2-2016

Perceptions and predictors of questionable research practices in the social sciences

Anita M. Gordon
University of Northern Iowa

Helen C. Harton
University of Northern Iowa

PERCEPTIONS AND PREDICTORS OF QUESTIONABLE RESEARCH PRACTICES IN THE SOCIAL SCIENCES

Anita M. Gordon and Helen C. Harton
Center for Academic Ethics and Depts. of Social Work and Psychology
University of Northern Iowa

Background

- Prevalence (Fanelli, 2009)
  - Low rates of “serious” misconduct (2%; e.g., FFP)
  - High rates of QRPs (34%; e.g., sloppy record-keeping,, data management errors)
- Implications
  - Potential harm to people relying on research results
  - Reduction in public trust in science
  - IRB-human participants concerns

Misconduct is MORE likely with:

- Certain personality characteristics (e.g, arrogance, exploitativeness, cynicism) (1)
- Interpersonal conflict (1)
- Experience (health sciences) (1)
- Early career stage (2,7)
- Certain kinds of mentoring (on financial matters, on learning to survive in one's field) increased specific types of misbehavior, such as misuse of funds and methodological problems (3)
- Perceptions of organizational **in**justice (2)
- Funding expectations and perceived competition (5, 6)
- Country/culture of author (e.g., publications rewarded with cash, less peer criticism, less regulatory structure) (7)

1 Mumford, M. D., Antes, A. L., Beeler, C., & Caughron, J. J. (2009); Mumford, M. D., Connelly, M. S., Murphy, S. T., Devenport, L. D., Antes, A. L., Brown, R. P., et al. (2009).
2 Martinson, B. C., Anderson, M. S., Crain, A. L., & DeVries, R. (2006); Martinson, B.C., Crain, A.L., Anderson, M.S., & DeVries, R. (2010).
3 Anderson, M. S., Horn, A. S., Risbey, K. R., Ronning, E. A., De Vries, R., & Martinson, B. C. (2007).
4 Anderson, M. S., Louis, K. S., & Earle, J. (1994).
5 Martinson, B. C., Crain, A. L., Anderson, M. S., & DeVries, R. (2009).
6 Anderson, M. S., Ronning, E. A., DeVries, R., & Martinson, B. C. (2007).
7 Fanelli D., Costas R., & Larivière V. (2015).

Misconduct is LESS likely with:

- Occupational engagement (1)
- Experience (social and biological sciences) (1)
- Females (2)
- Mentoring, at least for early career researchers (3)
- Training in research ethics, but only for mid-career researchers and for certain types of misbehavior (e.g., misuse of funds, regulatory compliance) (3)
- High productivity & publication rate (associated with fewer retracted papers) (7)

Little or no effect:

- Discipline, dept structure, and dept. climate (grad students, 4)
- Gender (7)

1 Mumford, M. D., Antes, A. L., Beeler, C., & Caughron, J. J. (2009); Mumford, M. D., Connelly, M. S., Murphy, S. T., Devenport, L. D., Antes, A. L., Brown, R. P., et al. (2009).
2 Martinson, B. C., Anderson, M. S., Crain, A. L., & DeVries, R. (2006); Martinson, B.C., Crain, A.L., Anderson, M.S., & DeVries, R. (2010).
3 Anderson, M. S., Horn, A. S., Risbey, K. R., Ronning, E. A., De Vries, R., & Martinson, B. C. (2007).
4 Anderson, M. S., Louis, K. S., & Earle, J. (1994).
5 Martinson, B. C., Crain, A. L., Anderson, M. S., & DeVries, R. (2009).
6 Anderson, M. S., Ronning, E. A., DeVries, R., & Martinson, B. C. (2007).
7 Fanelli D., Costas R., & Larivière V. (2015).

Theoretical foundations

- Rest (1984) model – Components of moral decision-making – moral awareness or sensitivity, moral judgment; intention to act on moral values present; actual behavior or action (1)
- Rational choice theory - broad field of research - cost/benefit analysis (2). In 1990's, series of studies applying RCT to academic cheating and criminal behavior (3)
- As part of RTC, Anticipated Shame associated with decreased cheating intentions and criminal behavior both (4) BUT "shame proneness" as a stable trait has been shown to lead to increased deviance (5)
- Studies also combined moral judgment and RTC, in business, criminal justice, and organizational management. Example: rational choice factors were only important in the intent to commit corporate crime when individuals were not restrained by moral considerations (3).
- Issue contingency theory by Jones (1991) – Moral Intensity – the higher moral intensity (more features present), the better awareness of a moral dimension, better moral judgments, and more ethical behavior.. Moral intensity factors: magnitude of consequences, social consensus, probability of effect, temporal immediacy, proximity, and concentration of effect. (6)

