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A Two-Question Method for Assessing Gender Categories in the Social and Medical Sciences

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Three studies (N = 990) assessed the statistical reliability of two methods of determining gender identity that can capture transgender spectrum identities (i.e., current gender identities different from birth-assigned gender categories). Study 1 evaluated a single question with four response options (female, male, transgender, other) on university students. The missing data rate was higher than the valid response rates for transgender and other options using this method. Study 2 evaluated a method of asking two separate questions (i.e., one for current identity and another for birth-assigned category), with response options specific to each. Results showed no missing data and two times the transgender spectrum response rate compared to Study 1. Study 3 showed that the two-question method also worked in community samples, producing near-zero missing data. The two-question method also identified cisgender identities (same birth-assigned and current gender identity), making it a dynamic and desirable measurement tool for the social and medical sciences.

In most research and practice contexts, professionals ask individuals to indicate the gender category to which they belong. The question is usually a single-item (e.g., *What is your sex?* Or *What is your gender?*) with two response options: *female* or *male*. It is important to note two response options alone do not capture the range of gender experiences that people have. Some people transition gender categories from male to female or from female to male (namely transgender experience). Other people experience gender identity as outside a binary (two-category) conceptualization (namely, genderqueer identity) (Factor & Rothblum, 2008).

Social and medical science research converge, at least descriptively, on the idea that one's gender identity is calculated across one's birth-assigned sex category and one's current sense of self in relation to societal gender categories. One's birth-assigned sex category is based on genital anatomy. Cultural authorities (usually medical professionals in industrialized countries) assign sex categories by judging genital structures at birth to be prototypical vagina-vulva or penis-scrotum structures. In the case of intersex conditions (wherein the genital structures are somewhere between the two prototypical

structures), this judgment can be aided by using the Prader scale (Hines, 2004). Consequently, there are three major birth-assigned sex categories in many industrialized countries—female, male, and intersex—and each is a statement about the appearance of genital anatomy. Nonetheless, for a variety of reasons—legal considerations chief among them in industrialized societies—some cultures require either *female* or *male* to appear on a child's birth certificate. Of course, *female* and *male* are more than anatomical sex categories; they are simultaneously gender categories referring to (a) a psychological sense of self that is informed by a sociocultural context which solidifies over time (Bussey & Bandura, 1999) and (b) a set of expectations that individuals use to interact with one another (in other words, gender roles; Eagly & Wood, 1999). Consequently, one can argue for two general ways by which birth-assigned sex category and current gender identity are experienced for any individual: cisgender and transgender.

Cis- is the Latin prefix for “on the same side of.” Accordingly, those individuals who are cisgender have a current gender identity that is the same label as their birth-assigned category. *Trans-* is the Latin prefix for “across” or “beyond.” Thus, those who are transgender have moved across or beyond their birth-assigned category to experience their current gender identity. As noted, many transgender persons move across gender categories, from one to the other—in other words, female to male (transgender men or trans men) or male to female (transgender women or trans women). Importantly, one can also move beyond or outside of current

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gender categories to another understanding of gender altogether (e.g., genderqueer, postgender, two-spirit) (Factor & Rothblum, 2008). We refer to the movement beyond current gender categories collectively as *gender-queer*, consistent with Factor and Rothblum's (2008) usage. Finally, both transgender and genderqueer "movements" are collectively described in this article as *transgender spectrum identities*.

Developmental psychology helps scholars understand the path of gender experience from birth-assigned category to current identity by providing a relatively accepted model of gender identity development that includes (a) learning about the gender categories in one's society; (b) labeling the self using gender terms supplied by others; and (c) behaving consistently or inconsistently with gender stereotypes (e.g., Bussey & Bandura, 1999). This path illustrates that gender is initially assigned to the self by others (e.g., medical professionals sex-typing genital structures) but is then accepted (or rejected) by the self later in life. Thus, one could argue that gender experience follows a time course that descriptively starts with birth-assigned gender labels (i.e., assigned by others) and continues to current gender labels (i.e., self-assigned).

The plan of this research was to empirically determine whether researchers can reliably observe a respondent's gender identity profile using birth-assigned category and current gender identity as separate demographic questions. To do this, we provided respondents with two different sets of demographic questions—namely, one question (Study 1) or two questions (Studies 2 and 3)—and examined the valid response rate compared to the missing data rate for each set. For the one-question method, we asked respondents to indicate their "gender." For the two-question method, we asked respondents to indicate their "current gender identity" and their "birth-assigned gender category." To the extent that *sex* and *gender* are often used interchangeably in everyday language, we decided to use one term for consistency. Since *gender* describes the felt-sense of self and the social use of categories, and explicitly describes transgender persons, we chose this term for all our questions. Moreover, asking about *birth-assigned gender* already implies that the concept has social meaning in addition to medical meaning (as we have described)—a nuance to which transgender spectrum populations are keenly aware (see Factor & Rothblum, 2008, note 1). Moreover, using *birth-assigned gender* does not imply that any medical meaning of the terms takes precedence over the social meaning. We do, of course, believe the distinction between gender and sex to be extremely important for scholarly discussions, as this section indicates; however, asking human volunteers to respond to demographic questions may be most successfully accomplished by respecting how language is used in everyday interactions.

