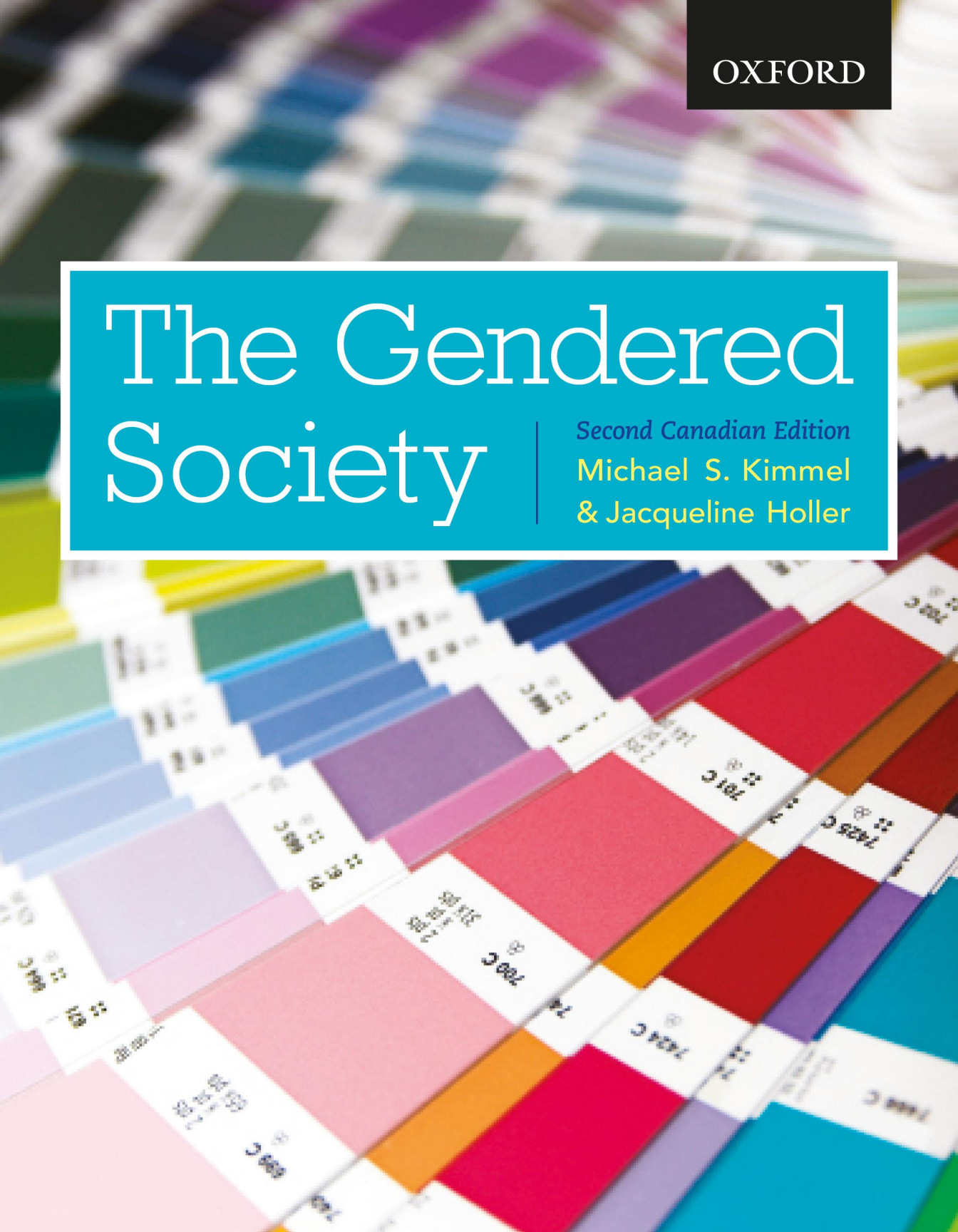
OXFORD
The Gendered Society
Second Canadian Edition
Michael S. Kimmel
& Jacqueline Holler