1 Rest (1984)
2 Lahno (1997)
3 Paternoster & Simpson (1996) and Tibbetts (1997)

4 Cochran, et.al. (1999); Rebellon, et.al. (2010); Tibbetts (1997)
5 Tangney, Stuewig, & Mashek (2007), Tibbetts (1997)
6 Jones (1991)

Gordon, 2014

- 581 Psych & Soc/Crim faculty from 40 R1 institutions (ave. 28% response rate across recruitment methods)
- Respondents read 9 scenarios depicting questionable behavior in research and reported their perceptions on:
  - *Likelihood they would take the same action as depicted in the scenario under the same circumstances*
  - *Was there a moral dimension in scenario, and if so, how wrong was the action*
  - *Probability of detection*
  - *Probability of sanctions, including shame*

Gordon, 2014

Perceived likelihood of misconduct/QRPs ranged from 3.5% overall for Fabricated Data up to 39% for Authorship to Gain Favor.

Predictors of likelihood of misconduct:

- Being sociology/criminology faculty, compared to psychology (4-6% higher on 7 of the 9 scenarios),
- Thinking that an action was wrong (moral judgment)
- Shame or embarrassment if detected
- Being an assistant professor, compared to full professors on the two authorship scenarios (4-9%) But assts. scored about 4% lower on False Reporting.
- Likelihood of external sanctions on the FFP scenarios, conditioned on moral judgments

Current Study

- Added measures of organizational justice – procedural & distributive, department & university (using scales compiled by Martinson, et al., 2006).

- Compared faculty from R1 versus Masters universities

- Added 2 fields: Biological Sciences and Social Work

Other changes:

- Added one of the Jones (1991) moral intensity components: perceptions of magnitude of harm
- Dropped moral dimension item (indistinguishable from moral judgment)

Hypotheses

- Moral judgment, perceptions of harm, and anticipated shame will be the most consistent predictors of the perceived likelihood of misconduct
- Perceived likelihood of detection and sanctions from others will predict the perceived likelihood of misconduct to a lesser extent.
- The effects of external sanctions on misconduct will be conditioned on moral judgment
- Perceived likelihood of misconduct will be higher for faculty from R1 vs. Masters universities
- Early career faculty will report higher probabilities (Year since PhD, Assistant Professors)
- Greater perceptions of organizational injustice will predict perceived likelihood of misconduct

Pilot Study in fall, 2014

- 240 randomly selected faculty from 4 disciplines
  - *Biology, Psychology, Sociology/Criminology, & Social Work*
- From 12 randomly selected institutions (about half each - R1 and Masters-Large universities)
- Response rates ranged from 13% online only to 45% for mixed methods (mailed and online), overall average of 28%
- Made minor adjustments to a few scenarios and refined procedures for identifying/obtaining contact info for the sample

Full Phase Sample

- 4,556 randomly selected faculty from 4 disciplines invited
  - *Biology, Psychology, Sociology/Criminology, & Social Work*
- Faculty were from 107 randomly selected institutions (about half each - R1 and Masters-Large universities)
- Dillman et al. (2008) mixed mode TDM – structured series of contacts starting with personalized contacts by mail, moving on to online invitations
- Response rates – overall 39%
- *n*=1,735 (53% from R1s)

Method

- Responded to 6 research scenarios indicating:
  - How likely it is that they would have acted the same in the situation
  - How harmful the action was
  - How likely they would feel guilt/shame
  - How morally wrong they and their colleagues would say it is
  - Probability of being caught by colleagues, administration, or funders/publishers
  - Probability of negative sanctions from others
- Other variables:
  - Organizational justice – dept/univ. procedural & distributive
  - Gender, Year of PhD, # of publications, IRB/IACUC experience
  - % of salary covered by grants and % of salary expected to be covered by grants
  - % of effort spent conducting research

Scenarios

- Adapted from Mumford, et.al. (2006) Ethical Decision-Making Measures (EDMs) for Social Science researchers
- Each scenario has a set-up paragraph - nature of research, junior or senior professor, any collaborators. Junior professor has tenure looming.
- Each scenario followed by 3 vignettes each for a total of 6 scenarios for which respondents answered questions

Sample Scenario

Dr. Cedar, a young developmental psychologist, obtained an Early Career Research Grant from the National Institute of Child Health and Human Development to study aggression in elementary school children. Cedar suspects that some children with a certain genetic makeup will be especially susceptible to the effects of television violence. Part of the project requires obtaining a cheek swab for DNA analysis, but interviewing and observing children in the classroom constitutes the major effort. Cedar has a well-known senior collaborator, Dr. Mitchell, at another university whose team is performing the same study with the intention of pooling the data. Cedar is very anxious to get results from this study published as soon as possible to support an upcoming tenure review.

