

## First 5-yearly Revision of the ASA Ethical Guidelines for Statistical Practice

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### Abstract

The American Statistical Association first established the Committee on Professional Ethics (COPE) in 1994, with the mission of “maintaining and disseminating the ASA Ethical Guidelines for Statistical Practice”. The first set of Guidelines was published in 1995, but the first revision was not initiated until 2014. This revision was completed in 2016, and in their approval of the revisions, the ASA Board of Directors instituted a new requirement that the Guidelines should be reviewed and, if necessary, revised, every five years. A COPE Working Group completed the first (ever) revision 2014-2016, and a second Working Group was established to respond to a Board request for a specific review/revision in 2018 to ensure the Guidelines were sufficiently clearly prohibitive about sexual harassment, bullying, and other forms of intimidation. In 2018, in preparation for the 2021 Guidelines Revision effort, an online comment collection system was created by the COPE and deployed to encourage ASA Members to contribute their ideas for revising specific Guideline Principles and elements. In 2020, a protocol was crafted based on the experiences of the previous two revision efforts, to ensure that the 2021 and future Guideline revision efforts would be based on this specific input, would equitably distribute the burden of revision across the Working Group, and would allow the revision project to be completed by the COPE Working Group within the calendar year. The 2021 revision effort was the first time the revision protocol was shared explicitly with the Working Group, and four COPE members volunteered for the effort. The Working Group was co-chaired by the COPE Chair (JC) and the Chair of the previous revisions Working Groups, a Friend of the COPE (RET, no longer a member). Meeting weekly (in addition to monthly COPE meetings) starting the first week of January 2021, the Working Group members synthesized the input from the online collection system and revised every aspect of the 2018 Guidelines. This paper outlines the core changes that were made and highlights both the rationales for key changes, and also what changed. The revised Guidelines will be reviewed by the ASA Board mid-November 2021, for approval and dissemination for the 2022-2026 cycle.

**Key Words:** Ethical practice, statistics and data science, ASA Ethical Guidelines, teaching professional ethics, ethical statistics, ethical data science

### 1. Introduction

The American Statistical Association first established the Committee on Professional Ethics (COPE) in 1994, with the mission of “maintaining and disseminating the ASA Ethical Guidelines for Statistical Practice”. The first set of Guidelines was published in 1995, but the first revision was not initiated until 2014. This revision was completed in 2016, and in their approval of the revisions, the ASA Board of Directors instituted a new requirement that the Guidelines should be reviewed and, if necessary, revised, every five years. The ASA describes the specific charge of this Committee (<https://ww2.amstat.org/committees/commdetails.cfm?txtComm=CCNPRO03>):

- To provide a point of contact with other societies and associations in the area of professional ethics.
- To develop and implement a program of education sensitizing members of ASA to the ethical issues in statistical practice and in other fields in which statistics is used.
- To maintain and promulgate, subject to Board review and approval, the set of ASA Ethical Guidelines that describes the general view of ethics in statistical practice, and develop and maintain supplements to the Ethical Guidelines for areas of application that give an understanding of ethical statistical practice as it applies to that area (e.g., law or medicine).

Thus, the five-year cycle for review and revision is consistent with the COPE charge. Periodic updates to these Ethical Guidelines are not due to changes in the underlying ethical principles. Rather they reflect evolutions over time in sources of data, new methodologies, and the types of work that statistical practitioners conduct. For example, the widespread use and availability of social media data and the increasing relevance of statistical practice in and for data science were gaps in the 2018 version that were targeted for revisions. Moreover, ensuring that the Guidelines remain current, accessible, and relevant for all statistics practitioners irrespective of their job title or training is a core focus of two of the three aspects of the COPE’s charge. For the 2021 revision, the Working Group (WG) charged with the revision effort had three goals: to update, to clarify, and to make as inclusive as possible the Ethical Guidelines for Statistical Practice. Part of the inclusivity ensured that practitioners outside of academia recognize the utility and importance of the Guidelines; this also had to do with ensuring that individuals from other fields would be able to recognize and follow ethical statistical practice standards as they apply statistical methods and techniques for other disciplinary work.

For example, the National Academies of Sciences, Engineering, and Medicine Committee on Envisioning the Data Science Discipline focused attention on the centrality of ethical professional practice in data science (2018, p.3):

*Recommendation 2.4: Ethics is a topic that, given the nature of data science, students should learn and practice throughout their education. Academic institutions should ensure that ethics is woven into the data science curriculum from the beginning and throughout.*

Given the core role of statistics in the definitions, and evolution, of data science, the COPE and Working Group agreed that the Guidelines should be recognizable, and applicable, to statisticians *and data scientists*. For the 2021 revision, the WG sought to respond to anecdotal reports that the 2016/2018 Guidelines were too focused on academic practice. This revision effort was the first of the three revisions to date to explicitly broaden the

Guidelines beyond experimental or survey and scientific focus, or what might be work considered “designed data collection”. The WG sought to emphasize work involving curated data (data found, scraped, or otherwise accessed without a prospective design). This is also the first revision to specifically identify responsible teaching and mentoring/leadership as part of ethical statistical practice. While the 2016 revisions were the first to specify that *any user of statistics* is a practitioner the Guidelines are intended for, the 2021 revisions specify that the Ethical Guidelines are also relevant for organizations using statistical practice.

## 2. Revisions to the Guidelines proposed for 2021

The COPE was specifically charged with revising the 2016 version of the Guidelines in 2018 with a sole focus on ensuring that sexual harassment and other forms of intimidation were explicitly identified as unethical and intolerable behaviors. There were two main changes between 2016 and 2018, adding specific language to the Preamble, and to Principle A (Professional Integrity & Accountability). These targeted changes were achieved using a similar method to that presented in the Appendix: weekly meetings and final approval by the full COPE prior to submission to the ASA Board for consideration and approval. Once the 2018 revisions were complete, a translation of the 2016 version into Chinese was updated and was published with the endorsement of the International Chinese Statistical Association on the ASA Website.