Why Reliably and Precisely Assessing Gender Identity Matters for Both Social Science and Medical Research

Statements from the American Psychological Association (APA, 2008) and the American Medical Association (AMA, 2007) (among others) have indicated nondiscrimination policies toward transgender and gender-variant (or genderqueer) identities within research and practice contexts. Despite these statements, a recent survey of 6,000 individuals who identified as transgender or were described as gender variant found that 19% were refused medical care based on their gender identity and/or expression, and that 50% reported having to educate their medical providers about transgender health care issues (Grant et al., 2011). Finally, 28% cited discrimination as the reason they delayed medical treatment (Grant et al., 2011). To achieve nondiscrimination, it behooves researchers and practitioners to use a demographic assessment tool that is able to track a person's gender experience as cisgender or transgender spectrum, while being sensitive to the fact that current gender identity (not birth-assigned category) is how virtually all transgender and genderqueer people communicate their gender to the world (Factor & Rothblum, 2008).

In addition to achieving nondiscrimination within social and medical sciences separately, there are particular research questions to which gender is regularly tied. For social science research, comparisons of gender groups continue to be one avenue of knowledge acquisition for a variety of topics, including the processes underlying the development of a stable sense of gender identity (Bussey & Bandura, 1999); processes contributing to prejudice and discrimination (Glick & Fiske, 2001; Rudman & Glick, 2001); possible differences in cognitive performance based on brain structures or social experiences (see Halpern et al., 2007); power and social differences (Eagly & Wood, 1999, 2011); possible differences in emotional dynamics based on hormones (Taylor, Saphire-Bernstein, & Seeman, 2010); and characterizing national Census data to track and predict population growth and shrinkage. Within medical research, comparisons of gender groups also continue to be avenues by which to acquire knowledge within epidemiology and to further understand health risks and protective factors for geriatrics (Gorman & Read, 2007), oncology (American Cancer Society, 2011; Giordano, Cohen, Buzdar, Perkins, & Hortobagyi, 2004), sexual transmitted infections (Centers for Disease Control and Prevention [CDC], 2002; Harvey, Bird, De Rosa, Montgomery, & Rohrbach, 2003), and a variety of other topics. Moreover, accurately assessing gender identity is crucial to transgender health (Feldman & Safer, 2009).

A Format for More Precision: Asking Two Questions about Gender

As one can see, the scope of gender research is broad across the social and medical sciences, but the methods used to assess individual respondents' gender identities are rather uniform. Having a uniform measure of gender identity across diverse fields is desirable because it allows scholars to make connections between, and inferences across, research findings even while additional methods and questions may be specific to the field of inquiry. However, asking a single question (*What is your sex? Or What is your gender?*) with two response options (*female* or *male*) does not allow researchers or practitioners to organize information at a level of specificity needed to create advances in either social or medical science. Since one's gender identity is experienced across the medical categories used for birth assignment and the intrapersonal experiences of gendered social labels, one might sensibly argue that to improve measurement precision, researchers and practitioners could ask two separate questions: one about birth-assigned gender category and one about current gender identity. Using this method, one could simply examine the response pattern across the two questions to empirically determine cisgender (same response to each question) or transgender spectrum (different responses across questions) identities. While this method is logically sound and easy to implement, it has not been widely used in either the medical or social science fields. Yet, a two-question format may not be needed. It might be possible to expand the single-question method of assessing gender to include *transgender* and *other* as response options (in addition to *female* and *male*). Importantly, a portion of psychological researchers who study transgender spectrum identities have used an equivalent method: single question method with four response options (Deogracias et al., 2007; Singh et al., 2010). In these studies, participants reported whether they were a *man*, *woman*, *transgender*, or *other* to indicate their current gender identity. Consequently, the aim of our investigation was to determine whether a one-question or two-question method of asking about a person's gender identity captures more data than it loses for transgender spectrum identities in particular.