IRB NONCOMPLIANCE

After collecting data for one semester, Dr. Cedar becomes concerned that the preliminary results from the study are not promising and decides to expand the research to include adolescents. Cedar is frustrated, however, that the study may require additional IRB review due to the change in sample, and therefore decides to proceed with the consent documents already approved for the younger children without bringing the sample change to the attention of the IRB.

Sample Characteristics

Field/Discipline	*n*	%
Biology	429	25
Psychology	522	31
Sociology/Criminology	509	30
Social Work	244	14
Total	1704	100
Missing	31	
Total	1735	

Primary Position	*n*	%
Assistant Profs	459	27
Associate Profs	507	29
Full Professors	598	35
Administrators	135	8
Other	22	1
Total	1721	100
Missing	14	
Total	1735	

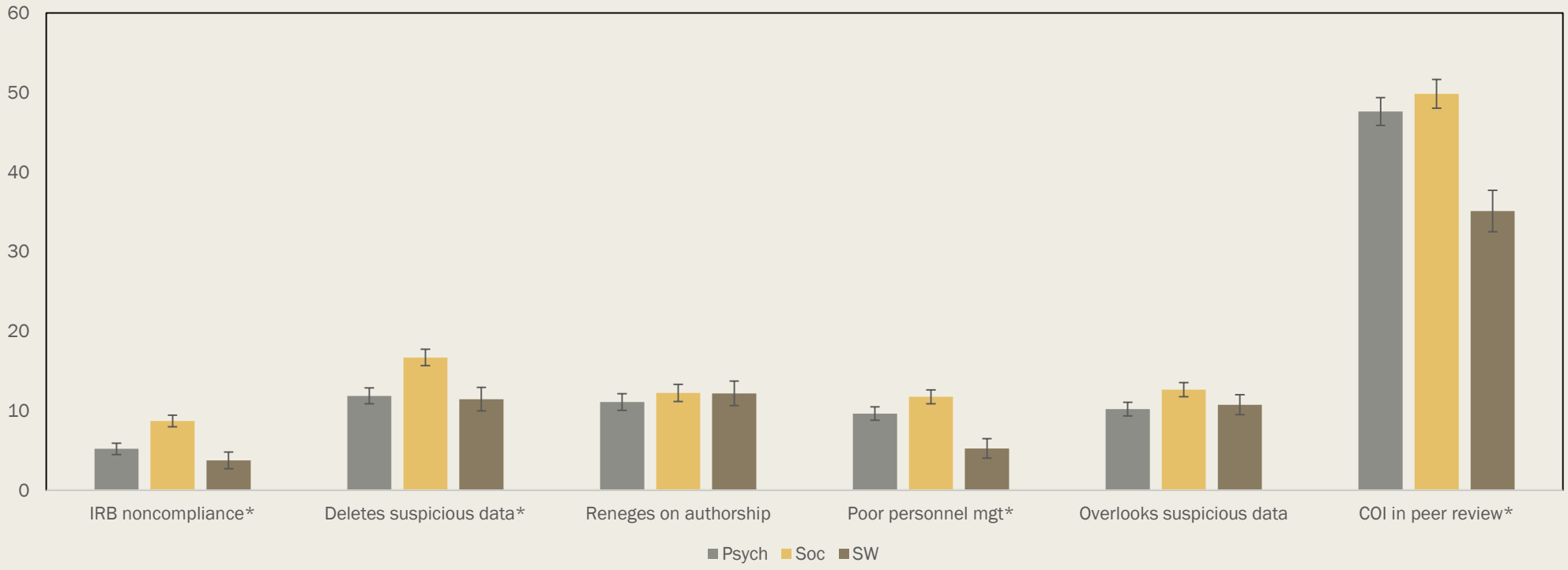
R1 vs. Masters faculty

- R1 faculty have greater expectations for contributing to salary with grants (4% of salary vs. <1% on average)
- R1 faculty do contribute more to salary with grants (9% vs. 2%)
- R1 faculty have more publications (mean of 41 vs. 18)
- R1 faculty have more IRB experience (16 completed protocols vs. 12)
- R1 faculty on average spent a greater percentage of their time in research (45% vs. 26%)

