

The Utility of the Two-Step Gender Measure Within Trans and Cis Populations

Emilia Lombardi¹ · Swagata Banik¹

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Abstract It has been acknowledged that more research into the health and well-being of trans people is needed in order to identify important health issues. While recent studies have suggested using a two-question gender status measure to assess assigned sex at birth and gender identity, it is not well understood how participants understand and subsequently answer the questions. The study recruited a convenience sample of 50 people (25 trans and 25 cis) from the general population of Cleveland and Akron, OH. The study used cognitive interviewing methods with scripted, semi-structured and spontaneous probes when appropriate. Participants were asked to read questions out-loud, answer the questions, and explain why they answered the way they did. Interviews were audio recorded and transcribed prior to analysis. The gender status questions were found to be easy to use and understood by both trans and cis participants. The two-question gender status measure was able to encompass a diversity of identities within a trans sample and be consistently answered by the study's cis participants. The measures were able to differentiate between trans and cis groups. The two-step gender measure can be a useful tool in examining gender diversity within general population studies.

Keywords Transgender · Cisgender · Survey methods · Cognitive interviewing

✉ Emilia Lombardi
elombard@bw.edu

¹ Department of Public Health and Prevention Sciences H219, School of Health Sciences, Baldwin Wallace University, 275 Eastland Rd, Berea, OH 44017, USA

Introduction

There has been much discussion on the need for greater research on the health of transgender, transsexual, and gender nonconforming (trans) people in order to address significant disparities experienced by these populations in terms of health care access and outcomes. Both the Institute of Medicine and National Institutes of Health have identified the need for greater research about the health disparities experienced by trans individuals (Institute of Medicine 2011; NIH LGBT Research Coordinating Committee 2013). Although limited, recent years have evidenced an increase in the number of studies addressing health issues of gender minorities (Pittsburgh Transgender Health Research Summer Institute 2010). However, existing quantitative research suffer from a primary limitation; they have consisted of small samples collected through convenience or snowball sampling methods within specific geographic areas without any systematic approach to define the target population. As such, the generalizability of these studies is limited.

The lack of research regarding trans issues is partly due to the lack of inclusion within population level studies, and a major reason being the lack of measures that can effectively differentiate between different gender identities. There has been a range of measures used to identify trans populations, as most studies have focused on small, convenience samples and they did not need to differentiate between people who are trans and those who are not (Boles and Elifson 1994; Lombardi et al. 2001; Nuttbrock et al. 2009).

Health researchers have used various terms like transvestite, transsexual, transgender, even conflating them with gay and lesbian populations or include them within the population of men who have sex with men without considering trans people's unique psychosocial contexts (Boles and Elifson 1994; Operario et al. 2008). This has resulted into a lack of

understanding about adequate and relevant health care needs for trans populations. The population itself also uses a wide range of labels in reference to themselves, which can also complicate the creation of study measures (Grant et al. 2011). The lack of consistency in how trans populations are identified within research also mirrors what is found within clinical settings where protocols tend to focus primarily upon one's physical sex without consideration about the patients gender identity (Deutsch et al. 2013).

There has been much activity to have the federal government include measures to capture gender identity in order to better understand the health and social issues transgender people experience. There are only a small number of federal studies that currently include any kind of measure to identify transgender people. The National Inmate Survey (NIS) was created as part of the Bureau of Justice Statistics' National Prison Rape Statistics Program to provide more detailed information regarding the issue of sexual victimization within jails and prisons (Gaes 2008). The NIS asks inmates, "Are you male, female, or transgender?" This manner of identifying transgender individuals is problematic in that it does not allow for the gender identity of the inmate to be identified. As a result, it will be impossible to know whether the inmate identified as a man, woman, or anything else. Additionally, many transgender individuals may choose the male or female option as either may represent their gender identity rather than transgender and this may result in the undercounting of transgender individuals. The only other federal program that collects gender identity is the CDC's HIV/AIDS Surveillance program, which uses the Center for Excellence for Transgender Health two-step measure (Center of Excellence for Transgender Health 2011; Centers for Disease Control and Prevention 2015).

