Measuring Transgender and Non-Binary Identities in Online Surveys:
Evidence from Two National Election Studies

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Abstract:
A small but growing number of people identify as transgender or non-binary. Their political attitudes and behavior are important to examine, but we know little about them. We argue that current survey research practices for identifying transgender and non-binary respondents fall short in treating "transgender" as something to ascribe onto people rather than as a social identity. Current practices likewise show evidence of measurement error. We illustrate the consequences of common conceptualization and measurement issues by analyzing two large-sample online surveys–the 2019 and 2021 Canadian Election Study (CES) online panels. We find that the 2019 CES generates inflated estimates of the percentage of non-binary people and potentially distorts the correlates of non-binary identity because transgender men and women select the same "Other" response category as non-binary respondents. We conclude with recommendations for future political surveys.

A growing number of people identify as transgender or non-binary, and statistical agencies and survey researchers are increasingly starting to collect data on transgender and non-binary people.[1] Transgender and non-binary identities are important to examine in their own right. However, they are also critical to include in political research to broaden our understanding of how gender shapes political attitudes and behaviors. In addition, transgender and non-binary identities are critical to include in survey research as part of identifying lesbian, gay, bisexual, transgender, queer, and other gender and sexual minority (LGBTQ+) respondents. Much of the research on LGBTQ+ political behavior focuses only on lesbian, gay, and bisexual people (Egan, 2012; Guntermann and Beauvais, 2022; Hertzog, 1996; Page and Paulin, 2022; Turnbull-Dugarte, 2020a, 2020b, 2020c, 2021; Turnbull-Dugarte and Townsley, 2020; Wurthmann, 2023). Studies that include transgender people in their analyses of LGBTQ+ political behavior tend to show they are distinct from lesbian, gay, and bisexual people in their support for the left (for example, Jones, 2021; Strolovitch et al. 2017), and hardly any studies of LGBTQ+ political behavior include non-binary people at all. Better understanding how to measure sex/gender in survey research is both important and necessary for understanding how the gender identity of non-binary and transgender people matter for politics. In this article, we focus on bringing transgender and non-binary identities into the practice of political behavior research. How should we conceptualize these identities? And how should we measure them in survey research?

We argue that political researchers ought to conceptualize gender identity and transgender identity as analytically distinct and politically relevant social identities

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[1] We use the term "non-binary" to refer to people who identify as neither men nor women for parsimony. We recognize that some people who identify as neither men nor women may prefer other terms, such as agender, genderqueer, or bi-gender. Unfortunately, we cannot disaggregate these identities using the data presented here.

and use survey measures that reflect this underlying conceptualization. By gender identity, we mean an individual's self-categorization in terms of gender (for example, "I am a woman" or "I am nonbinary").[2] By transgender identity, we mean individuals' self-categorization (or not) as transgender ("I am transgender" or "I am not transgender"). These two identities are not mutually exclusive. For example, many transgender men and women identify both as transgender and as men and women, respectively.

Our proposed conceptualization and measurement differ from other existing proposals for moving beyond simple binary sex/gender questions.[3] Many of these proposals do not treat "transgender" as a social identity and, when they do, they usually fall short in taking it as analytically distinct from gender identity and politically relevant to measure in surveys. For example, the "two-step approach"—the dominant approach for studying transgender and nonbinary people, especially in demographic and health surveys—does not use a strictly social identity approach. Instead, it ascribes "transgender" onto anyone whose gender identity does not "match" their assigned sex at birth. This approach does not follow best practices for studying other identity groups in political behavior research, which generally include using identity-based theories and survey questions.[4] Other proposals for moving

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[2] This use of gender identity differs from common legal definitions of gender identity, which are often taken to refer to human rights protections for transgender people. This legal use of "gender identity" has come under criticism from trans theorists for not capturing what transness is (Ashley, 2022).

[3] We take sex and gender as distinguishable but interrelated concepts. Much of the past work conflates the two of them (Bittner and Goodyear-Grant, 2017). In addition, different surveys may say that they measure one or the other or use sex or gender category language in their survey questions (for example, "Male" and "Female" as opposed to "Man" and "Woman"). We simplify our discussions of past work by labelling the variable they measure as "sex/gender" and the categories measured in past work as "Male/Man" and "Female/Woman."

[4] The Cooperative Election Study also falls short on this social identity standard. For example, the 2020 Cooperative Election Study uses the following question to identify transgender respondents: "Have you ever undergone any part of a process (including any thought or action) to change your gender / perceived gender from the one you were assigned at birth? This may include steps such as changing the type of clothes you wear, name you are known by or undergoing surgery." This is not a question about identity but about behavior.

beyond simple binary coding of sex/gender in survey research either do not treat gender identity and transgender identity as analytically distinct (for example, by sticking "transgender" as an additional response option in a close-ended gender identity question) or do not treat transgender identity as politically relevant (for example, by not asking questions specifically about it).

We critically review past research to show that existing approaches are likely to introduce measurement error precisely because they do not treat gender identity and transgender identity as analytically distinct and politically relevant social identities. Then, we illustrate the pitfalls of not treating gender identity and transgender identity as analytically distinct and politically relevant by comparing a survey that does not meet these standards—the 2019 Canadian Election Study (CES) online panel ($N = 37,822$)—with one that does—the 2021 CES online panel ($N = 20,968$).[5] The 2019 CES online panel uses a gender identity question that offers respondents three options (Man/Woman/Other). The "Other" option explicitly mentions "Trans, non-binary, two-spirit, etc." as options included in the category.[6] It does not include any other questions that identify transgender respondents. In doing so, the 2019 CES does not treat gender identity and transgender identity as analytically distinct and politically relevant. By contrast, the 2021 CES uses a series of gender questions that include (1) a gender identity question with an explicit close-ended non-binary response option and an open-ended gender response option and (2) a transgender identity question. Otherwise, these two surveys are very similar in their survey designs, including question wording, and were fielded only two years apart, which approximates a most-similar comparison.

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[5] Both datasets are publicly available at Harvard's Dataverse (Stephenson et el. 2020, 2022).
[6] Two-Spirit is a term coined by Indigenous LGBTQ+ activists to represent Indigenous understandings of gender/sexuality in English. It does not neatly fit into Western notions of gender and sexuality as analytically separate (Pruden and Selway, 2020).

Our comparative analysis suggests that almost three-fifths (57-58 percent) of the 2019 CES "Other" respondents are likely trans men or trans women who selected the "Other" category. Furthermore, the 2019 CES "Other" respondents do not match past estimates on the demographics of nonbinary people from previous studies or the demographics of nonbinary people in the 2021 CES. Our analysis shows that the unusual deviations in the 2019 CES sample are consistent with a substantial number of trans men and women (around 55 percent) selecting the "Other" category. As a result, we conclude that researchers cannot rely on the "Other" category to study nonbinary people specifically because it captures many respondents who are (likely) actually men or women.

Based on our critical review and analysis, we recommend that large-sample population surveys, such as online election study panels, adopt a two-step approach that includes a gender identity question with an explicit non-binary option and an open-ended response category immediately followed by a transgender identity question. This approach helps make it clear to trans men and women respondents that they can identify both as trans and as men or women. This clarity not only helps identify trans men and women among respondents but also avoids measurement error from pushing trans men and women to select non-binary response options. Finally, the transgender identity question, rather than an assigned sex question, treats "transgender" as a social identity rather than ascribing transness on all respondents whose gender identities do not match their assigned sex. This approach allows researchers to examine the role of transgender self-categorization among non-binary respondents, which can inform future studies of their political attitudes and behaviors.

In this article, we make three main contributions. First, we illustrate the conceptual gap between common measurement strategies and the ways in which transgender people identify themselves – distinguishing between gender and trans identity. Second, we use the 2019 CES three-option gender identity question to demonstrate the resulting measurement error from using survey questions that do not treat gender identity and transgender identity as analytically distinct and politically relevant. We expect similar problems to arise in other surveys that treat "trans(gender)" as a mutually exclusive category separate from "male/man" or "female/woman." By directly mentioning "trans" in its list of identities in the "Other" category, the size of the measurement error in the 2019 CES may be particularly large. Finally, we make recommendations on best practices for questionnaire design for trans and non-binary respondents for future large-scale population surveys and surveys that over-sample trans and non-binary people.

These contributions are especially relevant for future research, for two reasons. First, public opinion researchers are increasingly conducting disaggregated analyses that examine sub-group differences among LGBTQ people (for example, Jones, 2021; Strode and Flores, 2021; Strolovitch et al., 2017). To date, these studies typically do not include gender identity questions that identify non-binary respondents. Sound measures of trans and non-binary identities are necessary for disaggregated analyses of LGBTQ public opinion. Second, trans and non-binary populations are growing over time, especially as younger generations are more likely to identify as trans or non-binary (Herman et al., 2022; Lagos, 2022; Statistics Canada, 2022). This population growth makes it increasingly important for all public opinion researchers to include questions identifying trans and non-binary

respondents in their surveys so they can understand how their identities shape their political attitudes and behaviors.

Questionnaire Design for Trans and Non-Binary Respondents

For any group, we need to have conceptually clear definitions of how we identify group members to study them using quantitative survey research methods. However, for most groups, it is possible to devise multiple approaches to identifying group membership. For example, survey research on race has used interviewer-coded perceptions of race and respondents' self-identification (Saperstein et al. 2015). Similarly, research on sexuality distinguishes between sexual attraction, behavior, and identity (Geary et al. 2018, Sexual Minority Assessment Research Team 2009. Wolff et al. 2017). Although multiple measures are almost certainly better (Saperstein et al. 2015, Saperstein and Westbrook 2021, Westbrook and Saperstein 2015), surveys often only have space for one measure. When there is only one measure, political researchers generally use identity-based definitions to study public opinion. This approach has a theoretical basis in social identity theory and political behavior research that emphasizes identities as key to understanding political behavior (for a useful review, see Achen and Bartels 2016).