Faculty characteristics across different social science disciplines

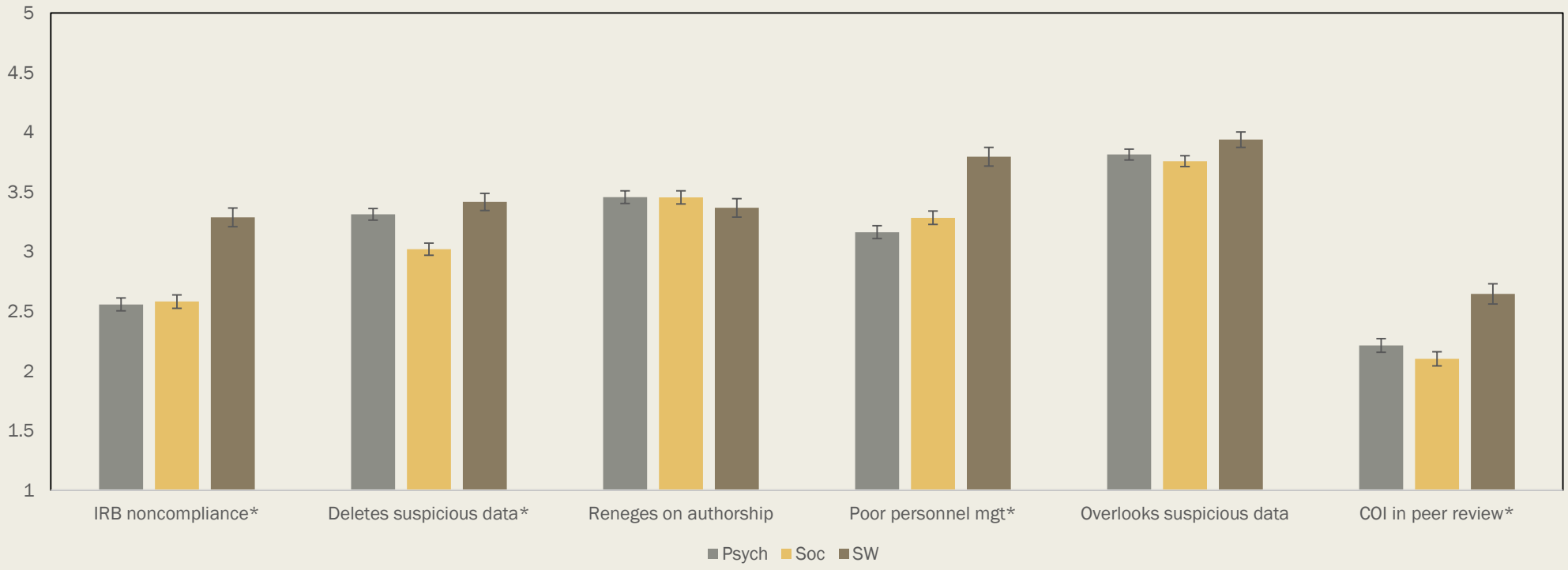
- SW faculty have greater expectations for contributing to salary with grants than Soc (3% vs. 2%)
- SW faculty do contribute more to salary with grants than Soc (8% vs. 4%)
- Psych faculty have more publications (38 Psych, 25 Soc, 24 SW)
- Psych faculty have more IRB experience (23 Psych, 7 Soc, 11 SW)
- Psych and Soc faculty have greater percentage of time ascribed to research (37% Psych, 37% Soc, 33% SW)

Probability P would do the same by scenario and discipline



* = significant difference, $p < .05$; Soc more on first two, SW less on last two