Many LGBT organizations have been working to have the Health and Human Services Administration (HHS) include gender identity measures within their data collection activities (Cahill and Makadon 2013, 2014). Currently, HHS has not included gender identity measures in any of their programs. In 2012, they stated that they were not going to include any measures since there was a lack of consensus for the definition of gender identity or any measure for it (Department of Health and Human Services Office of the Secretary 2012). Also, when asked whether to collect either sex or gender, their response was to have people record sex. They made a differentiation between sex and gender, but did not include a specific definition of sex other than it not being gender. In 2015, they did make changes to include Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) codes for gender identity categories, but at the same time did not include specific questions to for programs to use (Department of Health and Human Services Office of the Secretary 2015).

There has been movement in conceptualizing trans populations as those with a gender identity that differs than what would be associated with their sex at birth (Institute of

Medicine [US] Board on the Health of Select Populations. 2013). The Center of Excellence for Transgender Health outlined a mechanism based on that definition to differentiate trans population from cis populations (cis—having a gender identity that is associated with their sex assigned at birth) within a general population (Center of Excellence for Transgender Health 2011). This method is referred to as the two-step method and versions of this measure is being advocated by many researchers and used in HIV surveillance programs (Gender Identity in U.S. Surveillance [GenIUSS group] 2013).

Quantitative studies examining the utility of the two-step measure found it to be effective and easy to use within general population studies (Cahill et al. 2014; Tate et al. 2013). Tate et al. utilized university students to test their questions and found the two-step measure to be more reliable than the single question method. Overall, 78 % reported they understood the gender questions within Cahill et al. study. They also did not find any significant difference in responses by race/ethnicity, but they did find that older (65 and older) and heterosexual people were more likely to report not understanding the questions. Even with these differences, the majority still stated that they would answer the questions. Other versions of the two-step measure were also found to be effective (Reisner et al. 2014a; Reisner et al. 2014b). These studies show promise that the two-step measure can work within quantitative studies, but the differences in how people understand the concepts embedded within the two-step measures require further study. Thus, a qualitative examination of these measures was needed to better understand how people responded to the measure and how they interpreted the questions in their own minds. These studies also did not provide much discussion regarding the difference between trans and cis participants. How these two groups understand and respond to the two-step measure will be important to know in order to be more confident in its effectiveness in differentiating between the two groups.

This study is focused on understanding how trans and cis individuals interpret each of the questions within a two-question measure to assess transgender and cisgender status. Both groups will likely vary how they experience and interpret sex and gender. Trans populations can vary widely in regards to their gender identities (Grant et al. 2011; Lombardi 2009). At the same time, cis populations will likely have a very traditional belief of sex and gender. We have quantitative studies showing that trans and cis groups will answer the questions, but what is not known is either groups understanding of the measure. The current study addresses that gap.

Methods

The two-step measure used is based on the Center of Excellence for Transgender Health version (at the time of this study, this was the only recommended version) (Center of

Excellence for Transgender Health 2011). As this study wanted to assess the effectiveness of the two-step measure for general population studies (rather than LGBT or primarily trans populations), the number of response categories for the question asking about people's sex or gender was limited to only Male, Female, and Other (specify). The percentage of trans people of all categories to be found within a general population is likely to be small and will create problems during quantitative analysis (e.g., statistical power, how to combine responses). This study decided to force a choice between male, female, and an "other (specify)" category in order to differentiate between binary and nonbinary (genderqueer, agender, etc.) identified individuals. This is seen as the simplest way to differentiate between trans and cis, male and female, and binary and nonbinary populations for studies targeting general populations. As opposed to LGBT or trans-specific populations where one would expect greater number and variation of gender identities.

Participants

The study recruited a purposeful sample from the general population of trans and cis people from Cleveland and Akron, OH. Twenty-five cis individuals were interviewed for the study. Of these, 15 were female assigned and 10 were male assigned at birth. Three participants were African-American and the remaining 22 were White, and their average age was 32 years (range 19–61). Twenty-five trans individuals were also interviewed. Of these, 20 were assigned male at birth and 5 were assigned female at birth. Three participants were African-American and the remaining 22 were White, and their average age was 45 years (range 19–81) (see Table 1). Recruitment utilized internet resources, community venues, and word of mouth. Participants were informed that researchers were interested in conducting a health survey in the area and that they needed feedback regarding demographic questions that will be used in order to be confident that the questions accurately identify social groups when linking those groups to health issues. The study was conducted under the guidance of Baldwin Wallace University's Institutional Review Board, and informed consent was obtained from all individual participants included in the study.