Survey researchers should identify transgender and nonbinary respondents by following the same identity-based approach used for studying other social groups. However, recent proposals for improving the measurement of trans and non-binary identities in survey research fall short of this standard. These proposals tend to fall into two camps. The first camp recommends a "two-step approach" that includes gender identity and assigned sex at birth (usually referencing the respondent's original birth certificate) questions (Badgett et al., 2014; Kronk et al., 2022;

Saperstein and Westbrook, 2021).[7] Researchers then identify transgender respondents ascriptively by coding whether their gender identities "match" their assigned sex. By this standard, *all* nonbinary people are transgender. Indeed, this is the format that the 2021 Canadian Census employed in the first Census to officially count trans and non-binary people (Statistics Canada, 2022). Some prominent "best practices" reports that advocate the two-step approach also recommend offering transgender as a separate, mutually exclusive gender identity response option from male and female to be inclusive of transgender people (Badgett et al. 2014, National Academies of Sciences, Engineering, and Medicine 2022). The second camp recommends revisions for improving single-item measures of gender identity, such as by adding an additional non-binary category (Medeiros, Forest, and Öhberg, 2020) or moving to an open-ended question (Fraser, 2018; Fraser et al., 2020). Under this approach, transgender men and women can only identify themselves specifically as transgender if they volunteer that information in open-ended response categories.

Conceptually, both camps do not treat gender identity and transgender identity as analytically distinct and politically relevant social identities. The first camp does not treat transness as a social identity but as something to ascribe based on a "mismatch" between assigned sex and gender identity. In addition, best practices reports within the first camp often do not treat gender identity and transgender identity as analytically distinct. Instead, they conflate these identities by including "transgender" as a gender identity category alongside "male/man" or "female/woman." The second camp—likely unintentionally—does not treat

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[7] Kronk et al. (2022) propose an alternative question that avoids asking about assigned sex directly, which is worth evaluating further.

transgender identities as politically relevant by leaving it to transgender respondents to volunteer that information in open-ended response categories. These conceptual errors are also likely to introduce measurement error, as we discuss in the following sections.

Measurement Error Under Ascriptive Approaches

Ascriptive approaches to identifying transgender respondents are likely to include many respondents that do not consider themselves transgender. For example, some men and women assigned female and male (respectively) at birth may simply describe themselves as men and women without identifying as transgender. Similarly, ascriptive approaches count nonbinary people as transgender, regardless of whether they self-categorize themselves as transgender. As we show below, most non-binary respondents in the 2021 CES *do not* self-categorize themselves as transgender. Saperstein and Westbrook (2021) find that they can identify more transgender respondents using the ascriptive approach than through direct questions about whether respondents are transgender. This result should not be a surprise because these questions measure different concepts of who "counts" as transgender and only some people who have gender identities that do not match their assigned sex will take on transgender as a social identity. As a result, if researchers are interested in studying "transgender" as a social identity, they will mismeasure the concept if they use the traditional two-step approach.

The traditional two-step approach may also introduce measurement error by asking about something trans and non-binary respondents often view as invasive—assigned sex (Holzberg et al., 2017; Roundy, 2022). Flores et al. (2021) present some evidence to support this using a pooled 2017-2018 National Crime

Victimization Survey dataset. They find that 12 percent (51 of 420) of transgender respondents do not respond to that survey's assigned sex question. We have good reasons to believe this estimate undercounts nonresponse. This survey uses a two-step approach that has an assigned sex question and a gender identity question with the responses male, female, transgender, or none of these. Flores et al. (2021) classify respondents as transgender if their assigned sex is male and their gender identity is female, their assigned sex is female and their gender identity is male, or their gender identity is transgender. That is, all the respondents who are identifiably transgender and did not respond to the assigned sex question selected "transgender" in the gender identity question. This approach potentially undercounts non-response to assigned sex questions among transgender respondents. Some transgender men and women may simply have refused to answer the assigned sex question and then selected "male" or "female" on the gender identity question. Flores et al.'s (2021) approach would miss this kind of non-response. There is also the possibility that some transgender respondents simply would not have completed the survey because of these questions (unit non-response). As a result, the true amount of non-response is likely even higher than Flores et al. (2021) estimate.

Measurement Error in Gender Identity Questions with Transgender Response Options

Some best practices reports advocating the two-step approach also recommend conceptually-misguided gender identity questions that include "Trans(gender)" as a separate, mutually-exclusive response option separate from "Male/Man" or "Female/Woman" (Badgett et al., 2014; National Academies of Sciences, Engineering, and Medicine, 2022). These recommendations are

conceptually misguided because they treat "Trans(gender)" as a gender identity like being a man or a woman. "Trans(gender)" is not an additional or "third gender" category. Instead, it is an identity that refers to an individual's experience of how their gender identity relates to their assigned sex at birth (Ashley, 2022). As a result, it is not mutually exclusive with being a man or a woman.

These questions are particularly likely to introduce measurement error into the estimates of both trans and non-binary respondents. First, trans and non-binary respondents generally find this question objectionable (Holzberg et al., 2017; Roundy, 2022). It suggests that being trans and being a man or a woman are mutually exclusive–that is, that trans men and women are not really men or women. This is invalidating to trans men and women. It also suggests to trans and non-binary people that survey researchers are not familiar with basic concepts relevant to their lives (Roundy, 2022). As a result, it may increase item or unit non-response among trans and non-binary people. Second, this type of question forces trans men and women to choose between identifying as trans or as men and women. As a result, trans men and women are necessarily misclassified as either not men or women (if they select "Transgender") or as not transgender (if they select "Male" or "Female"). Third, when these questions provide only three options (Male/Female/Transgender), people who do not identify as men or women may not have any option that accurately reflects their gender identity. In the 2021 Census of Canada, about two-thirds of respondents who were neither men nor women selected some variation of non-binary as their preferred identity label (Statistics Canada, 2022). In addition, many non-binary people do not identify with the term transgender, which means that

even the alternative to "Male/Man" and "Female/Woman" may not resonate with them.[8]

Measurement Error in Single-Item Gender Identity Proposals

Single-item gender identity questions that replace the separate "Transgender" response option with a "Non-Binary" response option (Male or Man/Female or Woman/Non-Binary format) or use an open-ended gender identity question are less likely to mismeasure trans men and women's gender identities, but they are likely to undercount trans men and women. Some trans men, for example, may write into open-ended response boxes that they are a "transgender man." However, when researchers ask trans men and women about their sex, gender, or gender identity, many of them simply select "Male/Man" or "Female/Woman" (Kronk et al., 2022, 5). As a result, these questions may correctly categorize trans men and women as men and women, respectively. However, they do not allow researchers to examine the experiences of trans men and women separately from cis (non-trans) men and women. Many of the trans men and women in the sample would be simply invisible because relatively few of them may self-identify in an open-ended response category.

This under-estimation problem is not just an issue in large-sample online surveys where there may be large enough subsamples of trans men and women to analyze separately. If researchers want to identify LGBTQ+ respondents, then they

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[8] [8] In the 2021 CES, we find that only 35 percent of non-binary respondents responded "Yes" to the question, "Are you transgender?" The other 65 percent responded "No" (48 percent) or "I don't know" (18 percent). Under the traditional two-step approach, all non-binary respondents are classified as transgender because their gender identity *cannot* match their assigned sex at birth (male or female). Given that most of the non-binary respondents do not identify as transgender, a social identity approach is likely to produce very different estimates of who "counts" as transgender than an ascriptive approach.

need to have some way to identify trans men, trans women, and non-binary people even in surveys with more typical sample sizes, such as 600-2,000 respondents.

Revising the Two-Step Approach

We argue one way to address these conceptual and methodological issues is to use an alternative version of the two-step approach. Unlike the traditional two-step approach, our alternative does not include an assigned sex question and a gender identity question. Instead, it follows up a gender identity question with a transgender identity question that better reflects the underlying concept of interest—transgender as a social identity. Our proposed gender identity question avoids the conceptual and measurement errors involved in including "Trans(gender)" as a separate close-ended gender identity response category alongside "Male/Man" and "Female/Woman" by using the more common "Non-binary" as a third close-ended response option and offering an open-ended response option to allow respondents to identify themselves as "Another gender." We expect this alternative approach to produce lower measurement error than approaches that treat "Trans(gender)" as a separate, mutually exclusive response option alongside "Male/Man" and "Female/Woman" and do not include a separate transgender identity question.

Data and Methodology

We draw on two large-sample online surveys conducted during the 2019 and 2021 Canadian federal election campaigns, the 2019 CES ($N = 37,822$) and the 2021 CES ($N = 20,968$). The 2019 and 2021 CES aim to represent Canadian citizens and permanent residents aged 18 or older on election day. The 2019 and 2021 CES have quota targets stratified by region (Atlantic, Quebec, Ontario, Prairies,

and British Columbia), and balanced on gender and age within each region.[9] Finally, targets were used for language (nationally, within Quebec, and within the Atlantic region). Importantly, the studies were both designed by the same team of investigators, and there is substantial overlap in the content of both survey instruments.