Perceived harm by scenario and discipline

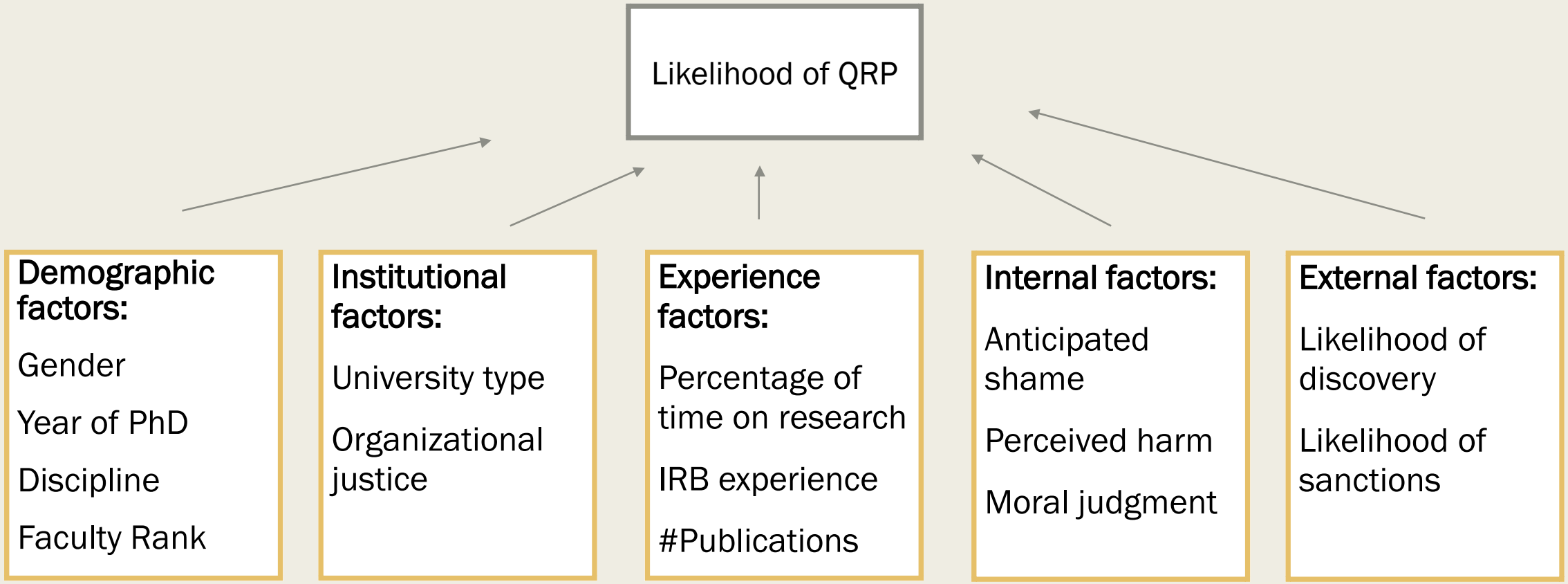


* = significant difference, $p < .05$; SW more on 1, 4, 6, Soc less on 2

Summary of descriptive results

- Faculty less likely to say they would do IRB-related QRPs
- Faculty more likely to say they would do the COI-peer review QRP (but ambiguously written)
- Harm perceived as higher for data and student-related concerns
- Social work faculty tended to be less likely to report that they would do QRPs and generally saw more harm in them
- No differences by type of university

Tested model



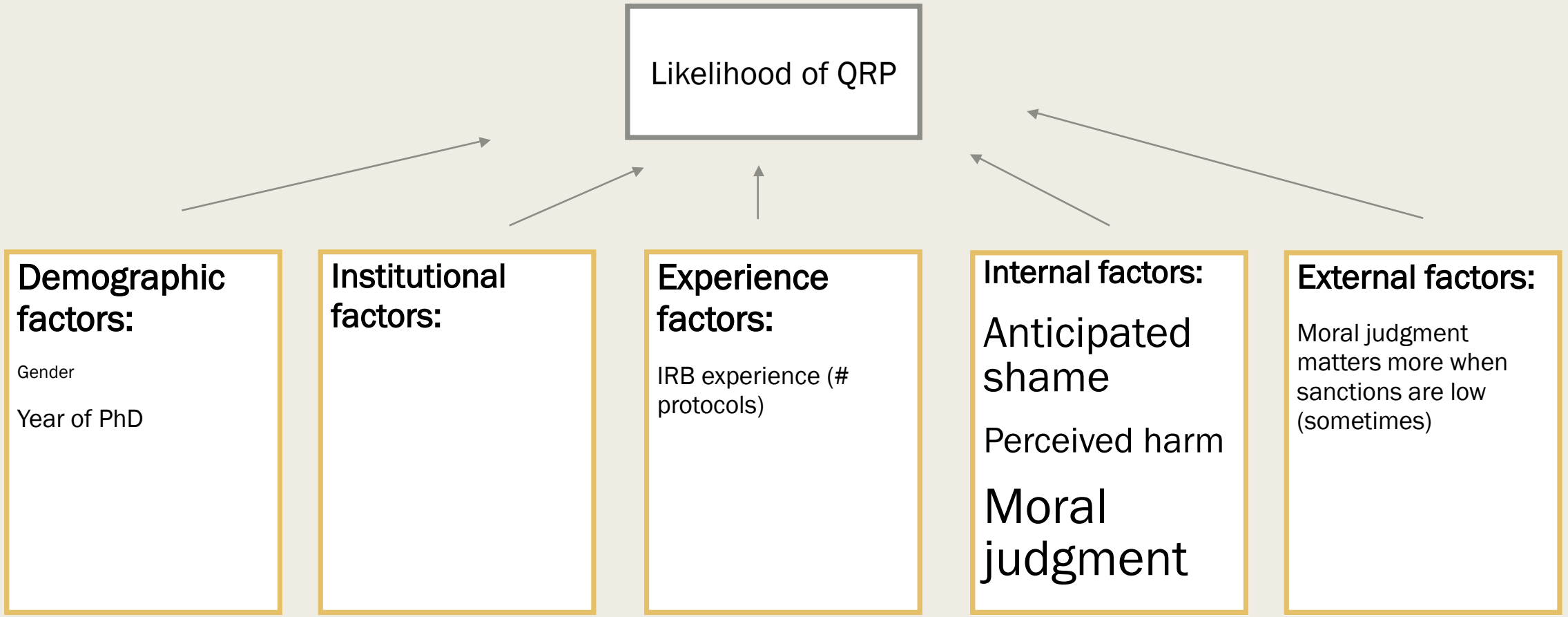
What did NOT predict?

- Organizational justice
- Anticipated sanctions
- Salary grant expectations
- Number of publications
- Discipline
- University size
- Faculty rank (with one exception)
- Percentage of time spent in research (with one exception)

What relates to lower likelihoods?

