Aadland, 2022, p. 67; Haidt, 2012). We do have evidence from the field of scientific production that members from the community and the broader public view transgressions of authenticity (plagiarism) as highly immoral (Faria, 2015; Faria, 2014; Hesselmann, Grad, Schmidt, & Reinhart, 2017, Pickett & Roche, 2018).

While we might expect a transgression of authenticity to be judged as morally dubious, there is an outstanding question of whether it is due to cultural expectations about how individuals in the occupations act or due to a violation of the purity of the product. Two theories in sociological research lead to this line of questioning. Affect control theory and creative control could each plausibly explain judging misrepresentations of authenticity as immoral, with affect control theory focusing on

expectations of how individuals behave under the control principle of meaning maintenance, and creative control focusing on the importance of a single entity having responsibility for all aspects of the creative production process.

Affect control theory is a formal model of social interaction based on the premise that individuals act in ways to maintain shared cultural meanings. Affect control theory posits that social identities have affective meaning along three dimensions: Evaluation, determination of good/bad, Potency, meaning powerful/weak, and Activity, meaning active/inactive. Evaluation, Potency, and Activity (hereafter EPA), have been defined for many identities and behaviors based on multiple surveys across multiple years and countries (Hamid et al, 2016; Schroder 2007; Mukherjee and Heise, 2017). The result of previous research collecting EPA scores from cultural respondents is an affect control theory dictionary that provides mean culturally agreed upon fundamental sentiments for identities and behaviors. These mean values are considered the baseline for cultural meanings of social terms, called their fundamental sentiments within the theory. For instance, the fundamental sentiment of Mother in the most recent affect control theory dictionary is an EPA profile of (3.05, 2.66, .76), meaning that Mothers are seen as very good, very powerful, and moderately active (Smith-Lovin, et al., 2016; Maloney, 2023).

Previous researchers in affect control theory have derived equations that define affective reactions to an Actor doing a Behavior to an Object (hereafter ABO) by assessing how the EPA profile of each element moves in the affective space as a

consequence of the event. These post-event EPA positions are called transient impressions (Heise & Smith-Lovin, 1981). Events that follow cultural expectations result in transient impressions that are very close to each element's fundamental sentiments. For instance, the transient impressions of the elements of the ABO event "Mother Loves Child" are very close in EPA space to their fundamental sentiments. In contrast, in the transient impressions from the ABO event "Mother Hits Child" will be further away from the fundamental sentiments—Mothers, who are good, powerful, and somewhat active (3.05, 2.66, 0.76) are not expected to do a bad, powerful action like Hit (-2.66, 1.3, 2.12) to a good, powerless, active Child (1.89, -1.14, 1.87) (Maloney & Smith-Lovin, 2021).

Finally, affect control theory uses the difference between transient impressions and fundamental sentiments to formalize cultural unexpectedness. By taking the sum of squared differences across all situational elements and EPA dimensions, the *deflection* of the event is produced. Deflection is a measure of how much a situation disturbs cultural meanings, conceptualized a measure of unexpectedness. Affect control theory argues that people will act in ways to keep deflection low and restore cultural meanings: this is the control principle of the model (Jacobs & Quinn, 2022; Robinson & Smith-Lovin, 2018).

We can examine past research to understand how well-suited affect control theory is to understand occupational identities and perceptions of morality, the core themes of this study. Recent work has used affect control theory and validated EPA



ratings to understand occupational identities. EPA ratings are a better predictor of status rankings from survey data than other measures of occupational prestige. Further, affect control theory has been able to predict emotional satisfaction from occupational identity and exemplify cultural changes in occupational meaning from economic and social shocks as exemplified by the recent COVID-19 pandemic (Freeland & Hoey, 2018; Maloney, 2023; Quinn, et al., 2022). Taken together, affect control theory is well suited to represent affective perceptions of different occupational identities, a crucial element of this study.

Although deflection scores derived from EPA ratings is fundamentally a measure of unexpectedness, recent work has shown an association between deflection and perceptions of morality. Although employing a simplified deflection-equation, Ochoa (2022) demonstrates how distance from exemplar identities and behaviors is a strong predictor of judgements of morality and perceived harmfulness. Using survey experiments and quantitative text analysis, Ochoa (2022) argues that moral transgressions typically involve negative, potent behavior towards a vulnerable (low potency) object, providing a rigorous connection between affect control theory and assessments of immorality. Even stronger though, is the predicted relationship between deflection and impressions of frequency of behavior. Lower deflection events are more culturally expected, and thus more likely to occur, than higher deflection events.