Due to their large sample sizes, these surveys have relatively large trans and non-binary sub-samples relative to traditional general population surveys. Importantly, however, we do note that the number of trans and non-binary respondents is still small enough in absolute terms that randomizing gender identity questions within a single survey may cut power too much to do meaningful analysis on correlates of identity.

The 2019 CES uses a three-option gender identity question that explicitly lumps together trans, non-binary, Two-Spirit, and other gender minority respondents into a category other than "Man" or "Woman." At the beginning of the first wave of the 2019 CES online panel, respondents see the following gender question:

Are you...?

A man

A woman

Other (e.g. Trans, non-binary, two-spirit, etc.)

This question is mandatory to proceed with the survey. Respondents must select one and only one of these answers. The "Other" category is unusual in explicitly mentioning trans, non-binary, and Two-Spirit respondents. While the 2019 CES provides an explicit option for non-binary respondents, we expect it to have similar

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[9] The gender quotas were based on man/woman quotas, and all people who identify as "Other" (2019) and "non-binary" or "another gender" (2021) were accepted into the sample.

measurement error problems to other surveys that include "Trans(gender)" as a separate, mutually-exclusive response option from "Male/Man" and "Female/Woman." That is, we expect that the 2019 CES will have a substantial number of trans men and women who select response options other than "Man" or "Woman," which will artificially inflate the "Other" category by including respondents who identify as men or women.

The 2021 CES online panel uses a new two-step approach that addresses many of the issues with single-item gender measures while adopting a self-categorization approach to measuring transgender identity. It presents respondents with a multiple category gender identity question followed immediately by a transgender identity question:

Are you...?

A man

A woman

Non-binary

Another gender, please specify: _____

Are you transgender?

Yes

No

Don't know/Prefer not to say

These questions appear on the same page in the 2021 CES online survey so that trans men and women know in answering the gender identity question that they can self-identify as transgender in the following question. This modified two-step approach allows for the identification of non-binary people as well as trans men and

trans woman as compared to cis men and women, allowing researchers to explore the consequences of transgender and non-binary identities for political behavior.

We construct common variable codings for standard demographic and political variables to compare the measurement approaches in the two surveys. The overwhelming majority of these variables draw on questions that are common to both surveys, including items about age, education, income, province/territory of residence, language of questionnaire, mother tongue, country of birth, citizenship status, religious identity, community size, party identification, vote intention, and attitudes toward lesbians and gay men. The 2019 and 2021 CES have different questions about racial and sexual identity. We recode them to have common categories. We describe the question wording and coding scheme for these variables in more detail in Appendix A.

The shared questions and variable coding across the 2019 and 2021 CES allow us to conduct three types of analyses that illustrate the consequences of the measurement strategy in the two surveys. First, we compare the estimates of the percentage of respondents who identify as neither men nor women. Second, we compare the correlates of non-binary identity across the two surveys to examine whether these two approaches produce different results about the demographics of non-binary respondents. Third, we pool the two surveys together and use cross-survey multiple imputation to estimate the percentage of "Other" respondents in 2019 that are actually trans men or women. Researchers have used cross-survey multiple imputation to simulate how respondents would have responded if they had taken a survey using a different mode (Kolenikov and Kennedy, 2014; Park et al., 2016; Peytchev, 2012; Powers et al., 2005) or how they would have responded if they had received an alternative questionnaire (Eckman, 2020).

Both the 2019 and the 2021 CES include raked weights on age, gender, education, and province or territory of residence based on the 2016 Census.[10] For respondents who do not select "man" or "woman," the population target is effectively zero percent because the 2016 Census measures binary "sex." While this target is obviously lower than the actual non-binary population, the weighted estimates nonetheless correspond better to the preliminary 2021 Census targets than the unweighted estimates.[11] For this reason, our analyses include weights.

Estimating the Percentage of Non-Binary Respondents

We examine whether the 2019 CES "Other" category inflates the number of non-binary respondents with trans people who would have otherwise identified as men or women by comparing the percentage of respondents classified as neither men nor women across the 2019 and 2021 CES. The two surveys differ substantially in the percentage of respondents who identify as "Other" or "Non-Binary." Table 1 shows the number of respondents and the unweighted and weighted percentage of respondents who identify as men, women, and "Other" (in 2019) or "Non-Binary" or another gender identity (in 2021), along with the number and percentage of missing data. We recode the 35 respondents who select "Another gender, please specify" in

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[10] Unfortunately, we cannot construct weights using the 2021 Census because Statistics Canada has only released population data on some of these variables.

[11] The 2019 CES weights produce an estimate of "Other" gender respondents (0.3 percent) that is similar to the 2021 Census data on trans and non-binary people (0.33 percent). The 2021 CES weights produce a higher estimate of the trans and non-binary population (one percent, of whom 30 percent are non-binary) than the 2021 Census (0.33 percent, of whom 41 percent are non-binary). This higher estimate of the non-binary population size in 2021 is not necessarily concerning, for two reasons. First, the percentage of people who identify as trans and non-binary is increasing over time as younger generations are increasingly likely to identify as non-binary. Second, the 2021 Census' traditional two-step approach may under-estimate the trans and non-binary populations because (1) its "sex at birth" question may produce item or unit non-response among trans and non-binary people who find the question offensive, (2) trans and non-binary people may distrust the government and be unwilling to "out" themselves to the government or researchers, and (3) the household questionnaire may lead to situations where someone erroneously reports a trans or non-binary person's "sex" or "gender identity" because that person is not out to them as trans or non-binary.

2021 based on their open-ended responses. The details of the recoding are

available in Appendix B.

Table 1: Number, Unweighted Percentage, and Weighted Percentage of Respondents, by Gender Identity, 2019 and 2021 CES

Year	Gender Identity	N	% (Unweighted)	% (Weighted)
2019	Man	15,551	41.1	48.4
	Woman	21,980	58.1	51.3
	Other	291	0.8	0.3
	Missing	0	–	–
2021	Man	9,480	45.2	48.4
	Woman	11,378	54.3	51.3
	Non-Binary	99	0.5	0.3
	Missing	11	<0.1	<0.1

Table 1 shows some similarities between the 2019 and 2021 CES in terms of

the percentage of men, women, and non-binary people. Both the 2019 and 2021

CES over-represent women and under-represent men relative to the 2016 Census in

the unweighted percentages. However, the two surveys differ substantially in the

percentage of respondents who select a category other than "man" or "woman" - 0.8

percent of respondents to the 2019 CES selected the "Other" response, while only

0.5 percent of 2021 CES respondents selected the non-binary response.[12] (The

weighted percentage yields an estimate of 0.3 percent in both surveys, but this

similarity in weighted percentages in unsurprising given that the weighting procedure

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[12] An additional 0.5 percent of the 2021 CES sample is trans men and women.

is the same across the two surveys.) This discrepancy in the unweighted

percentages of "non-binary" respondents is surprising if the non-binary population

share is increasing over time. As a result, this discrepancy is suggestive evidence

that the 2019 CES gender identity question does not solely measure non-binary

identity but includes some people who identify as trans and/or Two-Spirit but not

non-binary.

In Appendix C, we present additional evidence that some trans and Two-Spirit

men and women select the "Other" category by examining the gender identity

responses selected by 2019 respondents who identify as trans or Two-Spirit in the

sexual identity open-ended question. These respondents generally select the "Other"

category.

Correlates of Non-Binary Identity in 2019 and 2021 CES

The 2019 CES question wording not only inflates the number of respondents

who do not identify as men or women but also distorts the correlates of identifying as

neither a man nor a woman. We show this by comparing the correlates of identifying

as "Other" in the 2019 CES and non-binary in the 2021 CES. We focus on four

correlates on which we find significant differences between the 2019 and 2021 CES:

age, sexual identity, party identification, and attitudes toward lesbians and gay men

(LG).[13]

We present a series of figures that plot the estimated percentage of (1) 2019

"Other" respondents, (2) 2021 trans and non-binary respondents, (3) 2021 non-

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[13] In the Supplementary Materials, we include additional analyses of other demographic variables, including education, income, country of birth, race, mother tongue, and region that do not differ significantly across the two surveys. We also include comparisons of the 2019 "Other" respondents and the 2021 non-binary respondents with other published data sources, including the 2019 Trans PULSE Survey's non-binary sub-sample (Bauer 2021b) and Census data, which support our claims about age and sexual identity.

binary respondents only, and (4) 2021 trans men and women respondents only

(pooled together for sample size) within age, sexual identity, and party identification

categories. Given that relatively small percentages of these groups may fall within

particular categories, we use Wilson confidence intervals rather than the more

commonly-used Wald confidence intervals.[14] Past work on confidence intervals for

small proportions indicates that Wilson confidence intervals typically produce better

estimates than normal approximations of confidence intervals for small proportions

(Newcombe, 1998; Vollset, 1993). We transform these proportions into percentages

and estimate them using the 2019 and 2021 CES raked campaign period weights.

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[14] By construction, Wilson confidence intervals always produce values between 0 and 1, while Wald confidence intervals can fall outside of the range between 0 and 1. As a consequence, Wilson confidence intervals tend to be asymmetric around the estimate with longer bounds on the side of the estimate closer to 0.5 and shorter bounds on the side of the estimate further away from 0.5.