For the 2018 revisions, the then-COPE Chair (RET) invited COPE members – already meeting monthly – to join a weekly Working Group meeting to address the Board’s request to ensure that the Guidelines were sufficiently specific in terms of language against sexual harassment and other forms of intimidation. The Chair took the request and synthesized it with the 2016 Guidelines by identifying every place where such behaviors *were*, and *where they could be*, implicitly or explicitly addressed. This clearly over-represented such behaviors, so that discussions in the WG meetings could focus on ensuring that these behaviors were addressed explicitly and not redundantly. The diverse representations throughout the 2016 Guidelines document provided several different opportunities for considering how best to address the Board’s request. In the end, the WG added bullying and other forms of intimidation, as well as sexual harassment and unwanted contact, as unacceptable behaviors to the Guidelines.

Based on this experience, the then-Chair formulated the method for the 2021 full-Guidelines revision effort (included in the Appendix). Working Group members for the Revisions year would commit to not less than 5 months of weekly 2-hour meetings. Four COPE members (co-authors MJL and JKG, and current COPE Chair JC, plus current COPE Vice Chair Matthew Rotelli) volunteered for the Working Group. The COPE had instantiated an online comment and suggestion collection method, so each WG member volunteered to take responsibility for synthesizing the input that was received for two of the 2018 Guideline Principles. The WG Co-Chairs (RET, JC) agreed to perform this synthesis for the remaining two Principles (A, H) and the Preamble. When it was a WG member’s turn to “run” a Principle, they performed the synthesis of all comments received on that Principle, together with suggestions for addressing the comments or identifying challenges such as needing to resolve two conflicting suggestions, or when a suggestion had already been raised/addressed earlier in the process. The WG member kept notes about discussion and once the first round of revisions for that Principle were done, submitted the original and ‘final’ versions based on the WG’s discussions to the Co-Chairs. WG members also presented unresolved issues and summarized the WG’s work for the COPE during

monthly meetings. After 8.5 months, these WG member notes were synthesized together into a single document maintained by the first author (RET) as the official version of recommended revisions, and were shared with the full COPE. These were also the subject of a presentation at JSM 2021. For the second round, comments were solicited from the COPE members (including WG members) and were also shared with the ASA 2021 Anti-Racism Task Force for input and to ensure the recommended Guidelines revisions were consistent with the Task Force’s activities and recommendations for the ASA.

The table below summarizes the superficial differences between the 2018 and proposed 2021 versions of the ASA Ethical Guidelines for Statistical Practice. The revisions effort in 2021 involved 40 weeks of 2-hour long meetings of the core WG COPE members (COPE Chair; COPE Vice-Chair; and two other COPE members, plus one Friend of the COPE, a former COPE Chair and Vice Chair). The protocol for the WG is attached in the Appendix. The revisions thus took over 80 hours of intense and reflective participation by each of the five committed WG members, plus additional time each week between meetings to synthesize the work of that week’s meeting. Most meetings were also joined by at least one other (non-WG) COPE member, and for six of the nine months of the revisions effort, the monthly COPE meeting (1-hour long) was also dedicated to reviewing the WG’s progress and soliciting input. The WG presented its results, and asked other COPE members to weigh in on several issues throughout the nine months of focused revisions work. All COPE members were asked to endorse the recommended changes, summarized here, prior to presentation of these recommendations to the ASA Board for the November 2021 meeting.

**Table 1:** Summary of original (2016/2018) and recommended revisions to Guideline Principle titles and element counts.

Principle	2016/2018 (52 elements)	2021 (60 elements + Appendix (10 elements))
A	“Professional Integrity & Accountability” 7 elements	“Professional Integrity and Accountability” <b><u>11 elements</u></b>
B	“Integrity of data and methods” <b><u>11 elements</u></b>	“Integrity of Data and Methods” <b>7 elements</b>
C	“Responsibilities to Science/Public/Funder/Client” 5 elements	to “Responsibilities to Stakeholders” <b>7 elements</b>
D	“Responsibilities to Research Subjects” 7 elements	“Responsibilities to Research Subjects, Data Subjects, and those directly affected by statistical practices” <b><u>11 elements</u></b>
E	“Responsibilities to Research Team Colleagues” 4 elements	“Responsibilities to Multidisciplinary Team Members” 4 elements
F	“Responsibilities to Other Statisticians or Statistics Practitioners” 4 elements	“Responsibilities to Other Statisticians or Statistics Practitioners” <b>5 elements</b>
G	“Responsibilities Regarding Allegations of Misconduct”	<b>NOW PRINCIPLE H</b> , “Responsibilities Regarding Potential Misconduct”

H	6 elements “Responsibilities of Employers/Clients Employing Statistical Practitioners” 8 elements	of	<p><b>10 elements</b> Broken up into “Responsibilities of Leaders, Supervisors and Mentors in Statistical Practice” (<b>NOW PRINCIPLE G, 5 elements</b>) and a new Appendix for employers and organizations, “Responsibilities of organizations/institutions”, <b>10 elements: 6 elements for organizations PLUS 4 elements for those in leadership, supervisory, or managerial positions who oversee statistical practitioners</b></p>
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Bold type indicates a change in the number of elements for that Principle. Underlined type indicates the largest number of elements (formerly Principle B; both A and D for the 2021 recommended revisions).

### 1. Title and Preamble

One of the earliest comments contributed to the online system was a query or suggestion that the title of the Ethical Guidelines might need to extend from “only” statistical practice to include both the practice of statistics and the practice of data science. Thus, the WG spent at least one meeting (two hours) discussing the pros and cons of making this change (from “Ethical Guidelines for Statistical Practice” to “Ethical Guidelines for the Practice of Statistics and Data Science”).

