

# Diversity Corner

## Sex and Gender in Clinical Science Research

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Clinical science has a long history of confounding the terms “sex” and “gender”. Although many studies purport to include gender as a variable, what is actually being measured is sex. In fact, gender is rarely considered unless it is a specific focus of study. Unfortunately, improper use of these terms remains commonplace, even among eminent researchers, and continues to be passed down to future generations of clinical scientists. This article addresses key, research-pertinent distinctions between sex and gender and considers relevance of gender assessment to clinical science research. A list of references and resources are provided at the end of the article. We begin with (research friendly) definitions of sex and gender (APA, 2011; WHO, 2015).

### Definitions

**Sex:** Male or Female. This is a discrete, categorical variable. Category assignment is based on a set of biological attributes, including chromosomes, physical features, hormones, and reproductive anatomy.

**Gender:** Femininity and Masculinity. These are multi-dimensional, non-mutually exclusive constructs representing socially determined characteristics, behavior, and roles of males and females.

### Distinguishing Sex and Gender

As variables, sex and gender have distinct properties and connotations that affect assessment, analysis, and interpretation of results.

Sex is a well-behaved, low maintenance variable. It typically consists of two distinct categories, male or female (although “intersex” or “other” can be included as an additional category), it is easily assessed by self-report (DNA testing or physical exam are valid, but unnecessarily invasive), and results are generalizable across populations and studies. That said, when we assess sex, it is important to be clear on what is and is not being measured. This sounds silly. Obviously, we want to know if a subject is male or female. Yet, it can be easy to forget that these data are collected independent of social context and interpretation is specific to biological effects. On its own, sex does not reflect the influence of social roles or norms. Without information about social context and environmental factors, interpretation is limited to effects of male and female physiology.

Gender can provide this missing information, allowing for more nuanced interpretation of results.

Gender is highly relevant to human experience, impacting social and cultural roles and expectations, social cognition and behavior, self-perception and perception by others, decision making, socioeconomic status, help-seeking behavior, experience of illness, and social wellbeing. Accordingly, characterizing the role(s) of gender is relevant to many areas of clinical science and has implications for psychological treatment, public policy and law. Gender also can interact with a number of commonly assessed variables, including age, education, income, family structure, and interpersonal functioning, and may influence results. Assessment of gender can be uniquely informative and aid interpretation of other measured variables. However, gender norms can vary greatly between and within populations. As such, for main and interaction effects to be interpretable, gender must be carefully operationalized and appropriately assessed within a well-characterized sample.

There are several resources that can assist with selecting measures of gender and integrating gender assessment into a research protocol or program. Three sources are described here, but this list is certainly not exhaustive. References and links for these and other resources are provided below.

The Williams Institute, a collaborative research initiative on sexual orientation and gender identity law and public policy, provides examples of different approaches to gender assessment. Among those discussed are: 1) a two-item method of assessing socially assigned gender expression, with the first item assessing gendered appearance and the second assessing gendered mannerisms (e.g., very feminine to very masculine) and 2) a “single” item assessing both gender identity and sexual orientation, structured as a series of Yes/No questions (e.g., Are you straight? Are you gay or lesbian? Are you bisexual? Are you transgender, transsexual or gender-variant? Are you not listed above?).

The World Health Organization (WHO) provides research and literature on gender, particularly in the context of health risk and services. Resources include information on the roles of sex and gender on health outcomes. Assessment tools are also available, with a particular focus on gender analysis and use of these data in health-related contexts.

The Institute of Gender and Health (IGH), Canadian Institutes of Health Research, promotes integration of sex and gender into biomedical and health research. They offer a variety of resources for researchers, including publications, education, and strategies for using sex

and gender in research.

### Relevance of Gender to Clinical Science Research

Assessing gender and integrating this information into research can be a step towards improving clinical science. The following is a brief discussion of the potential benefits of assessing gender, as well as the challenges researchers may encounter when considering or trying to implement the assessment of gender in research.

**Benefits of assessing gender.** As opposed to attributing similarities or statistically significant differences between groups to biological sex, gender-informed data allow for the possible influence of an array of social factors that may be at play. Additionally, the assessment of gender provides a more precise and sensitive measurement of the socially and culturally relevant experiences of participants. Gender can reflect the differential impact that these social and clinical phenomena have on men and women. For example, gender-sensitive research considers how social hierarchies and roles differ by gender, and we may be able to find interactions of gender and other key variables of interest such as income, education, and age. The point here is not to debunk important clinical science that examines biological sex differences and utilizes “sex” as a variable of interest in studies. The Institute of Medicine (2001) released a report emphasizing the importance of understanding the biological contributors to health, and we uphold these points and recommendations to continue promoting this research. Instead, by assessing both sex *and* gender, researchers may find that some variables are differentially associated with sex and gender. Researchers are encouraged to think about how, from study conception to dissemination of results, gender and sex can be considered separate variables and data disaggregated to clarify differential effects of biological sex and gender as a social construction.