Figure 1: Estimated Percentage of Respondents by Age Category, 2019 Other Respondents, 2021 Trans and Non-Binary Respondents, 2021 Trans Men and Women Respondents, and 2021 Non-Binary Respondents
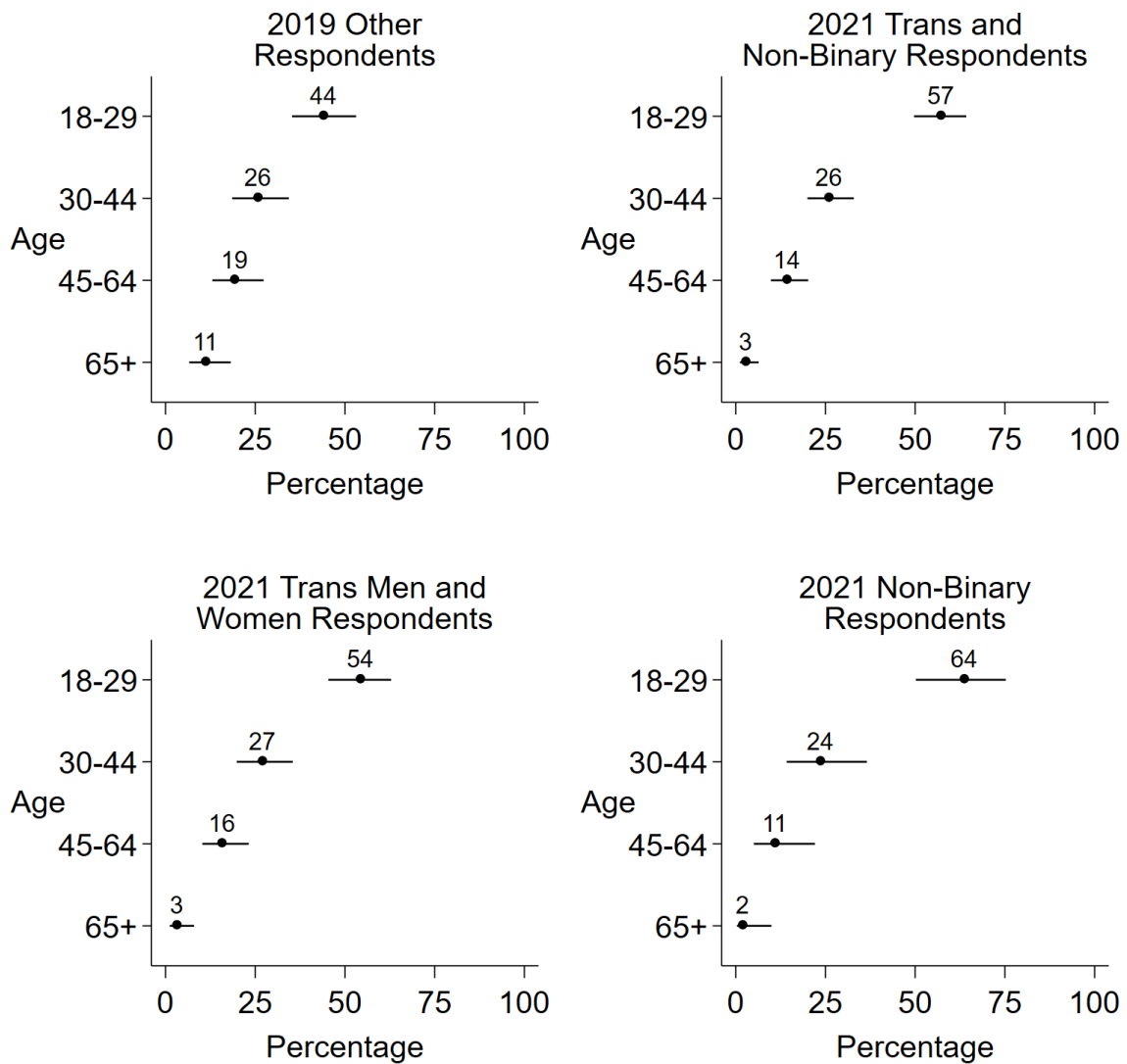

Figure 1 displays the estimated percentages of 2019 "Other" respondents, 2021 trans and non-binary respondents, 2021 trans men and women respondents, and 2021 non-binary respondents within a common set of age categories (18-29, 30-44, 45-64, 65+). Figure 1 shows that all four sets of respondents skew young, especially to ages 18-29. However, the 2021 non-binary respondents are much more likely to be 18-29 than both the 2019 "Other" respondents and the 2021 trans men and women respondents. If anything, the 2019 "Other" respondents most resemble

the 2021 trans men and women respondents rather than the 2021 non-binary respondents. The 2019 "Other" respondents also have a higher share of people 65 and older than any of the 2021 groups. One possible explanation for these results is that the 2019 "Other" respondents may include a substantial number of trans men and women as well as non-binary people.

As an additional check, we run Kolmogorov-Smirnov tests to examine whether (1) the 2019 "Other" respondents and the 2021 non-binary respondents and (2) the 2021 trans men and women respondents and the 2021 non-binary respondents come from the same underlying distribution on age. We find that the age distribution of the 2021 non-binary respondents skews younger than the 2019 "Other" respondents ($p < 0.05$). Similarly, we find that the 2021 non-binary respondents' age distribution is younger than the 2021 trans men and women respondents ($p < 0.05$). This result fits with evidence that non-binary people are younger than trans men and women (Statistics Canada, 2022).

Figure 2: Estimated Percentage of Respondents by Sexual Identity, 2019 Other Respondents, 2021 Trans and Non-Binary Respondents, 2021 Trans Men and Women Respondents, and 2021 Non-Binary Respondents
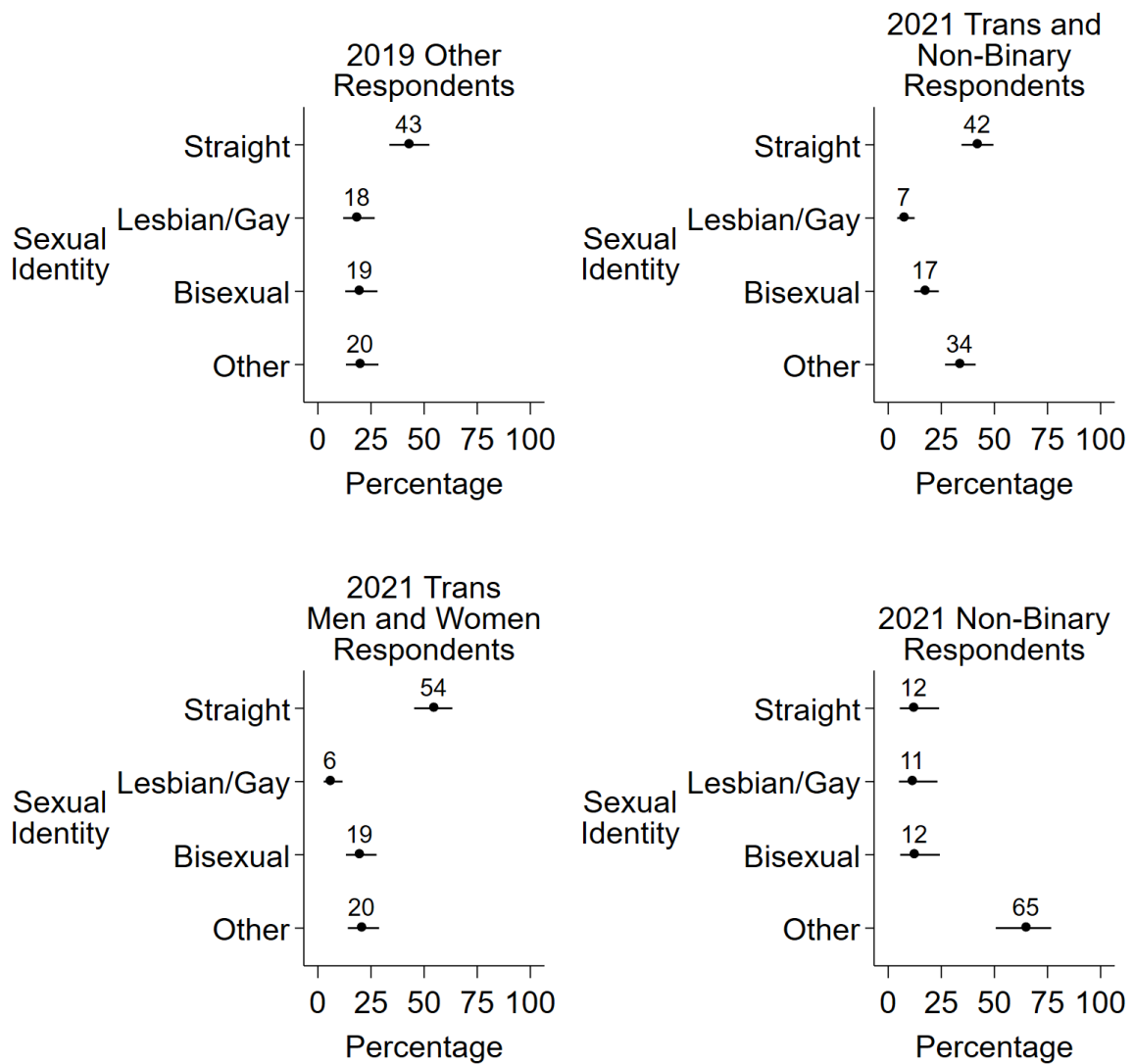

Figure 2 shows a similar plot for sexual identity. The 2019 "Other" respondents are almost half straight or heterosexual respondents, while the remaining respondents are evenly split among lesbian or gay, bisexual, or other sexual identities. (The other category includes substantial numbers of respondents who write in queer, pansexual, or asexual identities.) The 2021 trans and non-binary respondents look similar, though fewer of them are lesbian or gay and more of them choose the other sexual identity option than the 2019 "Other" respondents. The 2021

trans men and women respondents are majority straight or heterosexual, though a substantial number report bisexual or other sexual identities. Finally, the 2021 non-binary respondents overwhelmingly choose "other" sexual identity.

