1. Background and Purpose of the Study

a. Legislative and Regulatory Background

When misconduct in science is alleged, there are often two sides to the story. More often than not, there is insufficient evidence to support allegations or other explanations for the alleged offense. In files of the Public Health Service's Office of Research Integrity (ORI), approximately 70 percent of all closed cases in which PHS-funded researchers were accused of scientific misconduct did not result in findings of such misconduct. In accordance with the American jurisprudence system, those accused of scientific misconduct should be considered innocent until proven guilty. In this spirit, a PHS regulation (42 CFR Part 50, Subpart A) required that institutions to which scientific misconduct in PHS research is alleged take all reasonable steps to protect the confidentiality of the accused or to restore their reputations if the accusations are not confirmed. Given the large number of cases of alleged scientific misconduct that result in exoneration, these requirements on institutions receiving allegations of scientific misconduct are substantial. Yet, there have been no studies of the extent to which allegations result in adverse consequences for the accused or the extent to which institutions engage in reputation-restoring activities.

The PHS regulation requires that policies and procedures developed by institutions to handle allegations of scientific misconduct in the use of PHS funds must include provisions to address the needs of the accused. Specifically, the institutions must: (1) afford the affected individual(s) confidential treatment to the maximum extent possible, a prompt and thorough investigation, an opportunity to comment on allegations and findings of the inquiry and/or investigation, and (2) undertake diligent efforts, as appropriate, to restore the reputations of persons alleged to have engaged in scientific misconduct when allegations are not confirmed.

Although there is a regulation in place, the overall effectiveness of this regulation is unknown. Anecdotal information suggests that some individuals accused of scientific misconduct may still suffer career-altering consequences of these allegations even when they are not confirmed. However, more systematic information was needed to assess the full impact of being accused of scientific misconduct on the lives and careers of those accused but exonerated[1] of such misconduct.

[1]Exonerated means that the allegation of scientific misconduct under the PHS definition was not confirmed by the preponderance of available evidence. In some cases, exonerated individuals may have been subjected to institutional actions because they were found to have committed other misconduct as determined by the institution, or performed inadequately in their positions.

Consequently, ORI contracted with the Research Triangle Institute in July, 1994 to conduct a survey to determine the type and extent of consequences experienced by such individuals in cases of alleged research misconduct.

b. Purpose of This Study

This study was conducted to determine in a systematic way what types of actions were taken following allegations, what the direct outcomes of these actions were, and what efforts were made by the cognizant institutions to protect confidentiality and/or restore the reputations of those accused of scientific misconduct. The results of this survey are intended to help ORI meet its mandate to monitor what happens to the accused, and to continue to improve regulations to target the types of abuses that have already occurred.

The study was originally intended to examine the consequences of being accused of scientific misconduct on all those so accused--those individuals exonerated of scientific misconduct, and those for whom the allegations were confirmed. In the course of the study and in response to requirements established by the Office of Management and Budget (OMB) during the reports clearance process, the focus of this effort was narrowed to include only those individuals exonerated of scientific misconduct.[2]

As part of this effort, the survey attempted to contact and interview by mail those individuals listed in the ORI files as having been accused but exonerated of scientific misconduct. Only individuals involved in closed cases were contacted for the study. The study was intended to provide data on the consequences experienced by those accused but exonerated who were in varying positions within the scientific community and thus, inform the efforts of the ORI staff to address this issue.

The aim of the study was to collect data on what types of actions were experienced by those accused and then exonerated during and after the allegations were made, how these actions affected their personal and professional lives, and to gather more detail about the circumstances of the allegation and its handling (i.e. the relationship of the accused to the complainant, the type of allegation, the outcome of the allegation, the amount of publicity which it received, etc.). In addition to reporting on the specific consequences and larger impacts of being accused of scientific misconduct, we have also sought to understand the circumstances in which those accused but exonerated are more or less likely to suffer adverse consequences of the allegations. Such findings should prove helpful in identifying circumstances requiring particular vigilance on the part of ORI and institutions supported with PHS funds. Due to the small number of cases involved, the study must be considered primarily a descriptive

[2]Consequently the original project title, "Survey of the Accused in Cases of Research Misconduct," was replaced by the title, "Survey of Accused but Exonerated Individuals in Research Misconduct Cases."

work, although it does, for the first time, produce some statistical data on the perceived consequences of being accused of misconduct in scientific research.

It is important to note that the self-reports of survey respondents cannot be taken as reports of "facts" but instead represent the beliefs, perceptions, and assessments of those completing the survey. Thus, those who say their case received an inquiry but not an investigation may or may not correspond to those identified by ORI as individuals whose cases were closed at the inquiry stage. Similarly, those who said they were not represented by an attorney in one question may still report spending money on legal fees in response to another question. We have no way of resolving such inconsistencies and simply report the answers given by survey respondents.

2. Study Methods

a. Questionnaire Contents

The self-administered questionnaire used to collect data for the current study was modeled after that used for the "Study of the Consequences of Whistleblowing for the Whistleblower in Misconduct in Science Cases" (also referred to as the Whistleblower Study; Lubalin, Ardini, and Matheson, 1995).[3] This was done primarily so that the data from the two studies could be comparatively analyzed by ORI to understand an allegation of scientific misconduct from both sides; that of the person making the allegation, and that of the subject of the allegation. We incorporated some of the lessons learned through the Whistleblower Study to clarify issues and simplify administration of the questionnaire for this study.

We also added a few questions about the investigative process which had been reported by whistleblowers as vital to an assessment of the experience, but that were missing from our original instrument. We made an effort to limit the number of changes to the instrument however, since we wanted the data to be comparable in most respects. Some questions had to be rephrased, since this was a distinctly different group. Also, there were a few issues to be explored with regard to the subject of an allegation which were quite different from those which are salient to the whistleblower. Among these issues was the institutional effort to restore the reputation of individuals accused but exonerated of scientific misconduct. As in the Whistleblower instrument, we included a series of three open-ended questions, appended to the fixed-response items, which allowed survey participants to give personal accounts of their experiences and advice to others who might become the subject of an allegation of scientific misconduct.[4]

The questionnaire was finalized in mid-August, 1995. A copy of the survey instrument plus letters used to obtain contact information and solicit participation appear in Appendix A.

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[3] Lubalin, J.S., Ardini, M.E., and Matheson, J.L. 1995. "Consequences of Whistleblowing for the Whistleblower in Misconduct in Science Cases." Final Report prepared for the Office of Research Integrity. Contract No. 282-92-0045. Research Triangle Institute.

[4] This report does not analyze those open-ended items but is focused instead on quantitative analysis of fixed-response items.

b. Data Collection

Data collection was carried out in two phases. First, we used information from ORI's files to locate as many accused individuals as possible and to obtain up-to-date mailing addresses. Second, we mailed the survey and conducted follow-up procedures to maximize the response rate.

Database Preparation and Advance Mailing. The following pieces of information were available for each name in the closed case file delivered by ORI:

- the ORI case reference number, consisting of the year the allegation was made known to ORI and a sequential number;
- the name and address of the institution where the alleged scientific misconduct occurred;
- the name of the respondent (accused);
- the work address and phone number (if available) of the respondent at the time the alleged scientific misconduct was reported;
- the home address and phone number (if available) of the respondent at the time the alleged scientific misconduct was reported;
- whether the case involved an investigation or an inquiry;
- whether the report was made to the institution or directly to ORI; and
- the outcome of the case.

We also had information on the type of allegation that was made, the date of the allegation, the respondent's field of specialty, and the degree attained (i.e., M.D., Ph.D., etc.).

We received the data from ORI at the end of October, 1994, and database construction occurred in November and December, 1994. The datafile included a total of 192 names (45 "scientific misconduct found"/146 "scientific misconduct not found"/1 "missing") from which we were to select a total of 150 people to include in the study. It was initially decided to include all the names in the "scientific misconduct found" group because we wanted to insure reaching as many of this group as

possible. From the "scientific misconduct not found" group, we sampled the number needed to produce the desired total sample base. We used systematic random sampling, drawing the desired names from a complete listing, starting with a randomly selected respondent. Since we already had 45 members from the "scientific misconduct found" group, we chose a total of 105 (72%) from the "scientific misconduct not found" group.

As noted earlier, late in Phase 1 of the study, after we had nearly completed efforts to locate respondents, OMB clearance placed a restriction on the study that caused us to drop the "scientific misconduct found" group. OMB stated that to analyze findings, the study had to receive a 50 percent response rate and a minimum of 30 completed questionnaires from each of the two sample groups ("scientific misconduct found" and "misconduct not found"). Since there were only a total of 45 names in the "scientific misconduct found" category, it was evident that location problems and mail survey response rates would make it unlikely we would receive a total of 30 completed surveys. Because this restriction was imposed late in the survey process and the survey budget was inadequate to support such a change, ORI and RTI project directors agreed not to replace the "scientific misconduct found" members with an equal number of "scientific misconduct not found" cases. Otherwise, we would have had to begin the advance tracing process anew for the new group.

From the information provided by ORI, we created a database which was used as a control system for the initial address verification mailing and full mail survey. We created a record for each name and assigned a unique ID number to each case. This ID number was used in place of the name of the sample member during all phases of the study in order to protect confidentiality. This database was used as the foundation for a control system for the initial address verification mailing and the full mail survey.

The advance contact effort consisted of three phases -- two mailings and a follow-up telephone call -- in an attempt to locate a valid address to send the questionnaire. Each successive phase occurred four to six weeks apart in order to allow time for sample members to respond.

We conducted telephone tracing on the cases which had not responded to our two mailings. If the sample member was no longer at the location and/or telephone number listed, we made inquiries in an attempt to locate the individual. After several months of such tracing efforts, we were able to obtain current addresses for a total of 87 (83%) of the original group of 105, and we discovered that one of these sample members was deceased (this person was removed from the survey population), leaving us with 86 potential subjects (82%). In addition, we received a call from a person who was accused of scientific misconduct but was not in the original ORI database, asking to be included in the study. After checking with ORI, we discovered that he was not included because his case closed in September, 1994

after the datafile had been compiled by ORI. However, it was decided to augment the database with the cases closed in September, 1994, thus including the caller in the sample, as well as four additional cases. These individuals were mailed a survey without the benefit of an advance tracing effort to confirm addresses.[5]

Survey Administration. The survey administration component of the study began with the mailout of a survey packet which included a cover letter, questionnaire, and pre-stamped return envelopes to 108 of the 110 persons in the data file (including all 105 of the initial cases except the one deceased and one firm refusal we received at the advance confirmation stage, plus the 5 "late addition" cases). However, only 86 people who were alive and for whom we were able to confirm an address were considered our "primary sample".[6] The survey cover letter requested return of the completed questionnaire within two weeks of receipt. Results of the mailout are discussed in Section 3 when we review the response rates and representativeness of the completed surveys. Figure 1 presents an overview of the initial contacts and the initial survey mailed.

Four weeks after mailing the questionnaires, we made a reminder call to each individual who had not responded. We made calls to the telephone numbers associated with the addresses used in the mailing (i.e., if the preferred address for mailing was the residence, follow-up calls were made to the exonerated individual's home). For individuals who preferred to be contacted at home, we left messages on answering machines explaining the nature of the call. However, if after multiple attempts we were unable to reach a person using the preferred location, we attempted to reach him/her at the alternate location (if one was available). Through this initial round of reminder calls, we determined:

- whether the address was current for the accused individual;

Figure 1

[5]We accepted this procedure for this small group because the contact information on these cases was of recent vintage, since we mailed the survey less than one year after their cases were closed. With these added cases, our database included 110 individuals, although only 86 living respondents had confirmed addresses.

[6]For purposes of calculating response rates, as discussed in a later section, we look only at live respondents for whom we obtained an initial address (86), and we exclude the 23 respondents with unconfirmed addresses (including the five added cases) to whom we would not ordinarily mail a survey. However, to maximize the respondents we could analyze, we mailed surveys to these 23 persons, three of whom completed the questionnaire.