Applying affect control theory to transgressions of authenticity in credence-goods markets, we can derive specific hypotheses of how we might expect people to form moral judgements. We draw on EPA ratings from the US Combined surveyor 2015 dictionary to construct ABO events and produce deflection scores to provide us with predictions about moral judgements (Heise & Machinnon, 1987; Smith-Lovin, et al., 2016). Because this dictionary does not include the word “plagiarize”, we define two sets of ABO statements to measure the effect of taking another’s work without giving credit, and the effect of deception to the consumer about who contributed to the product. In turn, our ABO statements take the form of “Occupation” Steals From “Occupation”, and “Occupation” Deceives Consumer, where “Occupation” is either artist, farmer, or scientist. Table 8 presents all ABO statements and deflection scores. Both sets of ABO statements produce a consistent deflection ranking across industries, leading to our first hypothesis: people will view farmers and scientists as being more immoral and more likely to misrepresent their products than artists.

**Table 8: ABO Statements and their Deflection Scores**

ABO	Deflection
Artist Steals from Artist	19.503
Scientist Steals from Scientist	21.142
Farmer Steals from Farmer	25.354
Artist Swindles Artist	16.047
Scientists Swindles Scientist	17.670
Farmer Swindles Farmer	20.829

In contrast to affect control theory, the idea of creative control highlights the importance of accurate and singular representation in the production of creative goods. Rather than focusing on the affect associated with identities, creative control emphasizes the authenticity of the goods based on an accurate representation of the creator and their intentions (Valsesia, Nunes, & Ordanini 2016). Grayson & Martinec (2004) define a key element in creative control. This is *indexical authenticity*, the idea that a product's origin or authorship is not in question or certainty that the product was created by the party given credit (p. 297). Although only one dimension of authenticity, indexical authenticity plays an important role in assuring consumers that they can trust what they see is an accurate reflection of the vision of the creator, engendering positive expectations about the intentions of others (Rousseau, Sitkin, Burt, & Camerer, 1998). Previous research argues that trust is associated with qualities such as fairness, honesty, competency, and benevolence, which are also all dimensions important to the

perception of morality (Baumard, André, & Sperber, 2013; Rotter, 1971; Valsesia et al., 2016).

The importance of creative control has been demonstrated through analysis of critical acclaim and sales in the music and beer industries and through experiments about music authorship (Valsesia, et al., 2018). Creative control strongly predicts critical acclaim, although not popular consumption. However, when consumers do not feel confident in their ability to assess the value of an experience (such as with credence goods), creative control and authenticity predicts both critical acclaim and popular appeal (Valsesia, et al., 2018, p. 910). The idea that perceived authenticity provides basis for evaluation is also highly present in the research on food experiences and cultural consumption (De Hooge, Giesen, Leijsten, & Herwaarden, 2022; Gaytán, 2019; Giorda, 2018). Not only relying on the perception of indexical authenticity, consumers also look to evaluate the type authenticity—the idea that the product is consistent with beliefs about the (ethnic or class) category it belongs to (Carroll & Wheaton, 2009). However, again enforcing the importance of the origin of the product, consumers only likely to trust the authenticity of the product when the cultural producer is also perceived to be authentic (Hahl, Zuckerman, & Kim, 2017).

Using what we know about the moral perceptions of plagiarism in science, and the decreased positive effects of morality when inauthenticity is detected, we can make predictions about how people might view transgressions of authenticity across

industries with a varying degree of creativity. Because past literature on creative control focuses on creative industries such as music and food as it is experienced—for example, drinking beer at a bar, or dining at a restaurant—we predict that a violation of the authenticity of visual art will be perceived as the most immoral since art is singularly defined as a creative industry (Flew, 2022; U.S. Census Bureau, 2022). Essential to the idea of creative control is that the product is produced through a creative process. Science closely follows the two key stages defined as part of every creative process: the generation of new and abstract ideas, and the exploration of such ideas, producing more concrete concepts (Finke, Ward, and Smith, 1996; Valsesia et al., 2016). Due to science heavily involving creative processes, we predict that a transgression of authenticity in science will closely follow the moral judgements of inauthentic art—that is it will be perceived as highly immoral. In contrast, we predict that a violation of authenticity of organic food presented in a grocery store will be judged as the least immoral. Research on authenticity of food focuses not on the production of ingredients, but the experience of dining or rustic presentations when shopping (Valsesia et al., 2016). Further, we know that consumers are already skeptical of organic food and while likely to think organic ingredients are more ethical, they are not likely to purchase them (Balineau & Dufeu, 2020). Because skepticism indicates an impression that this transgression might be prevalent, we predict people will be less surprised and therefore offended at this act.