Interview Activities The study methods utilized cognitive interviewing methods to examine the effectiveness of the two-step measure (Drennan 2003). Interviews were conducted by the first author (a trans woman who has conducted many research studies examining health and social disparities among trans populations). The study used scripted, semi-structured and spontaneous probes when appropriate. Participants were asked to read questions out-loud, answer the questions, and explain why they answered the way they did. In addition, participants were asked whether they found the questions to be hard or easy to answer, to define sex and

Table 1 Sample demographics

Number by race		
	White	Black
Cis	22	3
Trans	22	3
Number by sex assigned at birth		
	Male	Female
Cis	10	15
Trans	20	5
Age		
	Mean (standard deviation)	
Cis	32.44 (13.92)	
Trans	44.88 (15.68)	

gender, and whether they believed their friends and family could answer the question. Additional questions were asked in regards to people's understanding of the wording of questions (i.e., what does sex assigned at birth mean to you?).

Interviews were conducted primarily face to face within the interviewer's office or off site in a closed room. Five interviews were conducted online via Adobe Connect (an internet-based system allowing people to communicate and to share electronic materials) to allow for those who could not travel to interview sites. In both instances, participants were able to read questions (off a sheet of paper or computer screen) out loud, interact verbally with the interviewer, and have their interviews audio recorded. All interviews were conducted by the principle investigator, and audio recordings were transcribed for analysis.

Analysis Interviews were audio recorded and transcribed prior to analysis within a dedicated qualitative research program (NVIVO) (QSR International Pty Ltd 2012). The principle investigator for the study analyzed the transcripts and initially identified sensitizing concepts and to examine the diversity of reports given by the participants, while subsequent analysis focused on people's understanding and interpretation of each question. The analysis was conducted separately by trans/cis status by the interviewer. The study was able to attain theoretical saturation with the 50 cases examined (Table 2).

Two-Step Gender Status Measures

1. What is your sex or gender? (Check ALL that apply)
 - (A) Male
 - (B) Female
 - (C) Other: Please specify: _____
2. What sex were you assigned at birth? (Check one)
 - (A) Male
 - (B) Female
 - (C) Unknown or Question Not Asked
 - (D) Decline to State

Table 2 Assigned sex and gender

	Trans	Male only	Female only	Other only	Male and other	Female and other
Assigned male		1 ^a	12	5 ^b		1 ^c
Assigned female		3			2 ^d	
Unknown		1			1 ^e	
Cis						
Assigned male		10				
Assigned female			15			

^a During the interview, the participant identified themselves as a male to female crossdresser

^b Other responses include

- The reason I answered that was is because I'm transgender
- I'm not really super male, and I'm not really super female
- Transgendered—male to female
- Male cross-dresser
- I am transgendered, but I also consider myself female. But, I don't consider myself until I have the entire female body or the entire female parts

^c Response: I am a transsexual woman

^d Male and other responses include

- Female to male transsexual
- Transgender male

^e Response: I'm just going to say "I'm a question mark."

Results: Trans Participants

What Is Your Sex or Gender The majority of the trans female participants only chose female for their gender identity, one also chose the other category in order to specify their transsexual woman identity. Most trans male participants only chose the male option and two chose male and other in order to specify identifying as a female to male transsexual or transgender male. Among those who were assigned male and just chose the other response reported very diverse identities including crossdresser, and female but without female anatomy. There was also someone with a very unique conception of their assigned sex (choosing unknown) and gender identity ("I'm a question mark."), but this was not due to having an intersex identity. Overall, even with a simplified set of gender identity categories, trans individuals were able to express a diversity of gender identities.

All but one participant saw sex and gender as being two different categories. For many trans participants, sex referred to one's biological status and gender referred to one's identity (internal sense of themselves as men, women, or something else). Examples include:

- "sex is your biological, ahh, sex according to your physical makeup, where gender is your internal identify of who you are by your own identity."
- "gender to me is a mental thing, a belief, a feeling, an identification if you will. Ahh, sex is really a strange term. Sex could be sexual orientation, a blend of both genders, it

could be who is the bigger gender, or It could be confused with the physical stuff. Sex can be confusing."