- whether the survey arrived at the address; and

- whether the individual planned to return the survey.

Our reminder calls urged individuals to return the completed questionnaire. Using the script shown in Appendix B, the caller explained the nature of the survey and asked whether the questionnaire was received. If it was not, we verified the name and address and sent a replacement packet immediately. If the survey was received but completion was delayed, the caller urged the individual to return it as soon as possible. Many were inclined to complete and return the questionnaire once reminded of the importance of the information they would provide.

Approximately five weeks after the initial distribution, we sent a second survey packet to those from whom we had not received a completed questionnaire, with a slightly amended cover letter. The letter referenced the previous mailing and urged the person to complete and return the enclosed form immediately.

Two weeks after the second mailing, we began another series of telephone calls to those who had not responded. Many of those contacted said that they had already returned the completed survey. In all but one case, the surveys arrived for those who reported them as having been returned.

Through the efforts described above, we received a response from 64 members of the primary sample and three of the supplemental sample members. We received completed questionnaires from 51 primary sample respondents and three supplemental sample respondents, or a total of 54 sample members. The other responding members included the six ineligibles and seven refusals (one prior to mailing the questionnaire and six thereafter). These results appear in Figure 2, and we describe the results of our effort in more detail in the next section. Specifically, we present the results of all these contacts and discuss the response rate and representativeness of the surveys returned to us for analysis. Then we turn to a more substantive review of what the survey results indicate about the consequences of being accused of scientific misconduct.

c. Analyses

Before turning to the analyses of response rates and more substantive findings, several points about our survey design and analytic approach are worth noting. In discussions with ORI, it has been clear that the closed cases in their files are not representative of a larger set of cases.

Figure 2

Institutions are only required to report investigations that fall under ORI jurisdiction. They are not required to report inquiries that do not recommend initiating an investigation unless ORI requests the report. They simply represent the set of closed cases about which ORI is knowledgeable. Because there is no basis for extrapolating the results of this survey to some larger universe of cases, the typical statistical tests of significance and estimates of standard errors that we normally apply to sample survey data are inappropriate in this study.[7] Rather, we can simply take the self-reported data as descriptive information about a conveniently available set of individuals who had been accused and exonerated of the allegation of scientific misconduct. The differences that appear in the data are the real differences that exist in this convenience sample -- no significance tests have been done to assure that the differences were not due to random error. Rather, we are concerned only with the practical question -- how big a difference should be considered meaningful? The answer to this is more political than scientific and is really a question of how big a difference would have to exist in order to cause ORI, or the scientific community generally, to change its policies and procedures. In most cases, we have discussed differences only when they exceeded 10 percent, and we have drawn major conclusions only when the differences are substantially larger than this.

The analyses in this report are descriptive and are largely cross-tabulations of one variable or one set of variables with another. More complex multi-variate techniques could be used to define measures empirically or try to better understand possible causal connections in the data. However, these techniques will be of little use with this data set due to the small number of observations (N=54). In one sense, this study represents a large case study of a set of exonerated individuals. There is an extensive set of information about each individual in the study, and we have explored some of the major relationships among these factors in this report. While we cannot make strong inferences from the data in this report, they represent the best information available to date on the consequences of being accused but exonerated of scientific misconduct. At a minimum, they provide the basis for formulating a set of hypotheses that others might explore in additional studies or in additional analyses of this data set.

3. Analysis of Survey Response Rates

[7] We could extrapolate the data from our 72 percent sample to all cases in the ORI file, but this itself is not a meaningful population for which to make estimates. Consequently, we report actual (unweighted) frequencies for those we surveyed in this report.

Before turning to the descriptive analyses that are the heart of this report, it is important to answer the following two questions:

- what was the response rate to the Accused Survey; and
- do those who completed the survey appear to represent the full set of cases of interest to ORI?

To address these two questions, we used a combination of information about cases derived from ORI's case files and the results of our survey mailings and other contacts.

a. Overall Response Rates

Figure 1 above indicates that, after tracing and other follow-up efforts described in the previous chapter, we were able to obtain what appeared to be a current address and/or other current contact information for 86 (excluding the deceased) of 105 (or 82%) exonerated individuals in ORI's files. Figure 2 indicates that, using this address information, we were ultimately able to obtain completed survey forms from 51 of 86 exonerated individuals (59%). Figure 3 identifies reasons for 35 non-completions: six individuals (7%) who reported no involvement with an allegation of scientific misconduct and who were deemed ineligible; seven persons (8%) who refused to participate (one during the initial address confirmation round); and 22 individuals (26%) who could not be contacted in the final round after obtaining what appeared to be a current address in the initial address verification stage of the study. Excluding the people who reported themselves ineligible, Figure 3 shows that we obtained responses from 51 of 80 surveys mailed (64%).

b. Response Rates of Different Types of Allegations

In addition to the overall response rates, it is important to examine the response rates of exonerated individuals in cases of different types. This is to be sure that there were no biases in who completed our survey and who did not.

figure 3

Table 1 employs measures from the original ORI data file to compare respondents in the initial ORI cases with those to whom we mailed a survey (i.e., those we found) and those that completed the survey.

Using the following factors -- age of case initiation, who conducted the inquiry and/or investigation, whether an inquiry and/or investigation was pursued, the degree held by the accused individual, their field of concentration, and the nature of the allegation -- we were able to develop what appeared to be current contact information (% found) for three-fifths of cases in all categories, and in the majority of categories we found at least three-fourths of the cases.

Although some of the differences are small, the middle columns of Table 1 indicate that it was relatively easy to find the exonerated individuals (at least 89% found) when their cases:

- were initiated before 1989 (100%);
- were dealt with by a federal agency, including ORI, OSI, NIH, and NCI (95%);
- involved only an inquiry (89%); or
- involved more than one of the listed allegations (94%); generally both fabrication and falsification.

They were relatively hard to locate and identify (70% or fewer were found) when their cases:

- involved an investigation (70%); or
- involved an accusation of fabrication alone (63%).

In most cases, the completion rates for different groups were inversely related to the rates at which they were found, resulting in total representation in the final sample that roughly paralleled the rates for these groups in the initial ORI list. Relatively higher than average completion rates (70% or more of those we found completed the survey) occurred for cases:

- that were recent -- i.e., opened between 1992 and 1994 (79%);
- in which the respondent had a Ph.D. (71%); or
- that involved allegations only of fabrication of data (80%).

Table 1

Relatively lower than average completion rates (50% or fewer of those we found completed the survey) occurred in cases:

- in which the inquiry and/or investigation was conducted by a federal agency (50%);
- in which the respondent had a degree other than a research or clinical doctorate, or had no reported degree (17%); or
- that were closed in 1988 or earlier (50%).

Although not shown in this table, completed surveys in each category proportionally resemble cases in the total frame. The only differences of note are that we were able to obtain completed surveys from a higher proportion of Ph.D.s, a higher proportion of inquiry cases, and a lower proportion of investigation cases than in the total frame. All things considered, it appears reasonable to report information from those who completed the survey to represent all ORI cases.

Before leaving ORI's data, it is important to note a few key features of the cases we selected to examine. Most of the cases in our study were initiated no later than 1991 (40 of 51, or 78%). Second, most of our cases (42 of 51, or 82%) were investigated by the institutions themselves and not by ORI or its predecessors. It should also be noted that there are nearly twice as many inquiries as investigations represented by our completed cases (35 and 16, respectively), although the return rates for these two groups are very similar.[8]

c. Who Are the Exonerated Individuals Included in This Survey?

Although it is important to look at the exonerated individuals' characteristics, the survey responses are the keys to understanding who the people are who were involved in this study and what their collective experiences were.

Table 2 gives details about the study population's self reported characteristics. At the time of the allegation: (1) the vast majority (96%) of the exonerated individuals held doctoral level degrees (61% research doctorates and 35% clinical doctorates or combined clinical and research degrees); (2) more than four out of five (83%) worked in academic settings, and the rest worked in

Table 2

[8]For the sake of completeness, we note that the supplemental cases fall out as follows: all recent cases; all with inquiry/investigations by institutions; all inquiry cases; one in medicine, one "other", and one not listed; two Ph.D.s and one M.D.; and two accusations of falsification only and one "more than one" accusation.

Table 2 (cont'd)

government or other settings (6% and 11%, respectively); (3) of the 45 exonerated individuals who worked in academic settings, an equal number worked in basic science or clinical programs (35% in each), while the remaining 13 percent worked in another type of academic department; (4) about half of all exonerated individuals (52%) held tenured positions, and all (100%) worked full-time; (5) just under half of the exonerated individuals (44%) were full professors, 35 percent held other academic ranks, and the remainder (20%) held no academic rank; and (6) a substantial minority of the exonerated individuals (39%) held an administrative or management position, with 20 percent in a more senior institutional, departmental, or divisional leadership position and 19 percent leading a lab or section.[9]

[9] In the survey questionnaire, we asked the exonerated individuals to check all positions they held at the time of the accusation. Someone could report being a department chair and a lab chief. To avoid double counting in this item, we recoded the set of responses in a sequential fashion. An exonerated individual who checked senior administrator was coded as a senior administrator regardless of anything else checked. An exonerated individual who checked department chair/head was coded as such unless he or she had checked senior administrator -- again regardless of anything else he or she might have checked. This same logic continued through the remainder of the subcategories.

4. Findings: Consequences of Being Accused for Exonerated Individuals

This study was primarily concerned with identifying the consequences experienced by people who had been accused of scientific misconduct, and who eventually were exonerated. Another purpose of the study was to determine how far the institution where the scientific misconduct was alleged went in protecting the confidentiality of and restoring (when necessary) the reputation of the person accused and exonerated.

a. Specific Consequences of Being Accused of Scientific Misconduct

We asked the exonerated individuals to indicate what actions were taken against them, and by whom. We were interested in finding out about their negative experiences both during the incident and afterward. The list of possible negative actions included items such as being fired, being denied a salary increase, being ostracized by their colleagues, or having a lawsuit initiated or threatened. Two respondents who filled out the survey did not have the opportunity to answer the questions pertaining to specific negative actions experienced. This was because those two survey booklets were inadvertently sent without those pages attached. Therefore, although the total number of exonerated individuals in the survey is 54, in every instance where a question about specific negative actions is tabulated, the total number of exonerated individuals will not exceed 52.

How many exonerated individuals reported negative actions, and how many actions did each one experience? Table 3 shows the number of people reporting differing numbers of negative actions. Of the 52 people who responded to this set of items, 40 percent reported experiencing no negative outcomes associated with the allegations of scientific misconduct, while the remaining respondents (60%) reported at least one negative action. Nearly one-quarter (23%) of the exonerated individuals reported experiencing one or two negative outcomes, an additional one-quarter (25%) reported from three to five negative actions, and the remaining 12 percent reported six or more actions.

What negative actions were taken against the exonerated individuals? The fifteen consequences listed in the survey vary in terms of severity and how often that action was experienced by the accused. Feeling pressure to admit guilt to the allegation is arguably less

Table 3

severe a consequence than being denied tenure. Table 4 presents the number and percent of people who report four broad categories of consequences ranging from most to least severe -- (1) loss of position, (2) denial of advancement, (3) loss of research resources and opportunities, and (4) being hassled, pressured, or having work delayed. Each individual item is listed in Table 4, and we report the number and percent of exonerated individuals who reported that category of negative consequence. The numbers shown are representative of all responses given by those exonerated individuals. For example, four exonerated individuals reported being denied a salary increase and five reported being denied a promotion. Those nine responses, however, came from only seven people: two of whom reported being denied both a salary increase and a promotion. An exonerated individual could have checked as many negative actions as there were, therefore the numbers in Table 4 reflect number of occurrences of each action, not the number of people who experienced them.