### **3.2 Data and Methods**

In order to understand moral perceptions of transgressions of authenticity across industries, we conducted survey on the online crowd-sourcing platform Prolific. A link was posted to our Qualtrics survey on the Prolific platform. Because norms about plagiarism vary across cultures and countries, we decided to limit our sample adults in the US to assure shared cultural schemas, an especially important element in affect control theory (Mahmud, Bretag, & Foltýnek, 2019; Yi et al., 2022). As with all surveys posted on Prolific, our participants were offered a small monetary incentive to participate. We paid participants \$1.50 after survey completion based on the estimate that our survey would take between five and seven minutes to complete and the goal of providing a livable wage. Our final dataset is a convenience sample of 234 adults in the US, all of whom fully completed the survey and are therefore included in the analysis.

After ensuring informed consent, we collected demographic information on the respondents including age, gender, race, ethnicity, level of education, and political affiliation. Next, the respondents were asked to read three short vignettes and answer questions about each before moving onto the next. Each vignette presented a two-sentence description about either a scientist, farmer, or artist who is employed by either a university, grocery store, or publishing house, and takes work from a colleague and presents it as their own. The full survey with all vignettes is included in Appendix B. We were careful to avoid words such as “steal”, “plagiarize” or “misrepresent” which might

be associated with other, already-criminalized activity (Pickett & Roche, 2018). We also tried to keep vignettes jargon-free as previous research demonstrates that jargon may lead to decreased perceptions of trustworthiness and morality (Markowitz, Kouchaki, Hancock, & Gino, 2021).

The main outcome variable of interest measures participants' perceptions of morality (coded: very moral, somewhat moral, neither moral nor immoral, somewhat immoral, = 0, very immoral = 1). In an attempt to validate our measure and tease apart morality from unexpectedness, we also asked respondents how often they believe each occupation engages in that type of behavior (coded: never, very rarely, rarely, and occasionally = 0, frequently, very frequently, and always = 1).

We also collect demographic information as prior research indicates that opinions about science and art both vary by education level and to some degree political affiliation (Alderson, Junisbai, & Heacock, 2007; Eriksson, Strimling, & Coutlas, 2015; Blank & Shaw, 2015; Suhay & Druckman, 2015). Descriptive results of demographic information are presented in Table 9. As is common with other respondent pools collected on Prolific and other online resources like it, our sample tends to be younger than older, more liberal than conservative, and have more white respondents than any other racial category. We run models with both the full ordinal scale and dichotomized versions of education level and political affiliation and find that results are robust to both specifications.

**Table 9: Demographic Composition of Respondents**

	N	Percent
<b>Age</b>		
18-30	75	0.321
31-45	93	0.397
46-60	43	0.184
61 or older	23	0.098
<b>Gender</b>		
Man	128	0.457
Woman	98	0.419
Transgender and Non-Binary	8	0.034
<b>Race</b>		
Asian	16	0.068
Black or African American	12	0.051
Multiple	16	0.068
White	190	0.012
<b>Education</b>		
Less than a high school degree	3	0.013
High school degree or equivalent	29	0.124
Some college, no degree	49	0.209
Associate degree (e.g. AA, AS)	27	0.115
Bachelor's Degree (e.g. BA, BS)	84	0.359
Master's Degree (e.g. MA, MS, Med)	28	0.120
Professional Degree (e.g. MD, DDS, DVM)	9	0.038
Doctorate (e.g. PhD, EdD)	5	0.021
<b>Political</b>		
Very Conservative	12	0.051
Conservative	15	0.064
Somewhat Conservative	21	0.090
Moderate—neither Liberal nor Conservative	52	0.222
Liberal	57	0.244
Somewhat Liberal	35	0.150
Very Liberal	42	0.179



We employ a logistic regression for each outcome variable, using the conditions of the vignette as the predictors in each model. In addition to the models presented below, we also run models controlling for demographic information, and models with individual-level fixed effects in order to control for repeated measures from single participants. Although exact estimates vary slightly, our main effects remain unchanged in sign and significance. For ease of interpretation, we present models with only main effects below.

### **3.3 Results**

Model results for perceptions of morality are presented in Table 10. We also provide marginal results for ease of interpreting the effect of each condition, rather than interpreting the comparison to artist (the reference group in our logistic regression). For this outcome, we find stronger support for the importance of creative control. Both artists and scientists are significantly likely to be judged as very immoral. Farmers, on the other hand, are significantly less likely than artists and scientists to be judged as immoral. Examining the marginal effects of the farmer condition on immorality, we find a negative, significant effect, meaning that people are less likely to judge farmers as immoral in general. This is in line with the predictions from creative control; the more creative goods are more likely to be judged as immoral when the author of the product is misrepresented.