	Changes w/o IRB approval	Deletes suspicious data	Reneges on authorship	Poor personnel mgt/Human part. issues	Overlooks & publishes suspicious data	COI in peer review
Being female	.07		.05			
Being male				.09		
Earlier PhD year		.10	.09		.08	
More IRB protocols	.12				-.08	
More time spent in research					-.08	
Perceived harm		.16	.19	.20	.16	.08
Anticipated shame	.23	.25	.25	.18	.13	.19
Moral judgment	.29	.26	.40	.21	.29	.58
Being discovered	.10					
Being a less than a full prof						.07
Moral judgment when sanctions are low (-/+)	.10		.07	.06		.09
R^2	.28	.38	.51	.26	.30	.70

Model based on our results



How well could we predict perceived likelihood of misconduct/QRPs?

- How much of people's reported likelihood were we able to predict by scenario?
  - *Peer Review COI* *70%*
  - *Reneging on authorship* *51%*
  - *Deleting data* *38%*
  - *Publishes suspicious data* *30%*
  - *IRB noncompliance* *28%*
  - *Poor personnel mgt.* *26%*
- **Better** prediction for scenarios that are likely to have ***fewer*** negative effects on ***knowledge***
- **Worse** prediction for scenarios that are likely to have ***more*** negative effects on ***participants***

Conclusions

- As expected, moral judgment, anticipated shame, and perceptions of harm were the strongest and most consistent predictors of the perceived likelihood of misconduct.
- Perceived likelihood of detection only predicted for one scenario, and sanctions had no overall effect (sanctions did affect how strongly moral judgment affected likelihoods).
- There were no differences in perceived likelihood of misconduct by type of university.
- Early career faculty reported higher likelihoods.
- Organizational justice was not related to likelihoods.

Discussion

- Replicated many effects from Gordon, 2014: moral judgment, anticipated shame, interaction of moral judgment and external sanctions
- Perceived harm as new predictor
- One of the first studies to examine QRPs in social work faculty (and showed they tend to be more sensitive to these issues)
- One of the first studies to examine Masters/nongrant funded faculty (and showed likelihoods are similar)
- Did not find that organizational variables such as pressures from funding expectations or department/university organizational justice had an effect

Limitations

- Are people being honest?
  - *Used anonymous survey*
- Can people imagine what they would do in a situation without being in it?
  - *Used scenarios to reduce social desirability and to assess situations that may have not yet happened to Ps*
- Are people willing to do a study like this different from those who don't?
  - *Further analysis will attempt to assess this.*

Ideas for future analyses and results

- Further explore possible interactions
- Look at higher-level university factors
- Do an experiment manipulating some of these factors
- Ask people what they think colleagues would do
- Explore other factors (e.g., justice within the field)

Implications for reducing QRPs

- Focus on early career researchers, but rather than compliance-oriented education, work to enhance ethical decision-making through moral judgment-oriented mentoring or other methods.
- Don’t make it all about R1 faculty; include training for faculty at a variety of types of institutions.

Acknowledgements

This research was supported by the Office of Research Integrity, Department of Health and Human Services, grant # ORIIR140009-01-00. Contents are solely the responsibility of the authors and do not necessarily represent the official views of the Department of Health and Human Services or the Office of Research Integrity.

The authors are also grateful to Director Mary Losch, Ph.D. and the staff of the UNI Center for Social and Behavioral Research for their assistance in administering the survey process.

