



Full-Length Paper

**Do I Have To Be An “Other” To Be Myself?
Exploring Gender Diversity In Taxonomy, Data
Collection, And Through The Research Data Lifecycle**

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Abstract

Objective: Existing studies estimate that between 0.3% and 2% of adults in the U.S. (between 900,000 and 2.6 million in 2020) identify as a nonbinary gender or otherwise gender nonconforming. In response to the RDAP 2021 theme of radical change, this article examines the need to change how datasets represent nonbinary persons and how research involving gender data should approach the curation of this data at each stage of the research lifecycle.

Methods: In this article, we examine some of the known challenges of gender inclusion in datasets and summarize some solutions underway. Using a critical lens, we examine the difference between current practice and inclusive practice in gender representation, describing inclusive practices at each stage of the research lifecycle from writing a data management plan to sharing data.

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Abstract Continued

Results: Data structures that limit gender to “male” and “female” or ontological structures that use mapping to collapse gender demographics to binary values exclude nonbinary and gender diverse populations. Some data collection instruments attempt inclusivity by adding the gender category of “other,” but using the “other” gender category labels nonbinary persons as intrinsically alien. Inclusive change must go farther, to move from alienation to inclusive categories. We describe several techniques for inclusively representing gender in data, from the data management planning stage, to collecting data, cleaning data, and sharing data. To facilitate better sharing of gender data, repositories must also allow mapping that includes nonbinary genders explicitly and allow for ontological mapping for long-term representation of diverse gender identities.

Conclusions: A good practice during research design is to consider two levels of critique in the data collection plan. First, consider the research question at hand and remove unnecessary gendering from the data. Secondly, if the research question needs gender, make sure to include nonbinary genders explicitly. Allies must take on this problem without leaving it to those who are most affected by it. Further, more voices calling for inclusionary practices surrounding data rises to a crescendo that cannot be ignored.

Introduction

Analyses suggest that between 0.3% and 2% of adults in the U.S. (between 900,000 and 2.6 million in 2020) identify as a nonbinary gender or otherwise gender nonconforming (Goodman et al. 2019). That number only includes those willing to share their identity with researchers; it is reasonable to expect the actual number to be higher and increase in studies if the risk of social repercussions decreases. Yet, there is a schism between current data practice and inclusive data practice in this regard, enacting what Hoffmann (2017) terms 'data violence.' Data violence is "harm inflicted on trans and gender nonconforming people not only by government-run systems but also the informational systems that permeate our everyday social lives" (Hoffmann 2017) Data structures that limit gender to "male" and "female" (M/F) or ontological structures that use mapping to collapse gender demographics to binary values are exclusionary and can lead to potentially misleading or harmful research conclusions. Instead, researchers must be intentional about their collection of gender demographics, only doing so when required for examining their research question (Jaroszewski et al. 2018). Ethical guidelines decry the act of p-value fishing instead calling for including gender in a research design to be theoretically supported and identified before data collection and analysis (Marín-Franch 2018). Similarly, if using existing data sets that may not stratify participants accurately, care must be taken in analysis and interpretation. During discussion and conclusion sections, if gender is an important factor, then the analyst should mention the lack of nonbinary options as a limitation. Mentioning it as a limitation should then lead to discussing how the absence of nonbinary gender categories may be affecting the results.

For research involving people (not exclusively research designated by an IRB as being human subjects research), basic demographics tend to be included in most studies. Participants are asked their age, race, ethnicity, location - and their sex. While the categories for demographic variables have changed (and continue to change) over time, few arguments are made that, for example, age should be measured as a binary between 'young' and 'old,' or race as a binary (Lindqvist et al. 2020). Both gender and sex are well documented as not falling into a binary (Ansara and Hegarty 2014; Hyde et al. 2019; Richards et al. 2016). This creates several problems; as noted by Frohard-Dourlent (2017), by forcing binary choices through categorical variables, researchers will create inaccurate measurements among those who answer. It also causes harm to survey respondents who do not fall into the binary, who will either self-select out of the survey (as all the authors of this article often do) or answer inaccurately.