An example of how the fields of research and health care have become more gender-conscious and attuned to gender as a key determinant of health is the strategy of “gender mainstreaming” by the World Health Organization (WHO). This strategy assumes that gender norms and roles are experienced by both men and women, but they impact individuals differently due to socially accepted values about women, or other oppressed and marginalized groups (e.g. gender non-conforming, transgender individuals). The WHO response aims to integrate gender analysis and actions into the work by the WHO, and this strategy was adopted by the Sixtieth World Health Assembly in May 2007. The WHO Gender Strategy includes ensuring capacities for gender analysis and planning, mainstreaming gender in corporate functions (e.g. gender responsive results-based management planning, budgeting, monitoring

and evaluation), disaggregating data and conducting gender analysis, and establishing accountability for mainstreaming gender. Gender is an important determinant of health outcomes (WHO 2011), and by assessing for gender and including gender-specific research, clinical science can address the implications of gender values, norms, and behaviors on mental health and other clinical outcomes.

**Challenges of assessing gender.** There are also challenges with assessing for gender in psychological research. The misuse of the term “gender” versus “sex” in psychological research may often be attributed to misinformation or lack of knowledge about the difference between these two terms. However, there may be reasons researchers intentionally choose to use the term “gender” interchangeably with “sex”, or disregard the importance or relevance of examining gender in research studies. One such reason may be due to the dimensional nature of the gender construct. From a methodological standpoint, adopting constructs that are not well defined adds “messiness” at the level of statistical analyses. A nominal category of “male” and “female” appears to be a clear-cut way of assessing for “gender”. However, as noted above, it is important that selected measures accurately reflect the conceptual variable we are interested in studying. For example, in a hypothetical study examining differences in adolescents’ academic functioning and possible results indicate that “girls perform better than boys” on an achievement test, are findings reflecting something biologically different between males and females? Or, might these findings speak to the impact of gender socialization, stereotype threat, or biases in teachers’ treatment towards girls and boys, which in turn, impacts their academic performance?

Secondly, researchers may argue that gender, as a social construct, is not relevant to their studies. Conceptually, individuals may be interested in examining differences between males and females from a categorical level on the basis of biological sex. In this case, we propose that researchers accurately reflect this goal by using the term “sex” in the dissemination of their work, not “gender.” On the other hand, those who desire to find differences in peoples’ experiences based on their gender identity, and utilize the term “gender” in their research questions, are encouraged to recognize that this construct assumes important social roles, norms and values.

Thirdly, researchers may believe that the conclusions they draw from finding “gender” differences are synonymous to sex differences. One may ask, “does it really matter?” or claim that consumers of our research will know what the intended meaning is when someone states there are effects by gender or sex. We want to challenge these assumptions and propose that clinical science should accurately reflect what we intend to relay

to the community. Specificity in our language can help reduce bias and overgeneralization, making research increasingly accurate as well as culturally sound.

## Summary

The wide-spread acknowledgement in today's society of the variance in gender identity and the greater prevalence of gender non-conforming individuals require methodological assessments and terminology to reflect this variance (APA, 2011). Scientists generally agree that variable operationalization and measurement are a key aspect of a well-designed study and essential for clear communication of findings, and sex and gender are no different. The more nuanced our assessments, the more inclusive and accurate our conclusions and in turn, the information we bring back to the community.

We end with the following resources (not an exhaustive list) that include assessment measures for gender. We encourage the growing use of gender-specific assessments to add a more clearly differentiated and accurate representation of the constructs we as clinical scientists intend to study.

## Resources

### Definitions

American Psychological Association (APA, 2011) presents an excerpt with definition of terms (sex, gender, gender identity, sexual orientation) taken from the *Guidelines for psychological practice with lesbian, gay, and bisexual clients*. Retrieved from <https://www.apa.org/pi/lgbt/resources/sexuality-definitions.pdf>

A comical, simplified, but poignant illustration of the differences between gender, sex, sexual orientation, and related terms is available at <http://itspronouncedmetrosexual.com/2011/11/breaking-through-the-binary-gender-explained-using-continuums/>. The continuum approach is illustrated here.

Institute of Gender and Health, Canadian Institutes of Health Research. This webpage provides definitions, information, and publications on gender in pre-clinical and clinical research. <http://www.cihr-irsc.gc.ca/e/8681.html>

The World Health Organization (WHO) Gender fact sheet N°403; August 2015 provides key facts about gender, definitions and information about gender equality, as well the WHO response. <http://www.who.int/mediacentre/factsheets/fs403/en/>

### Gender Assessments

World Health Organization (2011), Department of Gender, Women, and Health. Gender mainstreaming for health managers: a practical approach

Williams Institute, GenIUSS group (Gender Identity in U.S. Surveillance) (2013), Gender-Related Measures Overview This document discusses models of gender assessment and provides examples of questions that assess gender. Retrieved at <http://williamsinstitute.law.ucla.edu/wp-content/uploads/GenIUSS-Gender-related-Question-Overview.pdf>

Williams Institute, Sexual Minority Assessment Research Team (SMART) (2009), Best Practices for Asking Questions about Sexual Orientation on Surveys. Retrieved at [http://lgbttobacco.org/files/SMART\\_Report%20DATA%20Nov09.pdf](http://lgbttobacco.org/files/SMART_Report%20DATA%20Nov09.pdf)

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