- "I heard a quote a couple of years ago, I don't remember who it was, but I was told that sex is between the legs and gender is between the ears."

This distinction influenced how many would answer their questions. When focused on just the first questions, some participants would provide two answers: one referring to their male or female identity and the other option to provide additional detail regarding their trans status. There were also four responses who defined sex as a behavior: "sex is when two people have intercourse," "Sex is what two people do." However, they were still able to answer the question about their sex assigned at birth as designed.

What Is Your Sex Assigned at Birth Everyone was able to answer the question regarding their sex assigned at birth. When asked to define "sex assigned at birth" their answers focused on their anatomical status, with many specifying whether they had a penis or vagina or sex organs, or in some cases DNA. People also mentioned birth certificates as being part of the assignment process. Examples:

- Interviewer: Can you tell me what "sex assigned at birth" means to you? Ummm, it's whatever they put down on your birth certificate.

- Interviewer: Can you tell me ‘what sex assigned at birth’ means to you? It’s what your DNA and chemistry decide to make you at birth.
- Interviewer: Can you tell me ‘what sex assigned at birth’ means to you? Your sex is assigned at birth due to your genitals.

While there was a clear consensus regarding sex being a biological or legal characteristic (birth certificate), many participants (16) also mentioned that assignment was done by someone else other than themselves. Approximately two thirds of the participants described sex assignment as being done by a doctor or other health care provider or generally by another person referred to as “they.” Examples include:

- “Mainly ‘assigned at birth’ means what did the doctor think when they had a look.”
- “It means the doctor’s perception of you sex at birth.”
- “They see that you have the sex organs of a female or male.”
- “What they mark off on your birth certificate. It’s basically what they think you are.”
- “What the doctor determined when he looked between my legs.”

The other participants provided their answer without attribution and focused primarily of their own physical status and biology.

- “The sex you were born as, depending on your genitals.”
- “It’s what your DNA and chemistry decide to make you at birth.”
- “I guess what you were born biologically, male or female.”
- “How our body was formed at birth, whether or not we have the male genitalia, the female genitalia.”

There was a definite consensus among the participants that “sex assigned at birth” referred to one’s biology or physical state at birth, many trans people also viewed it as a process being done to them rather than a neutral activity. There were two participants who discussed their intersex status, but they were still able to answer the questions using the existing categories (neither of these people chose the unknown category).

Trans participants were found to answer the questions in the expected manner. Few expressed nontraditional gender identities and expressions, and were still able to answer the questions by utilizing the “other” response category. When asked about making changes to these questions, many requested that the gender identity question (what is your sex or gender) only ask about sex or gender and not include both as many trans participants found it contradictory. Of the two, it would be best to only ask about gender rather than sex,

especially when using the additional question regarding their sex assigned at birth. Most trans participants preferred having the question asking about one’s gender be asked prior to the question about their sex assigned at birth.

Cis Participants

What Is Your Sex or Gender All cis participants answered both questions with the same answer; those who answered female (or male) in question 1 answered female (or male) in question 2 as well. No one used any of the other options. Many people said either male or female when answering either question, and others made “I” statements (“I am a female,” “I would choose male”). Participant’s answers were given in a very straightforward manner with very little elaboration.

Cis participants were mixed in regards to their understanding of sex and gender. Ten participants identified sex and gender to refer to the same thing. Examples:

- What is your sex and what is your gender in those-in those questions, I think of it as the same
- When I see the words, uh, sex or gender, I could almost say you could use them as synonyms.
- Personally, I feel that they’re basically the same

Nine participants made distinctions between sex and gender. Examples:

- I think gender is more where your mindset is and, sex is more where your physical features are.
- I believe its sex is biological and gender is what you identify more with.
- Sex, I’d have to say, would be, um, what your reproductive organs are. Gender is probably more where you identify with between the two sexes.

There were also two participants who mentioned that sex can also refer to sexuality or sexual behavior. Regardless of whether they saw sex and gender as being the same or not, it did not affect how they answered either question.

