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Use singular they—and other lessons learned from editing JGR-Space

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Introduction

As Editor in Chief (EiC) of the *Journal of Geophysical Research—Space Physics* (hereinafter, JGR-Space), an issue I addressed was communication and transparency between the American Geophysical Union (AGU) and the space physics research community (Liemohn, 2020). When I became EiC, colleagues would congratulate me on the selection and then complain about some aspect of publishing. When I would inquire with AGU staff, I would often learn that the offending policy or practice had changed.

To address this disconnect, I started a blog¹, writing 300 posts over the 6 years of my EiC term (December 2013–December 2019). Most posts discussed publication news, policies, and practices. Some were advice on writing and reviewing, while others were about EiC duties and life. During my term as JGR-Space EiC, issues arose regarding diversity, equity, inclusion, and accessibility (DEIA). One of my top-10 most-viewed posts² was on this topic, expressing disappointment in the research community for the sexism within it, as experienced by my PhD student. I went on to write ~20 more posts on this issue, plus another ~10 on accessibility concerns. In the following section is a distillation of the highlights.

Advice for increasing diversity, equity, inclusion, and accessibility awareness and action

Use singular they

I occasionally received angry emails from reviewers when an author used “he” in their response. While we should learn and use people’s personal pronouns, this is impossible with anonymous manuscript reviews. This case requires gender-neutral pronouns. In addition, many of our space physics colleagues use nonbinary personal pronouns. There are several options (e.g., Atherton et al., 2016), but my favorite is “singular they.” Societal acceptance of this has come swiftly, with one example being the American Dialect Society declaring “singular they” to be the

1 The blog can be found at: <https://liemohnjgrspace.wordpress.com/>.

2 The top-10 most-viewed post can be found at: <https://liemohnjgrspace.wordpress.com/2016/06/13/women-in-space-physics/>.

2015 Word of the Year.³ If in doubt, then use they instead of assuming he or she. Singular they works exactly like singular you; it is still plural within the sentence but refers to an individual. An example of usage is in the first sentence of this paragraph.

Slow down

Kahneman (2011) describes two modes of thinking, one fast and another slow. Our fast brain is our initial reaction, the in-the-moment thoughts that pop into our mind. The slow brain is our deliberative thought process, which takes energy and focused attention. One publication-centric benefit of slowing down is conducting a thorough literature review. This should be done early in the scientific process so that effort is not spent on unoriginal research. Too often, though, it is left for late in the manuscript development process and subsequently rushed. This leads to citations of only the “famous research works” that easily come to mind rather than conducting a systematic search. There are many hidden gems among space physics studies, and it is worthwhile to take the time to find them, cite them, and compare the new results against those from these studies. This is a DEIA issue because most of the “classic” works were written by white men (see, e.g., the 2018 AGU demographic study⁴).

Another problem that could be addressed by slowing down is that of cordiality in correspondence. As EiC of JGR-Space, I saw some reviews, responses, and emails with unprofessional language. When writing in these forms, we sometimes do not take the time to edit. First, think of the golden rule—treat others as you would like to be treated—and revise your initial word choices to reflect this mantra. Moreover, I encourage you to read it again and consider applying the platinum rule—treat others as *they* want to be treated—which means respecting the background and culture of the person with whom you are corresponding (Taylor, 2016).

Furthermore, slowing down our thinking could result in better science. Several studies have found that diverse teams lead to better outcomes (see the review by Liemohn et al., 2022). Figure 1 shows my artistic support of this evidence. When forming a project team, it is useful to go beyond your immediate circle of colleagues. When hiring a new member of your group or department, move beyond research work and citation counts as your measure of “best.” As stated by Hurley (2014), diversity within a meeting room or a project team matters, especially to those among historically excluded groups.

Our brains have these two systems to conserve energy and focus effort where it is truly needed. Some tasks should be done in fast-



FIGURE 1

The sign the author made when he participated in the March for Science walk on Earth Day in 2017.

brain mode. When learning to drive a vehicle, many governments require a minimum number of hours of driving experience before the student can qualify to take the license test. This time converts the thought processes of driving away from the high-concentration slow-brain mode and ingrains them into fast-brain automatic responses. Other tasks are best with slow-brain thinking and action, as noted by Honore (2005). For some undertakings, like scientific publications, challenge the “cult of speed.”

Assume positive intent

Some of the author–reviewer disputes I witnessed as EiC were the result of miscommunication Newport, 2016. More precisely, they arose from one or both sides inferring belligerence from the other person. Manuscript correspondence lacks delivery style nuance, and its asynchronous nature disallows immediate correction of misconceptions. Problems sometimes ballooned, creating much more work for me to disentangle the discussion and reach a decision.

As detailed by Taylor (2016), it is useful to assume positive intent in our interactions with others. In general, we do not know what others are going through, so it is useful to not take negative comments personally but rather assume that it originates from a completely different issue in their life. It is helpful to slow down and rethink the situation.

Plain language summaries

A publications-specific DEIA item that emerged during my time with JGR-Space was the use of plain language summaries

3 The American Dialect Society’s 2015 “word awards” page can be found at: <https://www.americandialect.org/2015-word-of-the-year-is-singular-they>.

4 The American Geophysical Union 2018 membership demographics survey results are available at: https://www.agu.org/-/media/Files/AGU_Membership_Demographics_2018.pdf.