Resources such as the Trans Language Primer (n.d.) offer a comprehensive and regularly updated listing of terms and vocabulary used to inclusively describe gender. However, ethical research calls for minimizing the burden to participants. Hence, scholars have called for researchers to request the minimum information necessary and recommend asking for gender only when required for analysis and guided by theoretically supported research design (Jaroszewski et al. 2018). The first question for researchers then should be whether gender is relevant to the

research question being asked. Is there a theoretical basis to expect gender to affect outcome variables? Or is it, as one author has experienced, a survey about staff and faculty usage of parking lots, where a binary gender question is both irrelevant and inaccurate. In that case, an email to the office running the survey received a response acknowledging that the question was “archaic and not necessary for our purposes on this project.” In many situations, the most inclusive approach may be to remove gender from the equation altogether.

Planning for Research

Inclusivity when the study needs gender

If collecting information on the gender of participants is crucial to accomplish the research goals, researchers have the responsibility to ensure they are appropriately stewarding gender data throughout the research lifecycle, from the beginning/planning stages of the project to the end stages. The early stages of the research lifecycle should involve formulating a data management plan (DMP). DMPs are short documents that a researcher/research team in any area of study can use to strategically outline and plan the data curation process for their projects (Burnette, Williams, and Imker 2016). Usually, DMPs are used in the context of grant-funded research (Mannheimer 2018), but they are valuable tools for any research regardless of the funded status. This value comes because DMPs provide a space to plan out the details and logistics of working with data throughout a project. In larger studies, the curation protocol may need more space than a DMP can address; however, in those cases the study protocol, data curation protocol, or other analysis planning document may be used to address these data-handling logistics.

If collecting data on the gender of participants is theoretically necessary for purposes of fulfilling the specific research goals, the project DMP should explicitly address how the research team will inclusively approach the data curation process throughout the research lifecycle. This includes information on how data will be gathered, stored, transformed, and cleaned with respect to gender inclusivity. The DMP should also describe any budgetary considerations for hiring gender consultants for survey design. The DMP should be a living document in that as the research progresses, the researchers should both refer to the plan for guidance as well as update the plan as any project details change. The language and vocabulary around gender is evolving (Shi and Lei 2020), and researchers should be prepared to update their DMP and codebook if evolving language around gender influences the project details.

Further, part of the role of a DMP is to proactively consider data throughout the lifecycle of a project, including how the data may be shared and reused in the future. Following the suggestions made in this article may make a data set incompatible with outdated or inaccurate existing data sets where gender data was collected in a binary or limited manner. The DMP should note how this will affect not only the specific research project at hand but other research where the data

be used or compared with other data. Some studies will depend on both gender inclusivity and comparison with outdated or inaccurate variables. When inclusivity and interoperability are both important, researchers can include a crosswalk. A crosswalk is a guide to variable interoperability. A gender variable crosswalk can describe how the current study’s variables could best be connected to outdated historic variables, with robust documentation of the basis of the logic why the researchers suggest particular connections. Crosswalk documentation in the DMP can help allow for inclusivity, but should also foreground interpretation inaccuracies that arise when linking exclusionary variables with inclusive variables. During the DMP planning process, where researchers explicitly address the inclusive approach to data, one can begin defining how gender relates to the research question and how it will be collected. Survey questions that ask about gender need to provide the opportunity for respondents to answer accurately about their gender. At the same time, however, there is the question of how much disclosure is needed. Researchers should examine if they need to know someone’s entire gender history (for example, whether someone is a binary trans man or a binary cis man) or if their current gender more directly applicable to the research question.

Collecting Data

Asking about gender

Once a research team has identified how much gender history is required by their research question, they must then examine the gender data they are collecting. Like racial and ethnic categories, the language around gender is culturally contextual and changes over time. Also, like racial categories, many officially sanctioned metrics may, in fact, be offensive and reify societal prejudices. While many studies default to the use of OMB racial/ethnic categories for demographics, no equivalent federally sanctioned standards exist for gender identity (Bates and Fisher 2019). The potential harm a respondent may face when asked questions about gender can range from general discomfort, to psychological distress, to potential for job loss or violence.