Table 4 shows that exonerated individuals report consequences that are less severe or no negative consequences far more frequently than they report severe consequences. Twenty-one individuals (40%) report no negative actions, while 19 (37%) report having a lawsuit threatened and 18 (35%) report that additional allegations were made. Other less severe consequences reported fairly often include ostracism (21%) and delays in processing grant applications (17%). It is important to remember that people often report more than one negative consequence (see Table 3). A total of 30 exonerated individuals reported one or more types of hassles, pressures, or delays either during or after the incident. In addition, 17 percent of exonerated respondents reported a reduction in their research support and 8 percent reported losing a desirable work assignment.

Very severe consequences were also reported by only a small proportion of exonerated individuals. The most common was denial of promotion (10%) and others included denial of salary increase (8%) and being fired (6%). Keep in mind again that the numbers of negative consequences reported in each row represent individuals who experienced that consequence; but that the totals of actions experienced reflects not the number of people who experienced the action, but all actions suffered by all who reported such consequences.

Those who are accused and not found guilty of the accusations still frequently suffer significant hardship due to the allegations. It is notable that three people who were cleared of all

Table 4

wrongdoings reported that they were fired[10] and one reported that his/her position was not renewed. In addition, four were denied salary increases and five were denied promotions. We consider these to be severe negative consequences resulting from accusations of scientific misconduct. On the other hand, it is also clear from Table 4 that many people go through such an experience without suffering any or any severe adverse actions.

When did the negative actions occur? The next section analyzes temporal patterns associated with negative consequences suffered by people who were accused of scientific misconduct, although eventually exonerated. Table 5 shows the same items as in Table 4, but the negative actions are related to when the action was experienced -- only during the inquiry/investigation, during and after the inquiry/investigation, or only after the inquiry/investigation. Again in this table, the individual often reported more than one consequence. Therefore, the numbers add up to more than 52 since more than one consequence could be reported for each respondent. The temporal pattern they report for a given consequence may be different from what they report for another consequence. For example, an exonerated individual could report having a lawsuit threatened only during the inquiry/investigation but report additional allegations against them only after the finding of no scientific misconduct was announced.

Table 5 first shows that when the 31 exonerated individuals who experienced any negative actions are classified into the three time periods based on their collective set of consequences, eight (26%) only had consequences during the inquiry/investigation, 20 (65%) reported experiencing them both during and after the inquiry/investigation, and only three people (10%) said their consequences were suffered only after no scientific misconduct was found.[11] The data show that 28 of the 31 exonerated individuals (90%) suffered consequences of their accusations while their case was still active. On the other hand, someone accused of scientific misconduct who experienced no negative consequences while the case was active (i.e., 24 of the exonerated individuals -- three who reported negative actions only after the incident and 21 who reported no negative actions) had only a one-in-eight chance of being subjected to any negative consequence.
Table 5

[10]The three exonerated individuals who were fired were not found guilty of scientific misconduct, including scientific and academic/professional.

[11]The first full row of data in Table 5 (Total with Negative Action Experienced) shows cumulative temporal patterns of actions experienced. Those numbers represent all of the experiences that each of the 52 people reported. Therefore, that row adds up to 52 people. The rows that follow represent individual occurrences of each consequence by each person. Therefore, the numbers represent at what period each consequence occurred individually. In any row, the number of respondents reporting an action during a particular period may exceed the number in the top row because the criterion for the top row is more stringent (i.e., every one of the actions experienced must fall in "after only" for the person to be classified in that category, whereas for any row, a person may report an action "after only" but might still fall into the "during and after" category when all actions are considered at once).

When we look at the consequences separately, two patterns emerge. First, for the most severe consequences, (loss of position and denial of advancement) anywhere from 25 percent to 100 percent of people reporting such actions indicate that they occurred only after they were exonerated. For the less severe consequences (loss of research resources/opportunity or hassles, pressures, and delays), the percentages of respondents reporting such outcomes only after the incident is resolved is much lower, ranging from none to a maximum of 25 percent for each outcome. The other pattern that emerges is that the lower the severity of consequence, generally the higher the proportion who report that the particular negative consequence occurred only during the incident, not afterwards. Anywhere from 42-100 percent of the exonerated individuals reported each instance of hassle, pressure, or delay as occurring during this period, while 25-44 percent reported loss of research resources/opportunity and 0-20 percent reported denial of advancement. Loss of position does not follow this pattern because a person can only lose their position once -- during or after the incident -- so the during and after category is essentially inapplicable.

Who took negative actions against the exonerated individuals? In addition to asking what negative actions were experienced by each exonerated individual, we asked who was responsible for the action. Table 6 provides the number of exonerated individuals who reported each type of person responsible for any negative consequence. Each exonerated individual is included only once in any row even if he/she indicated that a particular type of person was responsible for multiple actions. As before, however, each exonerated individual can be counted in more than one row, giving a total across rows of types of persons responsible for actions, not total exonerated individuals who experienced an action.

The data in Table 6 show that respondents were almost twice as likely to attribute responsibility for the negative consequences they experienced to complainants than to any other type of person (44%). Other categories reported to be responsible for negative actions against the exonerated individuals were the department chair/head (19%), university administrators (17%), colleagues (15%), deans (10%) and the funding agency (20%). Many types of people not listed were named as the person responsible (as indicated in the "other" category) which also included a few students. No major subcategories were apparent in the list of other types.

In Table 7, we show the severity level of consequences experienced by who was responsible for that level of negative action. For purposes of this report, we combined the top two

Table 6

Table 7

categories listed in Table 5 (i.e., loss of position and denial of advancement) to make a category called Severe Negative Consequences.[12] We also combined loss of research resources/opportunity and hassle/pressure/delay to make a new category called less severe negative consequences. Each exonerated individual who experienced a negative action is assigned to only the most severe of the two levels of negative consequence. In other words, if someone was both fired and pressured to admit allegations, they were counted only as having experienced severe negative consequences for Table 7 (and subsequent tables using these same categories). For each type of consequence experienced, the exonerated individuals could list more than one person who was responsible for that action. Therefore, the numbers in a row do not add up to the total number of people experiencing that level of consequence.

When looking at the results in Table 7, it is clear that institutional officials (which include university administrators, deans of colleges and schools, department chairs or heads, laboratory chiefs or heads, or center directors) were reported as being responsible for eight out of nine (89%) of the severe negative consequences suffered by the exonerated individuals. (It should be noted that higher ranking individuals are better positioned to impose severe consequences than lower ranking ones. Only high ranking officials are able to impose such severe actions). Respondents believe that a substantial number of severe consequences were caused by the complainant (67%) and by colleagues (56%). Funding agencies were only seen as responsible by a small portion of those who experienced severe negative actions (11%). The pattern is fairly different for consequences which are categorized as less severe. In these cases, the complainant was deemed to be responsible for more than three-quarters of the occurrences (77%), while the institutional officials were believed to have caused 32 percent of the actions, and the funding agency and colleagues were thought to be involved a much smaller percentage of the time (18% and 14%, respectively).

We suggest, to prevent the accused from experiencing negative actions before a case has closed, ORI regulations and enforcement approaches should be focused on both institutional officials and complainants. Although important, it is unlikely that targeting colleagues and the funding agency is likely to alter the bulk of the negative consequences suffered by those accused and eventually exonerated of the accusations.

Table 8 shows the overall measure of when the negative action occurred by the person responsible for the action. Each exonerated individual who experienced a negative action is counted only once in the three temporal categories (only during, during and after, or only after). However, the

[12] We used this grouping, developed as part of the earlier Whistleblower Study, in order to permit comparisons between two reports.

person responsible could be counted more than once by each exonerated individual, depending on how many consequences were experienced and who was deemed responsible for each. The complainant was viewed as responsible more than twice as often (63%) as any other category of people (24% of respondents felt that institutional officials or the funding agency was responsible) when the action occurred only during the active period of the inquiry/investigation. When it occurred both during and after the incident, the complainant was seen as even more responsible for the consequence (80%), but so were institutional officials (60%) and colleagues (40%).

b. Consequences Experienced by Different Exonerated Individuals

In the previous section, we described the negative outcomes the exonerated individuals experienced and looked for some structural characteristics of these outcomes that might be useful in helping to target the application of federal and institutional resources. In this section, we look at what happened to the exonerated individuals of different types to determine if there are some people who can weather an accusation with relative impunity, while others find themselves particularly vulnerable to adverse outcomes when they are accused of scientific misconduct. Again, this may help focus resources where they can do the most good in protecting the most vulnerable exonerated individuals.

It should be noted that higher ranking individuals are most likely better equip to impose severe consequences than lower ranking ones. This could be due to the nature of their position and the increased responsibility inherent in such positions.

How do the exonerated individuals differ in the consequences they experience? Table 9 examines the relationship between the personal characteristics of exonerated respondents and whether or not they experienced negative consequences as a result of being accused of scientific misconduct. We looked at a number of respondent characteristics, including:

- **Degree Held.** In general, type of degree has little impact on the extent to which the exonerated individuals report negative consequences of being accused of scientific misconduct. Of those with research-oriented doctorates (Ph.D. or Sc.D.), 59 percent experienced negative consequences of being accused of scientific

Table 8

Table 9

Table 9 (cont'd)

misconduct, while of those with clinically-oriented degrees (M.D., M.D./Ph.D., M.B., or D.D.S.), 63 percent experienced negative consequences of being accused of scientific misconduct. The similarities extended to the level of severity reported as well. Just over two-in-five of those with research doctorates (44%) and clinical doctorates (42%) reported less severe consequences, while 16 percent of those with a research doctorate and 21 percent of those with clinical doctorates reported the more severe consequences of being accused of research scientific misconduct.

- **Work Setting.** Exonerated academics were slightly more likely (61%) than non-academics (56%) to suffer negative consequences of being accused of scientific misconduct.

- **Type of Academic Department.** Among exonerated academics, those in basic science departments (63%) were nearly as likely as those in clinical departments (67%) to report negative consequences when accused of scientific misconduct. However, only 33 percent of the respondents in other departments reported suffering negative consequences of being accused and exonerated of scientific misconduct, while those outside academia were almost as likely as the first two categories to report negative consequences (56%).

- **Academic Rank.** Academic rank appears to make little difference in experiencing negative consequences by those accused but exonerated of scientific misconduct. Of full professors, 65 percent experienced negative consequences compared with 60 percent of associate professors and 67 percent of assistant professors, lecturers, and instructors. Academic rank did, however, influence the severity of the consequences reported by those exonerated individuals. Full professors were less likely (9%) to experience severe consequences as a result of being accused than were associate professors (20%), assistant professors, instructors, and lecturers (22%), or those without an academic rank [students, post-docs, and non-academics] (30%).

- **Tenure.** Tenure is strongly correlated with academic rank. Consequently, the results mirror those just discussed. Although tenure makes no difference in the proportion who report negative consequences as a result of being accused of scientific misconduct (59% of tenured and 60% of non-tenured respondents reported experiencing negative consequences), it does make a big difference in the severity of the consequences they experience. Of non-tenured respondents, 28 percent reported experiencing severe

negative consequences while only seven percent of tenured respondents reported such consequences.

- **Institutional Position.** Nearly two-in-five respondents (38%) held a position of institutional authority at the time of the allegation. However, the number in any particular position is very small. For this report, we group respondents into three categories of institutional positions; those with senior positions (senior administrator, department head, or division head), those with less senior institutional positions (laboratory or section chiefs), and those with no institutional position (all others). Table 9 shows that 60 percent of those with the senior positions, 80 percent of those with the less senior positions, and 53 percent of those with no institutional position reported experiencing a negative impact. Not only do more senior institutional officials suffer fewer consequences than their less senior colleagues, but they also suffer severe negative consequences less frequently than their more junior cohorts -- just 10 percent of those in senior institutional positions reported severe negative consequences in contrast to 50 percent of the less senior officials who report them. The pattern for those with no institutional position is similar to that for the more senior officials, except that a slightly smaller proportion (44%) experienced the less severe consequences, and a corresponding higher proportion (47%) reported no negative consequences.