The WG concluded that we would serve the community (and their colleagues) better if we defined “statistical practice”, and specified that the particular aspects of data science that were subsumed under this definition were the most rational target of the guidance that the Guidelines is intended to offer. We did not change the title but did recommend changes for every Principle, and adjusting language throughout the document, to reinforce the idea that whenever an individual is engaging in “statistical practice” – whether in their job as a data scientist, chemist, etc. -- these Guidelines apply.

With the original title of the document retained, attention turned to reviewing and revising the Preamble. One of the first comments (arising from within the WG, not from the community comment collection system), was whether the current structure of the Guidelines (Preamble, Principles A-H) should be revamped. The WG aimed for concision but recognized that the Guidelines offer guidance by describing “the ethical practitioner”, but that they also offer additional, aspirational, descriptions of ethical statistical practice. That is, elements that might be or seem tangential to actual practice were retained to inspire ethical practice and a culture of ethical practice in the workplace, but also to help practitioner recognize when these were lacking (so they could make decisions about where and with whom to work). The WG considered organizing the Guidelines differently; this might be a topic for reconsideration for the 2026 revisions but the 2021 WG determined not to completely reorganize the Guidelines for 2021.

This manuscript is organized according to the recommended revised Principle titles and ordering, which is important for G, H, and the Appendix since these represent new order/elements that do not have direct correspondents in the 2018 version. The table below summarizes overall suggested changes to the Guidelines document.

**Table 2:** Original and changed text/decisions

<b>ORIGINAL (2018)</b>	<b>2021</b>
Title	unchanged
Organization	Changed G, H, and added an Appendix*
Preamble	Focused/shortened
Definition of statistician/practitioner	Definition of statistical practitioner (no mention of statisticians). Added organizations and leaders/supervisors.

\*G, H, and the Appendix are discussed in Subsections 8, 9, and 10 below.

Among other recommended changes throughout the document, to ensure the inclusion of data science within the Guidelines' applicability, the following language was included in the Preamble:

In these Guidelines, “statistical practice” includes activities such as: designing the collection of, collecting, summarizing, analyzing, interpreting, or presenting, data; as well as model or algorithm development and deployment. ... The Guidelines are intended for individuals, but these principles are also relevant to organizations that engage in statistical practice.

Finally, the WG removed the new-in-2018 language, “Ethical statistical practice does not include, promote, or tolerate any type of professional or scientific misconduct, including, but not limited to, bullying; sexual or other harassment; discrimination based on personal characteristics; or other forms of intimidation.” This removal was not unanimously supported, but the rationale for removing it from the Preamble included: a) most of this language describes behaviors that are already illegal or have policies preventing them in place for any worker; b) the activities that are excluded not promoted or tolerated are *not unique* to the practice of statistics, so do not have a place in the professional practice standards that are intended to specify and guide ethical statistical practice specifically; and c) the WG contemplated language about behaving respectfully in the workplace for other of the Guideline Principles, and so including it in the Preamble – which was done intentionally in 2018 to underscore the emphasis on not tolerating these sorts of intimidation and discrimination – seemed to double its perceived importance. Given the large number of elements in the Guidelines (larger in the 2021 revisions), this redundancy was targeted for elimination.

## **2. Principle A. Professional Integrity and Accountability (7 -> 11 elements)**

Making the Preamble more concise created a focus for the deliberations on other Principles. Beginning with Principle A, the WG focused on ensuring the “top line” content was appropriate and comprehensive for the Principle’s domain (Professional Integrity and Accountability in this case), without being redundant with elements that were specified. In addition, Principle A was the first opportunity to ensure that data science, and its uses in government, business, and academia, were equally supported with the language in Principle A and its sub elements.

Whereas the WG in 2014-2016 faced the challenge of revising the original (1995) Guidelines language discouraging data mining (“fishing expeditions”), and tended to encourage the ethical practitioner to focus on designed data collection (e.g., experiments, surveys, etc.), for 2021 the challenge was differentiating “fishing expeditions”, which tend to occur more in scientific applications where large data sets would be explored until a

significant inference test was found, from data mining and machine learning, which have evolved into an acceptable practice for gaining insight and direction for future experiments/hypothesis testing.

In adding four new elements (going from 7 in 2018 to 11 for 2021), the Guidelines now recognize the special responsibilities of those teaching and mentoring. For example, new element A11 states, “Upholds, respects, and promotes these Guidelines. Those with responsibilities to teach, train, or mentor in statistical practice have a special obligation to promote behavior that is consistent with these Guidelines. They are also obligated to foster a safe environment for collaboration and learning.”

Other recommended changes to Principle A include:

- a. The principle was revised to be more general, so that its elements would more clearly instantiate how to exhibit or conform with the high-level principle. The working group struggled to find an appropriate synonym for “fair” –and selected “prudent”, which has a much more concrete definition in multiple online dictionary sources.
- b. In response to comments received in the new online system, as well as discussion in the working group and COPE, three new elements were created (currently A9, A10 and A11). The entire set of elements was re-ordered.
- c. In response to comments received in the new system, item A8, which was added during the 2018 revisions, was clarified and broadened so that “respect for others” would be included as clear and concrete as possible, i.e., “Promotes the equal dignity and fair treatment of all people”.
- d. In general, the working group tried to ensure that the language was inclusive of people who are not PhD trained, or not working in academia -- these are two general criticisms the COPE has heard about the Guidelines in the past.
- e. Given the increasing importance of “data science” as an aspect of statistical practice, and the prevalence of statistical practice by data scientists, the elements were revised to be more inclusive of non-experimental data and a wider diversity of roles of the individual who seeks to use statistical methods/practice in an ethical manner.

### **3. Principle B. Integrity of Data and Methods (11 -> 7 elements)**

The WG spent nearly eight full hours deliberating on the revisions needed to ensure that Principle B, which focuses on the integrity of the data and the responsibility of the statistical practitioner to maintain it, would be relevant for modern statistical practice. This needed to include data science, statistics, analytics, and any application of statistical methods in any profession or domain. Moreover, the Guidelines needed to recognize and be compatible with the widest possible variety of methods of data collection (or curation).