What Is Your Sex Assigned at Birth Cis participants were able to answer the question about their sex assigned at birth. When asked, participants referred to biology (e.g., presence of a penis or vagina) or birth certificate. Participants were split in regards to their perception of how sex is assigned to people. Ten participants attributed assignment to a physician or other people.

- What the doctor said when you were born.
- It’s what your parents gave you, not necessarily what you identify with.

- What did the doctor say you were, you know, it's a boy, it's a girl.
- The way your parents interpreted your birth.

Twelve participants just made reference to biological or physiological characteristics.

- If you were born with, um, male genitalia vs. female genitalia
- Sex assigned at birth means, uh, like your physiology.
- I don't know, just...my female organs.
- Whatever genitalia I was born with.

Regardless of whether they attributed their assignment to others or not, there was consensus that sex assigned at birth primarily referred to their status when born and answered the question accordingly without any problems in understanding its purpose.

Cis participants did not have any problem answering the questions and did so in the expected manner (sex or gender and sex assigned at birth were consistent with each other). When asked if they had any problems answering the questions, there were those who wondered why we were asking the same question twice, but they realized that it was oriented to capture people with different experiences.

- First it sort of took me aback, like, 'what?' Why are they asking two different questions? Like would my answer be the same? And then, I realize that, maybe for someone else, the answer might not be the same, and that's why it's being asked.

Discussion

A review of studies examining transgender populations reflected upon the need to examine and utilize new methods in transgender health research (Melendez et al. 2006). Previous studies have focused on simplistic measures of sex or gender that fail to capture the reality of transgender people. The present study supports the use of the two-step gender measure as a basis for distinguishing between trans and cis populations. The gender status measure was found to be easy to use and understood by both trans and cis participants. The measure was able to differentiate between trans and cis groups, encompass a diversity of identities within a trans sample, and be consistently answered by the study's cis participants. There was a consistent understanding of the concepts within each question for both groups, especially with the idea of "sex assigned at birth." Both groups understood the phrase to mean one's physiological/legal status placed upon them when they were born. The one difference between trans and cis groups is how

they view sex and gender. Sex and gender among the trans sample were primarily seen as different concepts, with sex referring to one's physical status and gender being one's internal sense of themselves as a man or woman. The distinction is due to trans population's experiences with interpreting their biology in light of their gender identity. Among the cis sample, many saw sex and gender to refer to the same thing, resulting with most not reflecting on the distinction between the two.

Since the completion of this study, others have published their findings examining the utility of the two-step method of identifying gender within quantitative studies (Cahill et al. 2014; Gender Identity in U.S. Surveillance [GenIUSS] Group 2014; Reisner et al. 2014a; Reisner et al. 2014b; Tate et al. 2013). Each study is somewhat varied in regards to how questions are asked and which responses are offered. Our study's uniqueness is based on examining how trans and cis people understand the questions and the meanings inherent in the measures conceptualization. Its focus on older people and those living in the Mid-West also adds to its distinction. However, all were able to show that asking about one's assigned sex at birth and one's gender identity was effective for both trans and cis populations. This along with other reports from experts in the field shows support toward the usage of the two-step measure for identifying and differentiating between trans and cis populations (Gender Identity in U.S. Surveillance [GenIUSS] Group 2014). Future studies can work to refine the measures to see what version works best for a particular sample or context and how to transition existing studies using single measures for sex or gender to a two-step format.

This study utilized fewer response options than previous studies, but this did not create a problem for participants. The choice of responses can be a decision made by researchers based on the population to be studied and the study's purpose. Options like genderqueer, transgender, trans, etc. can be added as needed depending on the study and communities being examined. Another issue is how it can be used along with the new SNOMED CT codes (Department of Health and Human Services Office of the Secretary 2015). Table 3 outlines the arrangement of responses to the two questions and shows that it can be used effectively with the SNOMED CT codes.

Limitations

While the cognitive interviews cannot be generalized to any population other than itself, it did allow for inferring how a group of trans and cis people understood and answered questions on sex and gender identity. However, the small number of interviews did not allow for a detailed examination of how race/ethnicity could affect peoples' answers. The study also did not have many male identified trans participants compared to male identified individuals among the cis participants.