- **Relationship to the Complainant.**[13] When peers, such as colleagues or collaborators, make the allegation of scientific misconduct, respondents report experiencing negative outcomes two-thirds (67%) of the time. Those who were superiors or supervisors of the complainant reported negative consequences least often (55%), about as often as those not co-located with or otherwise related to the complainant (54%). Grouping the last three small categories as "other" and looking at the severity of consequences experienced, the patterns are not strong. Superiors/supervisors of complainants reported severe negative consequences slightly more often (18%) than did those who were colleagues/collaborators of complainants (13%), and about as often as did those otherwise related to complainants (20%). They were also less likely to report less severe consequences (36%) and more likely to report no consequences (46%) than either complainants' colleagues/collaborators (53% and 33% on these measures) or those related to complainants in some other way (40% on the two measures).

[13]The exonerated individuals in our survey could indicate more than one relationship to the accused (e.g., both supervisor and collaborator). However, we used the data to create unique categories for each individual. We categorized those who were supervisors/superiors as such regardless of other relationships they might hold with the accused. The remaining categories were assigned in descending order.

c. Consequences Experienced in Different Situations

In the above analyses, we have shown that what happened to a person accused of research misconduct appears to have something to do with who takes action against them, when they take that action, and what sort of person the respondent is. Another set of factors likely to influence the outcome of being accused of scientific misconduct is how the allegations were handled.

How do the consequences experienced by the exonerated individuals vary with differences in how the allegation of misconduct is handled? Tables 10-12 examine the relationship between characteristics of how the alleged incident of research scientific misconduct was handled and whether or not and to what extent respondents experienced negative consequences as a result of being accused of scientific misconduct. In Table 10, we looked at whether or not the case was publicized and other aspects of case publicity.

- **Case Publicity.** Respondents in cases that receive publicity were more likely (93%) than their colleagues whose cases were not publicized (47%) to report negative consequences of being accused of scientific misconduct. Of all those who experienced negative consequences, two-thirds (67%) of those whose cases were not publicized reported only less severe consequences. Just over three-in-four (77%) of those whose cases were publicized reported only less severe consequences. However, since the proportion reporting negative consequences is so much higher for cases that were publicized, the percentage of all cases with severe negative consequences was nearly twice as high (21%) for publicized cases as for their unpublicized counterparts (16%). Fortunately, only about one-fourth of cases (27%) were reported to have been publicized.

- **Where Case Was Publicized.** The number of cases publicized was small, and all but one respondent in such cases reported negative consequences. So, it appears that the medium through which alleged scientific misconduct is publicized has no impact on the outcomes. These small numbers also preclude meaningful analyses of

Table 10

the level of severity of consequences experienced by those whose cases were publicized in different media.

- **Who Was Responsible For Publicity.** The small number of publicized cases also precludes meaningful analysis of this question. The data do suggest that publicity by complainants alone may be unlikely to result in severe consequences, as no such situations were encountered.

Table 11 examines the relationship between any support received by the exonerated individuals and the consequences they experience. It includes information on the following items:

- **From Whom Received Support/Encouragement.** Interestingly, when respondents report receiving support and encouragement from university officials, they experienced negative consequences less often (62%) than when they received support elsewhere. This is a sharp contrast to those who reported that they received no support or encouragement, or who reported the lowest frequency of negative consequences (25%). Those who reported receiving support from each of the following groups experienced severe consequences 20 percent or more of the time: federal officials, family/friends, colleagues, attorneys, and other administrators. None of those who reported that they received no support from anyone experienced severe negative consequences.

- **Number of People Providing Support/Encouragement.** Forty-six respondents (85%) reported receiving support from at least one person. Eight exonerated individuals (15%) reported receiving support from no one. The number of different types of people who were reported to have provided support to the exonerated individuals seems to make some difference in the consequences experienced -- but, except at the extreme ends, the pattern is unclear. As before, people who explicitly reported having received no support from anyone experienced fewer adverse actions (25%) than other categories. In addition, those who received support from six or more types of people reported negative consequences in every case (100%). Other categories were in the middle, with 50 to 68 percent reporting negative consequences. Although the trend is not perfect, there is also a tendency for those who reported support from a wider range of people to experience less severe consequences more often, but to suffer severe consequences no more often than

Table 11

other respondents (17-20 percent for all groups, except those with no supporters, who reported no severe consequences).

Table 12 presents information about the inquiry and investigation phase of the incident of alleged scientific misconduct. It includes information on the following topics:

- **Representation by an Attorney.** Exonerated individuals who were not represented by an attorney at any point reported suffering negative consequences 41 percent of the time, but suffering severe negative consequences only 3 percent of the time. In contrast, those who employed an attorney at any point during or after the inquiry/investigation phase reported negative consequences 89 percent of the time and severe negative consequences 38 percent of the time. When the timing of attorney representation is considered, two-thirds of those who reported using an attorney only during the proceedings reported a negative outcome (67%) and half of these (33%) reported severe negative consequences. Those who reported using an attorney both during and after the active phase of the inquiry/investigation process reported a negative outcome 85 percent of the time, and these outcomes were severe 38 percent of the time. Both of the exonerated respondents who employed an attorney only after the active phase reported negative consequences and one of these (50%) reported a severe negative outcome. The most plausible interpretation of these results is that those who anticipate experiencing negative outcomes the most, especially severe negative outcomes, are most likely to hire an attorney.

- **Response to the Allegations.** Exonerated individuals who reported that their cases were subjected only to an inquiry reported suffering negative consequences 50 percent of the time. Those whose cases were subjected to an investigation but no inquiry reported suffering negative consequences 54 percent of the time. Exonerated respondents who said their case had been subjected to both an inquiry and an investigation reported experiencing negative consequences 75 percent of the time. Those who reported some other pattern or said they did not know what procedures followed the allegation were the most likely to report suffering a negative consequence (83%). Except for those who reported both an inquiry and investigation, of whom one-in-four (25%) reported severe negative consequences of the unsupported allegation of scientific misconduct, one-in-six exonerated individuals in all other categories reported severe negative outcomes (investigation only, 15%; inquiry only, 17%; and other/don't know, 17%). The results for

Table 12

inquiry only and investigation only are so similar that it may simply be that respondents cannot clearly distinguish those activities, that a number of individuals subjected only to inquiries nonetheless reported being subjected to investigations.Such a finding .would be consistent with data in Table 1 which indicate that, according to ORI records, the cases completing our survey were classified more often than not as "inquiry" (meaning inquiry only) cases.

- **Outcome Of The Allegations.** Of 15 exonerated respondents who said their inquiry did not proceed to an investigation, 67 percent reported experiencing a negative consequence. Of those whose cases did proceed to an investigation and in which the investigation did not find scientific misconduct of any kind, 53 percent reported experiencing negative consequences. Every one of the three respondents exonerated of scientific misconduct, but who were found to have engaged in some other kind of academic or professional scientific misconduct, reported having suffered negative consequences. When severity of consequences is considered, it appears that, although those whose cases were dropped after an inquiry more often reported negative consequences, the consequences were rarely severe (7%). Those whose cases were dismissed after investigation were twice as likely (14%) to experience a severe negative consequence. Those found to have engaged in other scientific misconduct reported severe negative outcomes in two-thirds (67%) of the cases.

d. Overall Impact of Being Accused of Misconduct on the Exonerated Individuals

In addition to asking the exonerated respondents about the specific negative consequences they experienced as a result of being accused of scientific misconduct, we also asked them to rate the impact of the accusations on their career overall (item 33), and on specific aspects of their careers (item 30), professional activities (item 32), and personal lives (item 31). In addition, we asked the exonerated individuals we surveyed about their current employment (items 25-29) and if they believed that they were still stigmatized by having been accused of scientific misconduct (item 34). The analyses in this section look first at their overall ratings, next at the individual dimensions that the exonerated individuals rated, and then at the relationship between the specific consequences and summary ratings of the impact of the accusations in these three domains -- career, professional activities, and personal life. After that, the analyses explore the job impacts on those exonerated of scientific misconduct and at their perceptions of any continuing stigma of the allegations.

What was the overall impact of being accused of scientific misconduct on claimants' careers? The survey included an item (item 33) which asked respondents to rate the overall effect of being accused of scientific misconduct on their careers. Table 13 provides an overview of this information for all the exonerated individuals in our survey, for those who experienced or did not experience a negative action, and among the former, those who experienced severe versus less severe negative consequences:[14]

- **The Exonerated Individuals Overall.** Among all the exonerated individuals, 57 percent reported that the impact on their career was neutral, 39 percent reported a negative impact, and only four percent reported a positive impact of being accused of scientific misconduct on their careers.

- **The Exonerated Individuals With/Without Negative Consequences.** The pattern is very different when a distinction is made among the 21 exonerated individuals who reported no negative consequences of their being accused of scientific misconduct and the 31 who reported some type of negative impact. Most (76%) of the former rated the impact as having no effect or as being uncertain and the remainder (24%) rated the impact as negative. However, among those who experienced a negative outcome, 45 percent felt the impact was negative, 48 percent felt it was neutral, and seven percent felt that being accused of scientific misconduct had a positive impact on their careers.

- **The Exonerated Individuals With Severe Versus Less Severe Negative Consequences.** When those who experienced negative consequences are further differentiated into those who suffered very severe consequences and those who suffer less severe consequences, the patterns differ again, but only slightly. Those who experienced severe negative consequences (loss of position or denial of advancement) were more likely to rate the overall impact on their career as negative

[14] The survey question we asked gave the exonerated individuals the opportunity to respond to this item by choosing one of eight items (very, somewhat, or slightly positive, very, somewhat, or slightly negative, no effect, and uncertain). For several reasons (small sample size, previous research with similar scales, and the fact that other career, professional activities, and personal life scales have fewer points), we collapsed categories for reporting into positive (very and somewhat positive), negative (very and somewhat negative), and neutral (no effect, uncertain, slightly positive or slightly negative).

Table 13

(56%) than to rate it as neutral (44%), with none of the exonerated individuals who experienced severe negative consequences rating the overall impact as positive. In contrast, those who reported experiencing the less severe adverse outcomes (loss of research resources or hassles, pressures, or delays) were more likely to rate their experience as no effect/uncertain (50%) than negative (41%), and some (9%) even rated it as having a positive impact on their careers.

What impact did being accused of scientific misconduct have on various aspects of respondents' careers? Table 14 presents information on respondents' self-assessments of the impact of being accused of scientific misconduct on various aspects of their careers. The overall pattern reflected in this table is that, on every dimension, the most selected option is the no effect/uncertain choice. The proportion choosing this neutral option varied from 52 percent for the impact on the exonerated individuals' reputations, to 87 percent for its impact on their consulting activities. Most of those who did not choose the middle option rated the impact on these career-oriented dimensions as negative. The proportion giving negative ratings ranged from highs for reputation (46%) and job mobility (30%), to lows for tenure (6%), consulting (13%), promotions (15%), fields of research (17%), and income (19%). With the exception of one dimension, no more than one exonerated respondent indicated that their being accused of scientific misconduct had a positive impact on any career dimension. The exception was that six percent felt that the incident had a positive impact on their field of research. In sum, relatively few people who were exonerated of scientific misconduct reported any impact on each of the dimensions we looked at. However, when they did report an impact, it was almost invariably negative.

Table 15 provides an overview of the relationship between a summary of respondents' self-assessments of the impact of being accused of scientific misconduct on various aspects of their careers by whether or not they experienced a negative consequence, and for those that did, whether the negative consequence was severe or less severe:[15]

[15] In this and several other tables, respondents are classified as mostly negative, neutral, positive, or as mixed based on their patterns of responses to the individual items in the domain. To be labeled "mostly" something, the number of ratings of that type must exceed by three the number of ratings of all other types combined. For example, with nine items assessing judgements of "career," at least 6 would have to be rated "negative" for the respondent to be labeled "mostly negative." Mixed ratings are any that do not fit the "mostly" patterns -- in general, the mixed patterns involved some balance of negative and neutral ratings and is, therefore, shown between these two "mostly" categories in these tables. Also in this table, we use the severe and less severe negative consequences distinction described earlier.