Originally, Principle B had the largest number of elements (11). It also garnered the most suggestions from the online system. Many of the 2018 elements seemed focused on probability and specifically experimental or survey focused aspects of methods and data. As the WG considered the relevance of the Guidelines for statistics practitioners who did not design experiments or clinical trials, or surveys, the discussion centered on how best to articulate that “the most appropriate method” needs to be used or prioritized, without making most of Principle B irrelevant to those who are not engaged with experiments or surveys.

The WG identified that two of the core ethical obligations discussed in Principle B are 1) to perform due diligence to assess the validity of the data; and 2) to be transparent about

any limitations/data quality problems that might affect the analysis or the inferences made therein. If analysis of the data quality is not possible (e.g., for a legacy dataset lacking sufficient metadata or paradata for such an analysis), then *full transparency* – which was underscored in the B elements that were retained – *suffices* to discharge the ethical practitioner’s responsibilities with respect to data and methods. The number of elements in Principle B was reduced through refining existing elements and ensuring that all elements were relevant for experimental/survey/designed as well as not-experimental, not-survey, and not-designed data collection efforts.

Other recommended changes to B include:

- a. Moving elements that are not specific to data or methods into Principles A (professional integrity) or D (respect for data donors or those affected by statistical practice).
- b. An emphasis on *communicating* – rather than reporting – the quality of the data, its fitness for use, and other limitations that can affect the understanding or attitudes of the user/stakeholder towards the results or towards the profession. Not all statistics practitioners are able to formally report their work, but all have the opportunity to communicate with stakeholders.
- c. Adding a new element that specifically addresses responsibilities relating to the development, deployment, and long-term use of models and algorithms.

#### **4. Principle C. Responsibilities to Stakeholders (5 -> 7 elements)**

The title of the Principle, its top line, and much of its content, were revised. In the original (2018) version, titled, “Responsibilities to Science/Public/Funder/Client”, the top-line Principle was the following: “The ethical statistician supports valid inferences, transparency, and good science in general, keeping the interests of the public, funder, client, or customer in mind (as well as professional colleagues, patients, the public, and the scientific community).” This tended to focus on science only, and be more academic-leaning. The widespread use – and recognition of this use – of statistics across disciplines and domains was lacking in the 2018 version of the Principle. Therefore, the new Principle is more general, but also more focused. The title was changed to “Responsibilities to Stakeholders” – recognizing that all entities in the 2018 title were stakeholders, but that modern statistical practice happens in support of business and government activities as well as in science. The overall theme of the Principle did not change, but the responsibilities were articulated in such a way as to ensure that those not in scientific fields, and those not in academia, would also recognize and be engaged in following the revised version of this Principle’s main (topline) statement:

“Those who fund, contribute to, use, or are affected by statistical practices are considered stakeholders. The ethical statistical practitioner respects the interests of stakeholders, while practicing in compliance with these Guidelines.”

Other recommended changes include:

- a. Existing elements were reworded, and like-themed elements were consolidated so that clear separation between clearly different elements could be reinforced.
- b. The new C2 represents a push to avoid confirmation bias, among other pressures, with an intent to mislead.
- c. A clear distinction between exploratory and confirmatory analyses is highlighted in item C3, with increasing the stakeholders’ ability to understand – and limiting the ability to mislead others – as the focus.



- d. Several points were re-directed to other principles for more coherent placement elsewhere within the Guidelines.

#### **5. Principle D. Specific responsibilities to research subjects, data subjects, or those directly affected by statistical practices (7-> 11 elements)**

The second most-discussed Principle to revise was Principle D. Originally there were seven elements, and after more than 10 hours of deliberation, the WG ended up with 11 elements for this Principle. The title changed to accommodate the diverse roles of data contributors – the original Principle focused almost exclusively on human subjects (with some consideration of animals), i.e., for designed collection (experiments and survey) work. Elements taken from Principle B were considered to be more descriptive of the practitioner’s ethical obligation to the data contributor (i.e., appropriate for D) rather than of the data set (i.e., appropriate for B). A key revision is the addition to the title of this Principle and its top line, “These responsibilities extend to those who will be directly affected by statistical practices.” This language includes those affected by designed collection as well as curated-data targeting statistical practices. Further, a new element is focused on curated data, “Uses data only as permitted by subject approvals when applicable or considering their interests and welfare when approval is not required. This includes primary and secondary uses, use of repurposed data, sharing data, and linking data with additional data sets.” This is an example of how the revisions both targeted moving beyond mainly designed collection work and also practitioners working outside the sciences or academia (e.g., in business or government).

Other recommended changes include:

- a. Clarifying that collecting or using more data than is necessary should be avoided, and considers risks – and impacts – of failures of de-identification.
- b. Requiring disclosure of how data will be used, as well as limitations.
- c. Reiterating (after B1) the fundamental importance of both data sources and their fitness for use.

#### **6. Principle E. Responsibilities to members of multidisciplinary teams (4 -> 4 elements)**

The critiques of the Guidelines focusing on their overly-academic, or designed collection, bias was perhaps reflected in the original title of Principle E, *Responsibilities to Research Team Members*. Because practitioners may work on theoretical problems, or on teams with diverse disciplinary backgrounds in not-scientific contexts, the title needed to change. The original Principle reflected an obligation for the statistical practitioner to educate the other members of their teams; this was discussed at length by the WG. It was decided that this expectation created an undue burden for statistical practitioners as a basic ethical requirement. An expectation that the statistics practitioner should educate team members might create an imbalance in the perceived roles among team members. Moreover, in many industry or business settings, and some government contexts, the statistical practitioner might not actually be able to educate team members because all the work is carried out asynchronously. The requirement to educate team members was a clearly context-dependent and limiting one, so it was eliminated. Further, there was discussion regarding statistical practitioners who fill more than one role on a team and whether additional guidance is needed for these individuals, particularly when they may have the option of following ethical practice standards pertaining to those different roles.