Following other researchers such as Jaroszewki et al. (2018), the authors of this paper propose a principle of not asking for more information than is minimally needed, but offering the opportunity to provide specific details for respondents who wish it. Often accommodations for minority populations also benefit the general population; we posit this is the case here. Some transgender and gender non-binary respondents may want less gendering because of concerns about disclosure, social sanctioning, or being in a questioning/fluid space where they cannot comfortably answer. The optional opportunity to add gender details may also, however, benefit other marginalized genders. For example, some cis women may appreciate the opportunity to not be gendered in spaces where they may be targeted for harassment. Others may want to be recognized and validated as their specific gender. Making conscious choices benefits the entire sample in terms of limiting collected information to what is necessary. Further, poorly planned

attempts at inclusivity may be counterproductive as misunderstanding, miscategorizing, and misconceptions about gender can lead to inaccurate data collection.

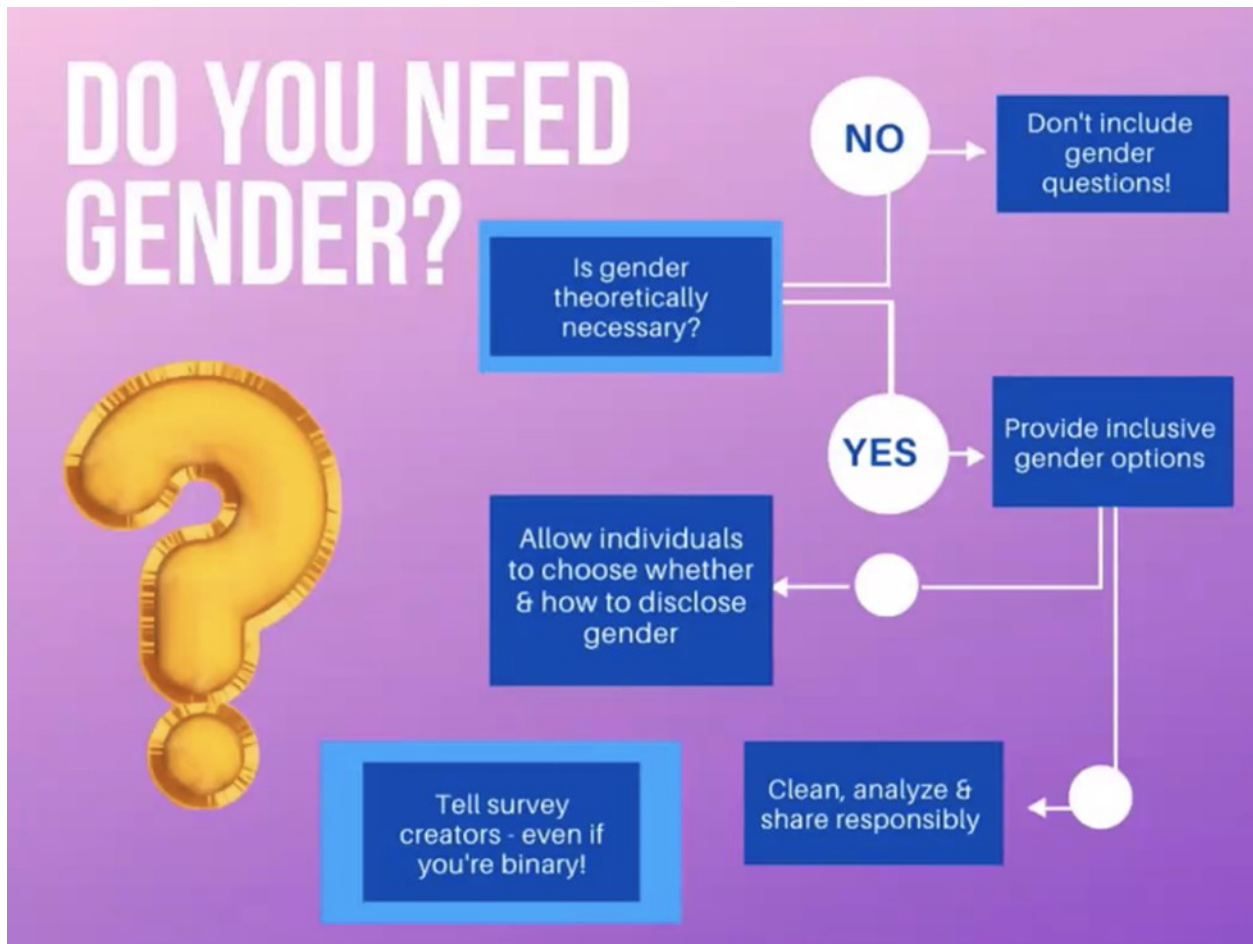


Figure 1: Do You Need Gender Decision Flowchart.