Table 14

Table 15

- **The Exonerated Individuals Overall.** Among all the exonerated individuals, a substantial proportion (61%) rated the impact on their careers as "mostly neutral," most of the rest (30%) rated the impact as "mixed," a few (7%) rated the impact as “mostly negative,” and just one person (2%) rated the impact as “mostly positive.”

- **The Exonerated Individuals With/Without Negative Consequences.** As in Table 13, the pattern shifts when we distinguish those who experienced no negative actions and those who experienced a negative consequence. The vast majority of those who reported experiencing no negative actions (81%) reported that being accused of scientific misconduct had little impact on their careers, and the remainder rated its impact as either mixed (14%) or negative (5%). Those who experienced a negative reaction were more divided in their opinions. Just over half (52%) rated the impact as mostly neutral, more than one-third (36%) rated the impact as mixed, one-in-ten (10%) felt that being accused of scientific misconduct had a mostly negative impact on their career, and the remainder (3%) rated the impact as positive.

- **The Exonerated Individuals With Severe Versus Less Severe Negative Consequences.** Again, the pattern is quite different for those who experienced severe versus less severe consequences of their being accused of scientific misconduct. Fully one-third of those who experienced the more severe negative consequences of being accused of scientific misconduct reported that the impact was mostly negative (33%) and an equal number (33%) reported mixed impacts. The remainder reported the impact as mostly neutral (22%) or positive (11%). For those reporting only less severe negative consequences, nearly two-thirds (64%) reported the impact was mostly neutral, while the rest reported the career impact as mixed. None rated the impact as either mostly negative or mostly positive.

What impact did being accused of scientific misconduct have on various aspects of respondents' participation in professional activities? Table 16 presents information on respondents' self-assessments of the impact of being accused of scientific misconduct on various aspects of their participation in professional activities. The overall pattern reflected in this table is that, on every dimension, the most selected option is the no effect/uncertain choice. The proportion choosing this neutral option varied from 57 percent for the impact on respondents’ presentations and research activities to 85 percent for its impact on both publishing and teaching. Most of those who did not choose the middle option rated the impact on their various professional

Table 16

activities as negative. The proportion giving negative ratings ranged from highs for presentations (39%), research (37%), and chairing sessions (30%), to lows for publishing (9%), teaching (13%), and editorial posts (15%). All other categories were judged to have had a negative impact by 20 to 28 percent of the exonerated individuals. Not more than three of the exonerated individuals (6%) rated the impact of being accused of scientific misconduct as positive on any of these dimensions. In sum, relatively few respondents reported any impact on each of these dimensions. However, when they did report an impact, it was almost invariably negative.

The same pattern exhibited in Table 15 is replicated in Table 17, which compares a summary of self-ratings of the impact of being accused of scientific misconduct on participation in various professional activities with reports of specific negative consequences experienced.

- **The Exonerated Individuals Overall.** Among all the exonerated individuals, more than two-thirds (69%) rated the impact on their professional activities as "mostly neutral," just under one-fifth (19%) rated the impact as "mostly negative," and the rest rated the impact as mixed (11%), with only one of the exonerated individuals (2%) rating the impact as "mostly positive."

- **The Exonerated Individuals With/Without Negative Consequences.** As in earlier tables, the pattern shifts when we distinguish those who experienced no negative actions and those who experienced a negative consequence. The vast majority of the exonerated individuals who reported experiencing no negative actions (81%) reported that being accused of scientific misconduct had no impact on their professional activities, and the rest (19%) reported that it had a mostly negative impact. Those who said they experienced a negative reaction were more divided in their opinions. More than half (58%) rated the impact as mostly neutral, 19 percent rated the impact as mixed, and an equal number (19%) rated it as mostly negative. One respondent thought that being accused and exonerated of scientific misconduct had a mostly positive impact on his/her professional activities.

- **The Exonerated Individuals With Severe Versus Less Severe Negative Consequences.** Again, the pattern is quite different for those who experienced severe versus less severe consequences of their being accused of scientific misconduct. Most often, those who experienced the more severe negative consequences reported that the impact of their being accused of scientific misconduct was mostly negative (44%), but substantial numbers also reported

Table 17

mostly neutral (33%) or mixed (22%) impacts. For those reporting only less severe negative consequences, more than two-thirds (68%) reported the impact was mostly neutral, while 18 percent reported mixed impacts, nine percent reported negative impacts, and five percent reported mostly negative impacts.

What impact did being accused of scientific misconduct have on various aspects of respondents' personal lives? Table 18 presents information on respondents' self-assessments of the impact of being accused of scientific misconduct on various aspects of their personal lives. The overall pattern reflected in this table is that, on nearly every dimension, the option selected most often is the "no effect/uncertain/missing" choice. The proportion choosing this neutral option varied from 19 percent for the impact on the exonerated individuals' mental health and 43 percent for the impact on the exonerated individuals' self-esteem, to 80 percent for its impact on their children and 74 percent for its impact on their friends. With the exception of two dimensions -- impact on friends and children -- most of those who did not choose the middle option rated the impact on the various aspects of their personal lives as negative. The proportion giving negative ratings ranged from highs for mental health (78%), physical health (48%), and self-esteem (46%), to lows for children (13%) and friends (15%). All other categories were judged to have had a negative impact by 22 to 39 percent of the exonerated individuals. More of the exonerated individuals reported positive impacts on areas of their personal life than reported such impacts on their careers or professional activities. On only two dimensions -- friends and self-esteem -- did even 10 percent of respondents indicate that being accused and exonerated of scientific misconduct had positive impacts on their personal lives, but only in the former did the number reporting positive impacts even approach the number reporting negative impacts. In sum, relatively few people who were exonerated reported any impact on each of these dimensions. However, when they did report an impact, it was more often negative than positive, with the exception of impact on friends, where the proportion reporting positive impacts nearly equaled the proportion reporting negative impacts.

Table 19 compares a summary of self-assessments by respondents of the impact of being accused of scientific misconduct on various aspects of their personal lives by the specific negative consequences they reported. The pattern in this table diverges somewhat from those in Tables 15 and 17, which looked at impacts on career and professional activities, respectively:

Table 18

Table 19

- **The Exonerated Individuals Overall.** Among all the exonerated individuals, nearly half (48%) rated the impact on their personal lives as mostly neutral, and just over one-fourth (26%) rated the impact as mixed, one-fifth (20%) rated the impact as mostly negative, and the rest (6%) rated it as mostly positive.

- **The Exonerated Individuals With/Without Negative Consequences.** As in earlier tables, the pattern shifts when we distinguish those who experienced no negative actions and those who experienced a negative consequence. Two-thirds of respondents who reported experiencing no negative actions (67%) reported that being accused of scientific misconduct had no impact on their personal lives. Nearly one-in-five reported the impact as mostly negative (19%), and the rest (14%) reported mixed impacts on their personal lives. Those who experienced a negative action were more divided in their opinions. The number of exonerated individuals who rated the impact as mostly neutral was about equal to those who rated it as mixed (39% and 36%, respectively). The remainder were split between the negative (16%) and positive (10%) categories.

- **The Exonerated Individuals With Severe Versus Less Severe Negative Consequences.** More than three quarters (78%) of those who experienced the more severe negative consequences reported that the impact of the accusations on their personal lives was mostly negative (33%) or mixed (44%). The remaining exonerated individuals who experienced severe negative outcomes were equally split (11% each) between mostly neutral and mostly positive. For those reporting only less severe negative consequences, half (50%) were mostly neutral in their judgements of its impact on their personal lives, and nearly one-third more (32%) reported the impact was mixed. The remaining exonerated individuals were split equally between mostly negative and mostly positive (9% each).

What impact did being accused of scientific misconduct have on respondents' employment? Another way of assessing the impact of being accused and then exonerated of scientific misconduct on respondents' careers is to examine their current patterns of employment and changes that have occurred as a result of being subjected to the allegations. Tables 20 through 24 include information on how the negative actions experienced are related to current employment patterns. One significant item to note is that 100 percent of the exonerated individuals are currently employed. Other breakdowns shown in these tables are as follows:

- **Employment Setting.** In Table 20, close to 80 percent of respondents are currently working in either a research university (36%) or medical school (43%).[16] Eighty-three percent of those who reported negative consequences and 71 percent who reported no negative consequences are currently employed in a research university or medical school. The pattern differs by setting. A higher proportion of those who experienced negative consequences (50%) than of those who did not (33%) work in medical schools, while a somewhat higher proportion of those who did not experience negative consequences (38%) than those who did experience them (33%) work in research universities. Those who experienced severe negative consequences now work mostly in medical schools (56%) or other places (33%), but rarely in research universities (11%). Those who experienced only the less severe consequences work in research universities almost as often (43%) as they do in medical schools (48%), but rarely work in other places (10%).

- **Current Research.** In Table 21, fully 94 percent of exonerated individuals reported that they were currently engaged in research. Slightly more of those who suffered negative consequences (97%) than those who did not (94%) are currently conducting research. All exonerated individuals who suffered severe consequences (100%) are currently doing research, while 95 percent of those who suffered less severe consequences are doing so.

- **Where Employed.** In Table 22, a substantial majority (71%) of exonerated individuals still work in the same institution where they worked at the time of the allegation.[17] The pattern is the same but the magnitude differs by whether or not the individual suffered negative consequences. Of those who did not experience negative consequences, 80 percent work at the same institution, while only 63 percent of those who suffered a negative consequence still work at the same place. Further distinguishing those who experienced severe versus less severe negative consequences shows a similar pattern. Those with more severe consequences are the least likely to be working at the same institution (44%), while those who reported less severe consequences were about as likely as all exonerated individuals

[16] This almost matches to the 35 percent each of respondents who reported that they were in clinical or academic departments at the time of the allegations.

[17] Two individuals reported changing departments within the same institution.

Table 20

Table 21

Table 22

(71%) to be working at the same institution they were at the time they were accused of scientific misconduct.

- **Desirability of Change.** In Table 23, of those who changed institutions or departments, most (75%) thought the change was desirable. The pattern differs for those who did and did not suffer negative consequences. For those who reported no negative consequences, only 67 percent thought the change was a desirable one, while 83 percent of those who suffered negative consequences thought the change beneficial.

- **Role of Allegation in Current Employment.** In Table 24, relatively few respondents (29%) thought that the allegations were a significant factor in their current employment. More than one-third (37%) of those who experienced a negative consequence reported such a relationship, while few of those with no negative outcomes (10%) reported an association. The strongest attributions were by those who suffered the most severe consequences, with 56 percent of these respondents indicating an association, while only 29 percent of those with less severe consequences report such impacts.

Is there a stigma associated with being accused of scientific misconduct? Table 25 reports on respondents' beliefs about whether or not being accused of scientific misconduct continues to stigmatize them.

- **The Exonerated Individuals Overall.** Overall, more than half (54%) of respondents believe that it is somewhat or very unlikely that they will suffer continuing stigmatization as a result of being accused of scientific misconduct. Most of the rest (39%) believe that it is either somewhat or very likely that they will continue to suffer stigma as a result of their earlier involvement in alleged scientific misconduct. The remainder (12%) do not know whether or not they will suffer a continued stigma.

- **The Exonerated Individuals With/Without Negative Consequences.** The pattern of beliefs is distinctly different for those who experienced negative consequences and those who did not. Among those who experienced no adverse outcomes, only a small proportion (14%) think it is somewhat or very likely that they suffer a continuing stigma attached to being accused of scientific misconduct, and more than

Table 23

Table 24

Table 25

three-fourths (76%) think such a continuing stigma is somewhat or very unlikely. For those who experienced a negative action, more than half (52%) believe that a stigma is somewhat or very likely, while most of the others (39%) believe it is somewhat or very unlikely they are still stigmatized. About 10 percent of each group is uncertain if they are still stigmatized or not.