Since these Guidelines apply specifically to statistical practice, guidance was deemed unnecessary for other roles.

Other recommended changes include:

- a. Changed references to research and scientific to ensure relevance for the broad qualifications and type of work undertaken by statistical practitioners.
- b. Changed the term statistician to statistical practitioner.
- c. One item in Principle E was expanded to three individual points.
- d. Expanded scope of work covered to include all statistical practices.
- e. Team pressure was added as a reason for expediency, which should be resisted no matter the source.

#### **7. Principle F. Responsibilities to Fellow Statistical Practitioners and the Profession (4-> 5 elements)**

Originally this Principle was titled, “Responsibilities to Other Statisticians or Statistics Practitioners”. Given our definition of statistical practice, the original title was redundant. However, while the title of this Principle needed to change because of our focus on including all who use statistics (statistician -> statistical practitioner), we also augmented the Principle with responsibilities to the profession itself. This brings the ASA motto into the Guidelines for the first time, “Promoting the Practice *and Profession* of Statistics” (emphasis added).

The emphasis in the 2021 revisions was in ensuring that the Guidelines were as relevant to those not doing or supporting science as they are for those engaged in scientific research; any language from Principle F that was specific to research or science was removed. Moreover, we expanded the rationale for several elements, including F4 (“*Promotes reproducibility and replication, whether results are “significant” or not, by sharing data, methods, and documentation to the extent possible.*” Emphasis added), and F5 (“*Serves as an ambassador for statistical practice by promoting thoughtful choices about data acquisition, analytic procedures, and data structures among non-practitioner and students.*” Emphasis added).

Other recommended revisions include:

- a. A focus on providing constructive input, rather than (any) input was added (F1, F2).
- b. F3 was added to highlight and augment that ethical responsibilities to practitioners and the profession explicitly include meaningful teaching and advising.

#### **8. Principle G. Responsibilities of Leaders, Supervisors, and Mentors in Statistical Practice (5 elements)**

Original Principle H, “Responsibilities of Employers, Including Organizations, Individuals, Attorneys, or Other Clients Employing Statistical Practitioners” was deemed to be inconsistent with modern statistical practice. It also highlighted attorneys as a specific type of employer for which the Principle was intended. Because of suggestions that were submitted through the ASA portal for commenting and making suggestions for revisions in the 2021 cycle, a need for articulating responsibilities specifically for those leading, supervising, or mentoring statistical practitioners was identified. Aspects from old-H were revised for use in the new Principle G, “Responsibilities of Leaders, Supervisors and Mentors in Statistical Practice” (5 elements), and a new Appendix for employers and

organizations, “Responsibilities of Organizations/Institutions Employing Statistical Practice”, with 10 elements. Creating a new Principle, now G (instead of last/H), clarifies responsibilities that leaders, supervisors, and mentors owe to the practice, profession, and statistical practitioners they lead/supervise or mentor. As has been described, ethical statistics practitioners owe an obligation to other practitioners and the profession to promote the Guidelines (in Principle A) and to take responsibility for providing their best contributions as teachers and advisors (in Principle F). Following the Guidelines and modeling ethical behavior and statistical practice will go far toward training new practitioners to be ethical. However, there were still aspects of leadership and supervision by statistics practitioners in the workplace that required articulation. Principle G is now described as follows:

Statistical practitioners leading, supervising, and/or mentoring people in the curation or collection, management, analysis, interpretation, and communication about data have specific obligations to follow and promote these Ethical Guidelines. Their support for – and insistence on – ethical statistical practice are essential for the integrity of the practice and profession of statistics as well as the practitioners themselves.

With these responsibilities specific to those leaders, supervisors, and mentors who are statistics practitioners themselves, we were able to outline, and place Responsibilities of Organizations/Institutions into a new Appendix with 10 elements: six elements for organizations, plus four additional elements for those in leadership, supervisory, or managerial positions who oversee statistical practitioners. These are elaborated below.

### **9. Principle H. Responsibilities Regarding Potential Misconduct (6 in old G)-> 10 elements).**

The WG determined that what had originally been Principle G, originally titled “Responsibilities Regarding Allegations of Misconduct”, should be shifted to the end of the Guidelines, labeled H, and retitled. The original content and title was deemed to be too focused on academic settings and specifically, federal definitions of “misconduct” in only research situations – i.e., fraud, falsification, and plagiarism. Moreover, because “misconduct” is used to relate almost exclusively to scientific work in academic settings, original Principle G required extensive revisions. The first revision was to put this Principle at the *end* of the Guidelines – it became Principle H. It was retitled and expanded, with clarifications on nearly every element. Principle H now is much less specific to settings where science is carried out, and to the conduct of science itself. Another important change is that bad-faith allegations of misconduct are now treated as rejectable behaviors in themselves. Insisting on a transparent and fair process for adjudicating claims of misconduct is now an ethical obligation, as is full participation in such a process when the practitioner faces accusations. Originally there were six elements to the Principle discussing misconduct, but H now contains 10.

Other recommended revisions include:

- a. Item H1 specifically requires the ethical practitioner to seek “to clarify facts and intent” before alleging misconduct.
- b. A new item (H4) specifically charges the ethical practitioner with utilizing appropriate channels to discreetly and correctly lodge complaints with relevant institutional bodies. This new item explicitly identifies social media campaigns alleging misconduct as activities to be ignored.