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Preface

Since the first edition of this text (now more than five years old!), gender studies have become an even more urgent and central theme of our time. Gender, it seems, is "having a moment." Some of the most important national conversations are ones in which gender takes a front seat, whether those discussions are of missing and murdered Aboriginal women (and men) or sexual violence as experienced on university campuses or at the hands of once-adored media figures. A mere decade ago, those who raised such topics were often greeted with barely veiled impatience—or even eye-rolling. But today, increasing numbers of us seem to be acknowledging that gender matters. While there is still a long way to go to combat *all* forms of discrimination and inequality in Canadian society, our growing willingness to engage with the issue is heartening—and long overdue.

I have heard from many readers and users of the book, and I thank everyone who has contacted me. Rewriting the first edition has transformed it significantly, particularly in the second half of the book. I have been guided by reviewer comments and by my own sense of needed changes.

The growth in gender studies and the explosion of research in the field makes any text like this an exercise in selection. Choosing what to highlight—and what to include at all—is painful and challenging. But I hope that readers will find the changes helpful, and I look forward to hearing your comments.

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On this second edition, once again, I had the privilege of working with an excellent team at Oxford. Lisa Peterson, Suzanne Clark, and Jodi Lewchuk were tremendously helpful in the planning stages, and Developmental Editor Tanuja Weerasooriya was both helpful and monumentally patient through the long process of revision. Shelly Stevenson proved an effective and incredibly cheerful copy editor. Thank you to all of you!

At UNBC, Sarah Blawatt served as my very capable research assistant; I thoroughly enjoyed our discussions about new directions in gender studies. My graduate and undergraduate students have continued to challenge and inform my thinking, and I thank all of them. It is an honour to be able to work with so many engaged and thoughtful students.

Finally, as ever, I must thank my children, Helga and Urs, for their patience and for their fine company. To them I dedicate whatever is valuable in the work I have done.

Jacqueline Holler
2016

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Introduction

Human Beings: An Engendered Species

Daily, we hear how men and women are different. We hear that we come from different planets. They say we have different brain chemistries, different brain organization, and different hormones. They say our different anatomies lead to different destinies. They say we have different ways of knowing, listen to different moral voices, and have different ways of speaking and hearing each other.

You'd think we were different species, like, say, lobsters and giraffes, or Martians and Venusians. In his bestselling book and on his popular website, pop psychologist John Gray informs us that not only do women and men communicate differently, but also they "think, feel, perceive, react, respond, love, need, and appreciate differently."[1] It's a miracle of cosmic proportions that we ever understand one another!

This **interplanetary theory** of complete and universal *gender difference* is also typically the way we explain another universal phenomenon: *gender inequality*. Gender is not simply a system of classification, by which biological males and biological females are sorted, separated, and socialized into equivalent sex roles. Gender also expresses the near-universal inequality between women and men. When we speak about gender, we also speak about hierarchy, power, and inequality, not simply difference.

Therefore, the two tasks of any study of gender are to explain both difference and inequality or, to be alliterative, *difference* and *dominance*. Every general explanation of gender must address two central questions along with their ancillary derivative questions.

First: *Why is it that virtually every single society differentiates people based on gender*? Why are women and men perceived as different in every known society? What are the differences that are perceived? Why is gender at least one—if not the central—basis for the division of labour?

Second: *Why is it that virtually every known society is also based on* ***male dominance****?* Why do most societies divide social, political, and economic resources unequally between the genders? Moreover, why is it that men almost always get more? Why is a gendered division of labour often an unequal division of labour? Why are women's tasks and men's tasks valued differently?

It is clear, as we shall see, that there are dramatic differences among societies regarding the types of gender differences, the levels of gender inequality, and the amount of

violence (implied or real) that are necessary to maintain both systems of difference and domination. Nevertheless, the basic facts remain; *virtually every society known to us is founded upon assumptions of gender difference and the politics of gender inequality.*

On these axiomatic questions, two basic schools of thought prevail: **biological determinism** and **differential socialization**. We know them as "nature" and "nurture," and the question of which is dominant has been debated for a century in classrooms, at dinner parties, by political adversaries, and among friends and families. Are men and women different because they are "hardwired" to be different, or are they different because they've been taught to be? Is biology destiny?