**Table 10: Effects of Condition on Choosing 'Very Immoral' in Log-Odds**

	Estimate	Standard Error	Z Score	P Value
<b>Model Results</b>				
Constant	0.732	0.140	5.243	0.000
Farmer	-1.563	0.199	-7.843	0.000
Scientist	-0.171	0.195	-0.875	0.381
<b>Marginal Effects</b>				
Artist Effect	0.578	0.114	5.076	0.000
Farmer Effect	-0.985	0.115	-8.573	0.000
Scientist Effect	0.047	0.112	3.625	0.000

However, while we find support for creative control on judgements of morality, we also find support for affect control theory in the perceptions of how often each actor engages in the behavior. Table 12 presents model results and marginal effects for perceptions of how frequently each actor engages in the behavior. In line with the predictions of affect control theory, we find that farmers and scientists are significantly less likely than artists to be perceived as frequently misrepresenting their goods. The marginal effects also support affect control theory, although results are non-significant for farmers. Although we cannot be confident in the extent of how frequently people perceive farmers to engage in misrepresenting their goods, we can have confidence that it is significantly lower than artists, which is consistent with the rankings produced by deflection scores in our ABO calculations.

**Table 11: Effects of Condition on Choosing 'Always', 'Very Frequently', or 'Frequently'**

	Estimate	Standard Error	Z Score	P Value
<b>Model Results</b>				
Constant	-1.087	0.151	-7.222	0.000
Farmer	-0.651	0.237	-2.743	0.006
Scientist	-0.992	0.257	-3.864	0.000
<b>Marginal Effects</b>				
Artist Effect	0.548	0.136	4.014	0.000
Farmer Effect	-0.103	0.149	-0.691	0.490
Scientist Effect	-0.445	0.160	-2.785	0.008

At its core, deflection is a measure of expectation, which is more tightly linked, conceptually, with impressions of likelihood and frequency than normality. Indeed, earlier work that has used Affect Control Theory to translate moral foundations vignettes into ABO statements found deflection a poor indicator for morality impressions for certain foundations, in particular purity events (Ochoa, 2021). For ACT, immoral (Bad, Powerful) behaviors committed by Bad, Powerful actors result in impressions that are in about the same EPA space, thus low deflection and culturally expected. While prior work has linked perceptions of commonality of behaviors to morality, employing a sort of common-is-moral heuristic, these results suggest a clarification of that link, as we find the inverse. Respondents were more likely to report

the highest perceived frequency to the vignette they perceived as most immoral: artists stealing from artists.

### **3.4 Discussion and Conclusion**

Our study has several limitations that should be noted. Because of the short length of our survey, we were not allowed to include a manipulation check through the Prolific platform. Further, although we pretested with respondents and consulted multiple experts in the field, there is a possibility that our vignettes are not comparable and differ in meaningful ways on factors that could bias our modeled relationship. Future research could address these concerns by including questions on the respondents' interpretation of each vignette. Additionally, one might decide to increase the sample size of future related surveys in order to increase power and ensure the (non)significance of the effect of farmer condition on the perception of how frequently they misrepresent organic produce. An increase in sample size would also help tease apart the relatively small differences in moral perceptions between scientists and artists. Finally, although we tried multiple synonyms for "plagiarize" in our ABO statements which produced consistent deflection rankings, it might be valuable to collect EPA ratings on plagiarize.

Further, the relationship between expectation and immorality needs to be further clarified. While we introduce alternative findings to those typically found (that

common-is-moral), it could be possible that the common-is-moral heuristic is more often used as a way of reverse-engineering something's moral justification rather than acceptableness (Eriksson et al, 2021).

Another question raised by this research that needs clarifying is what basis respondents made their moral judgments of these vignettes. A recent strain of work questions the five pillars of moral foundations theory and asserts a model in which morality is largely seen as different shades of harm (Schein and Gray, 2018; Ochoa, 2021). In this case, it is an open question whether the dimensions of creative control are better explained by a combination of fairness, loyalty, or purity violations or largely seen as simply a kind of harm. Is more harm done when art is stolen versus science versus organic food?

Although this study has some limitations, it nevertheless provides a contribution to the research on authenticity and perceptions of morality across various industries. Research on authenticity tends to be disjointed, with studies in different industries not citing each other (Newman, 2019, p. 9). This paper demonstrates that the creative element in authenticity carries more weight in the judgements of morality than the cultural impressions of how different professions should act. This study has also been generative for future lines of research. For instance, future studies could examine transgressions of other types of authenticity to see how it compares to the violation of indexical authenticity investigated here. Further, research could build upon this study

by disentangling which dimensions of morality are being used in moral judgements of breaches of authenticity. Finally, this study validates the intention of affect control theory as a measure of unexpectedness, which is not necessarily predictive of immoral perceptions.