**10. Appendix. (10 elements)**

Specific aspects of old-H, outlining responsibilities of employers of statisticians, were problematic for several reasons. Firstly, the Guidelines are intended for statistics practitioners, and many employers of statistics practitioners are not practitioners themselves. If they are, then they should follow all the Guidelines including the Appendix; but if they are not, then the Appendix can be shared with employers or used by non-practitioners to structure or ensure an ethical working environment. Secondly, the Guidelines can only govern those people and institutions that explicitly agree to follow them. Members of the ASA should follow the Guidelines, but it was logically incoherent to include a section of the Guidelines that would purport to govern employers - particularly organizations and institutions – who/that are not ASA members. Finally, the WG determined that leaders and organizations had specific responsibilities that could be differentiated from those incorporated specifically for statistics practitioners who are mentors, supervisors, and leaders (new G). The contents of the new Appendix were therefore taken from what had originally been Principle H (Responsibilities of Employers... (8 elements)). This material was broken up into G (see above, 5 elements), plus the new Appendix under Responsibilities of Organizations/Institutions Employing Statistical Practice (6 elements), and a second section to the new Appendix, under Responsibilities of Those in Leadership, Supervisory, or Mentor Positions Who Oversee Statistical Practitioners (4 elements). In addition to separating and clarifying responsibilities, the language was revised or added to clearly and concisely reflect the diverse individuals, organizations, and roles to which the Appendix is intended to apply.

Like the new G, the Appendix has a slightly different structure relative to the other Principles. The Appendix identifies its target readership as follows:

**Responsibilities of organizations/institutions**

Organizations and institutions that curate or collect, manage, analyze, interpret, and/or communicate about data, including for the purposes of model or algorithm development and deployment, have responsibilities to promote ethical statistical practice. Specifically, they should be accountable for using statistical practice in ways that are just, transparent, and respectful.

The COPE intends to pursue a more comprehensive description of Responsibilities of Organizations/Institutions Employing Statistical Practice with respect to ethical statistical practice. As this was determined to be within the COPE's mission but fall outside the scope of the WG remit to revise the Guidelines, the recommendation is to make the above-detailed changes to old-H/new-G and to include revised language relating to organizations and institutions in this new Appendix as part of the 2021 Guidelines revision.

The structural changes between the Board-approved 2018 version and the recommended revisions for the 2021 version are recapitulated in the following figures.



**Figure 1:** Summary of original version of the ASA Ethical Guidelines for Statistical Practice from 2016/2018



**Figure 2:** Summary of recommended revisions to the ASA Ethical Guidelines for Statistical Practice for 2021/2022

### 11. Discussion

More than 80 hours each from five different working professionals represents an incredible commitment to the task of revising the Guidelines for 2021. As noted, this was the first time that the entirety of the Guidelines was considered for revision since the five-year cycle was created. For this effort, the WG had three goals: to update, to clarify, and to make as inclusive as possible the Ethical Guidelines for Statistical Practice. While prior revisions

have also sought to update and clarify the Guidelines, the expansions resulting from the 2021 effort were particularly challenging and time-intensive to conceptualize and complete. This was the first time the Guidelines have shifted beyond experimental or survey and scientific focus to also include work involving curated data. While seeking to ensure that the 2021 version of the Guidelines are not too specific to the academic context, this is also the first time these Guidelines explicitly identify responsible teaching and mentoring as part of ethical statistical practice. It goes further, to also formulate responsible leadership and supervision both by practitioners (new-G) and by those employing practitioners (new Appendix). Keeping the articulation that *any user of statistics* is a practitioner the Guidelines are intended for, the 2021 recommendation for Guidelines revisions also emphasize that and how the Ethical Guidelines are relevant for organizations where statistical practitioners engage in this profession.

The WG membership, like the COPE itself, was balanced between industry and academia, Bayesian and frequentist, and experience with designed-collection and curated-data applications. Fortunately, we also had experienced practitioners from government on the COPE who joined our discussions frequently to ensure that this perspective was also included. The full contents of the Appendix, like the rest of the WG's recommendations for revising the ASA Ethical Guidelines for Statistical Practice, must still be considered by the ASA Board, and we do not include the proposed revised Guidelines here because they have not been vetted as of the 2021 Proceedings submission deadline.

The COPE determined that concision was essential to effective Guidelines, so the WG avoided revising content --- including footnotes, commentary, examples, and long definitions --- that added meta-information to the text. Similarly, the WG favored language that carries a low ideological valence in today's political climate over more overt ideological constructs (e.g., "treatment of all persons with respect" instead of "avoidance of ageism, sexism, etc."), despite that some higher-valence terms and concepts are currently widely used in other ethical frameworks and within institutions. The WG also leveraged the presence of a translator (English-Chinese) in the current COPE Chair (JC), and used terms and concepts that allowed for straightforward translation into other languages, including Chinese. The WG seek to ensure translations like the one to Chinese that was completed for the 2018 Guidelines would be feasible for these revisions. They also sought to use language straightforward enough to promote accessibility to English-speaking colleagues from other cultures as well as people new to the practice of statistics. This focus yielded final text that was semantically less dense and less amenable to deliberate or accidental misconstruction. Although the changes to the structure and content of the Guidelines are not minor, the WG also considered a more significant restructuring of the Guidelines and may elect to follow a different structural framework at the next five-year review.

The changes to the structure and language are not minor, but the Working Group and COPE agree that the revisions strengthen the Guidelines while broadening their accessibility. Overall, we have added 8 new elements to the main Principles (52->60), while adding ten new elements to the Appendix. This required considerable effort by the WG and COPE members throughout 2021, resulting in greater applicability and accessibility of these Guidelines across statistical practice and practitioners, and across the career span and diverse roles that practitioners may take.

### **Acknowledgements:**

This paper describes the process by which the 2021 ASA Ethical Guidelines for Statistical Practice were revised and the results as of 5 October 2021. The recommended revisions presented here reflect the Working Group and COPE members only, and have not been finalized or approved by the ASA Board. For these reasons, the full recommended revisions are not included in this document.

