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Updated guidelines on reporting race and ethnicity in the *AMA Manual of Style*

– *Stephanie Deming*

The *AMA Manual of Style* is extremely influential in scientific publishing; its guidelines on writing and publishing scientific articles are followed by *JAMA*, the JAMA Network journals (e.g., *JAMA Oncology*), and many other biomedical journals. Recently, the committee that oversees the *AMA Manual of Style* updated the manual's guidelines on reporting race and ethnicity (1).

These updated guidelines are available in the [online version of the 11th edition of the manual](#), which can be accessed from any MD Anderson–connected computer. If you happen to have a copy of the print edition of the 11th edition, do not refer to it for guidelines on race and ethnicity as the manual was printed before the guidelines were updated; use the online version instead.

We encourage authors who write about people to read the updated guidelines in the manual. Here, we highlight some of the key guidelines on reporting race and ethnicity.

Person-first language

The *AMA Manual of Style* advocates the use of person-first language (1), which is language that emphasizes the person over the person's conditions or characteristics. This has 2 important implications regarding the reporting of race and ethnicity.

First, names of racial and ethnic categories should be used as adjectives, not nouns. For example, instead of "We compared Blacks and Whites," which equates people with their race, write "We compared Black patients and White patients," which presents race as a characteristic of the patients.

Second, people should not be referred to as *minorities*. If the term *minority* is used, it should be preceded by an explanatory modifier and treated as an adjective, for example, "Special effort was made to recruit members of racial and ethnic minority groups" or "Special effort was made to recruit racial and ethnic minority individuals."

Treatment of names of racial and ethnic categories

The guidelines on reporting race and ethnicity also include several principles for reporting the names of racial and ethnic groups, including the following:

- Capitalize all names of racial and ethnic groups. Formerly, the *AMA Manual of Style* recommended lowercasing *black* and *white* as these terms are not derived from proper nouns. However, in February 2021, the style manual committee decided to begin capitalizing *Black* and *White* so that all terms used to describe race and ethnicity are capitalized. The committee notes that an exception may be warranted if "capitalization could be perceived as inflammatory or inappropriate"; they give "white supremacy" as an example of an appropriate exception (1).
- Avoid *Caucasian* except to refer to people from the Caucasus region. Previously, *Caucasian* was sometimes used as a synonym for *White*, but that usage is now considered outdated.
- Do not hyphenate names derived from geographic entities. For example, instead of "Asian-American and Mexican-American caregivers," write "Asian American and Mexican American caregivers."
- Do not abbreviate names of racial and ethnic groups. For example, do not abbreviate "African American" as "AA." However, in tables and figures in which a lot of information needs to fit within a small space, abbreviating the names of racial and ethnic groups may be acceptable if the abbreviations are defined in a footnote.

Reporting on race and ethnicity in research articles

In research articles, authors should use "the formal terms used in research collection" (1). For example, if a survey used in a study listed *Caucasian* as one of the racial and ethnic categories, even though that term is considered outdated today, the report of the study should use *Caucasian* rather than *White*.

In tables, names of racial and ethnic groups should be presented in alphabetical order, not in order of the numbers of individuals in the groups.

A conceptual change

The 10th edition of the *AMA Manual of Style* noted that “Like gender, race and ethnicity are cultural constructs, but they can have biological implications” (2). The 11th edition indicates that “Although race and ethnicity have no biological meaning, the terms have important, albeit contested, social meanings” (1). Later, the manual further explains these concepts, noting that “There are many examples of reported associations between race and ethnicity and health outcomes, but these outcomes may also be intertwined with ancestry and heritage, social determinants of health, as well as socioeconomic, structural, institutional, cultural, demographic, or other factors (3-5). Thus, discerning the roles of these factors is difficult” (1).