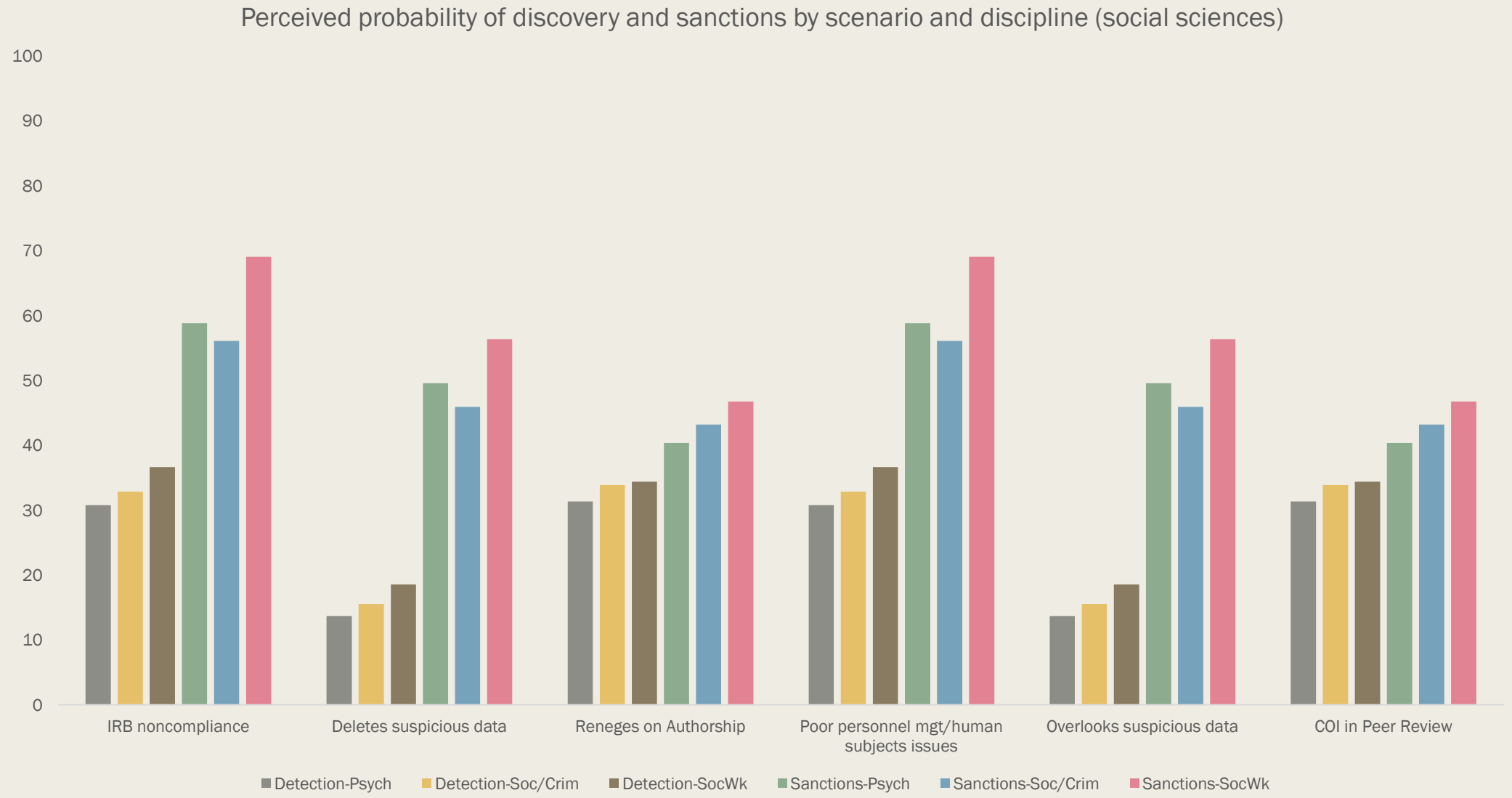
Questions? Discussion? Comments?

References

- Anderson, M. S., Horn, A. S., Risbey, K. R., Ronning, E. A., De Vries, R., & Martinson, B. C. (2007). What do mentoring and training in the responsible conduct of research have to do with scientists' misbehavior: Findings from a national survey of NIH-funded scientists. *Academic Medicine, 82*(9), 853-860.
- Anderson, M. S., Louis, K. S., & Earle, J. (1994). Disciplinary and departmental effects on observations of faculty and graduate student misconduct. *Journal of Higher Education, Special Issue: Perspectives on Research Misconduct, 65*(3), 331-337.
- Anderson, M. S., Ronning, E. A., DeVries, R., & Martinson, B. C. (2007). The perverse effects of competition on scientists' work and relationships. *Science and Engineering Ethics, 13*, 437-461. doi: 10.1007/s11948-007-9042-5
- Cochran, J. K., Chamlin, M. B., Wood, P. B., & Sellers, C. S. (1999). Shame, embarrassment, and formal sanction threats: Extending the deterrence/rational choice model to academic dishonesty. *Sociological Inquiry, 69*(1), 91-105.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2008). *Internet, mail, and mixed-mode surveys: The Tailored Design Method (3rd ed.).* New York: Wiley & Sons.
- Fanelli, D. (2009). How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data. *PloS ONE, 4*(5), 1-10. Retrieved from doi:10.1371/journal.pone.0005738
- Fanelli D., Costas R., & Larivière V. (2015). Misconduct policies, academic culture and career stage, not gender or pressures to publish, affect scientific integrity. *PLoS ONE 10(6)*: e0127556. doi:10.1371/journal.pone.0127556
- Gordon, A.M. (2014). Rational choice and moral decision-making in research. *Ethics & Behavior*, *24* (3), 175-194. DOI: 10.1080/10508422.2013.830573.
- John, L. K., Lowenstein, G., & Prelec, D. (2012). Measuring the prevalence of questionable research practices with incentives for truth telling. *Psychological Science, 23*(524), 524-532.
- Jones, T. M. (1991). Ethical decision-making by individuals in organizations: An issue-contingent model. *The Academy of Management Review, 16*(2), 366-395.
- Lahno, B. (2007). Rational choice and rule-following behavior. *Rationality and Society, 19*(4), 425-450.