Past work shows that non-binary people are overwhelmingly not straight or heterosexual (Bauer, 2021a,b; James et al., 2016; Wilson and Meyer, 2021). This result makes the 2021 non-binary respondents' sexual identity responses reassuring. However, the sexual identity results among the 2019 "Other" respondents indicate that this response category is unlikely to capture only non-binary respondents. Kolmogorov-Smirnov tests indicate that (1) the 2019 "Other" respondents and the 2021 non-binary respondents and (2) the 2021 trans men and women respondents and the 2021 non-binary respondents come from different underlying distributions (p < 0.05 in both cases). Given that trans men and women are much more likely to identify as straight or heterosexual, we take these findings as evidence that the 2019 CES question pushes trans men and women to select the "Other" category.

If we assume that the 2019 "Other" respondents are either (1) trans men or women or (2) non-binary people, we can use data from a restricted sample of trans men, trans women, and non-binary respondents in the 2021 CES and Bayes' Rule to generate an estimate of the percentage of trans men and women among the 2019 "Other" respondents. This analysis suggests that 60 percent of the 2019 CES "Other" respondents may actually be trans men or women. (See the Supplementary Materials.) This estimate is similar to our multiple imputation results, as we describe below.

Figure 3: Estimated Percentage of Respondents by Party Identification, 2019 Other Respondents, 2021 Trans and Non-Binary Respondents, 2021 Trans Men and Women Respondents, and 2021 Non-Binary Respondents
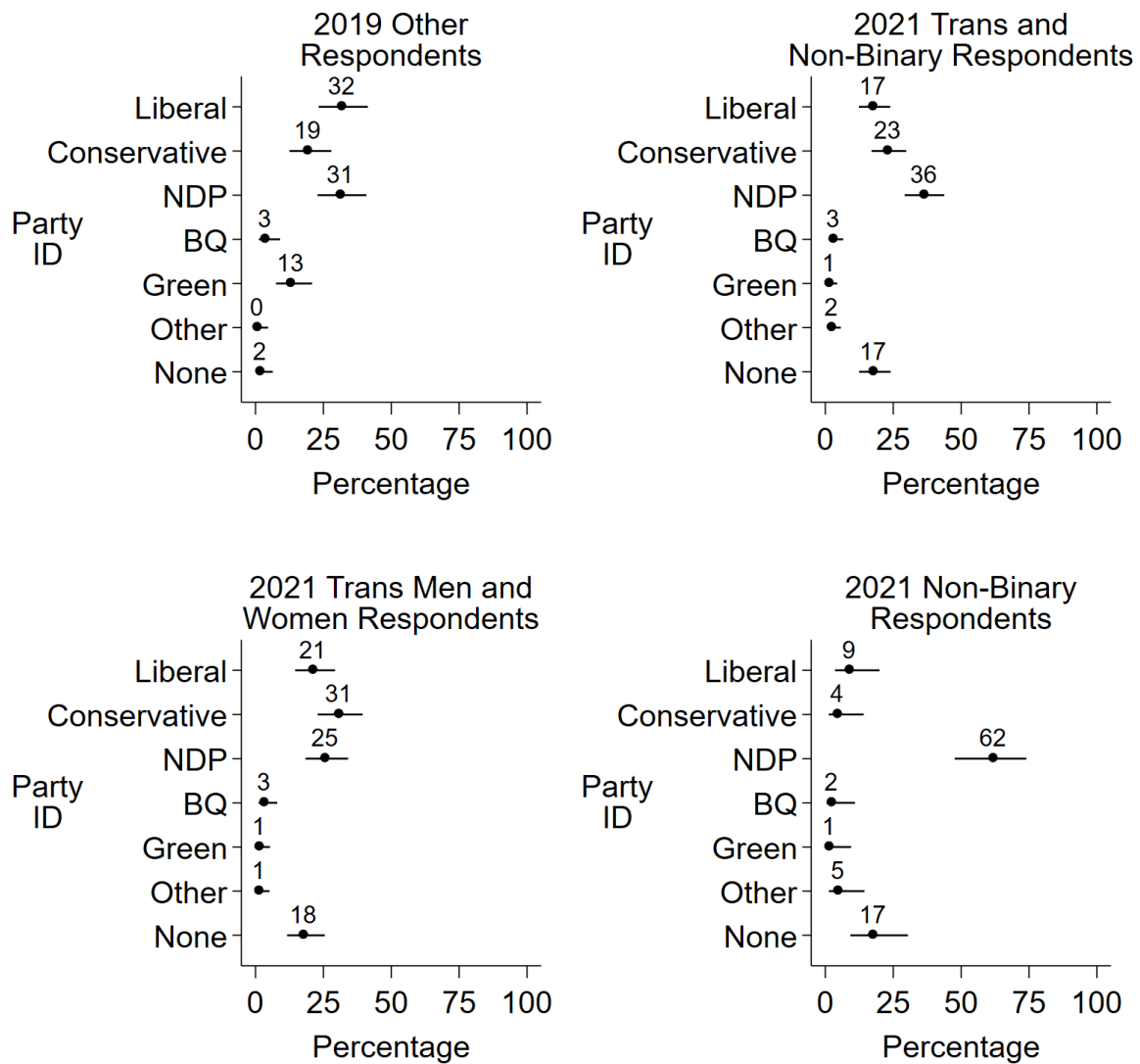

Figure 3 displays the percentage of respondents who identify as non-binary by party identification. We again find clear differences between the 2019 "Other" respondents and the 2021 non-binary respondents. The 2019 "Other" respondents are about equally as likely to identify with the left-of-centre Liberals or the social democratic NDP, but the 2021 non-binary respondents overwhelmingly identify with the NDP. The 2019 "Other" respondents are also more likely to identify with the Conservatives than the 2021 non-binary respondents. Using Kolmogorov-Smirnov

tests, we find that (1) the 2019 Other respondents and the 2021 non-binary respondents and (2) the 2021 trans men and women respondents and the 2021 non-binary respondents come from different underlying distributions ($p < 0.05$ in both cases). Of course, we acknowledge that it may be somewhat unrealistic to assume that the 2019 and 2021 respondents would necessarily come from the same underlying distribution. Party identification may still be developing for some trans and non-binary respondents, especially given how many of them are young. However, the magnitude of the differences between the 2019 Other respondents and the 2021 non-binary respondents is difficult to attribute to changes in party identification only over such a short time period. Instead, a simpler explanation is that the 2019 Other respondents include a substantial number of trans men and women respondents who are less likely to identify with the NDP.

Finally, we compare attitudes toward lesbians and gay men (LGs) by gender identity in each year. We use a feeling thermometer toward "gays and lesbians" (0-100) that appears in the post-election wave of both the 2019 and the 2021 CES. In Figure 4, we plot each respondent's feeling thermometer rating of "gays and lesbians" by gender identity and year using pairwise deletion to handle missing data. We jitter the values of the feeling thermometer along the x-axis to make it easier to see the individual points. We include a horizontal line at the mean for each group. Figure 4 indicates that all four comparison groups are generally positive toward gay men and lesbians. However, a two-sided t-test indicates that the 2021 non-binary respondents are substantially more positive toward lesbians and gay men than the 2019 "Other" respondents ($d = 9.3$, $p = 0.03$). We can explain this discrepancy between the 2019 and the 2021 results using the information provided in the top right panel in Figure 4, which shows trans men and women provide lower feeling

thermometer responses toward lesbians and gay men than non-binary people do in the 2021 CES (d = -9.9, p = 0.03). Overall, the means and distributions in Figure 4 suggest that 2021 trans men, trans women, and non-binary people are a better comparison group for the 2019 "Other" respondents than the 2021 non-binary respondents alone.

