



# A visual analysis of gender bias in contemporary anatomy textbooks



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## ABSTRACT

Empirical research has linked gender bias in medical education with negative attitudes and behaviors in healthcare providers. Yet it has been more than 20 years since research has considered the degree to which women and men are equally represented in anatomy textbooks. Furthermore, previous research has not explored beyond quantity of representation to also examine visual gender stereotypes and, in light of theoretical advancements in the area of intersectional research, the relationship between representations of gender and representations of ethnicity, body type, health, and age. This study aimed to determine the existence and representation of gender bias in the major anatomy textbooks used at Australian Medical Schools. A systematic visual content analysis was conducted on 6044 images in which sex/gender could be identified, sourced from 17 major anatomy textbooks published from 2008 to 2013. Further content analysis was performed on the 521 narrative images, which represent an unfolding story, found within the same textbooks. Results indicate that the representation of gender in images from anatomy textbooks remain predominantly male except within sex-specific sections. Further, other forms of bias were found to exist in: the visualization of stereotypical gendered emotions, roles and settings; the lack of ethnic, age, and body type diversity; and in the almost complete adherence to a sex/gender binary. Despite increased attention to gender issues in medicine, the visual representation of gender in medical curricula continues to be biased. The biased construction of gender in anatomy textbooks designed for medical education provides future healthcare providers with inadequate and unrealistic information about patients.

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## 1. Introduction

Previous research has shown that in medical education texts, men are treated as the norm, while women are underrepresented and primarily identified by their reproductive attributes (Alexanderson et al., 1998; Giacomini et al., 1986; Lawrence and Bendixen, 1992; Mendelsohn et al., 1994; Metoyer and Rust, 2011; Moore and Clarke, 1995). This is concerning given the influence that biased education can have on future healthcare practitioners' attitudes and behaviors (Burke et al., 2015; Risberg et al., 2003). We completed a comprehensive content analysis of gender images from the major anatomy textbooks used in Australian Medical Schools. In addition, images were analyzed for bias in the form of gender stereotypes and in the underrepresentation of the intersections of gender with minority and/or marginalized groups. By

examining the images found in anatomy textbooks, this research identifies what visual messages have been ascribed to the gendered body in an educational context.

## 2. Background

Androcentrism and gender-based inequality and discrimination have historically been a significant part of the social power imbalances present in medical discourse. In the late 1960s, feminist health movements began to draw attention to inequalities in women's healthcare (Moore, 2010). Since that time, there has been dramatic progress in achieving gender equality in healthcare research, knowledge, and policy (Doyal, 2001; Phillips, 2005; Risberg et al., 2003). Nevertheless, research continues to show that gender bias and inequality persists in medicine (Bierman, 2007; Colella et al., 2015; Hamberg and Larsson, 2009; Kent et al., 2012). Women continue to be underrepresented in medical research, which has resulted in limited and inaccurate knowledge about female health (Hamberg, 2008). Further, the production and

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maintenance of gender stereotypes in medicine affects the medical diagnosis, treatment, and management of patients (Balsa and McGuire, 2003; Martin and Suls, 2003). Healthcare practitioners' attitudes, beliefs, and behaviors have also been shown to significantly impact healthcare decisions and outcomes (Chapman et al., 2013; White, 2011).

Furthermore, little attention has been given to intersectional issues in medicine. Intersectional theory views identities as consisting of multiple social dimension of difference, such as gender, race, sexuality and/or class, and proposes that the complex interconnections between these dimensions have significant material consequences (Hill Collins and Bilge, 2016; Crenshaw, 1991; Davis, 2008). Ignoring how dimensions of difference intersect with gender has resulted in a limited understanding of all the factors contributing to health disparities in medical practice, research and education (Hankivsky, 2012; McCall, 2005). Indeed, the effects of gender bias are shown to increase when intersectional determinants of health such as class, ethnicity and sexuality are taken into account (Hankivsky, 2012). Adopting intersectional theory allows medical research "to study health and disease at different intersections of identity, social position, processes of oppression or privilege, and policies or institutional practices" and, by doing so, provides "greater attention to both heterogeneity of effects and causal processes producing health inequalities" (Bauer, 2014, p.10).