Uniqueness of this Particular Two-Question Method

We could find only one other set of published researchers who used a two-question method of obtaining gender identity in the medical sciences (Melendez et al., 2006). These researchers used the response options *male*, *female*, and *transgender* for an initial identity question, then the response options *male*, *female*, and *intersex* for a separate question regarding sex assignment at birth. Notably, there was no evaluation

of this method; instead, it was used to identify subsets of individuals for further analysis (Melendez et al., 2006). Our method is unique because it expands the response options for the current identity question to include *genderqueer*, which is increasing in incidence as a gender label (Factor & Rothblum, 2008) and is conceptually distinct from other transgender spectrum identities. Furthermore, individuals indicating a genderqueer current identity on our survey were directed to a separate page on which they could choose from a list of 17 descriptors to indicate their specific gender identity (e.g., *two-spirit*, *genderblender*, *postgender*) (see Factor & Rothblum, 2008). Also noteworthy for our survey, if a person checked *intersex* for the birth-assigned question, they were directed to an additional question: *As which gender were you raised?* The response options were *female* or *male*. Consequently, our specific two-question method should be able to capture virtually all transgender spectrum identities. The previous method (Melendez et al., 2006) would likely miss the genderqueer population. Similarly, within the social sciences, we found only one use of a two-question format. Deogracias and colleagues (2007) asked their university sample (Study 1) both a question about "biological sex" (i.e., birth-assigned sex category) and "self-labeled gender" (current gender identity) (p. 372). Notably, these authors did not mention *intersex* as a birth-assigned category option, nor did they provide *genderqueer* as an option for one's current identity. In addition, Deogracias and colleagues (2007) did not evaluate the two-question method used in relation to a single-question method.

General Method

Overview

We used adult respondents in all studies because one's sense of gender identity may be firmly held by this age; as Factor and Rothblum (2008) found that the mean age of disclosing a transgender spectrum identity was between 19 and 24 years old in their U.S. sample.

To establish the statistical reliability of assessing gender identity using a two-question method to assess gender identity in relation to a single-question method, we compared the missing data rates to the valid response rates across the methods. We recruited 7 samples of respondents, totaling $N = 990$ (all $n_s > 104$ within each sample) from the San Francisco Bay Area in California in the United States. We chose San Francisco, in part, because this area contains the largest percentage of gay, lesbian, and bisexual (GLB) individuals in the United States (Gates, 2006). While transgender spectrum identities are not sexual identities, transgender individuals nonetheless report finding greater acceptance in GLB communities as compared to heterosexual ones (see Factor & Rothblum, 2008). Thus, one might reasonably

expect that San Francisco has one of the largest percentages of transgender spectrum individuals in the United States, offering the chance to gather a large number of valid responses.

We refer to the samples using numbers (i.e., Sample 1 through Sample 7). Samples 1 and 2 used the single-question method with four response options: *female*, *male*, *transgender*, and *other*. Samples 3 through 7 used the two-question method of asking separately about birth-assigned gender category and current gender identity. Samples are organized by study: Samples 1 and 2 (Study 1), Samples 3 through 5 (Study 2), and Samples 6 and 7 (Study 3). Samples 1 through 5 were students at San Francisco State University (SFSU). Samples 6 and 7 were community members from the San Francisco Bay Area.

Participants

For Sample 1, participants were 123 students from an undergraduate social psychology class who ranged in age from 19 to 48 years old ($M_{\text{age}} = 23.86$, $SD_{\text{age}} = 5.40$). For Sample 2, participants were 115 students from an undergraduate social psychology class in a subsequent semester who ranged in age from 18 to 40 years old ($M_{\text{age}} = 22.65$, $SD_{\text{age}} = 3.41$). These samples are reported separately and summarized as Study 1.

For Sample 3, participants were 104 students from an undergraduate class in social psychology who ranged in age from 19 to 39 years old ($M_{\text{age}} = 22.5$, $SD_{\text{age}} = 7.30$). For Sample 4, participants were 130 students from an undergraduate introduction to statistics course who ranged in age from 18 to 47 years old ($M_{\text{age}} = 22.6$, $SD_{\text{age}} = 4.56$). These samples are reported separately and summarized as Study 2a. For Sample 5, participants were 130 students from a human sexuality course (no age information was collected). This sample is reported as Study 2b.

For Sample 6, participants were 116 community members who were friends, family, or acquaintances of SFSU students enrolled in a human sexuality course who ranged in age from 18 to 62 years old ($M_{\text{age}} = 29.76$, $SD_{\text{age}} = 11.23$). For Sample 7, participants were 272 community members who were friends, family, or acquaintances of SFSU students enrolled in a human sexuality course in a subsequent semester who ranged in age from 18 to 71 years old ($M_{\text{age}} = 26.49$, $SD_{\text{age}} = 10.16$). These samples are reported separately and summarized as Study 3.

General Procedure

In all samples, participants completed the single-question method (i.e., *What is your gender?*) or the two-question method (i.e., *What is your current gender identity?* and *What gender were you assigned at birth?*) before completing a survey that assessed various

psychological constructs of interest. Accordingly, the content of the survey items that followed the gender question(s) cannot have logically influenced these results.