- **The Exonerated Individuals With Severe Versus Less Severe Negative Consequences.** The patterns also differ by whether or not the negative consequences experienced were severe. Two-thirds (67%) of the exonerated individuals who suffered severe consequences believe that continuing stigmatization is likely, and one-third (33%) believe it is unlikely. By contrast, of those who suffered less severe consequences, fewer than half (46%) believe that being accused of scientific misconduct is likely stigmatizing, but almost the same number (41%) believe it is unlikely. While 14 percent of the exonerated individuals who suffered only the less severe consequences reported they were uncertain whether or not being accused of scientific misconduct was stigmatizing, not a single respondent who suffered a severe outcome reported such uncertainty.

e. Safeguarding the Confidentiality and Restoring the Reputations of Exonerated Individuals

Did the respondents' institutions adequately safeguard their confidentiality? A key obligation of institutions receiving PHS funds is to do everything reasonably possible to protect the confidentiality of those accused of scientific misconduct in PHS-supported research. Table 26 explores the extent to which the exonerated respondents believe that institutions succeeded in protecting their confidentiality. This table explores how respondents' differences at the time of the allegations influenced the success of these safeguards on a number of topics:

- **Overall.** Nearly half (47%) of all exonerated respondents believe that their institution did all it could to safeguard their confidentiality. However, more than one-third (36%) believe that their institution did not do all it could to protect their confidentiality, and the rest (19%) were unsure.

- **Degree Held.** Those with research doctorates were a bit more likely (49%) than their clinically-trained counterparts (42%) to believe that the institution effectively safeguarded their confidentiality. Conversely, researchers with clinical doctorates

Table 26

Table 26 (cont'd)

were as likely to believe that the institution failed them as that it did all it could to protect them (42% each). Those with research doctorates were substantially more likely to give the institution the benefit of the doubt (just 30% questioned the institution's behavior in this area) in terms of their effectiveness in safeguarding confidentiality.

- **Work Setting.** Beliefs about the extent to which the institution did everything it could to protect confidentiality varied substantially by work setting. The most significant finding is that those in academic settings were much more prone (40%) than those in other settings (17%) to question the adequacy of their institution in protecting their confidentiality.

- **Academic Department.** Those in clinical or other non-basic science departments were more likely (47% and 43%, respectively) than their basic science colleagues (32%) or non-academicians (11%) to question the institution's protection of their confidentiality. Conversely, significantly more than half of basic scientists (63%) believed that their institution did everything it could to protect them, while less than half of all other groups thought so (non-academics, 44%; clinicians, 37%; and other academics, 29%). There was little uncertainty on this issue among basic scientists (5%) or clinicians (16%), and modest amounts of uncertainty among other academics (29%) and non-academics (44%).

- **Academic Rank.** Within academia, confidence in the institution's response increased with seniority -- 58 percent of full professors, 40 percent of associate professors, and 22 percent of assistant professors, instructors, and lecturers thought their institution had done all it could to protect confidentiality. Only 33 percent of professors, but 40 percent of associate professors and 44 percent of other academics questioned their institution’s efforts in this area. Students and non-academics (46%) tended to think their institution had done all it could and were relatively unlikely (27%) to think it did not. Uncertainty about this issue was least for full professors (8%), next for associate professors (20%), next for non-academics (27%), and most for assistant professors, instructors, and lecturers (33%).

- **Continuity/Security of Position.** Consistent with the last set of findings, those with tenure were more likely to think their institution did all it could to protect confidentiality (57% vs. 35% for those without tenure), less likely to not question their

institution's efforts (32% vs. 39% for nontenured), and less likely to be uncertain about their views on this issue (11% vs. 27% for the nontenured).

- **Source of Funding.** Source of salary funding was also related to judgments of the institution's efforts. Those with support from within and outside the university seemed most satisfied with the role played by their institution in safeguarding their confidentiality (54% compared to 42% for those with only university funds and 29% funded completely with extramural funds). The reverse pattern holds with respect to questioning their institution's efforts with 32 percent of those with both types of funding, 37 percent with intramural funding, and 43 percent with extramural funding judging their institutions unfavorably.

- **Institutional Position.** Not surprisingly, senior administrators, department heads, or division heads accused of scientific misconduct usually felt that their institution did what it could to protect them (64%), but sometimes (27%) felt that it did not or were uncertain about this issue (10%). Lab or section chiefs, on the other hand, rarely felt that their institution did all it could for them (20%), often felt it did not do all it could (60%), and sometimes were also uncertain (20%). Those with no institutional position were in the middle; about half (49%) thought the institution did what it could, nearly one-third (30%) felt that it did not, and the rest (21%) were unsure.

- **Relationship to Complainant.** When the respondent was the complainant's supervisor or superior, he/she was most likely to perceive the institution as doing its job in the area of safeguarding confidentiality (52%). However, another large proportion of such respondents (35%) perceived the institution as not doing an adequate job in this area, and these respondents were least likely to be uncertain about the role of the institution in this area (13%). When the respondent was a peer of the complainant, he/she was most likely to question the institution's efforts (40%), next most likely to accept them (33%), and least likely to be uncertain (27%). Among outside researchers, reviewers, and others, 57 percent thought their institution had protected their confidentiality as much as could be expected, 29 percent thought the opposite, and 14 percent were unsure.

Did the actions taken by institutions to protect confidentiality reduce negative consequences experienced? The previous table looked at the extent to which respondents of different types believed their institution attempted to safeguard their confidentiality. Table 27 examines the

actions taken by institutions and assesses their relationship to the consequences experienced by those exonerated of scientific misconduct.

- **Institutional Efforts in General.** When respondents believed their institution did everything it could to protect them, 56 percent experienced no negative consequences, the remaining (44%) experienced only less severe negative consequences, and none reported severe negative outcomes. Quite a different pattern is apparent for those who felt their institution did not do everything it could to safeguard their confidentiality. In this case, 47 percent reported severe negative outcomes, and the rest (53%) reported less severe negative consequences. Not a single respondent in this group reported avoiding a negative outcome. Interestingly, when exonerated individuals were unable to judge the institution's actions in this area, most (78%) reported experiencing no negative actions, while some (22%) reported less severe negative consequences, and a few (11%) reported severe negative actions.

- **Specific Safeguards.** Conducting the inquiry/investigation and reaching conclusions quickly was reported by respondents to most often result in no negative consequences. When institutions were perceived to be speedy, 57 percent experienced no negative outcomes, 36 percent experienced less severe negative outcomes, and only seven percent experienced severe adverse consequences. All other actions specifically included in the survey -- limiting the number of people involved, asking complainants not to discuss the case, or maintaining respondents' work assignments -- were less effective in avoiding negative consequences for respondents, and resulted in less severe negative consequences more than half the time (52-57%) and severe negative consequences in at least 12 percent of the cases (12-16%).

- **Specific Breaches.** According to the exonerated individuals, the most serious breaches of confidentiality are notifying outsiders early (resulting in severe consequences for 60% of respondents and less severe negative consequences for the rest), involving too many people (resulting in 50% each reporting severe and less severe negative actions), not controlling leaks (47% severe consequences, and 53%

Table 27

less severe negative consequences), and not conducting a timely inquiry/investigation (39% severe negative, 44% less severe, and 17% no negative actions).

Did the actions taken by institutions to restore the reputation of the exonerated individuals reduce negative consequences experienced? In addition to protecting confidentiality, institutions are required to restore the reputations of any individuals damaged by the accusations who are exonerated of research scientific misconduct. Table 28 provides an assessment of the success of institutional efforts in this area. Only 17 percent of respondents reported that their institution consulted with them about appropriate measures to restore their reputations. In addition, only a quarter (25%) reported themselves satisfied while nearly two in five (39%) reported themselves dissatisfied with institutional efforts to restore their reputations. Thirty respondents (58%) reported that nothing was done by their institution to restore their reputations; four at the request of the respondent.

How did handling of their cases affect those individuals exonerated of scientific misconduct? Several aspects of the way in which cases were handled and their outcomes may influence the extent of satisfaction the exonerated respondents experience with the process and outcomes. The following tables include information on such topics:

- **Consequences Experienced and Satisfaction with Handling and Outcomes.** Table 29 provides an indication of how satisfied the exonerated individuals were with the handling of their cases as a function of what consequences they experienced. Overall, opinions about the handling of respondents' cases were split, with 44 percent satisfied, 44 percent dissatisfied, and 11 percent neutral in their assessment of the handling of their case. This pattern changes dramatically depending upon whether or not respondents suffered negative consequences. Among those who did not, 71 percent were satisfied with the handling and outcome of their case and the rest were evenly divided among neutral and dissatisfied categories (14% each). However, among those who experienced negative consequences, most (61%) were dissatisfied, while a substantial subset (29%) was satisfied, with the remainder (10%) neutral about the handling and outcome of their case. The severity of consequences experienced also influences respondents' ratings of their satisfaction with the handling and outcomes of their case. Of those who experienced severe negative consequences, 78 percent were dissatisfied with the handling/outcomes of their case and the rest were evenly split among those who

Table 28

Table 29

were satisfied and those who were neutral (11% each). Among those who experienced less severe consequences, a majority (55%) were dissatisfied but more than one-third (36%) were satisfied with the handling and outcomes of the case, with the remainder (9%) feeling neutral on this measure.

- **Specific Aspects of Overall Satisfaction with Handling/Outcomes.** We asked respondents questions about which aspects of the handling and outcomes of their cases contributed significantly to their opinions of how the case was handled. We also asked them about their overall level of satisfaction with the handling and outcomes of their case. Table 30 presents information, in the total column, on the number of exonerated individuals who thought each factor significant in influencing their overall opinion. Some of the most frequently cited aspects of handling of their cases were the length of the inquiry (cited by 61%), confidentiality of the proceedings (59%), having the opportunity to defend themselves (56%), receiving notification of the allegations (52%), promptness of the institution's response and length of the investigation (43% each), opportunity to review reports (41%), and expertise on the panel (33%). Three of the most frequently cited outcomes of their cases were the outcome of the inquiry (56%), the outcome of the investigation (44%), and efforts to restore their reputation (33%).

  When looking at respondents' perceptions of significant aspects of how their cases were handled, except those who rated promptness of institutional response as significant, those who rated each other item as significant were more often dissatisfied than satisfied with the handling and outcome of their cases. For example, for those who said length of inquiry was important, 58 percent said they were dissatisfied, while 30 percent were satisfied. Those who said that the opportunity to defend themselves influenced their opinion showed this same trend but were more evenly split in their overall ratings of satisfaction with the handling and outcome of their case (47% dissatisfied, 43% satisfied). When they cited notification of allegations as important, slightly more respondents said they were dissatisfied (46%) than satisfied (39%) with the handling and outcome. When they cited length of the investigation, 61 percent were dissatisfied compared with only 30 percent who were satisfied. The exception, as noted, is that of those who

Table 30

cited prompt institutional response as significant. Of those, 52 percent were satisfied with the outcome and handling of their case and only 26 percent were dissatisfied. Unfortunately, the way we asked these items provides no clear cut policy guidance. We do not know, for example, if those who thought length of the investigation was an important factor because the length of time was too long, too short, or just right. This ambiguity holds for each dimension. What is clear from these numbers is that those who thought an item was important were usually either satisfied or dissatisfied rather than having no opinion. No more than 22 percent on any item were neutral (and up to half of those whom we coded as neutral simply did not answer the satisfaction question).

The pattern is similar but the directionality is more mixed for the outcome items. Those who thought the outcome of the inquiry was an important determinant of their opinion were more often satisfied (57%) than dissatisfied (37%). The exonerated individuals who thought the outcome of the investigation was important had little difference in overall satisfaction with the handling/outcomes of their cases (46% satisfied, 42% dissatisfied). When they rated media attention or efforts to restore their reputations as important, at least three in four were dissatisfied with the handling and outcomes of their cases (for media attention, 75% dissatisfied, 25% satisfied; for efforts to restore reputation, 78% dissatisfied, none satisfied). Again, interpreting these results is difficult. We do not know if those exonerated individuals were influenced because the institutional efforts made things worse or because the efforts were inadequate.