Alt-text: Title: do you need gender? With a large question mark underneath. Flowchart: Is gender theoretically necessary? If no, don't include gender questions! If yes, provide inclusive gender options and clean, analyze and share responsibly. Allow individuals to choose whether and how to disclose gender. In all situations, tell survey creators to follow these practices—even if you're binary.

While many attempts to be inclusive include 'transgender' as a third option, this fundamentally misunderstands and misrepresents transgender and nonbinary identities. The National Crime Victimization Survey (NCVS), run by the Bureau of Justice Statistics, asks a two-part question, first asking for gender assigned at birth, and the second asking if respondents currently identify as male, female, or transgender (NCVS). Unfortunately, this is more harmful than helpful. 'Transgender' refers to someone whose gender does not match their assigned

gender at birth—they may be binary male or binary female or fall outside the binary such as nonbinary, genderqueer, or agender. Putting transgender as a mutually exclusive choice with male and female is entirely misrepresentative and does not improve inclusivity or accuracy in research. Beyond being inaccurate, this signals to transgender respondents that the researchers lack an understanding of gender diversity, often causing respondents to lose trust in those researchers' competence and good faith (Brown and Herman 2020). Many will, at that point, choose to opt out of the study, skewing the sample represented in the results. That skew will not only have fewer transgender and gender diverse respondents than the general population, it will also lose respondents who may not personally be transgender but have a commitment to accurate descriptions of gender. If gender is relevant enough to the research question to be included, this is a substantial concern.

Another common approach is to offer three options: male, female, and other. While including the existence of nonbinary people is better than entirely excluding it, being labeled literally as the 'other' is a frustrating, alienating experience. Fred Dervin writes, "Othering means turning the other into an other, thus creating a boundary between different and similar, insiders and outsiders.... The other is also often described through a deficit framework, that is, [they are] not as good or capable as 'we' are, which leads to stereotypes and other forms of representation" (Dervin 2015, p. 2). Using those categories as the standard in a survey reinforces ideas that there is a boundary between the 'normal,' 'accepted' genders and everyone else.

Other researchers have pursued an option of making gender a self-reported field, thus allowing people to provide as much or as little information about their gender history as they wish and avoiding creating default buckets. This is a reasonable strategy and preferred by many transgender respondents (Ansara and Hegarty 2014). Permitting respondents to self-identify freely and choose multiple identity terms allows increased representation of marginalized genders. Additionally, it is a powerful way to track changes in language over time which can contribute markedly to awareness of cultural history and shifts in gender definitions.

The main concern is creating a large amount of data cleaning from the variety of responses one can get (i.e., male, man, mle, he/him, Christian Man, etc.). Depending on the size of the sample, this may be a considerable burden. Another possible concern with this approach is whether cisgender respondents who are minimally familiar with gender will comprehend sufficiently to accurately identify themselves as cisgender. In 2011, a poll by the nonpartisan Public Religion Research Institute found that 30% of Americans were not familiar with the term 'transgender' or were unsure of its meaning (Public Religion Research Institute 2011). However, substantial social changes in the decade since have included prominent public figures transitioning in the public eye (for example, Caitlyn Jenner and Elliot Page) as well as legislation both supporting and attacking the rights of transgender people in serving in the military, being protected by anti-discrimination laws, using public restrooms, and playing sports. By 2019,

transgender rights had entered mainstream consciousness enough that the same organization had an entire survey on topics related to trans rights. In that poll, 62% of respondents said they had become more supportive of transgender rights over the previous five years, and 25% said they had become less supportive than five years ago (Greenberg et al. 2019). Given the overwhelming percentage of respondents with an opinion on the subject, the concerns about ignorance seem to be substantially lower now.