Study 1

The purpose of Study 1 was to estimate the percentage of transgender spectrum individuals that could be identified using a single question (i.e., *What is your gender?*) with four response options (i.e., *Female*, *Male*, *Transgender*, and *Other*) in relation to the missing data rate. The rationale for choosing this single question and its four response options is that a number of behavioral science researchers in the San Francisco area use this single-question method with exactly these response options to assess gender identity of respondents and, as noted in the overview, other psychological researchers who study transgender spectrum identities have used an equivalent single-question method with four response options (i.e., *man*, *woman*, *transgender*, or *other*) (see Deogracias et al., 2007, p. 372; Singh et al., 2010, p. 54).

Results

Sample 1

In Sample 1, 119 respondents chose either the *Female* ($n = 80$) or *Male* ($n = 39$) response option. One participant chose the *Transgender* option. Two respondents chose the *Other* option. Within the *Other* option, one participant wrote “androgynous” and the other wrote “none.” Factor and Rothblum (2008) found that *androgynous* is a descriptor used by genderqueer individuals. However, the same investigation did not find “none” used for any transgender spectrum identity. Accordingly, we treated “none” as missing data because we could not objectively determine whether the respondent meant “none of the above” or was trying to indicate a genderqueer identity. In addition, there was a blank response to this question in this sample that was also considered missing data. Consequently, 2 of 123 responses were classified as missing (1.6%). Also, in this sample, 2 of the 123 (1.6%) respondents could be identified on the transgender spectrum of gender identity.

Sample 2

In Sample 2, 114 respondents chose either the *Female* ($n = 74$) or *Male* ($n = 40$) response options. No participant chose the *Transgender* or *Other* option. In this case no respondents could be identified on the transgender spectrum of gender identity. There was one participant who provided a blank response to the gender question. Thus, this sample had a missing data rate of 0.87% on this question (1 in 115 respondents).

Table 1. Gender Categories and Missing Data Percentages by Method across Studies

Category	Study 1 ^a (N = 238)	Study 2 ^b (N = 364)	Study 3 ^b (N = 388)
Cisgender overall	—	98.35%	96.91%
Cis female	—	71.15%	49.49%
Cis male	—	27.20%	47.42%
Transgender overall	0.84%	1.65%	3.09%
Trans female	—	0%	0.77%
Trans male	—	0.55%	0.77%
Genderqueer	—	1.10%	1.55%
Missing data ^c	1.26%	0%	0.16%

Note: Studies 1 and 2 are college student samples from San Francisco State University. Study 3 is a community sample from the San Francisco Bay Area. All percentages are the number of people in the category divided by the total sample size. Percentages within a row can be directly compared. Cells with “—” indicate that the value could not be determined by the method used. *Cis* is a short form of cisgender; *trans* is a short form of transgender.

^aSingle-question method.

^bTwo-question method.

^cMissing data percentages reflect individual respondents who provided a nonresponse to at least one of the questions.

Summary and Conclusions

Across 238 respondents, 2 individuals (0.84%) could be clearly identified as having transgender spectrum identities. The missing data rate (3 responses in 238) across these samples was 1.26% (see Table 1). Thus, the missing data rate for this single-question method was as high as or higher than the identifiable (valid) transgender spectrum response rate. For this reason, the single-question method may not be as statistically reliable as one would desire. Reliable measurements should be able to identify numerically rare but valid responses at a higher rate than the missing data rate. Moreover, using the single-question method we have no clear indication of a cisgender profile for the 238 respondents who indicated either *Female* or *Male*. The single-question method is therefore imprecise for both transgender spectrum and cisgender identities.

Study 2

The purpose of Study 2 was to determine the percentage of transgender spectrum individuals that could be identified from using a two-question method (i.e., *What is your current gender identity?* and *What gender were you assigned at birth?*) in comparison to the missing data rate. The current identity question had five response options (i.e., *Female*, *Male*, *Transgender*, *Genderqueer*, *Intersex*). The birth-assigned category question had three response options (i.e., *Female*, *Male*, *Intersex*). The current identity response options represent natural language uses of gender identity (see Factor & Rothblum, 2008) and the birth-assigned response options represent medical classifications to sex-typed genital structures.

In addition to determining transgender spectrum identities using this two-question method, it is also possible to determine cisgender identities (which has hitherto not been assessed by any method of which we are aware). The two-question method can be used to determine those who have a cisgender identity by calculating the concordance between the selected options across both questions. If a person selects *Female* for current identity and *Female* for birth-assigned gender category, then this person is determined to be cisgender female (because the current identity is on the same side as her birth-assigned category). Similarly, if a person selects *Male* for current identity and *Male* for birth-assigned gender category, then this person is determined to be cisgender male (because the current identity is on the same side as his birth-assigned category).