## 4. Conclusions

The studies in this dissertation collectively clarify that scientific misconduct is a moral breach to both members of the scientific community and to the larger public. However, moral perceptions of scientific misconduct are not unique to the scientific field and this dissertation begins to disentangle which moral dimensions people use to judge this kind of malfeasance. Each study contributes to sociological areas of inquiry in the production of scientific knowledge and social psychology.

The results presented in Chapter 1 show that the transfer of stigma through co-authorship networks may not be as strong as expected. However, more than anything this study provides framework in which to analyze retractions through networks. The results of this chapter suggest there is a lasting effect of the stigma from a retraction, though stigma may not transfer throughout the network to the same extent that other forms of reputational information do. Through further data refinements, our confidence in these findings can be strengthened and improved. Given that identifying who is at fault for retractions of multi-authored papers is a known challenge, and seeing as there is an ongoing effort to improve scholarly metadata, this paper provides an initial starting point which others may find useful and build upon in the future.

The results of Chapter 2 fill an important gap in the literature by making common but far-reaching assumptions about the moral perceptions of misconduct more explicit. By documenting moral perceptions across a range of behaviors that vary on

intentionality and accuracy of results, we draw a more complete picture of how science is judged and consumed by the public. Not all transgressions are judged the same, and intention to deceive is the unifying factor in deeming behavior as immoral in this setting. Along with documenting the extent of moral impressions across different misconduct behaviors, this paper also shows that people across demographic categories and political affiliations react in the same way to incidences of misconduct. Although conservatives tend to be slightly more skeptical about how frequently scientists engage in misconduct, there are no distinguishable differences in their moral judgments. This is an important finding as researchers have become more interested in documenting differences in attitudes towards science along partisan lines (Blank & Shaw, 2015; Suhay & Druckman, 2015).

Chapters 2 and 3 also speak to the link between perceptions of how frequently scientists engage in misconduct with moral judgments. In Chapter 2, we find that behaviors which respondents least expected scientists to engage in are the behaviors that are judged as the most immoral. However, in Chapter 3, we find weaker support for the common-is-moral heuristic (Lindström, et al., 2018). Chapter 3 clarifies whether moral perceptions are based on cultural expectations of occupations or based around transgressions of authenticity. We find that it may not be suitable to use affect control theory's measures of unexpectedness as a proxy for moral judgements. While respondents' perceptions of how frequently each occupation engaged in deceitful



behavior is in line with the predictions made by affect control theory, the moral rankings of these behaviors do not seem to be based on expectations about their frequency. Instead, we find that misrepresenting originality in more creative processes (art and science) are penalized more harshly than less creative goods (farming). This chapter again helps to clarify the implicit assumption of moral perceptions in the authenticity literature. Furthermore, it highlights the importance for researchers to continue studying the link between commonness and morality, a burgeoning topic in the field of moral cognition.

## Appendix A: Survey Instrument for Chapter 2

You are being asked to take part in a research study. Taking part in this research is voluntary.

*What does this study involve?*

We would like to better understand how people make sense of the morality and appropriate consequences for different types of research activities. You will be asked a few questions about your demographics. In addition, you will be shown 4 vignettes describing possible scenarios followed by questions assessing your perception of the scenario.

*Will you be paid to take part in this study?*

Yes, you will be paid for your participation in this research. You will be paid \$1.50 through the Prolific platform. If you fail attention or speeding checks, you will not receive your compensation. We expect this survey to take approximately 5-7 minutes.

*How will your privacy be protected?*

The information collected for this study will be kept secure and confidential. No names or identifying information will be associated with the data in any way. Results will be reported in the aggregate, so your personal responses cannot be identified. The data will be accessible only to the investigator(s). De-identified information (data that is not linked to your identity) collected in this study may be made public and used for future research purposes.

*What are the options if you do not want to take part in this study?*

Your participation is completely voluntary. You may withdraw your consent and discontinue your participation at any time for any reason.

*Whom should you contact about this study?*

If you have any questions about this study, you can contact the research director for this study, Dr. Lynn Smith-Lovin at (919) 660-5786 or smithlov@soc.duke.edu. If you have questions, concerns, complaints, or suggestions about human research at Duke, you may call the campus institutional review board at (919) 684-3782 during normal business hours. Please reference protocol #2022-0485.

I have read the above information about the study "Perceptions of Morality of Research Behavior" and agree to take part in this study.

Yes (1)

No (2)

**End of Block: Informed Consent**

**Start of Block: Prolific ID**

What is your prolific ID?