- **Financial Factors and Overall Satisfaction with Handling/Outcomes.** Table 31 examines the relationship between costs incurred and respondents' overall satisfaction with the handling and outcomes of their cases. Twenty-four exonerated individuals (44%) reported incurring some costs related to the accusations of scientific misconduct. Of these, two-thirds (67%) were dissatisfied with the handling and outcomes of their cases and only 29 percent were satisfied. For those (56%) who incurred no costs, the majority (57%) were satisfied and only 27 percent were dissatisfied. Whether expenditures were for legal fees or for other items, most respondents who reported such costs (72% legal fees, 73% other costs) were dissatisfied with the handling/outcomes of their cases, while the

Table 31

majority of those who reported no such expenditures (53% legal fees, 51% other costs) reported themselves to be satisfied. An inverse relationship exists between the exonerated individuals' total costs incurred and their satisfaction with the handling and outcomes of their cases. Two-thirds of those who spent less than $5,000 on their case (67%) reported themselves satisfied, while one-third (33%) were dissatisfied. For those who spent at least $5,000 but less than $50,000 on their case, the situation is almost completely reversed: 70 percent were dissatisfied with the handling and outcomes, 20 percent were satisfied, and 10 percent were neither satisfied nor dissatisfied. Finally, for those who spent $50,000 or more on their case, 100 percent reported dissatisfaction with the handling and outcomes of their cases.

- **Representation by an Attorney and Overall Satisfaction with Handling/ Outcomes.** Table 32 examines the relationship between whether and when the exonerated individuals were represented by an attorney, and their overall satisfaction with the handling and outcomes of their cases. Those who employed an attorney were much less satisfied with the handling and outcomes of their cases than were those who did not. Three-in-five (59%) exonerated respondents who did not use an attorney were satisfied with the handling and outcomes, nearly one-in-four (24%) were dissatisfied, and the rest (17%) were neither satisfied nor dissatisfied. The pattern was quite different for those who used an attorney, with two-thirds (67%) reporting themselves dissatisfied, slightly more than one-fourth (29%) reporting themselves satisfied, and the rest (5%) reporting themselves neither satisfied nor dissatisfied. It is not clear from these data whether those who were dissatisfied more often hired attorneys or those who hired attorneys more often were dissatisfied. Table 32 also includes an analysis of the temporal pattern of using an attorney. The least satisfied with the handling and outcomes of their cases are those exonerated respondents who employed an attorney only during the active phase of their case (83% dissatisfied, 17% satisfied). Of those who employed an attorney both during this phase and after a finding of no scientific misconduct, a sizeable majority (62%) were dissatisfied with the handling and outcomes of their cases, with 31 percent satisfied, and eight percent neither satisfied nor dissatisfied. Again, it is not clear whether those who were dissatisfied employed attorneys at the outset, or if those who employed attorneys

table 32

at the outset were subsequently most dissatisfied with the handling and outcomes of their cases.

- **Satisfaction with Handling of Case and Overall Impact on Career.** Table 33 explores the respondents' satisfaction with the way key aspects of their cases were handled (i.e., safeguarding their confidentiality and restoring their reputations) related to their perceptions of the overall impact of the accusations on their careers. Most of those who indicated that the institution did all it could to protect their confidentiality (68%) thought the incident had no impact on their careers, but 28 percent thought the impact was negative, while four percent thought it was beneficial. The pattern was quite different for those who thought the institution had not done all it could to protect their confidentiality. Over half of these exonerated individuals (58%) thought the incident had a negative impact on their careers, 37 percent thought it had not impacted their careers, and a small number (5%) thought it was positive for their careers. For those who could not say if the institution had done all it could in this area, 70 percent thought it had no effect, on their career, 30 percent said it had a negative impact, and none believed the incident had positively impacted their careers. On satisfaction with the institutions' efforts to restore their reputations, the pattern was similar. When they were satisfied with the institutions' efforts, respondents most often (77%) thought it had no impact on their careers, though some (15%) thought the career impact had been negative, and a small group (8%) thought the impact was positive.

- **Satisfaction with Handling of Case and Perceptions of Ongoing Stigma.** Table 34 examines the relationship between respondents' perceptions of how key aspects of their cases were handled (safeguarding of their confidentiality and/or restoration of their reputations) and whether or not they still regard themselves as stigmatized as a result of being accused of scientific misconduct.

  Not surprisingly, the majority of those who thought the institution did everything possible to safeguard their confidentiality believed that they did not suffer from ongoing stigmatization (60%). The majority of those who thought the institution did not do everything possible to protect them believed they did suffer from stigmatization (63%). For those who could not say whether or not the institution

Table 33

Table 34

had adequately sought to protect them, the vast majority (80%) thought it unlikely that they suffered continuing stigmatization.

Just under one-fourth (23%) of those who were satisfied with the institutions' efforts to restore their reputations thought it likely that stigmatization would continue, slightly less than half (46%) thought it unlikely, and close to a third (31%) could not say whether or not they were still stigmatized. For those who were dissatisfied with institutional efforts in this area, half (50%) thought they were likely to still suffer stigmatization, but almost as many (45%) thought it unlikely, and the rest (5%) reported an uncertainty. When respondents were neither satisfied nor dissatisfied with institutional efforts to restore their reputations, a substantial majority (68%) thought it unlikely they were still stigmatized, but a little less than one-third of the rest (32%) thought it was likely they were still stigmatized. When we combine these and other aspects of case handling and outcomes combined, two-thirds or more who reported satisfaction (71%) or uncertainty (67%) with the handling and outcomes believed continuing stigmatization was unlikely, while 17 percent of each group believed it was likely. The situation was quite different for those reporting themselves dissatisfied with the overall handling and outcomes of their cases. A sizeable majority of them (62%) believed they were still stigmatized, while 29 percent believed that such continuing stigmatization was unlikely.

Table 34 also looks at the extent to which those who reported positive, neutral, or negative career impacts still consider themselves stigmatized. Of the two respondents who reported a positive impact on their career, one (50%) thought it unlikely and one (50%) was uncertain if there was any ongoing stigma associated with the earlier allegations. Of those who reported the impact on their career as negative, more than three-fourths (76%) thought it likely that they continued to suffer a stigma, only 14 percent thought it unlikely, and the rest (10%) were uncertain. Of those who thought the incident had no impact on their career or were unsure of its impact, more than three-in-four (77%) believed it unlikely they were still stigmatized, 13 percent thought it was likely they were, and the rest (10%) were unsure.

5. Conclusions and Recommendations

The evidence presented in this report provides a clear picture of what the impacts of being accused of scientific misconduct have been on exonerated individuals. The data also provide some insights into what types of exonerated individuals are more or less likely to suffer adverse results, and the circumstances under which exonerated individuals suffer or escape negative consequences. In addition, the data provide an opportunity to assess the extent and effectiveness of institutional actions to protect the confidentiality of respondents and to restore their reputations. In this section of the report, we synthesize our findings and draw a series of conclusions about the impacts of being accused of scientific misconduct on exonerated individuals. Along the way, we offer some recommendations for ORI consideration in ameliorating the problems experienced by many who are subjected to allegations and subsequently exonerated of scientific misconduct.

Keeping in mind that the cases in our study may represent only the tip of the iceberg is important. A person made an allegation in these cases and those allegations came to the attention of ORI (or its predecessor agencies). The data, therefore, provide no insights beyond these cases. We cannot assume the same results in cases where allegations were made but never pursued or noted in an official record. Nor can we provide insights in instances of suspected scientific misconduct that did not result in any allegations (for fear of retaliation or for other reasons). Moreover, they do not reflect cases in which the allegations were supported. Nevertheless, the results contained in this report represent the first effort to explore the experiences of those who were alleged to have engaged in but were exonerated of misconduct in science. These findings should prove useful to ORI in its continuing efforts to regulate and monitor the treatment of those who are accused of scientific misconduct as well as of those who are exonerated of such charges.

Extent to which being accused of scientific misconduct resulted in any negative outcomes. Our first set of conclusions concerns the extent to which respondents in closed cases experienced adverse consequences of being accused of scientific misconduct. Among the most significant findings in this area are the following:

- Fully three-in-five exonerated individuals reported experiencing at least one negative outcome as a direct result of being accused of scientific misconduct.

Conversely, two-in-five did not experience any adverse consequences of being accused of scientific misconduct.

- **The exonerated individuals <u>most</u> likely to have experienced <u>any</u> adverse outcome** of being accused of scientific misconduct included:

  * lower ranking institutional officials (lab/section chiefs).

- **The exonerated individuals <u>least</u> likely to have experienced <u>any</u> adverse outcome** of being accused of scientific misconduct included:

  * academics in other than basic science or clinical departments; and
  * students and others with no academic rank.

- **Being accused of scientific misconduct was <u>most</u> likely to result in <u>one or more</u> adverse outcomes** in situations in which:

  * the case received some publicity;
  * respondents received support from many different types of people (e.g., mid-level administrators, colleagues, family and friends, federal officials, or their attorneys);
  * respondents employed attorneys, especially when representation continued even after there was no finding of scientific misconduct;
  * there was both an inquiry and an investigation (not one or the other); and
  * there was a finding of other academic/professional scientific misconduct.

- **Being accused of scientific misconduct was <u>least</u> likely to result in <u>any</u> adverse outcomes** in situations in which:

  * respondents received "support" from no one; and
  * respondents were not represented by an attorney.

In general, these findings suggest that ***exonerated individuals are most at risk of adverse outcomes in high profile cases (publicized; support provided by many; attorney brought in; both an inquiry and investigation; and other scientific misconduct found), especially when the***

respondent is a lower ranking institutional official. Conversely, exonerated individuals who are students and non-academics, are least at risk of adverse outcomes. Institutional officials are responsible for safeguarding the confidentiality of respondents. These findings make it clear why protecting respondents' confidentiality is important -- and suggest that academic institutions, in contrast to other organizations, may not be doing a particularly good job of meeting this responsibility.

Types of negative outcomes experienced. Not surprisingly, the most common negative consequences of being accused of scientific misconduct are the least severe. When we consider each negative consequence exonerated individuals could report independently, allowing each respondent to indicate as many consequences as they experienced, the most common include the following:[18]

- more than one-in-three respondents reported that additional allegations were made against them beyond those of scientific misconduct, and a similar number reported that they had been threatened with a lawsuit;

- just over one-in-five respondents reported that they were ostracized by colleagues;

- more than one-in-six respondents reported reductions in their level of research support, and the same number reported delays in processing of their grant applications;

- just over one-in-ten respondents reported delays in obtaining clearance of their manuscripts; but

- fewer than one-in-ten respondents reported each of the more severe negative outcomes -- being fired, not being renewed, being denied a salary increase, being denied promotion, and being denied tenure; and similar small proportions reported a number of the less severe consequences (e.g., losing travel funds, staff support, and desirable work assignments, or being pressured to admit the allegations).

[18] These findings are drawn from Table 4, in which the unit reported is the outcome, not the respondent.

While this pattern holds for each item taken individually, our analysis indicated that, when respondents are classified according to the most severe of the consequences they suffered (and counted only once)[19]:

- about one-in-six reported experiencing at least one severe negative consequence (including losing their position or otherwise being denied advancement), *as a result of being accused but exonerated of scientific misconduct;*

- just over two-in-five others reported experiencing a less severe type of negative outcome (such as losing research support or opportunities or being hassled, pressured, or delayed) *as a result of being accused of scientific misconduct despite ultimate exoneration;* and

- the remaining two-in-five reported experiencing no negative consequences *as a result of their exoneration of allegations of scientific misconduct.*

Obviously, there is much room for improvement in protecting the exonerated individuals. Fortunately, there are some hints in our data about how to focus regulatory, monitoring, and enforcement efforts to improve this situation. For example, the evidence suggests that:

- the seed of nearly every negative action taken against exonerated individuals is sown during the inquiry/investigation. Very few exonerated respondents suffer adverse consequences exclusively in the period after their case is closed;

- the most severe consequences -- loss of position and denial of advancement -- simply do not occur without substantial involvement and direction by institutional officials, although respondents often also blame complainants for such outcomes; and

- less severe negative consequences -- loss of research resources and hassles, pressures, and delays -- sometimes involve institutional officials, but most often are attributed to complainants' actions.