Importantly, we counterbalanced the order of presentation for the birth-assigned and current gender identity questions across respondents in Sample 3. Half of the respondents completed the birth-assigned category question before the current gender identity question, and the other half completed the questions in the opposite order. Based on the Sample 3 results that follow, the current identity question always appeared before the birth-assigned question in Samples 4 through 7 to respect the importance of current identity, especially for those with transgender spectrum identities.

Study 2a Results

Sample 3

In Sample 3, one participant chose the *Genderqueer* option for current gender identity and the *Female* option for birth assigned gender (thus, this person was considered genderqueer). No participant chose either the *Transgender* option or the *Intersex* option for the current identity question. Notably, there were no missing data across both questions in this sample. Thus, 0.96% (1 in 104) of the sample was determined to have a transgender spectrum identity.

Examining other response patterns, using the method described, we determined that there were 74 cisgender females (*Female* birth-assigned and current gender identity; cis females, hereafter) and 29 cisgender males (*Male* birth-assigned and current gender identity; cis males, hereafter). Thus, we established that exactly 99.04% of Sample 3 respondents were cisgender.

In Sample 3, the order of the birth-assigned and current gender identity questions had no statistical effect on the answers respondents provided. The 104 respondents were exactly split between the order conditions described above ($N = 52$ in each). The self-reported birth-assigned category breakdown was 75 female-assigned, 29 male-assigned, 0 intersex-assigned. The current gender identity breakdown was 74 female-identified, 29-male

identified, 1 genderqueer-identified, 0 transgender, 0 intersex. Thus, the crosstabulation indicated that there was 100% concordance (29 out of 29) between the birth-assigned and current gender identity questions for male-assigned individuals. There was 98.6% (74 out of 75) concordance between the birth-assigned and current gender identity questions for female-assigned individuals. One participant indicated that ze was genderqueer as a current gender identity, and ze was assigned female at birth. (“Ze” is a gender pronoun that genderqueer individuals report using [Factor & Rothblum, 2008]). The overall phi correlation coefficient indicated high concordance between the two questions across all respondents and conditions, $r_{\phi}(102) = .97, p < .001$. There was no order effect on the correlation, $z < 1$.

Sample 4

In Sample 4, two of the 130 respondents were determined to have a transgender spectrum identity. Neither participant selected the *Transgender* option. Instead, both respondents indicated *Male* for current gender identity and *Female* for birth-assigned gender (both were therefore considered transgender male, or trans male hereafter). Similar to Sample 3, there were no missing data across the two questions in this sample. Thus, 1.53% of the sample was determined to have a transgender spectrum identity.

Exploring the other response patterns, we determined that there were 90 cis females (*Female* response for both current identity and birth-assigned questions) and 38 cis males (*Male* response for both current identity and birth-assigned questions). Examining the patterns within birth-assigned categories, the cross tabulation of birth-assigned and current gender identity was 97.8% in birth-assigned females (90 of 92). The cross tabulation of birth-assigned and current gender identity in birth-assigned males was 100% (38 of 38). The phi correlation coefficient again indicated high concordance between the two questions across all respondents, $r_{\phi}(128) = .96, p < .001$.

Study 2b

Study 2b was designed to assess the predictive validity of the two-question method. In addition, we added precision to the *Transgender* response option by separating it into *Transgender Female* and *Transgender Male* as response options to the current gender identity question.

Study 2b Results

Sample 5 Descriptives

Three respondents of the 130 individuals (2.3%) in the sample were determined to have a transgender

spectrum identity. These three respondents indicated their current gender identity as *Genderqueer* and their birth-assigned category as *Female* (thus, all were considered genderqueer). No respondent chose either *Transgender Female* or *Transgender Male* as a current gender identity. Similar to Study 2a, we calculated that there were 127 individuals (97.7%) with cisgender identities: 95 cis females, 32 cis males. In Sample 5, there were no missing data across the two questions.

Sample 5 Predictive Validity

The respondents in Sample 5 completed a group activity concerning gender identity weeks before completing these demographic questions. For the group activity, respondents were allowed to identify themselves as *female*, *male*, *transgender*, or *genderqueer* in order to have an in-person, small group discussion about social stereotypes relevant to their gender categories. In this group activity, three individuals (publicly) identified as either transgender or genderqueer and formed a group to complete the activity. The fact that exactly three individuals from this sample were determined to be on the transgender spectrum of gender identity using the two-question method (at a later date in this anonymous survey) demonstrates the predictive validity of the method.