This work was only successful because of the extraordinary efforts of the Working Group, and the Co-Chairs are incredibly grateful for their persistence and unstinting generosity of time and constructive input throughout the nine months of intensive work required to thoughtfully and carefully review comments from the community, synthesize diverse opinions from the community, COPE, and Working Group, and to make the completion of the process informative and enjoyable. The entire Working Group thanks the COPE for their commitment and attention to the outputs – and sometimes, the inputs! – of the Working Group during so many of our meetings. 2021 COPE members Harold Gomes, Nilupa Gunaratna, Andrew Hartley, Matthew Rotelli (also a WG member), Stephanie Shipp, and Millenia Young augmented the input the WG received from the community. Finally, we all extend profound thanks to Donna LaLonde, who made important contributions to further our understanding of the Guidelines, the Community, and the ASA so that this work could be as effective as possible. These individuals are acknowledged for their contributions, but they did not review this paper in advance and therefore they should not be inferred as endorsing the specific claims of this paper.

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### **References**

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## APPENDIX:

### **Procedures for revising the ASA Ethical Guidelines for Statistical Practice**

Prepared by: Rochelle Tractenberg (former vice chair (2014-2016) and chair (2017-2019) of the ASA COPE; chair of working groups on revising the Guidelines 2014-2016; 2018; co-chair 2021) & Jing Cao (former vice chair (2020) and chair (2021-) of the ASA COPE and co-chair of working group on revising the Guidelines 2021).

10 December 2020

#### **Background:**

In 2016 the ASA Board determined that the ASA Ethical Guidelines for Statistical Practice (“Guidelines”) should be reviewed and revised every five years. The first (ever) revision took place 2014-2015 and was an extensive revision given that the old Guidelines were 20 years old. To accomplish this much work in the allotted time, the working group was formulated with 3 individuals plus a working group chair, meeting weekly to discuss all suggested changes at length. Each individual was tasked with two Guideline Principles as their main focus; all working group members were tasked with coming to meetings prepared to discuss suggestions and make recommendations about what should change (or should not change). The COPE was meeting bi-monthly 2014-2016, so that all working group results were summarized and presented to the larger committee (of 9 people) over time. The weekly meetings of the working group were essential to completing the work, and the focused time of a small group on the task was also essential to its completion. Then in late 2017 the Board requested a review of the Guidelines specifically to ensure that sexual harassment, assault, and other intimidation practices were explicitly highlighted as inappropriate. The same working group approach was utilized for an efficient review and revision in 2018, and will be utilized again for 2021.

In 2016 and 2018, all revisions were completed by the COPE and its working group, with the resulting recommendations being circulated and shared throughout the ASA after this work was completed; any suggestions from the wider ASA community were then obtained after the working group had concluded. Thus, in 2018 the chair and vice chair of the COPE determined a system to elicit input on what the ASA community thought should be changed *prior* to the initiation of a working group’s effort. This was implemented in 2019 and piloted (by the chair and vice chair).

This document was prepared in December 2020 to provide the COPE and wider community with the outline of how the working group accomplishes its work.

#### **Working group (WG):**

The sole charge of the WG on revisions is to consider suggested revisions to the then-current Guidelines. Anyone on the COPE who is interested in serving on the WG should notify the COPE chair in writing of their interest.

The COPE chair and/or WG chair can invite other ASA members to join the WG if their perspective is important to the revision effort.

The WG requires a chair, to be appointed by the COPE chair. The COPE chair can chair or co-chair the WG themselves, or select a WG chair. The choice of WG chair, including whether to take the role themselves, is the COPE chair’s decision.



The WG chair(s) will seek to include diverse perspectives on the WG (e.g., industry, academic, local, state, and federal government, data science, etc), but the priority for selecting WG members is commitment of time, ability to work collaboratively, and intention to act to promote the practice and profession of statistics through ethical practice. Prior experience with the Guidelines (writing, teaching, or revising) or formal applied ethics experience/background are important considerations for selecting WG members and the WG co-chair.

It is best to have 3-4 individuals in this group: all participants should commit to full engagement with the task and should keep in mind that the purpose of the Guidelines is to promote ethical practice with statistics – so everyone who practices, in every context, needs to be considered when revisions are made.

Of the nine committee members, those with the most time to commit are the most likely to put in the work, but depending on how much needs to change, there may need to be 4-5 people on the WG. Friends of the COPE, and active ASA members, are eligible to be on the WG; it does not have to have all members taken from current COPE members. After discussion with the committee and committee staff liaison, the COPE chair can invite WG participants, preferably together with the WG chair (if this won't be the COPE chair), with the objective that the Guideline review and revisions are executed in a timely and competent manner. On the WG, and specific to WG meetings, all WG members (whether or not they are COPE members) have one vote. Only COPE members vote on COPE decisions.

The WG has a chair/co-chairs to ensure that the meetings are scheduled and time is used effectively. The WG members are expected to respect the time commitments of all members, and to prepare for each meeting so the work can proceed. The WG chair(s) will move on from a topic (as needed) once a decision is made that there are more than one option or perspective, and WG members will take responsibility for documenting their option or perspective in that case. The documentation should be concise and will be shared with the COPE for discussion.

A key function of the WG chair/co-chairs is to ensure that all WG work is completed in a timely manner, and the work is summarized. WG meeting will be scheduled more frequently (e.g., weekly) than COPE meetings, and are run by the WG chair(s). The WG will meet via zoom or skype (or some agreed-on platform) so that screen sharing is possible.

The WG exists to streamline the process of revising the Guidelines, but the entire COPE is responsible for ensuring that the Guidelines are relevant and coherent.

Each WG member is tasked by the WG chair(s) with a subset of the Guideline Principles (including the Preamble as one element). The number of Guideline elements a WG member is tasked with depends on how many suggestions are received. The purpose of this subsetting is to allow each WG member to focus intensively on the task without creating too great of a burden on any one member. However, every WG member (the purpose of being on the WG) is responsible for ensuring all comments and suggestions that are received are reviewed and decided about in a timely way.

Each WG member is expected to engage in the consideration of every Guideline element that is discussed; they take responsibility for leading the discussion and executing the WG's determination about revisions (or not changing) of their specific elements and Principles.

Moving through the document from the preamble to the end, discussion over the time period allotted to the revisions covers the suggested revisions *in the order of the Guideline Principles*. These may arise during WG meetings. Starting in 2021, the WG will submit suggestions for revisions into the online discussion thread, so that they can become part of the record for the community to revise.