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ARRIVE 2.0 and MDAR Framework guide methods reporting for animal research and other life sciences research

– Sarah Bronson

A comprehensive description of your methods is essential for reproducible and rigorous research. Valuable resources for methods reporting include the ARRIVE guidelines (Animal Research: Reporting of *In Vivo* Experiments), the NIH Principles and Guidelines for Reporting Preclinical Research, and the Cell Press STAR Methods framework, which we have discussed before in *The Write Stuff* (“[Guidelines for reporting your research methods to improve reproducibility and rigor](#)”). Now on the list are the ARRIVE guidelines 2.0 and the MDAR Framework.

ARRIVE 2.0

The ARRIVE guidelines originally constituted a checklist of details to include in reports of animal research. To this foundation, [ARRIVE 2.0](#) adds explanations and examples for each item on the list. For example, checklist item 9a under Experimental Procedures, titled “What was done, how it was done, and what was used,” includes a paragraph providing context and the rationale for the item, as well as a table of the types of information to include—e.g., pharmacological procedures such as drug formulations, doses, and volumes; surgical details, including descriptions of the surgeries and anesthetics used; and euthanasia methods, including the pharmacological agents and doses, timing of euthanasia, and tissues collected afterward. There are three examples from published papers, including a figure depicting one study’s timeline of procedures used in mice. ARRIVE 2.0 also creates a hierarchy of which items are most important. It designates the “Essential 10” items that are critically important to include: study design, sample size, inclusion and exclusion criteria, randomization, blinding, outcome measures, statistical methods, experimental animals, experimental procedures, and results. The rest of the list falls under a “Recommended Set” of items, which provide context for your study: abstract, background, objectives, ethical statement, housing and husbandry, animal care and monitoring, interpretation/scientific implications, generalizability/translation, protocol registration, data access, and declaration of interests.

MDAR Framework

From PLOS comes a set of reporting guidelines called [MDAR](#) (Materials, Design, Analysis, Reporting),¹ designed to apply to a broad range of life sciences research and thus to fill the gaps left by more specialized guidelines. Central to the MDAR guidelines is the MDAR Framework. Like ARRIVE 2.0, the framework gives both minimum requirements and best-practice recommendations in four domains. For example, in the domain “Materials and human research participants,” the subcategory “Cell lines” asks for, at a minimum, “species, strain, accession number in repository or supplier name, catalog number, clone number, or RRID if available,” while the best practice is to include Research Resource Identifier numbers and to confirm that you have not used cell lines from a register of misidentified cell lines. Accompanying the framework is a more detailed checklist structured the same way and an elaboration document that gives context for the framework and checklist and recommendations for their use. Keep an eye out in journal instructions for endorsements of ARRIVE 2.0 or the MDAR Framework. Even if a journal does not mandate compliance, consider consulting these guidelines when applicable to help ensure your methods reporting is complete.

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SciScore: A tool to measure reproducibility

– Bryan Tutt

SciScore is an online tool that evaluates biomedical research manuscripts to ensure the reproducibility and transparency of their methods. The tool was released in 2020.¹ For each manuscript submitted, [SciScore](#) generates 3 reports. The first, called the core report, assigns a score on scale of 1 through 10, with 5 points possible for rigor criteria such as including an ethics statement, describing the sample size estimation, and adhering to [NIH core reporting standards](#) and 5 points possible for listing key resources such as antibodies, cell lines, organisms, and software tools. The second report evaluates transparency by checking the manuscript against the Materials, Design, Analysis, and Reporting (MDAR) checklist.² The third assesses the methods according to the Structured Transparent Accessible Reporting ([STAR](#)) framework, which is used by Cell Press journals to ensure reproducibility and rigor. The MDAR and STAR reports do not assign a numeric score but instead note criteria from those checklists that seem to be missing. After SciScore generates these reports, the application deletes its copy of the manuscript to ensure security.