However, there is sufficient opposition to transgender rights that there is a substantial risk of intentionally inaccurate answers when prompted so loosely. A 2018 paper by Jaroszewski and team, for example, outlined two significant trends in responses to open-ended gender questions: good-faith responses that covered a wide range of genders and what they called “mischievous responders” (commonly referred to as “trolls”) who provided bad data for ideological or satirical reasons. This is unsurprising as similar trends are still found when asking about sexual orientation. Similarly, Bates and Fisher (2019) examined data from the “2020 Census Barriers, Attitudes, and Motivator Survey” which asked how respondents thought of themselves and offered lesbian or gay, straight—not lesbian or gay, bisexual, something else (write-in), and I don’t know. Overwhelmingly, the majority of write-ins were “normal” and “Christian male” (Bates and Fisher 2019). Jaroszewski and team’s study recommends using language that closely aligns with the intended respondent community to decrease the likelihood of aggressive responses; their survey asking with which gender respondents “most closely identify” seemed to trigger more trolling responses than other studies those authors have run which used different wording, such as a simple “gender” prompt. A 2016 report from the Federal Committee on Statistical Methodology research group on measurement of sexual orientation and gender identity (SOGI) outlines six Federal surveys that include gender identity questions beyond a binary male/female option. All of them operate either as a single-item measure, which asks explicitly whether a participant identifies as transgender, or as a two-step measure that asks for gender assigned at birth and current gender. The size of these studies means that there is a substantial amount of research about the response of both cisgender and transgender respondents to the metrics (Dahlhamer et al. 2014).

Gloria Fraser (2018) provides a detailed analysis of the advantages, disadvantages, and suitability of four inclusive measures of gender identity. Fraser’s model was originally built on research needs in quantitative psychology, and this paper offers a modification of a fifth option, inspired by Spiel, Haimson, and Lottridge (2019). Based on several iterations of research with populations including a high density of nonbinary people (on Tumblr) and low density of nonbinary people (fantasy football), Spiel and colleagues presented a recommended gender format that we endorse (see Figure 2). The question is presented as an optional (non-required) question with checkbox format, where respondents can select more than one choice (or no choice). The five options are: woman, man, nonbinary, prefer not to disclose, and prefer to self-describe, which provides a free text field. They note that this framework is for the Western context

in which they (and the authors of this paper) write, and it is furthermore not intended either for surveys designed to focus on transgender populations or for medical studies that involve health data related to sex characteristics. In either of those cases, a different set of gender fields, such as a two-step procedure that asks respondents if they identify as cisgender or transgender along with their gender identity, may better address the research question.

What is your gender?

Male

Female

Non-binary

Prefer not to disclose

Prefer to self-describe: _____

Figure 2: Gender demographics format from Spiel, Haimson, and Lottridge (2019).

Alt-text: The question is presented as an optional (non-required) question with checkbox format, where respondents can select more than one choice (or no choice). The five options are: woman, man, nonbinary, prefer not to disclose, and prefer to self-describe, which provides a free text field.

This framework provides many advantages and considerations compared to other common gender frameworks, which we have compiled in Table 1. It pre-populates common gender choices into tick-boxes that are quick and easy for respondents to complete. Respondents who do not fall into binary options can choose the analysis bucket they wish to be analyzed in: a broad non-binary umbrella or a more specific identity by using the self-describe field. Respondents who identify with two or more genders can easily select multiple choices. Respondents who are questioning or do not want to provide a concrete answer for other reasons can select “prefer not to disclose.” This also creates room for a broader range of cultural contexts; for example, Bauer and team (2017) explain, “some people identify with Indigenous or culturally-specific mixed- or multi-gender identities (e.g., two-spirit), which may not acknowledge a distinction between gender and sexuality.” The choices intentionally do not distinguish between binary cis people and binary trans people on the grounds that for most research, a respondent’s gender history is not necessary. While different measures can be used for studies focused within the trans community or on medical issues, most surveys focusing on social interactions do not need to ask whether someone is transgender. For studies where the research question needs to identify transgender participants, an

additional but separate question about transgender identity can be asked (i.e., do you identify as transgender?). Further, within the United States, there is an increasing number of states which are beginning to systematically allow for intersex designations on birth certificates. We fully support this movement and look forward to future researchers having different, more accurate choices than us. Conversations surrounding this growing movement in data consultations is crucial to support these changes.

