The term “gender” became popular among sociologists, psychologists, and sex researchers in the 1970s as a means to differentiate biological differences between men and women (sex differences) and differences due to socialization experiences (gender differences), or the act of having sex (e.g., 12, 19, 25, 27). In other words, unlike one’s biological sex, gender refers to the social construction of masculinity and femininity (19, 21). It does not exist within a person (10), but instead is a term that was designed to be used “...only when discussing social, cultural, and psychological aspects that pertain to the traits, norms, stereotypes and roles considered typical and desirable for those whom society has designated as male or female.” (8).

The distinctive usage of sex and gender was initially very successful, but in the last two decades, the media, in particular, has increasingly used gender as a synonym for sex. Recent examples include reporting the use of autopsies on skeletal remains to determine the gender of victims, referring to gender differences when reporting performance differences between fillies and mares in horse racing, and reporting that a South African track star (who had won a gold medal in the women’s 800-meter event in the World Games) was required to take a gender test. One’s gender cannot be determined by an anatomical exam, a urine test, or by an autopsy.

Despite some published appeals for proper usage of gender and sex (e.g., 14, 22, 29), misuses of the terms have increasingly begun to appear in academic publications as well. These include textbooks (13, 22) and academic journals (14, 22). Unfortunately, in recent years, this also includes studies using nonhuman animals that were published in biomedical, physiological, and neuroscience journals (14). For example, a search in the Medline database indicated that between January 2005 and December 2009 there were 489 published studies with the key words “sex differences” and “rats,” and an unprecedented 197 articles with the terms “gender differences” and “rats” (compared with 326 and 20, respectively, in the period 1985–1989 and 343 and 59, respectively, in the period 1990–1994). Among the latter, 105 contained “gender” in the titles of the articles. Of course, the numbers would be greater if the Medline search were expanded to include nonhuman subjects other than rats. Regardless of the species, nonhuman animals do not display gender differences.

The American Psychological Association has officially endorsed the distinctive usage of the terms sex and gender since 1994. In its Publication Manual of the American Psychological Association, 5th edition, “Guideline 1: Describe at the appropriate level of specificity,” the American Psychological Association states, “Gender is cultural and is the term to use when referring to men and women as social groups. Sex is biological; use it when the biological distinction is prominent. ... Gender helps keep meaning unambiguous.” (1).

Some other social science journals have also included the distinctive usage of the terms sex and gender as policy in their review of manuscripts (e.g., 9).

The Institute of Medicine endorsed a similar distinction in 2001:

“The committee defines sex as the classification of living things, generally as male or female according to their reproductive organs and functions assigned by the chromosomal complement, and gender as a person’s self-representation as male or female, or how that person is responded to by social institutions on the basis of the individual’s gender presentation. Gender is shaped by environment and experience.” (Ref. 17.)

Noting the “inconsistent and often confusing” use of the two terms in both the media and scientific publications, one of the recommendations of the Institute of Medicine was to “... clarify use of the terms sex and gender.” (Ref. 17a, p. 6).

This distinction does not mean that gender is always the appropriate term even when referring to humans. For example, sex is the appropriate term when categorizing male and female human subjects in biomedical studies. However, the term gender is never appropriate for nonhuman species. An example of the appropriate usage of the two terms with humans is with transsexual individuals, i.e., individuals who believe themselves to be of the opposite sex. Sex is the proper word to refer to their anatomy, whereas gender refers to their identity, and thus, the term gender identity disorder (4). Similarly, in the case of children born with ambiguous genitalia, it was once the practice to do corrective surgery shortly after birth. This practice became less common when studies showed that for many of the children they assigned (by parents and physicians) anatomy did not agree with their sense of gender identity (7).

There is no attempt here to trivialize the definitions of either sex or gender. Biological sex, whether defined by anatomy, chromosomes, hormones, or some combination, is not a dichotomous classification, for there are a large variety of intersexual individuals (20). The concept of gender is equally complex (see Ref. 28). The quoted short definitions by early social scientists (e.g., Ref. 8), the American Psychological Association (1), and the Institute of Medicine (17) may not appear to be identical (perhaps because they addressed different aspects of the concept), but the intent of all is the same: to “… distinguish culturally specific characteristics of masculinity and femininity from biological factors.” (15). Even if one were to attribute behavioral differences in male and female rats to a socialization process, that does not mean that they possess a sense of gender (and it would be anthropomorphic to suggest so).

It should also be noted that a great many of the 197 articles referring to gender differences and rats that were published in the period 2005–2009 did not even study behavior, but instead...
were studies of cellular, tissue, or organ responses. Some recent examples (all are parts of article titles) include “gender-related differences in GABAA receptor-mediated postsynaptic currents” (6), “cardiac ischemic injury and protection” (26), “S100 beta protein expression” (24), “erythrocyte and brain decosahexaenoic acid composition” (23), “liver and kidney expression of sulfate anion transporter sat-1” (5), “proliferation and osteogenic differentiation of bone marrow stromal cells” (16), “high-fat-diet-induced insulin resistance in skeletal muscle” (11), “beta-adrenergic receptor responsiveness” (3), “febrile response to lipopolysaccharide” (2), and “deoxygenocorticosterone acetate-salt-induced hypertension” (18). These examples, and numerous others, clearly have nothing to do with gender as defined by the Institute of Medicine (17).

The media cannot be expected to use the terms sex and gender properly if academic publications do not do so. Two of the major reasons that researchers give for using the term gender when referring to nonhuman animals are a “... desire to signal sympathy with feminist goals . . .” and an attempt “... to use a more academic term . . .” (Ref. 14, p. 94–95). Both reasons are misguided, lack scientific objectivity, and are opposite the intentions of feminist scholars (e.g., 10, 12, 19, 25, 27) and the recommendations of both the Institute of Medicine (17a) and the American Psychological Association (1). Both organizations emphasize that the terms sex and gender are not synonyms.

It is obvious from the Medline data that recommendations alone have not stopped the misuse of the term gender. Editors of biomedical journals are encouraged to consider adopting a policy following the recommendations of the Institute of Medicine when considering manuscripts for future publication.

REFERENCES


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