In addition to helping authors address weaknesses in their manuscripts, SciScore can be used to track trends in research over time. The creators of SciScore used the tool to evaluate more than 1 million research articles in PubMed Central published from 1997 through 2019.³ They found that although SciScores had doubled over the years, inclusion of some key elements—such as statements about the blinding technique and power analysis used—had increased little and were found in fewer than 10% of the articles published in 2019.

Several journal publishers, publishing software companies, and academic institutions have integrated SciScore into their workflow or are testing ways to do so. For instance, the American Association for Cancer Research,⁴ whose journals include *Cancer Discovery*, *Cancer Research*, and *Clinical Cancer Research*; Karger Publishers,⁵ whose journals include *Psychotherapy and Psychosomatics*, *Liver Cancer*, *Dermatology*, and *Cytogenetics and Genome Research*; and Research Square,⁶ a preprint platform,⁷ have begun pilot programs in which SciScore is integrated into their manuscript submission systems. Likewise, to facilitate SciScore's use by authors, journal editors, and peer reviewers, Aries Systems is integrating SciScore into its Editorial Manager software, which is used by Elsevier journals.⁸ Consensus, an AI-powered search engine for scientific literature, will include SciScore reports in its search results so that searchers can assess articles' rigor and transparency at a glance.⁹ In addition, the Luxembourg Centre for Systems Biomedicine has made SciScore available to its faculty so that they can correct flaws in their manuscripts before submitting them to peer-reviewed journals.¹⁰

SciScore charges a fee for each manuscript submitted, but users can submit 10 manuscripts per year at no charge by signing in with their [ORCID](#) account.

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Tips for using figures effectively in grant proposals

– Joe Munch

In competitive grant proposals, figures are used to help present information in a clean, clear, logical way. Follow these tips to use figures effectively in your next grant proposal.

Use figures logically and judiciously. Design each figure to illustrate a single aspect of your research (a central concept, a specific conclusion, a certain approach, etc.) that is key to understanding and appreciating the proposed work. Limit figures to the presentation of relevant

information that cannot easily be conveyed in the main text, such as large amounts of data, complicated relationships among data, and complex concepts. To conserve space in the proposal and help prevent “figure fatigue,” avoid using figures whose information can be presented in a simple sentence or two in the main text. To hold reviewers’ interest, vary the types of images and illustrations used.

Make figures easy to understand. Streamline each figure by omitting any unnecessary details that might prevent reviewers from quickly understanding its main point. Make each figure large enough that reviewers can easily discern its smallest elements and read its text. Clearly label all panels with boldface, capital letters, and arrange the panels in their alphabetical order from left to right and then top to bottom. Use symbols, highlighting, or other visual cues to draw reviewers’ attention to important information, and use these elements consistently throughout all figures. (For example, if a single asterisk indicates a P -value < 0.01 in one figure, it should also indicate a P -value < 0.01 in other figures.) Use colors that will be distinguishable from one another if the proposal is printed in black and white.

Pair figures with effective legends. For each figure, provide a concise yet informative legend (also called a *caption*) that tells reviewers the exact message they should glean from the figure. Begin each legend with a title summarizing what the figure illustrates. Use boldface, italics, and/or underlining to distinguish the title from the rest of the legend. For figures that present data, provide a descriptive title that explicitly states the specific conclusion supported by the data to help reviewers quickly grasp the main point of the figure; avoid using titles that give only a general idea of the type of data shown. (A specific title like “Paclitaxel plus ceritinib inhibits the growth of chemoresistant TNBC cells” is more descriptive, and thus more helpful to reviewers, than a general title like “Combination therapy in breast cancer cells,” for example.) After the title, give concise descriptions of the methods used to generate the data presented in each figure panel. These descriptions shouldn’t be overly detailed, but they should be detailed enough to ensure that reviewers appreciate the robustness and appropriateness of the methods used and thus are likely to agree with your interpretation of the data they generated. (In general, providing these descriptions in the legend in an 8- or 9-point font, rather than in the main text in an 11-point font, helps conserve space in the proposal.) At the end of the legend, define any abbreviations that appear in the figure that haven’t been defined in the main text, and explain the meaning of any symbols that appear in the figure.