---

**Start of Block: Demographics**

What is your gender identity? (check all that apply)

- Man (1)
  - Woman (2)
  - Transgender (3)
  - Non-binary (4)
  - Other (decline to say) (5)
- 

What is your race/ethnicity? (check all that apply)

- American Indian or Alaska Native (1)
  - Asian (2)
  - Black or African American (3)
  - Native Hawaiian or Other Pacific Islander (4)
  - White (5)
-

Are you Hispanic or Latino?

Yes (1)

No (2)

---

What is your highest level of completed education?

Less than a high school diploma (1)

High school degree or equivalent (e.g. GED) (2)

Some college, no degree (3)

Associate degree (e.g. AA, AS) (4)

Bachelor's degree (e.g. BA, BS) (5)

Master's degree (e.g. MA, MS, MEd) (6)

Professional degree (e.g. MD, DDS, DVM) (7)

Doctorate (e.g. PhD, EdD) (8)

---

On a scale of very liberal to very conservative, how would you describe your political views?

- Very Liberal (1)
  - Liberal (2)
  - Somewhat Liberal (3)
  - Moderate - neither Liberal nor Conservative (4)
  - Somewhat Conservative (5)
  - Conservative (6)
  - Very Conservative (7)
- 

What is your age in years?

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**End of Block: Demographics**

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**Start of Block: Science Plagiarism Vignette & Questions**

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the paper, the professor copied text

from another scientist's published work without citation and accurately presented the results in the publication.

---

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The paper should be retracted from the journal it was published in (1)
  - The scientist who wrote the paper should be subject to mandatory leave (2)
  - The scientist who wrote the paper should no longer be able to publish research (3)
  - The scientist who wrote the paper should no longer be a professor at their university (4)
  - The scientist who wrote the paper should be required to attend a research ethics training (5)
  - The scientist who wrote the paper should not be subject to any disciplinary actions (6)
  - The scientist who wrote the paper should be investigated by the police (7)
-

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the paper, the professor copied text from another scientist's published work without citation and accurately presented the results in the publication.

---

How immoral is this scientist's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the paper, the professor copied text from another scientist's published work without citation and accurately presented the results in the publication.

---



If you were to be studying this topic in the future, how likely would you be to trust the findings?

- Very Likely (1)
- Likely (2)
- Neither Likely nor Unlikely (3)
- Unlikely (4)
- Very Unlikely (5)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the paper, the professor copied text from another scientist's published work without citation and accurately presented the results in the publication.

---

How often do you believe scientists engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)
- Very Frequently (8)
- Always (9)

**End of Block: Science Plagiarism Vignette & Questions**

**Start of Block: Science Ethical and Accurate Vignette and Questions**

A scientist at a university has recently published a paper on the association between personality traits and color perception. The scientist conducted an experiment and accurately presented the results in a paper recently published in a flagship journal.

---

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The paper should be retracted from the journal it was published in (1)
- The scientist who wrote the paper should be subject to mandatory leave (2)
- The scientist who wrote the paper should no longer be able to publish research (3)
- The scientist who wrote the paper should no longer be a professor at their university (4)
- The scientist who wrote the paper should be required to attend a research ethics training (5)
- The scientist who wrote the paper should not be subject to any disciplinary actions (6)
- The scientist who wrote the paper should be investigated by the police (7)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. The scientist conducted an experiment and accurately presented the results in a paper recently published in a flagship journal? How immoral is this scientist's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. The scientist conducted an experiment and accurately presented the results in a paper recently published in a flagship journal.

---

If you were to be studying this topic in the future, how likely would you be to trust the findings?

- Very Likely (1)
- Likely (4)
- Neither Likely nor Unlikely (5)
- Unlikely (6)
- Very Unlikely (7)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. The scientist conducted an experiment and accurately presented the results in a paper recently published in a flagship journal.

---

How often do you believe scientists engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)
- Very Frequently (8)
- Always (9)

**End of Block: Science Ethical and Accurate Vignette and Questions**

---

**Start of Block: Attention Check**

Select "somewhat moral":

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

**End of Block: Attention Check**

**Start of Block: Science Mistake & Questions**

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the professor mistakenly recoded missing data to have real values, resulting in a false positive finding.

---

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The paper should be retracted from the journal it was published in (1)
- The scientist who wrote the paper should be subject to mandatory leave (2)
- The scientist who wrote the paper should no longer be able to publish research (3)
- The scientist who wrote the paper should no longer be a professor at their university (4)
- The scientist who wrote the paper should be required to attend a research ethics training (5)
- The scientist who wrote the paper should not be subject to any disciplinary actions (6)
- The scientist who wrote the paper should be investigated by the police (7)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the professor mistakenly recoded missing data to have real values, resulting in a false positive finding.