Figure 4: Feeling Thermometer Toward "Gays and Lesbians," 2019 Other Respondents, 2021 Trans and Non-Binary Respondents, 2021 Trans Men and Women Respondents, and 2021 Non-Binary Respondents
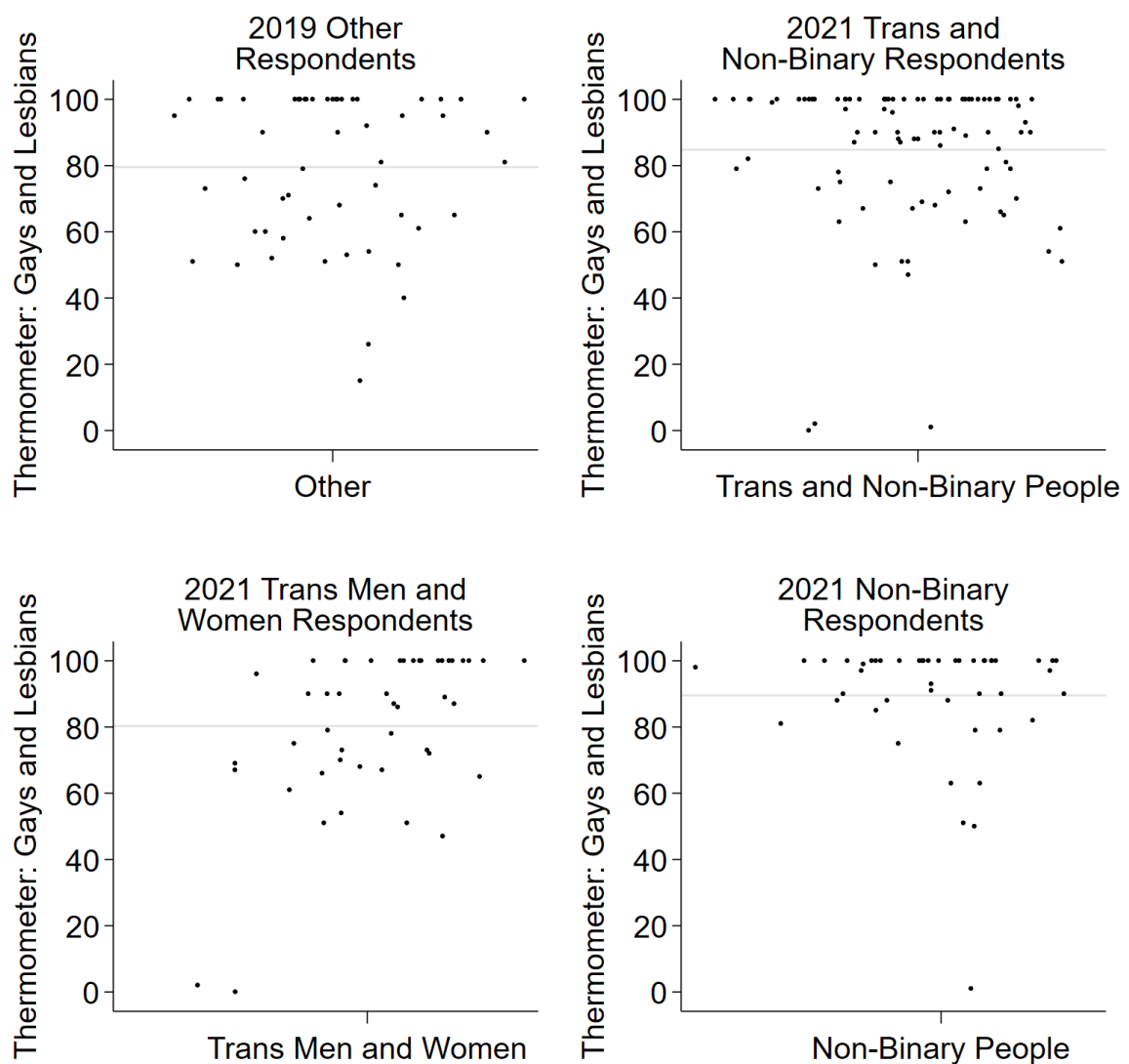
This analysis shows four major discrepancies between the 2019 "Other" respondents and the 2021 non-binary respondents. The 2019 "Other" respondents

are older, more likely to be straight or heterosexual, more likely to identify with the Liberals and Conservatives, less likely to identify with the NDP, and more negative toward lesbians and gay men than the 2021 non-binary respondents. When we compare the 2021 trans men and women respondents and the 2021 non-binary respondents, we find that trans men and women are older, more likely to be straight or heterosexual, more likely to identify with the Liberals and Conservatives, less likely to identify with the NDP, and more negative toward lesbians and gay men than non-binary people. As a result, we have strong reasons to suspect that some of the 2019 "Other" respondents are actually trans men and women who selected the "Other" response, especially given the "Other" category specifically mentioned trans people as falling under that category.

Multiple Imputation to Identify Trans Men and Women Among the 2019 "Other" Respondents

Although we have documented evidence that (1) the 2019 gender identity question inflates the size of the "Other" category and (2) the 2019 "Other" respondents differ from the 2021 non-binary respondents on age, sexual identity, party identification, and attitudes toward LGs in exactly the ways you would expect if trans men and women selected the "Other" category, we do not know how many of the 2019 "Other" respondents are trans men and women rather than non-binary people. We estimate the extent to which the 2019 CES over-estimated the percentage of non-binary respondents by constructing counterfactual estimates of how the 2019 "Other" respondents would have responded to the 2021 CES gender identity and trans identity questions if they had received them. We do this using multiple imputation with chained equations (MICE).

We treat the ambiguity in the 2019 CES as a missing data problem in which some of the "Other" respondents are non-binary and others are actually trans men or women. We restrict the data to 2019 "Other" respondents and 2021 trans or non-binary respondents. We code the quantity of interest ("non-binary") as 0 for trans men and women and 1 for non-binary people. This variable is non-missing for all 2021 respondents and six 2019 respondents who identified as trans men, trans women, or non-binary in the open-ended sexual identity response category (two trans men or women and four non-binary respondents) but is missing for the remaining 2019 "Other" respondents. We address this missing data problem using MICE. We construct 100 multiply-imputed datasets. We implement the imputation in Stata using -ice- (Royston, 2004; Royston and White, 2011), then we estimate the percentage of trans men and women respondents among the 2019 "Other" respondents using -mi-. This model necessarily assumes the non-binary dummy variable is missing at random and that the predictors of identifying as non-binary as opposed to as a trans man or woman are the same across 2019 and 2021. We construct two different multiple imputation models. In Model 1, we include variables common to the 2019 and 2021 campaign period surveys and predict whether respondents are (1) trans men and women (pooled together) or (2) non-binary. (We pool trans men and women together due to the size of these sub-samples.) These variables include four variables for which there is no missing data – age, region, language of questionnaire, and citizenship. They also include variables from the pre-election waves that are predictive of being a trans man or trans woman over being non-binary, including sexual identity, party identification, education, income, country of birth, francophone, and religious identity, along with the quantity of interest (non-binary). In Model 2, we add two variables from the post-election waves – the feeling

thermometer for "gays and lesbians" (0-100) and community size. We provide details

on the coding of the variables included in these models in the Supplementary

Materials.

Figure 5: Estimated Percentage Miscoded Trans Men and Women Respondents Among 2019 "Other" Respondents, Multiple Imputation Models
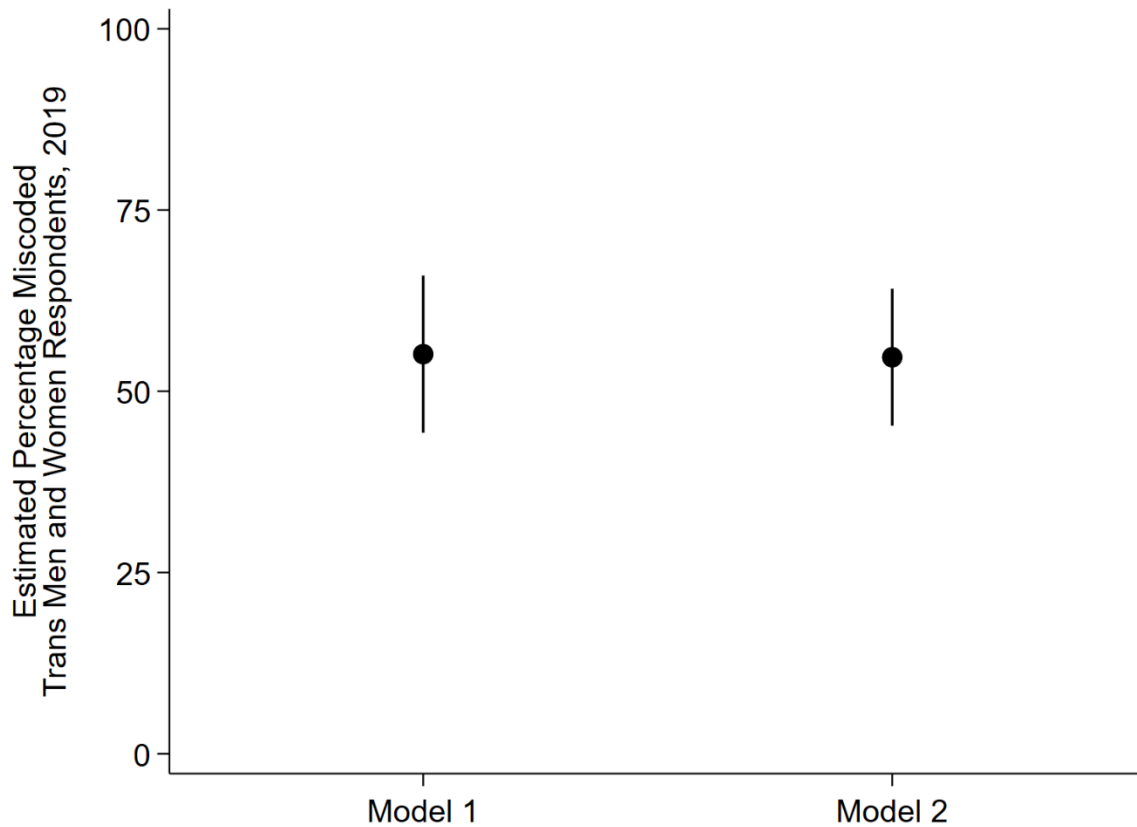

Figure 5 displays the estimated percentage of trans men and women

erroneously captured through the gender identity question, along with 95 percent

confidence intervals. Both models suggest that a substantial percentage of the 2019

"Other" respondents are trans men or women, rather than non-binary people. Both

models estimate that a majority of respondents who choose "Other" in 2019 are trans

men or women, rather than non-binary people (55 percent in both models). The point

estimates from these models are similar to the 2021 Census data, which suggest

that, of the trans and non-binary population, 59 percent are trans men and women while 41 percent are non-binary people (Statistics Canada, 2022). The lower bound of the confidence intervals falls below 50 percent, but even the lower bound of the estimates suggests that over 40 percent of the 2019 "Other" respondents are trans men or women rather than non-binary people (44 percent in Model 1 and 45 percent in Model 2). We conclude based on these results that the 2019 CES question wording overestimates the percentage of non-binary respondents.