Use figure citations. Cite each figure in the main text; for figures with multiple panels, ensure that every panel is cited. Provide each figure citation immediately after the text that describes what is shown in the figure or after the text that makes an assertion substantiated or supported by the information in the figure. Number the figures in the order in which they are first cited. Use boldface to bring reviewers’ attention to each citation:

“The workflow of the proposed project is illustrated in **Figure 1.**”

“On the basis of these findings, we propose a novel model of ferroptosis regulation (**Fig. 2**), which we will validate in this specific aim.”

“Kaplan-Meier analyses showed that patients who received the combination treatment had better overall survival (**Fig. 3A**) and progression-free survival (**Fig. 3B**).

Place figures alongside their citations. Position each figure in line with or below its first citation in the main text, on the same page. Take care to place each figure in a way that does not obscure the text or diminish its readability; in general, aligning figures to the right page margin ensures that section headings, paragraph indentations, and other important formatting cues in the text remain easily discernible.

Review your work. After you've converted your finalized proposal to a PDF for submission, check the figures again to ensure that their resolution, fonts, colors, locations, etc., have been retained.

Unusual terms used in scientific writing and publishing: Format-free submission

– Stephanie Deming

The term *format-free submission* means authors may submit a manuscript without complying with a journal's detailed formatting instructions. The term is used in various ways: journal publishers may describe their "format-free submission policy" or "format-free submission process" or note that they offer "format-free submission," and a manuscript submitted under a format-free submission policy may be referred to as "a format-free submission."¹ Other terms that have been used to describe the same type of policy include *free format submission*² and *your paper, your way*.³

In a 2018 article published in *EMBO Reports*, Aziz Khan and colleagues called for "a format-free submission process that enables researchers to spend their time doing science and not formatting manuscripts."¹ At the time of that article, few biomedical journals offered format-free submission. Today, many do, including selected journals published by Elsevier, Oxford University Press, Springer Nature, Taylor and Francis, and Wiley, among others.⁴

Format-free submission saves authors from spending time on minor formatting details, such as arranging the parts of the manuscript in a specific order; structuring the abstract in a specific way; or following a specific format for in-text reference citations, references, figure legends, and tables. The time saved by not having to comply with detailed formatting requirements may be substantial, especially for manuscripts that are eventually submitted to more than one journal before they are accepted for publication.

Although journals with a format-free submission policy do not request detailed formatting at initial submission, most will ask authors to submit a legible and easy-to-understand manuscript that contains certain key elements—e.g., title; abstract; Introduction, Methods, Results, and Discussion sections; and statements regarding authorship, funding, and conflicts of interest. Also, some journals with a format-free policy at the time of initial submission ask authors to apply detailed formatting at the time of revision after peer review.

The term *format-free submission* is a bit confusing because *x-free* usually means “not having x” but a manuscript submitted under a format-free submission policy does have a format—just one that may not match the journal’s detailed instructions. Nevertheless, the term *format-free submission* has been widely adopted and is probably here to stay.

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provide practical advice on writing the Candidate Section, Specific Aims, and Research Strategy of a K99/R00 application.

Registration is required. To streamline and simplify the registration process, the six separate modules of this session are set up as a series; registration for one module will register you for all six. You can attend any or all modules. The series will be repeated every few months.

Modules:

- Candidate Section, Part 1, Candidate's Background (**Tuesday, November 1**)
- Candidate Section, Part 2, Career Goals and Objectives (**Thursday, November 3**)
- Candidate Section, Part 3, Plan for Career Development/Training Activities (**Tuesday, November 8**)
- Specific Aims (**Thursday, November 10**)
- Significance & Innovation (**Tuesday, November 15**)
- Approach (**Thursday, November 17**)

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Wednesday, November 9, 12:00-12:30 pm

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