Most of the arguments about gender difference begin, as will this book, with biology (in Chapter 2). Women and men *are* biologically different, after all. Our reproductive anatomies are different, and so are our reproductive destinies. Our brain structures differ; our brain chemistries differ. Our musculature is different. Different levels of different hormones circulate through our different bodies. Surely, these add up to fundamental, intractable, and universal differences, and these differences provide the foundation for male domination, don't they?

The answer is an unequivocal maybe, or, perhaps more accurately, yes and no. Very few people would suggest that there are no differences between males and females. What social scientists call **sex differences** refer precisely to that catalogue of anatomical, hormonal, chemical, and physical differences between women and men. Nevertheless, even here, as we shall see, there are enormous ranges of femaleness and maleness. Though our musculature differs, plenty of women are physically stronger than many men. Though on average our chemistries are different, it's not an all-or-nothing proposition—women do have varying levels of androgens, and men have varying levels of estrogen in their systems. Although our brain structure may be differently lateralized, males and females both do tend to use both sides of their brain. Additionally, it's far from clear that these biological differences automatically and inevitably lead men to dominate women. Could we not imagine, as some writers already have, a culture in which women's biological abilities to bear and nurse children might be seen as the expression of such ineffable power—the ability to create life—that strong men wilt in impotent envy?

In fact, in order to underscore this issue, most social and behavioural scientists now use the term **gender** in a different way than we use the term **sex**. Sex refers to the biological apparatus, the male and the female—our chromosomal, chemical, anatomical organization. Gender refers to the meanings that are attached to those differences within a culture. Sex is male and female; gender is masculinity and femininity—what it means to be a man or a woman. Whereas biological sex varies little (though much more than we once thought, as discussed in Chapter 2), gender varies enormously. What it means to possess the anatomical configuration of male or female means very different things depending on where you are, who you are, and when you are living.

It fell to anthropologists to detail some of those differences in the meanings of masculinity and femininity. What they documented is that gender means different things to different people—that it varies cross-culturally. (We discuss and review the anthropological evidence in Chapter 4.) Some cultures, like that of mainstream North America, encourage men to be stoic and to prove their masculinity through strength and competition. Other cultures prescribe a more relaxed definition of masculinity,

based on civic participation, emotional responsiveness, and the collective provision for the community's needs. Moreover, some cultures encourage women to be decisive and competitive, whereas others insist that women are naturally passive, helpless, and dependent. What it meant to be a man or a woman in seventeenth-century France and what it means among Aboriginal peoples in the Australian outback at the turn of the twenty-first century are so far apart that comparison is difficult, if not impossible. *The differences between two cultures are often greater than the differences between the two genders*. If the meanings of gender vary from culture to culture and vary within any one culture over historical time, then understanding gender must employ the tools of the social and behavioural sciences and history.

The other reigning school of thought that explains both gender difference and gender domination is *differential socialization*—the "nurture" side of the equation. Men and women are different because we are taught to be different. From the moment of birth, males and females are treated differently. Gradually we acquire the traits, behaviours, and attitudes that our culture defines as "masculine" or "feminine." We are not necessarily born different: We become different through this process of socialization.

Nor are we born biologically predisposed toward gender inequality. Domination is not a trait carried on the Y chromosome; it is the outcome of the different cultural valuing of men's and women's experiences. Consequently, the adoption of masculinity and femininity implies the adoption of "political" ideas that what men do is culturally more important than what women do.

Developmental psychologists have also examined the ways in which the meanings of masculinity and femininity change during the course of a person's life. The issues confronting a man about proving himself and feeling successful will change, as will the social institutions in which he will attempt to enact those experiences. The meanings of femininity are subject to parallel changes, for example, among prepubescent girls, women in child-bearing years, and post-menopausal women, as they are different for women entering the labour market and those retiring from it.