Summary and Conclusions

Across 364 respondents, 6 individuals (1.65%) could be clearly identified as having a transgender spectrum identity using the two-question method of assessing gender categories. Also, there were no missing data across all the Study 2 samples for these questions. One can directly compare the 0% missing data rate in this study to the 1.26% missing data rate using the single-question method (Study 1) because both studies used college student samples from the same university. In addition, the two-question method used in Study 2 identified almost twice as many individuals with transgender spectrum identities (1.65% total) as compared to the single-question method (0.84% total) (see Table 1). Taking these findings together, we suggest that the two-question method is more statistically reliable than the single-question method because it provides higher valid responses compared to fewer missing data points when identifying transgender spectrum identities.

Furthermore, the two-question method allows for the determination of the logical counterpart to transgender spectrum identity: cisgender identity. Study 2 identified 358 cisgender respondents in a total sample of 364 (98.35%) (see Table 1). As previously stated, cisgender identity could not be determined for Study 1. The identification of cisgender respondents illustrates the precision of the two-question method over and above a single-question method—the two-question method can identify both transgender spectrum and cisgender identities simultaneously.

Study 3

The purpose of Study 3 was to determine whether the two-question method (i.e., *What is your current gender identity?* and *What gender were you assigned at birth?*) could be used equally well with community samples. We followed Tate's (2011) method of recruiting community samples from friends, family, and acquaintances of students enrolled in college courses. In line with this method, none of the students was aware of the purpose of the investigation, nor had they seen any of the materials used. It should be noted that students were asked to recruit two people who did not have the same gender identity. (It is important to note that the samples for Study 3 were collected before Sample 5 in Study 2. Consequently, the response options for Study 3 present only one *Transgender* option. The grouping of the studies is by demographics—college student versus community samples—not chronology.)

Sample 6

For this sample, 4 individuals of 116 respondents were determined to have a transgender spectrum identity. One participant selected *Male* for current identity and *Female* for birth-assigned category (and was thus considered trans male). Another participant selected *Transgender* for current identity and *Male* for birth-assigned category (and was thus considered trans female). One participant selected *Genderqueer* for current gender identity and *Female* for birth-assigned category (and was thus considered genderqueer). Finally, one participant indicated *Genderqueer* for current gender identity and did not select a birth-assigned category (and was also considered genderqueer). Thus, 3.4% of this sample was determined to have a transgender spectrum identity. Missing data as a blank response to the birth-assigned gender question (but a valid response to the current gender identity question) occurred in 1 participant in 116 (0.86%).

As in Study 2, the use of two questions allows for the precise assessment of cisgender individuals. In all, 112 respondents (of the 116) were determined to have a cisgender identity (96.5%): 57 cis females, 55 cis males.

Sample 7

For this sample, 8 individuals of the 272 respondents were determined to have a transgender spectrum identity (2.94%). Four individuals indicated *Genderqueer* for current gender identity. Three of the four individuals indicated *Female* as the birth-assigned category and one indicated *Male* as birth-assigned category (all were considered genderqueer). One participant indicated *Transgender* for current gender identity and *Male* for birth-assigned category (and was considered trans female). Two individuals indicated *Female* as current

gender identity and *Male* as birth-assigned category (both were considered trans female). One individual indicated *Female* as current gender identity and *Intersex* as birth-assigned category (and was considered trans female).

As with Sample 6, the two questions for current gender identity and birth-assigned category allows for the precise determination of cisgender individuals within the sample. In this sample, 264 respondents (of the 272) were determined to have a cisgender identity (97.06%): 135 cis females, 129 cis males.

Summary and Conclusions

Across 388 community sample respondents, 12 individuals (3.09%) could be clearly identified as having transgender spectrum identities using the two-question method of assessing gender categories. Within Study 3, we also determined that 376 individuals had cisgender identities (96.91%) across both samples (see Table 1). Study 3 also showed that it is possible to have missing data using the two-question method (see Sample 6 and Table 1); however, since there are two questions, researchers may still be able to identify transgender spectrum identities with the current identity question alone (as happened within this investigation)—but only when *transgender female*, *transgender male*, or *genderqueer* are explicitly selected.

General Discussion

Study 1 showed that a single question with four response options for gender identities could identify some respondents with transgender spectrum identities. However, this single-question method may not be statistically reliable considering that it features more missing data than valid transgender spectrum responses. Moreover, this particular single-question method cannot identify respondents with cisgender identities, nor can this method identify all types of transgender spectrum identities. Studies 2 and 3 showed that a two-question method that asks about current gender identity and birth-assigned gender category separately has three salient advantages over the single-question method. One advantage is that more respondents were consistently identified as having transgender spectrum identities using the two-question method. Across five samples, at least one participant could be identified on this spectrum using the two questions, and, in total, the two questions captured almost three times the number of transgender spectrum respondents (2.39% of samples) compared to the single question (0.84% of samples). Another advantage is that the two-question method had a much lower missing data rate (0.16%) compared to the single-question method (1.26%) (see Table 1). A third

advantage is the determination of cisgender respondents using the two-question method. Until now, researchers and demographers have been left to infer that most persons within their sample have cisgender identities, even while knowing that some counted in this number might have transgender spectrum identities. Study 3 showed that the two-question method can be efficaciously used with community samples, which argues that the method is not tailored to college student samples. Thus, it appears that many adults in the general public can use this two-question method, with a very low missing data rate across the two questions.