(PLS). A PLS is a second abstract written for a journal article, not for those within the field but for everyone else. It should be targeted specifically at the educated general public, typically a high school writing level (Halprin, 2021). The PLS increases the accessibility of the work because a major element of a PLS is the intentional omission of jargon.

Writing a good PLS is difficult, but helpful resources exist for their creation⁵. There is even a blog, The Plainspoken Scientist,⁶ about communicating scientific findings to a broader audience. It covers many topics about speaking and writing beyond one's disciplinary colleagues, but the PLS regularly comes up and the advice given there is useful for getting into the proper mindset to write a good PLS.

Accessible and inclusive graphics

Sometimes, presentations at space physics meetings would greatly annoy me because the author has simply reused a graphic from a journal article with far too many panels for audience readability. As Morgan and Whitener (2006) explain, care should be taken to create graphics that highlight the most important point and are tailored for your specific audience. For a publication, control of information flow lies with the reader, who can spend as much time as needed to understand a figure. For a presentation, the pace is set by the speaker. Once off the screen, the graphic is no longer available to the viewer, so it must be clear. A good graphic for a presentation also works well in publications, but the reverse is not necessarily true.

Color is a major component of many scientific figures. A regular complaint I heard involved colorblind unfriendly graphics. A significant minority of the population has deutanopia—red-green colorblindness—or other vision deficiencies for which some colors are indistinguishable (e.g., Brettel et al, 1997). Thus, certain color choices confound scientific interpretation. The most basic rule is to use either red or green in a particular graphic.

The rainbow colorscale is particularly egregious. It not only includes both red and green but also has a nonlinear intensity gradation, causing attention bias (e.g., Moreland, 2016). There have been multiple calls to the geoscience research community to stop using the rainbow colorscale (e.g., Light and Bartlein, 2004; Zeller and Rogers, 2020). Please stop using it.

End microaggressions

Microaggressions are seemingly small comments that nevertheless invalidate, devalue, or exclude some part of the

population. Rosen (2017) describes the bias facing women geoscientists as a “mountain of molehills,” of which microaggressions are a major component. As Clancy et al. (2017) note, the astronomy and planetary science workplace is also rife with bias. While outright sexual harassment is much worse, it is much less common. Microaggressions are a pervasive problem that degrades the inclusiveness of our work environment.

We must strive to eliminate microaggressions. Krook (2014) describes many examples of inappropriate statements made in the workplace, offering suggestions for how to respond to them. For the space science research community, I suggest checking ourselves from uttering male-focused comments. Do not make an offensive joke; it is not funny to all around you. Do not make the male-is-better analogy; these remarks are not received well by non-males. These comments perpetuate the marginalization of historically excluded groups.

It is encouraged to pause before you speak. Mentally consider the question, is my contribution appropriate and needed now? Be aware when you are dominating the conversation or when another in the group is taking up a disproportionate amount of time. Notice who has not spoken and call on them, engaging them in the discussion and helping them feel included in the group.

Volunteerism and donations

Another way to contribute to DEIA in the research community is through volunteering to help with the operations of the various scientific societies. While I especially encourage being a DEIA advocate on a business or awards committee, a good volunteering entry point is serving as a special session convener at a conference. Through this role, you could recruit speakers from historically marginalized groups. Session conveners select invited speakers and organize the submitted abstracts into oral and poster sessions. Selection for invited or oral presentations promotes career longevity and is, therefore, useful for eventually changing our community's demographics to be in line with the general population.

A more indirect but still effective DEIA engagement path is financial donation beyond the society's annual dues. For AGU, there are travel funds and award funds open to targeted donations⁷ that directly address diversity and retention in our research community.

Discussion

Over the course of serving as JGR-Space EiC, I realized that our research community struggles with DEIA issues. To achieve and

⁵ The AGU Sharing Science page on Plain Language Summaries can be found at: <https://www.agu.org/Share-and-Advocate/Share/Community/Plain-language-summary>.

⁶ The Plainspoken Scientist blog can be found at: <https://blogs.agu.org/sciencecommunication/>.

⁷ The American Geophysical Union's list of targeted funds is found by clicking the “Funds” menu option about halfway through this page: <https://www.agu.org/Give-to-AGU/Giving/>.

sustain diversity, we need to be a welcoming and inclusive research community. Have the courage to actively intervene to eradicate microaggressions. We should adopt policies and community norms that foster equity. We should redefine “best” to not only encompass research excellence but also incorporate perspective and background. Slow down and take sufficient time to think, reword, and rewrite toward equity and inclusivity. Learn and use each other’s personal pronouns, and when in doubt, use they. Do a thorough literature review, finding research works beyond the famous authors that come easily to mind. We should do the same when forming new project teams and when hiring new coworkers. We can be mindful of colorblindness and avoid those colorscales that cause confusion. Outer space fascinates people, and we should learn to communicate our scientific results beyond our colleagues.

Finally, we should remember the adage “practice makes perfect.” The more you do or think about something, the more it is ingrained in your fast-brain reactions. So, continue to learn. Attend seminars, training sessions, and refresher workshops; read articles and books; talk with your colleagues. There is an inspiring line about perseverance from Sarah Bessey, “This is Hope, with lines on her face and silver in her hair.”⁸

Let’s strive to promote diversity, foster inclusivity, achieve equity, and bring forth accessibility within the space physics research community.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

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⁸ The Sarah Bessey quote can be found at: <https://sarahbessey.substack.com/p/we-had-hoped-6d3>.

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