We recognize, of course, that the 2019 CES question wording, which explicitly mentions "Trans" in the "Other" category, may be particularly likely to push trans men and women respondents to select "Other." However, we contend the problem we have identified above is likely to exist in any survey that forces trans men and women to choose between identifying as trans or identifying as men and women by listing "trans(gender)" as a separate, mutually-exclusive response option within a gender identity question. If we want to include trans and/or non-binary communities in survey research, we need to recognize that it is possible to be both trans and a man or a woman, as well as neither a man nor a woman.

Discussion

In this article, we argue political researchers ought to conceptualize gender identity and transgender identity as analytically distinct and politically relevant social identities. We show through a critical review of recommendations for improving the measurement of sex/gender in survey research that existing proposals fall short of treating the two concepts as analytically distinct, politically relevant, and/or social identities. We argue that these underlying conceptual choices, along with other

features of the questionnaires, are likely to introduce measurement error in identifying transgender and nonbinary respondents.

We then illustrate some potential consequences of not treating gender identity and transgender identity as analytically distinct and politically relevant social identities by comparing a survey that does not meet this standard (the 2019 CES) with one that does (the 2021 CES). Our comparison of the two surveys suggests the 2019 CES question wording, which treats "trans(gender)" as a mutually-exclusive category separate from "man" and "woman," distorts estimates of the non-binary population size and correlates of non-binary identity. The 2019 CES "Other" responses generate higher estimates of the non-binary population than the 2021 CES non-binary responses, even though we would expect the non-binary population to have increased, or at least not shrunk, from 2019 to 2021. Our comparisons of the correlates of identifying as "Other" in 2019 and non-binary in 2021 suggest that the 2019 CES question wording alters the relationships between non-binary identity and age, sexual identity, party identification, and attitudes toward lesbians and gay men. Finally, our results from pooling the 2019 CES "Other" respondents and the 2021 trans and non-binary respondents together and imputing whether 2019 CES respondents were trans men and women or non-binary suggest the 2019 CES "Other" category is almost 55 percent trans men and women, rather than non-binary people. This measurement error inflates the size of the non-binary population by over a factor of two.

Based on our critical review and experience with the 2019 and 2021 CES, we make three recommendations for questionnaire design in political surveys. First, we recommend *against* including questions on assigned sex. If researchers identify transgender respondents by ascribing this identity onto anyone whose gender

identity does not match their assigned sex, they are not conceptualizing

"transgender" as a social identity, and they are treating transgender and nonbinary

people differently from how political researchers typically treat identity groups in

survey research. Although some scholars have argued that asking about

transgender identity directly may introduce some measurement error in comparison

with relying on assigned sex measures (Saperstein and Westbrook, 2021), assigned

sex questions likewise show evidence of non-response problems among

transgender respondents (Flores et al., 2021) and perform poorly among

transgender and non-binary participants in focus groups (Holzberg et al., 2017;

Roundy, 2022).[15] The traditional two-step approach likewise will over-estimate the

percentage of respondents who identify as transgender by counting some people

whose gender identities do not match their assigned sex but do not identify as

transgender. This includes many non-binary respondents. In fact, most non-binary

respondents in the 2021 CES do *not* identify as transgender, even though the two-

step approach always counts them as such. Given that identities are central to

understanding political attitudes and behavior (Achen and Bartels, 2016), we need to

understand how transgender and non-binary *identities* shape political attitudes and

behavior. It is not necessary to use such measures in public opinion surveys when

there is another option that more closely corresponds to the theoretical construct of

interest (that is, social identity).[16]

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[15] We argue that, if there are measurement problems with transgender identity questions, the solution is not to turn to assigned sex questions. Instead, we need to keep the underlying conceptualization of transgender and nonbinary as social identities and then improve the measurement of these identities.
[16] Future researchers may wish to ask multiple measures, such as an assigned sex question and a transgender identity question, to understand the demographic and political correlates of people who are generally considered to be transgender but who do not identify as such in the same way sexuality research examines men who have sex with men but self-identify as straight or heterosexual.

Second, we recommend that survey researchers avoid gender identity questions that present "Man/Male," "Female/Woman," and "Trans(gender)" as mutually-exclusive response options. Although the 2019 CES differs from other surveys in combining "Trans" into a broad "Other" category, it still illustrates the measurement error we expect under our conceptual argument. If researchers add other close-ended response categories to their gender identity questions, they should instead include a non-binary response option, which is by far the most common gender identity among people who do not identify as men or women (Statistics Canada, 2022).

Third, we recommend large-scale population surveys adopt a two-step approach that includes a gender identity question with an explicit non-binary response option and an open-ended response option followed on the same screen by a transgender identity question as fielded in the 2021 CES. This combination of questions helps mitigate the possibility that some trans men or women will select a gender identity option other than their actual gender identities as men and women, which is likely to improve measurement over single-item gender identity measures. It is consistent with how these communities self-identify. Most importantly, these questions are essential for understanding who trans and non-binary people are and how they think about and engage in politics.

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Appendix A: Description of Variable Coding

Most of the variables used in this study use the same question wordings across both the 2019 and the 2021 CES. Table A1 describes the question wording and variable coding for these common questions. However, the 2021 CES adopted new questions on sexual identity and racial and ethnic identity. Table A2 describes the question wordings in the 2019 and 2021 CES along with the common variable coding used to bridge the differences in question wording.

Table A1: Description of Variables Coded Based on Shared Questions, 2019 and 2021 CES

Variable	Question Wording	Coding
Age	To make sure we are talking to a cross section of Canadians, we need to get a little information about your background. First, in what year were you born?_____ [If respondent is born 18 years before the election:] How old are you? 1. 17 [screened out] 2. 18	We use two different codings of age: a four-category option (1 = 18-29, 2 = 30-44, 3 = 45-64, 4 = 65+) and a six-category option (1 = 18-19, 2 = 20-24, 3 = 25-34, 4 = 35-49, 5 = 50-64, 6 = 65+). We use the four-category variable in regressions to model nonbinary identity and the six-category variable to compare the demographics of nonbinary people in the 2019 and the 2021 CES with Trans PULSE and the 2016 Census of Canada.
Education	What is the highest level of education that you have completed? 1. No schooling	We use two main codings of education. For regressions, we use a standard education coding (1 = Below High

	2. Some elementary school 3. Completed elementary school 4. Some secondary/high school 5. Completed secondary/high school 6. Some technical, community college, CEGEP, College Classique 7. Completed technical, community college, CEGEP, College Classique 8. Some university 9. Bachelor's degree 10. Master's degree 11. Professional degree or doctorate 12. Don't know/Prefer not to answer	School, 2 = High School Diploma, 3 = Some College or University, 4 = Bachelor's or Higher). For comparison with the Census and Trans PULSE, we code a four-category education variable (1 = Below High School, 2 = High School Diploma, 3 = College or University, 4 = Graduate or Professional Degree).
Income	What was your total household income, before taxes, for the year [2018/2020]? Be sure to include income from all sources, to the nearest thousand dollars. For example, if your household had a total before-tax income of $71,336 in 2020, you would enter 71000. _____ We don't need the exact amount; does your household income fall into	We use a binary low-income variable (0 = $30,000+, 1 = Under $30,000) for comparisons with Trans PULSE and the Census and in the multiple imputation analyses.

	one of these broad categories? 1. No income 2. $1 to $30,000 3. $30,001 to $60,000 4. $60,001 to $90,000 5. $90,001 to $110,000 6. $110,001 to $150,000 7. $150,001 to $200,000 8. More than $200,000 9. Don't know/Prefer not to answer	
Province/Territory	In which province or territory are you currently living? 1. Alberta 2. British Columbia 3. Manitoba 4. New Brunswick 5. Newfoundland and Labrador 6. Northwest Territories 7. Nova Scotia 8. Nunavut 9. Ontario 10. Prince Edward Island 11. Quebec 12. Saskatchewan 13. Yukon	We recode the provinces in order from east to west, then the territories from west to east, following the order used by Elections Canada (1 = Newfoundland and Labrador, 2 = Nova Scotia, 3 = Prince Edward Island, 4 = New Brunswick, 5 = Quebec, 6 = Ontario, 7 = Manitoba, 8 = Saskatchewan, 9 = Alberta, 10 = British Columbia, 11 = Yukon, 12 = Northwest Territories, 13 = Nunavut).
Region	(See Province/Territory.)	We code respondents' region based on their province or territory of residence (1 = Atlantic (New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince Edward Island); 2 = Quebec; 3 = Ontario; 4 = West and Territories (Alberta, British Columbia, Manitoba, Northwest

		Territories, Nunavut, Saskatchewan, Yukon)).
User Language	(Metadata)	A binary variable that indicates the language of the questionnaire selected by each respondent (0 = English, 1 = French).
Mother Tongue	Which language(s) did you learn as a child and still understand today? (Select all that apply) 1. English 2. French 3. Indigenous language (please specify) 4. Arabic 5. Chinese, Cantonese, Mandarin 6. Filipino/Tagalog 7. German 8. Indian, Hindi, Gujarati 9. Italian 10. Korean 11. Pakistani, Punjabi, Urdu 12. Persian, Farsi 13. Russian 14. Spanish 15. Tamil 16. Vietnamese 17. Other (please specify) 18. Don't know/Prefer not to answer	We use a four-category variable based on whether each respondent is a native speaker of Canada's official languages (1 = English, 2 = French, 3 = Both English and French, 4 = Neither English nor French).
Born Outside Canada	Were you born in Canada? 1. Yes 2. No 3. Don't know/Prefer not to say	We code a binary variable (0 = Born in Canada, 1 = Born outside Canada). We recode "Don't know/Prefer not to say" to missing.