---

How immoral is this scientist's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the professor mistakenly recoded missing data to have real values, resulting in a false positive finding.

---



If you were to be studying this topic in the future, how likely would you be to trust the findings?

- Very Likely (1)
- Likely (6)
- Neither Likely nor Unlikely (7)
- Unlikely (8)
- Very Unlikely (9)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the professor mistakenly recoded missing data to have real values, resulting in a false positive finding.

How often do you believe scientists engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)

Very Frequently (8)

Always (9)

**End of Block: Science Mistake & Questions**

---

**Start of Block: Science Fraud Vignette & Questions**

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the scientist intentionally changed existing data to support their hypothesis.

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The paper should be retracted from the journal it was published in (1)
- The scientist who wrote the paper should be subject to mandatory leave (2)
- The scientist who wrote the paper should no longer be able to publish research (3)
- The scientist who wrote the paper should no longer be a professor at their university (4)
- The scientist who wrote the paper should be required to attend a research ethics training (5)
- The scientist who wrote the paper should not be subject to any disciplinary actions (6)
- The scientist who wrote the paper should be investigated by the police (7)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the scientist intentionally changed existing data to support their hypothesis.

---

How immoral is this scientist's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the scientist intentionally changed existing data to support their hypothesis.

---

If you were to be studying this topic in the future, how likely would you be to trust the findings?

- Very Likely (1)
- Likely (6)
- Neither Likely nor Unlikely (7)
- Unlikely (8)
- Very Unlikely (9)

[page break]

A scientist at a university has recently published a paper on the association between personality traits and color perception. In the analysis, the scientist intentionally changed existing data to support their hypothesis.

How often do you believe scientists engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)
- Very Frequently (8)
- Always (9)

**End of Block: Science Fraud Vignette & Questions**

**Start of Block: Success Condition**

Q50 Your Prolific Completion code is 855F92D9. Please copy and paste it into the appropriate location in Prolific.

**End of Block: Success Condition**

## Appendix B: Survey Instrument for Chapter 3

You are being asked to take part in a research study. Taking part in this research is voluntary.

*What does this study involve?*

We would like to better understand how people make sense of the morality and appropriate consequences for different types of research activities. You will be asked a few questions about your demographics. In addition, you will be shown 4 vignettes describing possible scenarios followed by questions assessing your perception of the scenario.

*Will you be paid to take part in this study?*

Yes, you will be paid for your participation in this research. You will be paid \$1.50 through the Prolific platform. If you fail attention or speeding checks, you will not receive your compensation. We expect this survey to take approximately 5-7 minutes.

*How will your privacy be protected?*

The information collected for this study will be kept secure and confidential. No names or identifying information will be associated with the data in any way. Results will be reported in the aggregate, so your personal responses cannot be identified. The data will be accessible only to the investigator(s). De-identified information (data that is not linked to your identity) collected in this study may be made public and used for future research purposes.

*What are the options if you do not want to take part in this study?*

Your participation is completely voluntary. You may withdraw your consent and discontinue your participation at any time for any reason.

*Whom should you contact about this study?*

If you have any questions about this study, you can contact the research director for this study, Dr. Lynn Smith-Lovin at (919) 660-5786 or smithlov@soc.duke.edu. If you have questions, concerns, complaints, or suggestions about human research at Duke, you may call the campus institutional review board at (919) 684-3782 during normal business hours. Please reference protocol #2022-0485.

I have read the above information about the study "Perceptions of Morality of Research Behavior" and agree to take part in this study.

- Yes (1)
- No (2)

**End of Block: Informed Consent**

---

**Start of Block: Prolific ID**



What is your prolific ID?

---

---

**Start of Block: Demographics**

What is your gender identity? (check all that apply)

- Man (1)
  - Woman (2)
  - Transgender (3)
  - Non-binary (4)
  - Other (decline to say) (5)
-

What is your race/ethnicity? (check all that apply)

American Indian or Alaska Native (1)

Asian (2)

Black or African American (3)

Native Hawaiian or Other Pacific Islander (4)

White (5)

---

Are you Hispanic or Latino?

Yes (1)

No (2)

---

What is your highest level of completed education?

- Less than a high school diploma (1)
  - High school degree or equivalent (e.g. GED) (2)
  - Some college, no degree (3)
  - Associate degree (e.g. AA, AS) (4)
  - Bachelor's degree (e.g. BA, BS) (5)
  - Master's degree (e.g. MA, MS, MEd) (6)
  - Professional degree (e.g. MD, DDS, DVM) (7)
  - Doctorate (e.g. PhD, EdD) (8)
-

On a scale of very liberal to very conservative, how would you describe your political views?