Although we typically cast the debate in terms of *either* biological determinism or differential socialization—nature versus nurture—it may be useful to pause for a moment to observe what characteristics they have in common. Both schools of thought share two fundamental assumptions. First, both "nature lovers" and "nurturers" see women and men as markedly different from each other—truly, deeply, and irreversibly different. (Nurture does allow for some possibility of change, but it still argues that through the process of socialization males and females become dramatically different from each other.) Additionally, both schools of thought assume that the differences *between* women and men are far greater and more decisive (and worthy of analysis) than the differences that might be observed *among* men or *among* women. Therefore, both "nature lovers" and "nurturers" subscribe to some version of the interplanetary theory of gender.

Second, both schools of thought assume that gender domination is the inevitable outcome of gender difference, that difference causes domination. To the biologists, it may be because pregnancy and lactation make women more vulnerable and in need of protection, or because male musculature makes men more adept hunters, or because testosterone makes them more aggressive with other men and with women, too. Or it may be that men have to dominate women in order to maximize their chances to pass on their genes. On

the "nurture" side, psychologists of "gender roles" tell us that, among other things, men and women are taught to devalue women's experiences, perceptions, and abilities and to overvalue those of men.

We argue in this book that both of these propositions are false—or at least incomplete. First, we hope to show that the differences *between* women and men are not nearly as great as are the differences *among* women or *among* men. Many perceived differences turn out to be differences based less on gender than on the social positions people occupy. Second, we argue that gender difference is the product of gender inequality, and not the other way around. In fact, gender difference is the chief outcome of gender inequality, because it is through the idea of difference that inequality is legitimated. As one sociologist put it, "the very creation of difference is the foundation on which inequality rests."[2]

Using what social scientists have come to call a **social constructionism** approach—discussed further in Chapter 5—we make the case that neither gender difference nor gender inequality is inevitable in the nature of things nor, more specifically, in the nature of our bodies. Neither difference—nor domination—is explainable solely by reference to differential socialization of boys and girls into sex roles typical of men and women.

When proponents of both nature and nurture positions assert that gender inequality is the inevitable outcome of gender difference, they take, perhaps inadvertently, a political position that assumes that inequality may be lessened or that its most negative effects may be ameliorated, but that it cannot be eliminated—precisely because it is based upon intractable differences. On the other hand, to assert, as we do, that the exaggerated gender differences that we see are not as great as they appear and that they are the result of inequality allows a far greater political latitude. By eliminating gender inequality, we will remove the foundation upon which the entire edifice of gender difference is built. What will then remain of gender difference is unknown. Will gender eventually disappear? No one knows the answer, of course; but as we discuss in our conclusion, the world of gender is already changing from one built on binary distinction and hierarchy to one that values plurality and egalitarianism.

Making Gender Visible for Both Women and Men

A dramatic transformation in thinking about gender has occurred within a generation or two. In particular, five decades of work by feminist scholars, both in traditional disciplines and in women's studies, have made us aware of the centrality of gender in shaping social life. We now know that gender is one of the central organizing principles around which social life revolves.

In the past 50 years, feminist scholars focused most of their attention on women—on what Catharine Stimpson has called the "omissions, distortions, and trivializations" of women's experiences—and the spheres to which they have historically been consigned (like private life and the family).[3] Women's history sought to rescue from obscurity the lives of significant women who had been ignored and to examine the everyday lives of ordinary women in the past. Feminist scholarship accordingly brought to academic attention both the lives of women and the role of gender in constructing (and constraining) the lives of individuals of both sexes. Women's Studies programs brought these key insights—and many more—to both academic publishing and the classroom.

Despite the fact that feminist scholars have been studying both women *and gender* for many years, it is not unusual to find, in courses on history of gender, psychology of gender, or sociology of gender, that the classroom is populated almost entirely by women. It's as if only women had gender and were therefore interested in studying it. Though more and more (brave) men are enrolling in women's studies classes, they remain a minority in courses dealing with gender. We need to integrate men into our curriculum and classrooms, because masculinity currently flies below many people's radar.