Tailoring the Two-Question Method

To the extent that the results obtained with this particular two-question method are not dependent on the exact wording of the questions, researchers are encouraged to tailor the language of these questions to fit their specific research needs, the samples on which they are collecting information, and the context in which their data collection occurs. The only caveat is that a genderqueer option must be present in the current identity question to capture valid responses. To the extent that the single-question formats of asking about gender identity have various forms (e.g., *Please describe yourself: Male, Female or Gender: Male, Female*), researchers should be able to create question stems such as *Please describe your current gender identity:* or *Please check the gender identity that best describes you currently:* for the two-question format as well. Likewise, the response options to the current identity question can be changed to indicate nouns. For instance, the response options can be *man, woman, trans man, trans woman, genderqueer, or intersex* for one's current identity. (Factor and Rothblum, 2008, note 1, found that many transgender persons prefer these terms. The space provided is to indicate that the *trans* term is a modifier or an indication of the path to one's current identity as female or male.) The birth-assigned question is most sensibly responded to with the *male, female, intersex* options because these are the medical categories used. For purely medical research and practice purposes, one might choose to leave out the *transgender female* and *transgender male* response options altogether for the current identity question insofar as *female, male, genderqueer, and intersex* would still capture all the major ways in which people identify their gender, and combining these responses with birth-assigned categories would allow professionals to determine a transgender spectrum profile from the pattern of responses. For purely medical research and practice, the birth-assigned category question could be changed to read: *Which sex were you assigned at birth?* and still include all three options (i.e., *female, male, and intersex*) since the medical context in which respondents experience the question will already elicit a focus on anatomy and bodies.

Added Precision for Estimating Identities

Because two-question methods of the kind evaluated here have been used only in a small number of past studies, researchers have a wide interval for the estimate of the number of people with transgender spectrum identities in the United States. The U.S. figures range from 41,067 to 1,149,900 individuals who identify as transgender because of the lack of precise measurement. The American Psychological Association's Task Force on Gender Identity and Gender Variance (APA, 2008) has estimated the occurrence of transsexuals who have had genital reassignment surgeries to be 1 in 10,000 for those birth-assigned male and 1 in 30,000 for those birth-assigned female. These estimates are the basis for the lowerbound value listed above. Importantly, Factor and Rothblum (2008) found that approximately 24% of trans women (birth-assigned male, currently identify as female) in their sample reported having genital reassignment surgery and that 0% of trans men (birth-assigned female, currently identify as male) in their sample reported having had genital reassignment surgery. We therefore adjusted the APA Task Force figures for the Factor and Rothblum proportions and applied these percentages to a U.S. population of 308 million to derive the numbers listed at the beginning of this paragraph. Of particular note, the APA Task Force did not include those who identify as genderqueer. Thus, the total number of transgender spectrum identities (including genderqueer) is even larger than the figures listed above and, might be reasonably doubled based on the results in Table 1. Thus, the two-question method is needed to provide accurate estimates of the number of transgender spectrum individuals in the U.S. and other countries.

Implications and Extensions

The two-question method of assessing gender will advance research and practice within medical and social sciences by providing the precision of measurement crucial to answering the fundamental questions posed within each domain, as briefly summarized at the outset. In this section, we develop the additional benefits, specific to each domain, that may result from the consistent and wide use of the specific two-question format used in our investigation. We discuss these extensions in the three sections that follow: (a) general medical practice, (b) transgender health care, and (c) basic research and practice in the social sciences.

General medical practice. For general medical practice, the two-question method can be used on intake questionnaires to provide a quick and precise determination of gender identity that is sensitive to the special medical concerns within transgender spectrum populations. A recent U.S. national survey found that transgender spectrum respondents reported over four

times the national rate of HIV infection (Grant et al., 2011). Thus, practitioners and researchers can assess HIV risk more easily based on demographic information obtained by using the two-question method. Also, practitioners in particular can be respectful toward transgender spectrum individuals during face-to-face interactions by using the two-question method. For example, practitioners can quickly determine the correct pronoun to use for their patients by examining response patterns across the two questions (e.g., virtually all trans women prefer *she* and virtually all trans men prefer *he*) (Factor & Rothblum, 2008). In addition, practitioners can simply ask genderqueer patients which pronouns they prefer because there is considerable variability for this group (Factor & Rothblum, 2008). Such basic courtesy may reduce the number of transgender persons who avoid medical treatment based on expectations or actual experiences of prejudice and discrimination (see Grant et al., 2011).