References, continued

- Martinson, B. C., Anderson, M. S., Crain, A. L., & DeVries, R. (2006). Scientists' perceptions of organizational justice and self-reported misbehaviors. *Journal of Empirical Research on Human Research Ethics, 1*(1), 51-66. doi: doi:10.1525/jer.2006.1.1.51
- Martinson, B. C., Crain, A. L., Anderson, M. S., & DeVries, R. (2009). Institutions' expectations for researchers' self-funding, federal grant holding, and private industry involvement: Manifold drives of self-interest and researcher behavior. *Academic Medicine, 84*(11), 1491-1498.
- Martinson, B.C., Crain, A.L., Anderson, M.S., & DeVries, R. (2010). The Importance of organizational justice in ensuring research integrity. *Journal of Empirical Research in Human Research Ethics, 5(3)*, 67-83.
- Mumford, M. D., Connelly, M. S., Murphy, S. T., Devenport, L. D., Antes, A. L., Brown, R. P., et al. (2009). Field and experience influences on ethical decision making in the sciences. *Ethics & Behavior, 19*, 263-289.
- Mumford, M. D., Antes, A. L., Beeler, C., & Caughron, J. J. (2009). On the corruption of scientists: The influence of field, environment, and personality. In R. J. Burke & C. L. Cooper (Eds.), *Research Companion to Corruption in Organizations* (pp. 145-170). Cheltenham, Glos, UK: Edward Elgar Publishing Ltd.
- Mumford, M. D., Devenport, L. D., Brown, R. P., Connelly, M. S., Murphy, S. T., Hill, J. H., & Antes, A. L. (2006). Validation of ethical decision-making measures: Evidence for a new set of measures. *Ethics & Behavior, 16,* 319-345. doi:10.1207/s15327019eb1604_4
- Paternoster, R., & Simpson, S. (1996). Sanction threats and appeals to morality: Testing a rational choice model of corporate crime. *Law & Society Review, 30*(3), 549-583.
- Rebellon, C. J., Piquero, N. L., Piquero, A. R., & Tibbetts, S. G. (2010). Anticipated shaming and criminal offending. *Journal of Criminal Justice, 38*(5), 988-997.
- Rest, J. R. (1984). The major components of morality. In J. R. Rest (Ed.), *Morality, moral behavior, and moral development* (pp. 24-38). New York: John Wiley & Sons, Inc.
- Tangney, J. P., Stuewig, J., & Mashek, D. J. (2007). What's moral about the self-conscious emotions? In J. L. Tracy, R. W. Robins & J. P. Tangney (Eds.), *The self-conscious emotions: Theory and research* (pp. 21-37). New York: The Guilford Press.
- Tibbetts, S. G. (1997). Shame and rational choice in offending decisions. *Criminal Justice and Behavior, 24*(2), 234-255.



When there were university size differences, R1 were less concerned (η_p^2 =.01). More consistent were discipline effects, with SW and sometimes Soc generally being more concerned, η_p^2 = .02

Regression beta wts and R^2

	Scenario 1	2	3	4	5	6
Gender	0.07	-0.003	0.05	-0.09	0.03	
Year of PhD	-0.01	0.1	0.09	0.05	0.08	
%fte	0.01	-0.04	0.05	0.05	-0.08	
#pubs	-0.01	0.01	-0.06	-0.03	0.02	
#IRBs	-0.12	-0.1	0.02	-0.03	-0.08	
R2	0.02	0.03	0.02	0.02	0.02	0
Harm	-0.03	-0.16	-0.19	-0.2	-0.16	-0.08
Shame	-0.23	-0.25	-0.25	-0.18	-0.13	-0.19
known	-0.1	0.02	0.04	-0.01	0.01	0.05
Sanctions	-0.01	-0.04	0.01	0.01	-0.06	-0.02
Wrong	-0.29	-0.26	-0.4	-0.21	-0.29	-0.58
Admin	0.04	-0.02	-0.02	-0.05	-0.08	-0.04
Associates	0.01	0.01	0.01	0.02	-0.01	-0.02
Full prof	0.01	-0.02	-0.03	0.02	-0.06	-0.07
Other	-0.01	-0.03	0.01	-0.01	-0.01	-0.02
Psych	0.04	-0.05	-0.02	-0.05	-0.04	0.04
Social work	-0.004	0.01	0.02	0.02	0.03	0.04
University size	-0.01	-0.01	-0.003	-0.04	-0.04	-0.01
R2	0.27	0.38	0.51	0.26	0.3	0.7
interaction	0.1		0.07	-0.06		-0.09
R2	0.28		0.51	0.26		0.7

Note: R2 and beta weights in bold are significant at $p < .05$