<https://community.amstat.org/ethicalguidelinesforstatisticalpracticecomment/ourdiscussiongroup/viewthread?MessageKey=ff4e3bac-3786-4c08-a31f-995286186107&CommunityKey=b482848a-43f9-441c-84cb-96bfe4f732c7&tab=digestviewer#bmf4e3bac-3786-4c08-a31f-995286186107>

The individual 'responsible' for each Principle presents the suggestions -including their rationale and a discussion of what is proposed to change. The individual is tasked with determining, and presenting for discussion among the WG, whether suggested changes are in conflict with other elements (looking ahead to not-yet-discussed Principles and behind to those already discussed), and/or whether there are other changes that may make the current suggestion moot (because it was already addressed in an earlier revision). Thus, consideration of each suggested revision requires careful attention to the entirety of the Guidelines.

The chair(s) of the WG will then be presenting to the wider COPE a summary of the discussion of the proposed revisions within the WG, together with the WG's consensus for revisions. Each WG member is responsible for writing up their recommendations for/against recommended revisions and submitting those in a timely fashion to the WG chair(s). The WG chair and co-chair are responsible for submitting the summary/summaries of WG meetings in writing to the COPE (and then to the Board).

Ultimately, the suggested revisions -based on COPE consensus – are submitted to the Board and the entire ASA Community for approval. Each change is required to be justified, particularly to the Board. The Board can (and usually does) ask for explication in addition to the justification; this is provided by the COPE chair at a Board meeting where the Guideline revisions are discussed (typically in April of the following year). This presentation to the Board may include elements of COPE discussion about revisions, as necessary.

WG members will consider if repetition is important, or should be avoided. For example, in both the preamble and in Principle A of the 2018 revision, an explicit statement appears, "*Ethical statistical practice does not include, promote, or tolerate any type of professional or scientific misconduct, including, but not limited to, bullying; sexual or other harassment; discrimination based on personal characteristics; or other forms of intimidation.*" (preamble) and "*Exhibits respect for others and, thus, neither engages in nor condones discrimination based on personal characteristics; bullying; unwelcome physical, including sexual, contact; or other forms of harassment or intimidation, and takes appropriate action when aware of such unethical practices by others.*" (Principle A7). In this example it was discussed in the WG, and also in the wider COPE, and determined that the idea needed to be included both times/places.

**WG interactions with wider COPE:**

As noted, **the entire COPE is responsible for ensuring that the Guidelines are relevant and coherent.** The WG members are agreeing to review and refine suggestions received by the COPE – these can be submitted at any time through the new ASA-wide submission system created in 2018, so there may be a lot of suggestions. The WG is acting to support the COPE by synthesizing this input, but is not the sole or even final decision on whether or not/how to revise any aspect of the Guidelines. It is possible that not all suggestions are incorporated into the revisions (that year).

In the event that the WG cannot come to consensus on the wording, or whether or not a change should be made, all versions of text will be circulated to the full COPE at least a week ahead of a COPE meeting so that all members can weigh in on the decision. In these cases, the rationale for the change – or the differences between suggested changes (or, change vs. not change) should be explicit and in writing. To avoid implicit or explicit bias, the suggestions will be anonymized by the WG chair(s) for presentation to the COPE. **Every COPE member will vote on these decisions**, by email directly to the COPE chair not later than 2 days after the COPE meeting. The COPE chair will share the email votes with the full the full committee to inform them of the outcome of the vote. This vote will be considered final. Failure to respond to the COPE chair request for votes, or to abide by a vote, on matters of central importance to the COPE like this one may be considered inconsistent with COPE membership.

Diverse perspectives are critical to an effective COPE and must be balanced with the time that is committed by all – and this time is limited. Consensus is a priority for the COPE's work, but it is not essential; the majority's decision will be respected and the minority's position can be documented.

In order to promote transparency and evidence-based decision making about the revisions, all requests for COPE votes must be based on (and preceded by) written options with rationales for the options. In some cases, suggestions or requests may come to the WG or COPE from outside the committee/WG, which may have limited (or no) rationales or information. Any COPE member or committee friend (including members of the Board) who is knowledgeable about the suggestion can offer some information or rationale to help the COPE better understand a suggestion. The COPE chair may suggest that a friend of the committee (or knowledgeable individual) participate in a committee meeting to provide this assistance, if needed. Out of respect for the broader community, suggestions from outside the COPE without ancillary information will be discussed. Suggestions from committee members should be supported with justification so that COPE members can make an informed decision. This material should be written and sent prior to any meeting, to ensure that everyone has the time to read and understand the options ahead of the time a vote is required.

**Completing the WG's work:**

The COPE chair summarizes the COPE and WG's work only after the full COPE votes to submit the revision recommendations to the Board. The COPE chair will decide whether to submit the revision recommendations in accordance with the majority of the COPE; 100% consensus on whether to submit is recommended, but not required.

Every COPE member must vote on the revisions that are recommended to the Board; any COPE member who disagrees with the decision to submit the revision recommendations will present their justification(s) in writing.

The COPE chair ultimately decides whether to submit the recommendations. In 2016, the COPE was unanimous and in 2018 8/9 voted to submit. The COPE chair will consult with the staff liaisons on the appropriate mechanism for sharing, including the stated objections/justifications for not submitting to the Board for their consideration along with the revision recommendations approved by the (majority of the) COPE. This is one reason why everything should be documented – to ensure all positions are explicitly, but concisely, presentable to the Board.

Once the Board approves the revision, it is advisable that the WG return to the elements of the Principles for which they were responsible and craft a summary statement that describes the outcome of revisions on that Guideline element. The Board will ask for a summary of what did and did not change to accompany the revision recommendations; that document can be composed over the revision period (i.e., the timeline of the WG) to document their execution of the task, and then copied and pasted into the online discussion.