Transgender health care. Feldman and colleagues (Feldman & Goldberg, 2006; Feldman & Safer, 2009) have argued for evidence-based best practices when providing medical services to trans men and trans women. Among the many important issues raised by Feldman and Goldberg (2006) is the need to evaluate transgender populations in relation to cisgender populations to answer a variety of time-sensitive questions, such as the nature and course of somatic hormone behavior (i.e., bodily) past age 65. Since some proportion of transgender individuals receive hormone treatment to effect bodily transitions (e.g., testosterone supplements for trans men or estrogen supplements for trans women), it is important to understand the physiological dynamics after age 65 when hormone levels for cisgender persons undergo further change. Yet, one may notice that to make accurate comparisons, researchers would need to assess cisgender populations with as much precision as transgender populations. The existing single-question methods cannot create this precision, but the two-question method presented here can, as demonstrated by our studies.

Furthermore, using the precision of the two-question method would also allow medical researchers and epidemiologists to track large-scale, national health outcomes for those transgender respondents who have not yet or never will seek hormonal augmentation of their bodies. Factor and Rothblum (2008) found that 88% of trans women and 76.5% of trans men reported using hormones for physical transition. Thus, 12% to 23.5% of trans women and trans men may not use hormone treatment, and this information would be important to track. Moreover, Factor and Rothblum's (2008) investigation showed that only 34% of genderqueer respondents were taking hormone supplements—and very few (1.6%) had undergone genital surgeries. Thus, comparisons among these three populations would create

better understandings of the reasons for and consequences of hormone use. Furthermore, at this point in time, genderqueer individuals are rarely included in discussions of transgender health, which means that while this population may grow in the future, medical research would not be able to identify and track health care concerns particular to this population. Thus, by being able to focus on genderqueer individuals using the two-question method described here, researchers would be able to create transgender spectrum health care, which would, with a broader scope, benefit more individuals—and sooner rather than later.

Basic research and practice in social science. For social science, the uses of the two-question method are various. Demographic research (e.g., national Census) can employ the two-question method to precisely and efficiently estimate the number of cisgender and transgender spectrum individuals within any locality and nationwide. Policy decisions will improve appreciably with a better understanding of the number of people who may require social services or be at risk of social prejudices using such U.S. Census data. For basic research, social scientists will benefit from the added precision of assessing gender experience for psychological processes such as self-categorization and identity dynamics. For example, researchers could discover nuanced answers to existing fundamental questions, such as the process by which people come to have particular, stable gender identities, by comparing the psychological profiles of cis women to trans women and cis men to trans men. Exploring different trajectories to the same identity will provide invaluable information by allowing researchers to track the similarities and differences in the identity formation process with more precise data organization. Moreover, researchers could create comparisons *within* transgender spectrum identities to further understand identity processes. There is some qualitative research on transgender participants contrasting “stealth” identity (i.e., not disclosing to others one's transgender path to current identity) with those who are open about their transgender path to their current identities (see Schilt, 2006). Using the two-question method might capture this distinction quantitatively to the extent that women, for instance, who may publicly identify as trans may more often choose the *transgender female* response option, while women who may be described as “stealth” may more often choose the *female* response option. Thus, the two-question method can foster complementary quantitative approaches to phenomena that are currently studied qualitatively. (Thus, our wording in Table 1 refers to a researcher's view of the path to current identity, not necessarily how a participant would describe her or his identity to another person.) For basic research on interpersonal attitudes, using the two-question method researchers can examine whether gender bias against

women, for example, has similar profiles for cis men and trans men. For applied research, being able to identify transgender spectrum individuals may help determine those who may seek social and counseling services to cope with discrimination and better understand their own experiences of gender.

Conclusion

In sum, this new two-question method of assessing gender can lay the foundation for new lines of research and greater social understanding for both cisgender and transgender spectrum experiences of identity in a manner that preserves measurement uniformity across the social and medical sciences. The particular two-question method described here creates less discrimination than existing two-question methods by explicitly including genderqueer identities (alongside transgender female and transgender male identities). And by virtue of its greater inclusion, this particular two-question method also allows for the expansion of transgender health care to include genderqueer identities. Finally, with the identification of cisgender identities as the logical counterpart to transgender spectrum experience, all fields of empirical inquiry can benefit from precise assessments of both profiles to create better scientific understandings of gender and its related constructs.

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