Processing and Analyzing Data

If research calls for gender, researchers must be thoughtful about gathering, managing, evaluating, and interpreting the data collected. In this piece, we have encouraged researchers to be intentional about their collection of gender demographics. However, the reality is data is messy. Once obtained, researchers are faced with a range of decisions during the data cleaning process. Building questionnaires to be inclusive is of little use if the data is ignored or collapsed. A critical first step is to retain the fidelity of the categories of gender initially collected. In practice, these data are often statistically negligible while complicating the data set (Jaroszewski et al. 2018). The most important consideration here is to retain the gender data for future use. While the response size may be too small to provide meaningful analysis for this single collection, over a field of researchers or a career of research, the data set becomes larger (Medeiros, Forest, and Öhberg 2020). However, depending on just how small the response size is, this may not be feasible without making participants personally identifiable (for example, a student experience survey for a particular school with a single non-binary engineering student responding).

Researchers who have collected gender data must be explicit in their reporting of results. If researchers choose to erase the experiences of nonbinary and trans participants, this should be clearly and distinctly reported, as well as justified (for example, with specific concerns about identifiability). Similarly, if participant responses over a range of multiple options are collapsed into a single category (i.e., non-binary), researchers must explain in their data reporting that they have decided, on behalf of their participants, that the varying definitions of gender are uniform enough to fall into one group. If such a statement cannot be supported, then the action should not be taken. A single category will rarely retain fidelity to the research goal. A mapped grouping might help, transforming the data for privacy and analysis. By clearly addressing the mapped groupings in a crosswalk or other recoding documentation, researchers can make their logic clear, refer to sources relevant to that timepoint that guide their recoding, and support future mapping, while respecting gender identities. Researchers can maintain the original question data and add a recoded Nonbinary variable and other gender variant variables as appropriate, while still reporting the actual gender responses.

In addition to transforming data for privacy or statistical representation, data may also need cleaning. When cleaning open-answer questions, researchers must consider the different ways people write out their gender, such as gender-queer

Table 1: Recommended Measures of Gender Identity

Gender identity measure	Example	Advantages	Disadvantages	Suitability
Categorical list (short)	What is your gender? Select all that apply <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Non-binary	<ul style="list-style-type: none"> Provides basic demographics for studies not focused on specific identities Minimizes time spent coding data Quick and easy for participants 	<ul style="list-style-type: none"> Does not allow self-identification Unlikely to identify all gender diverse participants Might impair collaborative research if response options differ between studies 	<ul style="list-style-type: none"> Suitable to accurately describe a participant group for a research question not focused on gender Suitable for large studies where there is limited time to code qualitative data
Categorical list (long)	What is your gender? Select all that apply <input type="checkbox"/> Cisgender male <input type="checkbox"/> Cisgender Female <input type="checkbox"/> Transgender male <input type="checkbox"/> Transgender female <input type="checkbox"/> Non-binary/ genderqueer <input type="checkbox"/> Prefer to self-describe: _____	<ul style="list-style-type: none"> Identifies specific gender identity and gender history Minimizes time spent coding Quick and easy for participants 	<ul style="list-style-type: none"> Asks transgender participants to out themselves; intrusive if not necessary and can cause participants to opt-out Cisgender participants may be confused Reinforces perception of binary transgender and binary cisgender people being different genders 	<ul style="list-style-type: none"> Suitable for large studies where gender history is important to the research question and there is limited time to code qualitative data
Single qualitative item	What is your gender? ¹ _____	<ul style="list-style-type: none"> Respondents can self-identify freely and can choose multiple identity terms; allows increased representation of marginalized genders Popular with transgender respondents (Ansara and Hegarty 2014) Takes up little space Allows researchers to track changes in language over time 	<ul style="list-style-type: none"> Requires substantial data cleanup to sort answers Unlikely to identify all transgender participants May include bad-faith answers from trolls (Jaroszewski et al., 2018) Little literature measuring the methodological strength (Fraser 2018) 	<ul style="list-style-type: none"> Suitable for studies in which there is a particular interest in self-identification of gender and where there are sufficient resources for data cleanup

¹ Using ‘gender’ rather than ‘gender identity’ for questions like this normalizes asking gender more broadly. The question is not “about trans people;” everyone has a gender, both cis and trans.