While support is growing for the use of the two-step measure to identify cis and trans populations, further research is needed in regarding adapting the measure to better identify differences between trans individuals (Scheim and Bauer 2015). For example, is there a difference between someone who would select female as a gender identity versus someone who would choose Trans woman, or between people who would choose male or female compared to someone who would choose another identity such as genderqueer, two-spirit, or another identity other than that of male or female. The measures work best to identify gender binary (male or female) identified trans people. Nonbinary identified trans individuals (genderqueer, crossdressers, etc.) tended to utilize the “other” category, but more research is needed to understand how to differentiate between the different trans populations of people who do not fit traditional conceptions of gender from gender binary identifying trans people. The responses of non-US populations also need to be examined.

Further studies are needed to examine how well the measures can be used in other languages and cultures. The USA does not have a third gender option that exist in other cultures around the world (e.g., Native American, Native Hawaiian, Latin American) and other cultures may have different ways to conceptualize biological sex, gender identity, and sexual orientation (Jacobs 1997; Lancaster 1998; Matzner 2001). Reisner et al. (2014a) utilized a version within a quantitative study of Men who have Sex with Men (MSM) in Latin America, Caribbean, Portugal, and Spain and found many participants utilizing the other, specify option to refer to their sexual orientation and sexual practices rather than their gender identity. Qualitative analysis and cognitive interviewing is necessary to examine how populations in Latin America relate between sex, gender identity, and sexuality in order to better refine the two-step measures for use within those contexts.

A third gender identity has become a constitutionally recognized gender category across South Asia (India, Bangladesh, Nepal). In India, “Hijras” are identified as neither men nor women and they have a long cultural history across south Asia (Nanda 1990). While some individuals, in recent years, identify themselves as [Trans] women, a majority will still identify themselves as “Hijra.” Due to social stigma and discrimination, Hijras members also experience significant disparities in healthcare access and outcomes (Banik et al. 2013). Thus, studies are needed to evaluate the effectiveness of the two-step measure among non-binary identified populations. At this point, the two-step gender measure is developing a strong consensus for its use within the USA with English-speaking participants.

Conclusion

This investigation found that the two-step gender status measure were understood by a sample of cis men and women, and its results were what were expected for both cis and trans populations. Based on the study’s findings, it will be important to refer to people’s gender or gender identity rather than sex. While the cis participants did not note a significant difference between the two, the trans participants did and saw gender as referring to their identity and sex as their physiology. The results support the consensus that is growing regarding the use of the two-step gender measure within population studies within the US Health surveillance system, but issues remain regarding the categories to offer in order to best capture diverse gender identities for the purpose of quantitative studies. The invisibility of trans people plays a large role in the health disparities they

Table 3 Two-step gender measure correspondence with SNOMED CT

U.S. Edition of SNOMED CT, March 2015 (Department of Health and Human Services Office of the Secretary 2015)	What is your gender? ^a (additional categories)	What sex were you assigned at birth?
Identifies as male gender SNOMED CT: 446151000124109.	Male	Male
Identifies as female gender SNOMED CT: 446141000124107.	Female	Female
Female-to-male transsexual SNOMED CT: 407377005	Male (transgender/trans man, etc.)	Female
Male-to-female transsexual SNOMED CT: 407376001	Female (transgender/trans woman, etc.)	Male
Identifies as non-conforming gender SNOMED CT: 446131000124102	Other (genderqueer, etc.)	Male or female
Other, HL7 V3 nullFlavor OTH	Other	Male or female
Asked but unknown, HL7 V3 nullFlavor ASKU	Declined to state/answer	Declined to state/answer

^a Only gender is asked for because of the difference trans populations see in regards to the terms sex and gender. Its use would not impact the response of cis populations

experience. The authors of this study found that the two-question gender status measure could be a useful tool in identifying trans populations within general population studies with little misunderstanding among cis populations.

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The study was conducted under the guidance of Baldwin Wallace University's Institutional Review Board for human research. Informed consent was obtained from all individual participants included in the study.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interest Emilia Lombardi and Swagata Banik declare that neither have a conflict of interest.

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