Nonbinary Systems: Gender-Inclusive Study Methods in Planetary Science

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PRESENTED AT:

INTRODUCTION

Over the past several decades, there have been numerous studies, community efforts, and institutional initiatives to evaluate and address gender disparities within planetary science, astronomy, and related fields. However:

- Efforts toward gender equity in space science primarily target and benefit **cisgender, white, heterosexual, abled women**.
- Space scientists are **not** experts in gender studies or social science. As a result, they often use methods that are **sloppy at best and harmful at worst**.
- There are nonbinary, gender non-conforming, and transgender people in planetary science and related fields, and **we want to be included!**

Our aims:

1. Summarize recent work on gender equity in earth and space science and discuss common pitfalls
2. Offer recommendations for studying gender dynamics and promoting gender equity in these fields going forward

Although our work focuses on the inclusion of nonbinary people, the suggestions made here are applicable to people of all marginalized genders.

TERMS & DEFINITIONS

***Disclaimer:* Language surrounding gender identity is continually evolving and rarely universally agreed upon by those it purports to describe.**

Nonbinary ***(adj.)*****:** We use 'nonbinary' as an umbrella term for all genders not represented by the categories of 'male' or 'female'. Not everyone whose gender falls under this definition uses the term 'nonbinary' to describe themselves.

The National Center for Transgender Equality provides more information (https://transequality.org/issues/resources /understanding-non-binary-people-how-to-be-respectful-and-supportive) about nonbinary people.

Transgender ***(adj.)*****:** Describes individuals who identify with a gender other than the one to which they were assigned at birth

Cisgender ***(adj.)*****:** Describes individuals who identify with the gender to which they were assigned at birth (i.e., not transgender)

Pronouns ***(n.)*****:** The set of pronouns that should be used to refer to an individual in the third person, such as "they/them/theirs" or "she/her/hers" [more information (http://www.mypronouns.org/)]

PROBLEMATIC APPROACHES

We have identified four major concerns common to analyses presented in studies of gender equity in earth and space science, most of which are written by and for professional physical scientists.

1. Gender as observable

- Acquiring gender information by means other than participant self-identification
- First name scrapers, photos, gender perception in real time

The problem: These methods result in misgendering and erasure, especially for nonbinary people, who are either misclassified or discarded. In addition, automated systems often use U.S.- or Europe-based name databases and discard all 'anomalies,' making their datasets disproportionately white.

Read more: Keyes 2018 (http://ironholds.org/resources/papers/agr_paper.pdf)

2. Gender as discrete

- Gender is treated as a set of discrete categories presumed to be stable and coherent across populations, within individuals, and over time
- Most studies require gender to be either binary or discretizable

The problem: This reduces members of a category to interchangeable data points, which denies people authority over how they are represented.

Best practices: Open Demographics (http://nikkistevens.com/open-demographics/questions/gender.html) (note self-identification write-in field)

3. Gender as statistic

- "While we recognize that gender is not binary, we do not include nonbinary people in our analysis due to lack of statistical significance."

The problem: These methods make statistical significance the determining factor in who matters, reducing the work of inclusion to simple quantification. They are also wrong - there are lots of nonbinary people in our fields!

Recent surveys in space science show...

- Goddard Climate Survey (LGBT Advisory Council, NASA GSFC)
  - 2018: 1.1% of respondents identified as neither male nor female
  - 2020: 0.5% of respondents identified as neither male nor female
- DPS (AAS) Workforce Survey
  - 2011: No questions about LGBTQ+ identities
  - 2019: 1.1% of respondents identified as nonbinary or other identity (including students)
- Space Science in Context Conference
  - 2020: 13% of respondents identified as nonbinary, 10% of presenters and speakers expressed preference for nonbinary pronouns (including but not limited to they/them/theirs)

4. Gender as inconsequential

- Gender groupings like "women and nonbinary people", "women+", "female, nonbinary, and female-identifying people"

The problem: Nonbinary people are not a subcategory of women. These phrases also attempt to separate transgender women from cisgender women and incorrectly imply that they are not women.