Table 1 continued: Recommended Measures of Gender Identity

Gender identity measure	Example	Advantages	Disadvantages	Suitability
Two-step approach	(1) What is your gender? _____ (2) What sex was documented at birth on your original birth certificate? <input type="checkbox"/> Male <input type="checkbox"/> Female	<ul style="list-style-type: none"> Identifies participants assigned gender at birth and current gender Developed by the Transgender Health Advocacy Coalition in 1997 and adopted in 2007 by the Centre of Excellence for Transgender Health 	<ul style="list-style-type: none"> Asking about assigned sex at birth could be uncomfortable or distressing for some transgender participants Potential to misclassify some intersex participants as transgender 	<ul style="list-style-type: none"> Unnecessarily intrusive for most studies; may be suitable for representative studies. Identifies many respondents with a history of transition who do not identify as transgender on surveys (Tate et al. 2013)
Single item transgender status	Do you consider yourself to be transgender? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I am unsure if I am transgender <input type="checkbox"/> I do not know what this question is asking	<ul style="list-style-type: none"> Likely to accurately identify a higher proportion of transgender participants than single-item measures Avoids potential discomfort of asking about sex assigned at birth 	<ul style="list-style-type: none"> Requires an additional item for gender identity Limited empirical research available to support the effectiveness of this approach 	<ul style="list-style-type: none"> Useful with an additional item asking gender identity Suitable for studies in which it is important to identify transgender participants Suitable for representative studies
Mixed	What is your gender? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Non-binary <input type="checkbox"/> Prefer not to disclose <input type="checkbox"/> Prefer to self-describe: _____	<ul style="list-style-type: none"> Quick and easy for participants Respondents can self-identify freely and can choose multiple identity terms; allows increased representation of marginalized genders Allows for participants to self-assign buckets for analysis Does not separate binary trans people from binary cis people; does not require trans people to disclose their gender history for research that does not require it Decreases time spent coding 	<ul style="list-style-type: none"> Intentionally does not identify all transgender people as transgender Can use additional single-item transgender status question if theoretically necessary for the question Requires some coding of datasets Intentionally allows for empty/missing value 	<ul style="list-style-type: none"> Suitable for studies that do not require identification of trans people as a category; can add a single-item transgender status question Suitable for large studies Suitable for studies in which transgender people should be represented but not where the core question is about gender identity or medical history

and genderqueer. If collating these, avoid conflating different genders together, such as gender nonconforming and genderqueer, while retaining the ability to group people of shared identities to be analyzed together. Document the cleaning to collate different ways of writing (hyphenated, spaced, run-together). Review resources such as the Trans Language Primer (n.d.) to guide and justify decisions made to group responses. Further, researchers should not make assumptions about their respondents. Choices of “I don’t know,” “other,” and similar categories do not automatically place the respondent in a nonbinary gender or otherwise gender nonconforming category. If there are any ‘trolling’ responses, those should be removed and their existence noted in the discussion.

Ethical research requires disclosure of the risks of participation as well as assurances of confidentiality. There is a long history of distrust and trepidation between the gender minority community and researchers (Brown and Herman 2020). Discrimination, job loss, and physical safety are all concerns faced by these participants. Researchers may be dedicated to de-identifying their data sets. Yet, by the nature of the community they are researching, the responses of an individual may be identified based on their selected gender identity. It is the responsibility of the researchers to ensure the anonymity and safety of the research participants while not taking that as a blanket reason to exclude them from research. It is a balancing act.

Sharing and Reusing Data

In various stages of the research lifecycle, whether at the beginning when writing a DMP or towards the end when preparing to close out the project, researchers may begin to explore data repositories to store and share their data. Concerning data repositories, there are two ways in which researchers can support gender inclusivity in data, from both a data creator and a data user perspective. As a data creator, when sharing data that contains information on the project participants’ gender(s), appropriate documentation (such as a README file or a codebook) should accompany the data and describe how and why gender has been included in the dataset and how reusers of the data can ensure they are appropriately representing this data in derivative research. Further, the documentation should describe the processes used for cleaning the data and transforming how any gender categories may have been recoded or collapsed.