Non-Citizen	Are you a... 1. Canadian citizen 2. Permanent resident 3. Other [screened out]	We code a binary variable (0 = Citizen, 1 = Not a citizen).
Religion	Please indicate your religion, if you have one? 1. None/Don't have one/Atheist 2. Agnostic 3. Buddhist/Buddhism 4. Hindu 5. Jewish/Judaism/Jewish Orthodox 6. Muslim/Islam 7. Sikh/Sikhism 8. Anglican/Church of England 9. Baptist 10. Catholic/ Roman Catholic/ RC 11. Greek Orthodox/ Ukrainian Orthodox/Russian Orthodox/Eastern Orthodox 12. Jehovah's Witness 13. Lutheran 14. Mormon/Church of Jesus Christ of the Latter Day Saints 15. Pentecostal/ Fundamentalist/Born Again/Evangelical 16. Presbyterian 17. Protestant 18. United Church of Canada 19. Christian Reformed 20. Salvation Army 21. Mennonite 22. Other (please specify)	We recode religion into a nine-category variable (1 = Atheist, Agnostic, or No Religion; 2 = Catholic; 3 = Mainline Protestant; 4 = Evangelical/Conservative Christian; 5 = Eastern Orthodox; 6 = Other Christian; 7 = Non-Christian Religions; 8 = Spiritual, Not Religious; 9 = Other). We not only recode the close- ended responses but also the open-ended responses into these categories.

	23. Don't know Prefer not to answer	
Party Identification	In federal politics, do you usually think of yourself as a: 1. Liberal 2. Conservative 3. NDP 4. Bloc Québécois [for Quebec respondents only] 5. Green 6. Another party (please specify) 7. None of these 8. Don't know/Prefer not to answer	We recode this variable into an seven-category variable (1 = Liberal, 2 = Conservative, 3 = NDP, 4 = Bloc québécois, 5 = Green, 6 = Other, 7 = None). We recode "Don't know/Prefer not to answer" to missing.
Gay/Lesbian Feeling Thermometer	How do you feel about the following groups in Canada? Set the slider to any number from 0 to 100, where 0 means you really dislike the group and 100 means you really like the group. If you do not know, or prefer not to answer, please click → Gays and lesbians [Slider from 0-100 with starting at 50]	We use the raw thermometer values.
Community Size	Do you live in... 1. A rural area or village (less than 1000 people) 2. A small town (more than 1000 people but less than 15K)	We recode "Don't know/ Prefer not to answer" to missing.

	3. A middle-sized town (15K- 50K people) not attached to a city 4. A suburb of a large town or city 5. A large town or city (more than 50K people) 6. Don't know/Prefer not to answer	

Table A2: Description of Variables with a Common Coding But Different Question Wordings, 2019 and 2021 CES

Variable	2019 Question Wording	2021 Question Wording	Coding Scheme
Sexual Identity	Do you consider yourself to be: 1. Heterosexual 2. Homosexual 3. Bisexual 4. Other (open-ended) 5. Don't know 6. Prefer not to say	Which of the following best represents how you think of yourself? 1. Straight or heterosexual 2. Gay or lesbian 3. Bisexual 4. Queer 5. Something else (open-ended) 6. I am not sure yet 7. I don't know what this question means 8. Prefer not to answer	For the sake of comparability, we construct a four-category sexual identity variable: 1. Straight or heterosexual 2. Gay or lesbian or homosexual 3. Bisexual 4. Another sexual identity (Other in 2019, Queer or Something Else in 2021) We recode all other responses as missing.
Race	Please select all that apply. Please click the forward arrow → below once you are done. 1. Aboriginal/First Nations 2. British 3. Chinese 4. Dutch 5. English 6. French 7. French Canadian 8. German 9. Hispanic 10. Indian 11. Inuk/Inuit 12. Irish 13. Italian	Do you identify as any of the following? (Please select all that apply) 1. Arab 2. Asian 3. Black 4. Indigenous (e.g., First Nations, Métis, Inuit, etc.) 5. Latino/Latina 6. South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)	Since individuals can have multiple racial backgrounds, we construct three separate binary variables (White, Indigenous, Racialized). In 2019, we code British, Dutch, English, French, French Canadian, German, Irish, Italian, Polish, Scottish, and Ukrainian as white; Aboriginal/First Nations, Inuk/Inuit,

	14. Métis 15. Polish 16. Québécois 17. Scottish 18. Ukranian 19. Other 1 (please specify) 20. Other 2 (please specify) 21. Don't know/Prefer not to answer	7. Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai, etc.) 8. West Asian (e.g., Iranian, Afghan, etc.) 9. White 10. Other (please specify) 11. None of the above 12. Prefer not to answer	and Métis as Indigenous; and Chinese, Hispanic, and Indian as racialized. In 2021, we code White as white; Indigenous as Indigenous; and the remaining close-ended responses as Racialized. We also code open-ended responses into these categories. In all cases, we recode respondents who only select "Don't know/Prefer not to answer" as missing.

Appendix B: Recoding of Open-Ended Gender Identity Responses, 2021 CES

We recode the 33 open-ended gender identity responses to the 2021 gender identity question into other categories where possible. Of the 33, nine provide recognizable gender identity responses other than man or woman (such as "genderfluid," "agender," or "bi-gender"), 14 provide binary gender responses (usually male or female rather than man or woman, sometimes combined with political commentary on the "political correctness" of asking about gender rather than sex), and 10 respondents provide hostile or non-cooperative responses that do not allow us to code their gender identities. We recode the first group as nonbinary, the second group as men or women based on their responses, and the third group as missing.

Table B1: Recoding of Open-Ended Gender Responses, 2021 CES

Recoding	Open-Ended Gender Identity Response
Man (6)	"Male" (1), "Genetic Male" (1), "Masculin" ["male" in French] (1), "Transman" (1), "There are only two valid genders, as listed in Genesis 5:2, and mine is male." (1), "I am a biological male in accordance with Genesis 1:27" (1)
Woman (8)	"Female" (3), "Woman" (1), "Femme" ["woman" in French] (1), "Femne" [typo of "woman" in French from a francophone respondent] (1), "Femme queer" ["queer woman" in French from a francophone respondent] (1), "I am offended that you are asking for `gender,' an ideological position, instead of `sex,' an immutable physical trait. I am a woman, which is not a gender, it is an adult human of the female sex."
Non-Binary (9)	"Aucun" ["none [of the above]" in French] (2), "Two Spirited" (1), "Genderfluid" (1), "IDK" (1), "Bi-gender" (1), "Gender apathetic" (1), "Agender" (1), "Gender-queer" (1)
Missing (10)	"No" (2), "Moon helicopter" (1), "Funny clown" (1), "Dodge Ram" (1), "Pokemon" (1), "Monkey" (1), "Licorne à pois" ["spotted unicorn" in French] (1), "Human" (1), "Spiritual being having a human experience" (1)

Appendix C: Qualitative Evidence That Transgender Men and Women Select the "Other" Gender Identity Category from the 2019 CES Sexual Identity Open-Ended Responses

There is additional evidence in the 2019 CES that respondents who identify as trans men or women may select the "Other" category. In the 2019 CES, several respondents provide gender identity, transgender identity, and/or Two-Spirit identity responses in the sexual identity question's open-ended response categories. Table C1 provides an overview of the close-ended gender identity responses given by respondents who provided gender identity, transgender identity, and/or Two-Spirit identity terms.

Table C1: 2019 Gender Identity Responses for Respondents Who Mention Non-binary, Genderqueer, Transsexual, Transgender, or Two-Spirit Identity in Their Sexual Identity Open-Ended Responses

Open-Ended Sexual Identity Response Term	Close-Ended Gender Identity Response
Non-Binary (1)	Other (1)
Genderqueer (2)	Woman (1), Other (1)
Transsexual (2)	Man (1), Woman (1)
Transgender (4)	Other (4)
Two-Spirit (2)	Other (2)

Table C1 displays the responses to the 2019 gender identity across categories of respondents who gave gender identity, gender modality, and/or Two-Spirit identity responses in the open-ended sexual identity response category. One respondent wrote in "non-binary" and selected the Other category, as intended. Two respondents wrote in "genderqueer" or a variant thereof. Of these two respondents, one selected Woman and the other selected Other. Two respondents identified as "transsexual," and they both selected binary gender responses. All four respondents

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who identified as transgender selected the "Other" option, even the ones who also indicated that they identified as men or women in the open-ended sexual identity question. For example, one of the four transgender respondents in the 2019 CES wrote "hetero transgender male" in the sexual identity open-ended response but selected "Other" in the gender identity question. Finally, two respondents provided "Two-Spirit" as a sexual identity response, and both of these respondents selected "Other" in the 2019 CES gender identity question. While these open-ended responses are not necessarily representative of all trans, non-binary, or Two-Spirit respondents, they illustrate that some respondents who take these identities as important enough to write in while responding to a sexual identity question selected the "Other" identity response on the 2019 gender identity question -- even if they also identified as men or women. These reuslts provide evidence that transgender respondents–even those who otherwise identify as men or women–selected "Other" on the gender identity question.