The persistence of gender bias in healthcare, alongside the significant opposition that movements such as the women's self-help movement have faced in trying to gain recognition and legitimacy, highlights the fact that gender continues to be used as an apparatus of power within medical discourse. The gender ideologies produced and maintained in authoritative discourses such as medicine are part of a hegemony that naturalizes and promotes certain power relations (Connell, 2005). Despite the fact that hegemonic knowledges are fallible and plural, they have the power to construct what is 'normal' and 'real' in our society (Foucault, 1980). This includes what gender roles, occupations, behaviors, personality traits, and physical attributes are socially acceptable. Significantly, hegemonic gender ideologies in medical curricula that, for example, represent the White male body as the norm, not only establish other bodies as abnormal but also provide inadequate information about caring for diverse patients (Klinge, 2010). As medical education is often a health practitioner's first significant encounter with the culture of medicine, it is critical that bias present during this period be examined and critiqued (Risberg et al., 2003).

The discipline of anatomy deals directly with the body and therefore plays a pivotal role in constructing normative bodies not only in medicine but also in society in general (Moore and Clarke, 1995). The highly visual nature of anatomy means that images are central to knowledge dissemination. Beyond their primary function of communicating facts, images have the ability to contain secondary information about the social rules and values of constructs such as gender (Dikovitskaya, 2012). As a part of discourse, images not only passively present a particular view of reality but can also actively construct that reality (Kress and van Leeuwen, 2006). High exposure to reoccurring themes within images has been shown to influence attitudes, beliefs, and behaviors (Banks, 2003). Therefore, the role that images play in the construction of gender within the authoritative discourse of medicine is particularly significant.

### 2.1. Existing research

Several studies have investigated the existence of gender bias in images from anatomy textbooks. Giacomini et al., (1986) study of eight textbooks found that 85% of all images in which gender could

be determined were male, and only 11% of images outside of urogenital sections were of women. Lawrence and Bendixen (1992) examination of 31 textbooks found that the ratio of male images outnumbered female images by approximately 2.5:1 and that men were consistently treated as the norm. Mendelsohn et al. (1994) reported that males comprised 68% of all gendered images from 12 textbooks, with only 11% of images that did not represent the urogenital system being female. Moore and Clarke (1995) found that the clitoris was either not represented, or was unclear and/or unlabeled in anatomy textbooks. Morgan et al., (2014) analysis of 10 anatomy textbooks used in Wales and France reported that most were male dominated.

Gender bias has also been identified in studies on gynecological textbooks that, being female-specific, have focused on the existence of damaging gender stereotypes. Scully and Bart (1973) conducted a pivotal study on 28 gynecological textbooks and found that representations of female sexuality were either non-existent or stereotyped as essentially reproductive and/or for the benefit of a woman's husband. Koutroulis (1990) found that, although improvements had been made since 1973, the same stereotypes still existed and discussions about women's health and sexuality remained scarce. Several studies also identified that traditional gender stereotypes have been used to frame the female egg as passive, vulnerable and dependent, and the male sperm as active, superior and dominant (Campo-Engelstein and Johnson, 2014; Martin, 1991; Metoyer and Rust, 2011).

### 3. Context of the present study

Research has shown that men are often treated as the norm in anatomy textbooks and women remain underrepresented except in reproductive sections, yet there has not being a large-scale systematic exploration of the visual representation of gender in anatomy textbooks since 1994. Thus, the current study explored the ratio of female and male representation in contemporary anatomy textbooks (see *Hypotheses 1* and *2*). Previous research has neglected to examine how intersections between gender and other marginalized and minority groups contribute to bias. Research has shown that gender inequalities exist at the intersections of: 1) ethnicity, where femininity is normalized as white (Deliovsky, 2008); 2) body type, with women's bodies expected to be thin and toned while men are muscular (Erchull, 2015; Roth and Basow, 2004); 3) age, where women in particular are expected to maintain a youthful appearance (Wearing, 2007); and 4) health, where the female body is considered weak in comparison to the male body (Dowling, 2000). This study therefore took on an intersectional approach in order to identify the ways in which these categories of difference contribute to normative constructions of gender (see *Hypotheses 3–6*). An examination of the visual representation of gender stereotypes represented in anatomy textbooks has also been absent from research. Gender stereotypes play a significant role in legitimating and perpetuating social norms and in producing discrimination (Burgess and Borgida, 1999). Broadly, traditional gender roles are socially constructed as 'feminine' (e.g. nurturing and emotionally expressive) and 'masculine' traits (e.g. being assertive and independent; Macionis, 2012). Research has shown that men in particular are more likely to be socially penalized for not conforming to masculine stereotypes (Prentice and Carranza, 2002; see *Hypothesis 7*). Social constructs of gender stereotypes also extend to work roles, behaviors, and emotions. Specifically, dominant gender norms emphasize that women primarily occupy domestic roles while men occupy occupational roles (Nicholson and Fisher, 2014; Rudman and Glick, 2008; see *Hypothesis 8*); portray women as passive versus men as active (Gauntlett, 2002; Campo-Engelstein and Johnson, 2014; see

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