Conversely, as a data user, if encountering this guidance in the documentation for a dataset containing information on gender, ensure the reuse of the data continues to honor gender in a respectful, compassionate manner in all derivative research conducted. If encountering a dataset with gender data that does not include documentation on how gender categories were defined, reach out to the data creator(s) to try to obtain this information. When searching for data in a repository, data users have many opportunities to support a more inclusive data-sharing environment concerning gender. Many of the larger generalist repositories such as figshare, Zenodo, and Dryad do not allow for detailed faceted/search of datasets beyond general subject areas, such as figshare’s Fields of

Research Classification (Figshare, n.d.), but if encountering a data repository with a faceted search option for gender, take note of which genders are included in that search. If the only options are “male” or “female,” reach out to the repository administrators to inquire why there are only two options listed and if they have considered expanding these options to include more gender categories. Ask about their plans for how to expand gender options in the future inclusively.

Data practitioners working with their own locally-built and maintained repository can assess if their users can search for datasets that include gender categories, and if so, which genders are included. If the faceting options are not inclusive, data practitioners should work with their local team to understand the steps needed to implement more inclusive faceting options. To achieve this, a repository would need appropriate ontological mapping for metadata to capture nonbinary gender. Hawkins and Burns (2018) discuss the importance of having inclusive metadata schemas available for data representing gender-diverse people. Even if the particular repository cannot currently undertake this ontological mapping, commit the time to develop a plan for how this metadata will be captured if/when such capabilities are possible. While this appropriate ontological mapping is not yet in existence, elements of such an ontology such as the controlled vocabulary system Homosaurus (IHLIA LGBT Heritage and Digital Transgender Archive 2021) could be incorporated. It is important to begin to think about what an inclusive metadata scheme would look like in regards to data containing gender information.

Implications

Remember that the language used to describe gender is fluid, and anyone undertaking research where gender is fundamental to the project goals must commit to understanding and staying on top of evolutions in the language around gender. Like other queer identities (e.g. those discussed in Drabinsky 2013 and Grundner 2019), gender concepts, terminology, and conceptual relationships are constantly evolving. Formal classification systems lag far behind the community social resistance and epistemic evolution of the nonbinary and gender variant community (Angell and Roberto 2014). The same problem that plagues these taxonomic systems will affect other ontologies. The more critique and gender nuance the study needs, the more complicated it will be to map gender responses accurately. If gender is explicitly necessary for your research and the research team is unfamiliar with gender knowledge systems, budget in consulting fees from trans, non-binary and gender-fluid individuals who offers consulting in this area. When a person from a marginalized community is providing guidance, they are speaking from their lived experiences, and that in itself can be a very emotionally intensive process. This is expertise and should be compensated as such.

There are also action steps that can be taken by research participants and members of the academic community other than the research team. Allies to nonbinary people should be prepared to reach out to survey creators when they encounter non-inclusive gender categories and share resources with those creators

for creating more inclusive survey options. Gender diverse people should not have to be the only ones who speak out when encountering these types of surveys, especially as encountering these surveys can cause gender dysphoria when reduced to "other" or not even given the option. Moreover, repositories for sharing and discovering datasets must support the metadata describing gender. A repository would need particular ontological mapping to allow for long-term representation of diverse gender identities. As an ally, take on this problem without leaving it to those most affected. Further, more voices calling for inclusionary practices surrounding data rises to a crescendo that cannot be ignored.

Notably, the authors note that while the focus of this article is on nonbinary and gender-diverse identities, other demographic categories have their own fundamental problems and avenues of improvement. Race, ethnicity, and nationality, in particular, are often operationalized in immensely problematic ways, and researchers should engage with racial and ethnic categories with intention and consciousness of stateless nations, rather than defaulting to nonsensical governmental categories.

In the interest of transparency, the authors of this paper are trans, gender nonconforming, or both. We are writing from professional and lived experience on the topic and acknowledge the many ways in which our positionality informs this analysis. Members of this group have faced different frustrations in addressing evolving ideas of gender representation. These frustrations have ranged from trying to find our own lived experiences represented, to consulting on data collection, to helping patrons find and use secondary data on gender experiences other than the traditional cis binary experience. In some ways, "other" is a very forward-thinking option in gender categories. But it is also literally othering people outside of the binary gender experience as well as failing the "exhaustive and exclusive" test for robust data collection. We've looked for better options, but they don't always work across the lifecycle. Our perspectives represent a range of experiences, but there are many others not included here. We find value in analyzing different practices in the current moment, but we fully expect community norms on the language of gender inclusion to continue changing rapidly.

Disclosures

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