- Very Liberal (1)
- Liberal (2)
- Somewhat Liberal (3)
- Moderate - neither Liberal nor Conservative (4)
- Somewhat Conservative (5)
- Conservative (6)
- Very Conservative (7)

What is your age in years?

---

**End of Block: Demographics**

**Start of Block: Farmer Fraud**

Q36 A farmer is employed by a restaurant to supply local, organic produce. One week, the farmer buys produce from a grocery store and sells it to the restaurant as their own.

How immoral is this farmer's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

A farmer is employed by a restaurant to supply local, organic produce. One week, the farmer buys produce from a grocery store and sells it to the restaurant as their own.

---

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The produce should not be used in the restaurant (1)
- The farmer should be fired as the restaurant supplier (2)
- The farmer should not be able to supply any restaurants (3)
- The farmer should be required to attend an ethics training (4)
- The farmer should not be subject to any disciplinary actions (5)
- The farmer should be investigated by the police (6)

[page break]

A farmer is employed by a restaurant to supply local, organic produce. One week, the farmer buys produce from a grocery store and sells it to the restaurant as their own.

---

How often do you believe people consume produce that was misrepresented as organic?

- Never (1)
- Very Rarely (6)
- Rarely (7)
- Occasionally (8)
- Frequently (9)
- Very Frequently (10)
- Always (11)

[page break]

A farmer is employed by a restaurant to supply local, organic produce. One week, the farmer buys produce from a grocery store and sells it to the restaurant as their own.

---

How often do you believe farmers engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)
- Very Frequently (8)
- Always (9)

**End of Block: Farmer Fraud**

---

**Start of Block: Art fraud**

An artist employed at a publishing house has been assigned to illustrate a new children's book. They use illustrations from a colleague's lesser-known book and publish them as their own.



How immoral is this artist's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

An artist employed at a publishing house has been assigned to illustrate a new children's book. They use illustrations from a colleague's lesser-known book and publish them as their own.

---

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The book should not be in circulation (1)
- The artist should be fired from the publishing house (9)
- The artist should not be employed at any publishing house (10)
- The artist should be required to attend an ethics training (11)
- The artist should not be subject to any disciplinary actions (12)
- The artist should be investigated by the police (14)

[page break]

An artist employed at a publishing house has been assigned to illustrate a new children's book. They use illustrations from a colleague's lesser-known book and publish them as their own.

---

How often do you believe people consume art that was misrepresented as original ?

- Never (1)
- Very Rarely (6)
- Rarely (7)
- Occasionally (8)
- Frequently (9)
- Very Frequently (10)
- Always (11)

[page break]

An artist employed at a publishing house has been assigned to illustrate a new children's book. They use illustrations from a colleague's lesser-known book and publish them as their own.

---

How often do you believe artists engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)
- Very Frequently (8)
- Always (9)

**End of Block: Art fraud**

---

**Start of Block: Science Fraud**

A scientist employed at a university has recently published a paper on the association between personality traits and color perception. They use a study from a lesser-known journal and publish it as their own.

---

What do you think are the appropriate consequences for this behavior? Please check all that apply

- The paper should not be published in the journal (1)
- The scientist should be fired from the university (2)
- The scientist should not be employed at any university (3)
- The scientist should be required to attend an ethics training (4)
- The scientist should not be subject to any disciplinary actions (5)
- The scientist should be investigated by the police (7)

[page break]

A scientist employed at a university has recently published a paper on the association between personality traits and color perception. They use a study from a lesser-known journal and publish it as their own.

---

How immoral is this scientist's behavior?

- Very immoral (1)
- Somewhat immoral (2)
- Neither immoral nor moral (3)
- Somewhat moral (4)
- Very moral (5)

[page break]

A scientist employed at a university has recently published a paper on the association between personality traits and color perception. They use a study from a lesser-known journal and publish it as their own.

---

How often do you believe people consume science that was misrepresented as original?

- Never (1)
- Very Rarely (6)
- Rarely (7)
- Occasionally (8)
- Frequently (9)
- Very Frequently (10)
- Always (11)

[page break]

A scientist employed at a university has recently published a paper on the association between personality traits and color perception. They use a study from a lesser-known journal and publish it as their own.

How often do you believe scientists engage in this type of behavior?

- Never (1)
- Very Rarely (4)
- Rarely (5)
- Occasionally (6)
- Frequently (7)
- Very Frequently (8)
- Always (9)

**End of Block: Science Fraud**

---

**Start of Block: Success Condition**

Q50 Your Prolific Completion code is 855F92D9. Please copy and paste it into the appropriate location in Prolific.

**End of Block: Success Condition**



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