Of course, men are far from invisible. They are ubiquitous in universities and professional schools and in the public sphere in general—not to mention in every subject in the university curriculum! Nevertheless, when we study men, we often study them as political leaders, military heroes, scientists, writers, artists. They are often invisible *as men*. What is the impact of gender on the lives of famous men? How does masculinity play a part in the lives of great artists, writers, athletes, politicians, etc.? How does masculinity play out in the lives of "ordinary" men—in factories and on farms, in union halls and large corporations?[4]

Gender, like race and class, plays out in everyone's life, male or female. These attributes affect not only people who are marginalized by racial, class, or gender inequality, but to those who enjoy privilege. Therefore, "whiteness" can (and must) be analyzed in terms of race just as can the experiences and identities of **racialized** people. When we talk about "class," it doesn't only apply to lower or working classes. Moreover, masculinity is just as much about gender as femininity is.

Still, the very processes that confer **privilege** to one group and not another group are often invisible to those upon whom that privilege is conferred. Invisibility is a luxury. Only white people in our society have the luxury not to think about race; and only men have the luxury to pretend that gender does not matter.

Consider another example of how power is so often invisible to those who have it. You've probably noticed that Canadian e-mail addresses, like those of most people in the world, end with a country code (in our case, .ca). If you were writing to someone in South Africa, you'd put .za at the end, .jp for Japan, .uk for England (United Kingdom), and .de for Germany (Deutschland). However, when you write to people in the United States, the e-mail address ends with .edu for an educational institution, .org for an organization, .gov for a federal government office, and .com or .net for commercial Internet providers. Why is it that the United States doesn't have a country code? From the point of view of the United States, a powerful and influential nation, all other countries are "other" and accordingly need to be named, marked, and noted. Once again, privilege is invisible.

The **invisibility of privilege** means that many men, like many white people, become defensive and angry when confronted with the statistical realities or the human consequences of racism or sexism. Because privilege is invisible, those who have it may not even believe they have it; or they may view an end to privilege as a fundamental attack on their rights.

The continued invisibility of masculinity also means that the gendered standards that are held up as the norm appear to us to be gender-neutral. The illusion of gender neutrality has serious consequences for both women and men. It means that men can maintain the fiction that they are being measured by "objective" standards; for women, it means that

they are being judged by someone else's yardstick. At the turn of the twentieth century, the great sociologist Georg Simmel underscored this issue when he wrote:

> We measure the achievements and the commitments . . . of males and females in terms of specific norms and values; but these norms are not neutral, standing above the contrasts of the sexes; they have themselves a male character. . . . The standards of art and the demands of patriotism, the general mores and the specific social ideas, the equity of practical judgements and the objectivity of theoretical knowledge, . . . —all these categories are formally generically human, but are in fact masculine in terms of their actual historical formation . . . it is a fact that in the historical life of our species there operates the equation: objective = male.[5]

Simmel's theoretical formulation echoes in our daily interactions. When a female professor makes a statement such as, "Men are privileged in North American society," students might respond by saying, "Of course, you'd say that. You're biased." They'd see such a normative statement as revealing the inherent biases of gender, a case of special pleading. However, when a man says it—an objective fact, transmitted by an objective professor—they'll probably take notes. Similarly, a white professor's statements on race privilege might be taken more seriously by students than the same comments made, say, by an Aboriginal colleague.

Such equations of "objective = male" (or "objective = white") have enormous practical consequences in every arena of our lives, from the elementary school classroom to professional and graduate schools and in every workplace we enter. As Simmel writes, "Man's *position of power* does not only assure his relative superiority over the woman but it assures that his standards become generalized as generically human standards that are to govern the behaviour of men and women alike."[6]

The Current Debate

North Americans, at this moment, are having a debate about masculinity—but we don't know it. For example, what gender comes to mind when you read about the following current North American problems: "teen violence," "gang violence," "suburban violence," "drug violence," "violence in the schools"? Additionally, what gender comes to mind along with the words "suicide bomber" or "terrorist hijacker"?