Further discussion: Crossley 2019 (http://medium.com/@quinncrossley/uplifting-diverse-genders-beyond-women-and-non-binary-916c890f2185)

OUR RECOMMENDATIONS

1. Do not gather gender data through any means other than **voluntary self-identification**.

- Do not use automated gender classification methods.
- Journals and funding agencies should prioritize gender equity initiatives that use the best practices developed by people of marginalized genders.
- Surveys must provide write-in fields and give respondents the ability to specify that they prefer not to disclose this information, or to refuse to answer the question entirely.

2. Employ or consult trained **social scientists** when studying marginalized people in space science.

- We don't have to reinvent the wheel!
- Funding agency? Put money here.
  - Create funding sources for interdisciplinary research on the space science workforce
  - Focus on enabling collaboration between physical and social scientists by providing funding to experts in these fields
- Unsure where to find a social scientist? Contact us and we will help direct you to an expert.

3. Shift focus from women to **people of marginalized genders**.

- Gender equity requires the adoption of a more complex model of gender than has historically been employed by equity initiatives.
- Consider the names of events, spaces, groups, and organizations, as well as descriptive language used to indicate who is welcome.
- Go beyond language!
  - Do not center cisgender women while ostracising, and ultimately reinforcing the marginalization of, the people that you purport to include.
  - Incorporate study in gender studies, transgender studies, critical race theory, and Science, Technology, and Society Studies (STSS) into curricula and workforce development programs.

4. The only thing that will bring about change is **action**.

- Do not let suggestions, conversations, or platitudes be the extent of your work toward equity and justice.
- This means providing material support for the most marginalized and vulnerable members of our communities. Some examples:
  - Job opportunities
  - Coauthorship
  - Funding

CONCLUSIONS

The true cost of studies and initiatives like those discussed here is an unknown number of students, postdocs, early career researchers, and other scientists and engineers who have been alienated and excluded from the earth and space science research communities.

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Background: Nonbinary pride flag by Laurie Raye, with images from the Mount Lemmon Skycenter

ADDITIONAL RESOURCES

More on Nonbinary Inclusion

Strauss et al. (2020), Nonbinary Systems: Looking Towards the Future of Gender Equity in Planetary Science [arXiv:2009.08247 (http://arxiv.org/abs/2009.08247)]

Rasmussen et al. (2019), The Nonbinary Fraction: Looking Towards the Future of Gender Equity in Astronomy [arXiv:1907.04893 (http://arxiv.org/abs/1907.04893)]

Examples of Improved Methods

Division for Planetary Science (DPS) of AAS workforce summary - see summary report (http://surveygizmoresponseuploads.s3.amazonaws.com/fileuploads/623127/5489366/54-afc62c580722c2501867d394be216edf_RiveraValentinEdgardG.pdf) by Rivera-Valentín et al.

Space Science in Context 2020 virtual conference: About SSiC (http://spacescienceincontext.wordpress.com/about-ssic/)

K. Acosta, Seminar Diversity Initiative (http://diversity.ldeo.columbia.edu/seminardiversity) at Lamont-Doherty Earth Observatory

To find more earth and space scientists of marginalized genders, check out 500 Queer Scientists (http://500queerscientists.com/)!

Further Reading

Ackerman et al. (2018), LGBT+ Inclusivity in Physics and Astronomy: A Best Practices Guide, AAS SGMA & LGBT+ Physicists [arXiv:1804.08406 (http://arxiv.org/abs/1804.08406)]

Atherton et al. (2016), LGBT Climate in Physics: Building an Inclusive Community, American Physical Society [APS (http://www.aps.org/programs/lgbt/upload/LGBTClimateinPhysicsReport.pdf)]

Berea et al. (2019), The Social Sciences Interdisciplinarity for Astronomy and Astrophysics - Lessons from the History of NASA and Related Fields [arXiv:1907.07800 (http://arxiv.org/abs/1907.07800)]

Inclusive Astronomy 2015 Recommendations [the "Nashville Recommendations" (http://docs.google.com/document/d/1JipEb7xz7kAh8SH4wsG59CHEaAJSJTAWRfVA1MfYGM8/edit)]

DISCLOSURES

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any agency of the U.S. government. Assumptions made within the analysis are not reflective of the position of any U.S. government entity.

ABSTRACT

#2306:

stop misgendering
your colleagues. we're right here and
we don't have to be