[19] These findings are drawn from Table 7, in which the unit reported is the respondent.

These findings suggest that ***for exonerated individuals to suffer the most severe negative outcomes, institutional officials must play a significant role in dealing with their cases.*** Complainants were also reported to cause problems for exonerated individuals, but generally ***the consequences attributed to complainants tended to be across-the-board, and such attributions were more common the less severe the consequence.***

Extent to which being accused of scientific misconduct resulted in one or more severe negative outcome. We have looked at who suffers negative consequences and in what situations. We have also examined the specific consequences experienced and who respondents believed was responsible for these outcomes. Our next set of conclusions pushes these analyses further to determine who is most likely to suffer severe adverse outcomes and in what circumstances. In some ways, the findings reinforce what we observed when looking at who experienced any negative outcomes and under what circumstances. However, in some ways the analysis of severe consequences stands in sharp contrast to what we found earlier.

Among the most significant findings in this area are the following:

- **The exonerated individuals <u>most</u> likely to have experienced a <u>severe</u> adverse outcome** of their being accused of scientific misconduct included:

  * lower ranking institutional officials (lab/section chief);
  * students and others with no academic rank; and
  * those whose full salary was paid with extramural funds.

- **The exonerated individuals <u>least</u> likely to have experienced a <u>severe</u> adverse outcome** of their being accused of scientific misconduct included:

  * full professors;
  * those with tenure;
  * those without an institutional position of authority; and
  * those whose misconduct was alleged by someone at another institution.

- **Being accused of misconduct was <u>most</u> likely to result in a <u>severe</u> adverse outcome** in situations in which:

* it was publicized by someone other than the complainant alone;
* respondents received support from mid-level institutional administrators;
* respondents were represented by an attorney; and
* there was a finding of other academic/professional misconduct.

- **Being accused of misconduct was <u>least</u> likely to result in a <u>severe</u> adverse outcome** in situations in which:

  * the complainant alone sought to publicize the case;
  * respondents received support from no one;
  * respondents did not employ an attorney; and
  * the accusations were dismissed after an inquiry with no further investigation.

As earlier, we again found that ***exonerated individuals most at risk of severe adverse consequences were those in high profile cases*** (e.g., representation by an attorney and a finding of other academic/professional misconduct). Although we found students and others without academic rank relatively unlikely to experience any negative consequence, this analysis shows that ***students, and others with no academic rank are much more likely to suffer a severe negative consequence*** than other groups. This suggests that institutions need to be particularly vigilant in protecting these groups from the most severe adverse outcomes which are based solely on the filing of unproven charges. Moreover, although those with various academic ranks and tenure status did not differ in the extent to which they experienced negative outcomes, this analysis indicates that ***those with high rank and tenure rarely suffer the most severe consequences of being accused of scientific misconduct.*** These findings, plus the fact that those with any institutional position of authority and those accused by outsiders are less likely to experience severe negative consequences, suggest that institutions tend to support their own, especially their most senior members.

Respondents' assessments of their experience of being accused of scientific misconduct. Respondents' views of the impact of their experience of being accused of scientific misconduct were significantly affected by whether or not they experienced any adverse outcomes, and by what type of negative actions resulted from their being accused of scientific misconduct. For example:

- **When exonerated individuals did not experience a negative consequence** as a result of the accusation, a substantial majority (two-thirds to four-fifths) reported that their being accused of scientific misconduct had "no effects" at all on their careers, professional activities, or personal lives. All are currently employed, and four-of-five are at the same institution and nearly all are conducting research in a combination of research university, clinical, and other settings. Just 10 percent believe their accusation is a factor of any sort in their current employment. Only one-in-seven believed that it was likely that being accused of scientific misconduct was still stigmatizing them.

- **When exonerated individuals experienced any negative consequence**, this pattern changed dramatically. A much smaller proportion (two-fifths to three-fifths) of these exonerated individuals reported that their being accused of scientific misconduct had "no effects" on their careers, professional activities, or personal lives. One-in-ten to two-in-ten reported that their being accused and exonerated of scientific misconduct had a negative impact on all these dimensions. All of these respondents also reported that they were currently employed, and a sizeable but smaller proportion (less than two-thirds) worked in the same institution, but an equally high proportion as for those who experienced no negative outcomes reported that they were still doing research. They also worked in all three types of settings, but more often in clinical settings and less often in other settings than their counterparts who experienced no negative outcomes. More than one-third thought that their earlier experience was a factor in their current employment, though the vast majority who changed positions thought the change had been beneficial. About half of these exonerated individuals thought that being accused of scientific misconduct was stigmatizing, but another two-fifths thought it was not.

- **When exonerated individuals experienced a severe negative consequence**, the pattern is similar to but more extreme than the one for those experiencing any negative consequence. One-third or more of these respondents thought the consequences on their careers, professional activities, and personal lives was “mostly negative”, and one-third or fewer thought it was “mostly neutral.” As noted, all respondents were employed, but few respondents who had suffered severe consequences (only about 11%) were employed in a research university, and less than half were at the same institution. A large majority (four-fifths)

thought the change was beneficial, and all were still conducting research. However, more than half in this group said that the allegations were a factor in their current employment. Two-thirds of these exonerated individuals believed that it was likely that they are still stigmatized by the allegations, though the rest believe they are no longer stigmatized.

These findings document the far-reaching consequences of the problems some respondents encounter even after they are exonerated. It suggests that institutions need to do more to prevent these adverse outcomes, especially the most severe outcomes. To focus in more on what institutions can do to protect the exonerated individuals, we look next at analyses of institutional efforts to protect the confidentiality and restore the reputations of those exonerated of scientific misconduct.

Respondents' assessments of institutional actions to protect their confidentiality and to restore the reputations of those exonerated of scientific misconduct in the event their confidentiality was breached. It is the responsibility of institutions receiving PHS funds to protect confidentiality and restore damaged reputations of exonerated individuals. In this study, we looked at these issues from a number of perspectives.

- **Respondent characteristics and perceptions of institutional actions to protect confidentiality.** Institutional efforts to protect respondents' confidentiality were judged quite differently by different respondents. Respondents who were academics in basic science departments, full professors, senior institutional officials, or who had tenure, and those against whom allegations were made by someone outside the institution were most likely to feel that the institution had done all it could to protect their confidentiality. Conversely, those who were in clinical departments, were lower level managers (lab/section chiefs), or were students or subordinates were most likely to feel that the institution had not done all it could to protect them.

- **Perceived institutional protections of confidentiality and consequences experienced.** When respondents reported that their institutions did not do all they could to protect their confidentiality, they always reported at least one negative consequence as a result, and nearly half the time it was a severe negative outcome.

In contrast, when respondents felt the institution had done all it could, fewer than half reported any negative outcomes, and all of these reported only outcomes that were of the less severe variety. Actions most likely to result in negative consequences for respondents included: involving excessive numbers of people in the case; notifying outside parties early in the process; not conducting the inquiry or investigation in a timely manner; not controlling leaks of information; and asking complainants not to discuss the case. Nearly, all of these resulted in relatively high proportions of respondents reporting severe negative consequences. However, asking complainants not to discuss the case resulted frequently in less severe consequences, but infrequently in severe adverse outcomes. On the other hand, conducting the inquiry/investigation quickly and maintaining existing work assignments during that time more often resulted in no negative consequences for exonerated individuals. When negative consequences were experienced in these circumstances, they were almost always of the less severe kind. Those who thought the institution did all it could to protect their confidentiality were more likely to report that the allegations had no impact than a negative impact on their careers. Those who thought the institution did not do all it could to protect confidentiality were much more likely to report negative career impacts than neutral impacts. Similarly, more than half of those who thought the institution did all it could in this area believed it unlikely that they carried an ongoing stigma, and only one-quarter believed it likely they did. The opposite pattern held for those who felt that the institution did not do all it could to protect their confidentiality.

- **Outcomes experienced and satisfaction with case handling and outcomes.** More than two-thirds of exonerated individuals who experienced no negative consequences as a result of the allegations against them were satisfied with the handling and outcomes of their cases. However, six-in-ten of those who experienced a negative action and more than three-in-four of those who experienced one of the more severe negative actions were dissatisfied with the handling and outcomes of their cases.

- **Satisfaction with specific aspects of case handling and outcomes.** A majority of respondents who indicated that prompt institutional response or outcome of the inquiry was important in determining their level of satisfaction with the handling and outcomes of their cases were satisfied with the handling and outcomes of their

cases. However, two-thirds or more of respondents who reported that their satisfaction was influenced by protection against conflicts of interest, legal representation, opportunity to review reports, media attention, or efforts to restore their reputation were dissatisfied with the handling and outcomes of their cases.

- **Costs incurred and satisfaction with case handling and outcomes.** At least two-thirds of exonerated individuals who incurred costs of any type (including legal costs) reported themselves to be dissatisfied with the handling and outcomes of their cases. Conversely, half or more of those who incurred no costs of any type reported themselves satisfied with the handling and outcomes of the case, and only one-fourth to three-tenths were dissatisfied. For those who incurred costs, the more costs they incurred, the less satisfied they were with the handling and outcomes of their cases.

- **Use of an attorney and satisfaction with case handling and outcomes.** Two-thirds of respondents who hired attorneys were dissatisfied with the handling and outcomes of their cases, and only a little over one-fourth were satisfied. For those who did not hire an attorney, the pattern is reversed: three-in-five were satisfied and one-in-four dissatisfied with the handling and outcomes of their cases. More than four-in-five of those who employed attorneys only during the active phase of the inquiry/investigation were dissatisfied with the handling and outcomes of their cases, while three-in-five of those who used attorneys both during and after were dissatisfied.

This set of findings again supports the conclusion that ***institutions do a better job of protecting the confidentiality of their most senior staff, who, in turn, suffer fewer negative consequences overall and almost never suffer one of the more severe consequences.*** We believe that ORI efforts should focus on how institutions deal with the populations more vulnerable to breaches of confidentiality. If they can effectively protect the confidentiality of their most favored members, with encouragement they should be able to improve the situation for less favored members accused of scientific misconduct. The findings also support the conclusion that ***effective institutional actions likely to protect the reputations of respondents include: (1) acting promptly to conduct and conclude a thorough inquiry and, if necessary, a thorough investigation of the allegations: (2) limiting the number of people who have information about the allegations or who are involved in the inquiry/investigation process to those who***

have a need to know; (3) deferring notification of outsiders to the extent feasible and consistent with existing laws, regulations, and requirements of a thorough inquiry/investigation; and (4) limiting access to information about the case and monitoring information flow to minimize leaks. We believe that ORI should focus on regulating and/or monitoring institutional performance in these areas.

These findings also suggest that there is substantial room for improvement in restoring the reputation of those exonerated of scientific misconduct. It appears ***important for institutions to consult with exonerated individuals to develop a plan for restoring their reputations and to take action,*** unless specifically requested not to by respondents, since inaction appears insufficient to assure that respondents are not hurt by unsupported allegations. Among the most important actions an institution should consider is officially notifying all pertinent officials within the institution that the findings of scientific misconduct were not confirmed in respondents' cases.

There is also a curious outcome in this set of findings for the accused. ***Turning immediately to an attorney or spending lots of money defending oneself may be self-defeating***. Based on the self-report data we received, those who adopted these tactics were, by and large, unhappy with how their cases progressed and with the outcomes they experienced. It is unclear whether these negative results are due to the more serious nature of the allegation that resulted in seeking counsel, to the adversarial atmosphere that resulted, or to other factors. Any cause and effect explanation based on the existing data would be mere speculation.