Most likely, you've imagined men. Moreover, not just any men—but younger men, in their teens and twenties, and relatively poorer men, from the working class or lower middle class. Nevertheless, how do our social commentators discuss these problems? Do they note that the problems of youth and violence are really problems of young *men* and violence? Do they ever mention that everywhere ethnic nationalism sets up shop, young men are the shopkeepers? Do they ever mention masculinity at all?

No. Listen, for example, to the voice of one expert, asked to comment on the brutal 1998 murder of Matthew Shepard, a gay 21-year-old college student at the University of Wyoming. After being reminded that young men account for 80–90 per cent of people arrested for "gay-bashing" crimes, the reporter quoted a sociologist as saying, "[t]his youth variable tells us they are working out identity issues, making the transition away from home into adulthood."[7] Aside from the offensiveness of linking brutal violence to

"working out identity issues," what about addressing this "*youth* variable"—what had been a variable about age and gender was transformed into a variable only about age. Gender simply disappeared. That is the sound of silence, what invisibility looks like.

Now, imagine that these were all women—all the ethnic nationalists, the militias, the gay-bashers. Would that not be *the* story, the *only* story? Would not a gender analysis be at the centre of every single story? Would we not hear from experts on female socialization, frustration, anger, PMS, and everything else under the sun? The ubiquity of men as perpetrators of these incidents, however, earns nary a word.

Take one final example. What if it had been young girls who opened fire on their classmates in Taber, Alberta; in Pearl, Mississippi; in Jonesboro, Arkansas; in Winnenden, Germany; or in Springfield, Oregon? What if nearly all the children who died were boys? Do you think that the social outcry would demand that we investigate the "inherent violence" of a particular culture; or would they simply express dismay that young "people" have too much access to guns? In these cases, no one seemed to mention that the young boys who actually committed those crimes were simply doing—albeit in dramatic form at a younger age—what American men have been taught to do for centuries when they are upset and angry. Men don't get mad; they get even. Moreover, very few mentions are made of the targeting of girls in school shootings. (The gender of violence is explored in Chapter 13.)

We believe that until we make gender visible for both women and men, our culture will not know how to address problems such as school shootings and terrorist attacks. That's not to say that all we have to do is address masculinity. These issues are complex, requiring analyses of the political economy of global economic integration, of the transformation of social classes, of urban poverty and hopelessness, and of racism. However, if we ignore masculinity—if we let it remain invisible—we will never completely understand society's problems, let alone resolve them.

Gender and Power: Hegemonic Masculinity and Emphasized Femininity

When we use the term "gender," then, it is with the explicit intention of discussing both masculinity and femininity. However, even these terms are inaccurate because they imply that there is only one simple definition of masculinity and only one simple definition of femininity. One of the important elements of a social-constructionist approach is to explore the differences *among* men and *among* women, because, as it turns out, these are often more decisive than the differences between women and men.

Within any one society at any one moment, several meanings of masculinity and femininity coexist. Simply put, not all North American men and women are the same. Our experiences are also structured by class, race, ethnicity, age, sexuality, and region. Each of these axes modifies the others. Just because we make gender visible doesn't mean that we make these other organizing principles of social life invisible. Imagine, for example, an older, black, gay man in Toronto and a young, white, heterosexual farm boy in Manitoba. Wouldn't they have different definitions of masculinity? Alternatively, imagine a 22-year-old middle-class, Asian-Canadian, heterosexual woman in Vancouver and an elderly, poor, white, Scots-Canadian lesbian in Halifax. Wouldn't their ideas about what it means to be a woman be somewhat different?

Consider that gender varies across cultures, over historical time, among men and women within any one culture, and during the life course. This being so, can people really speak of masculinity or femininity as though they were constant, universal essences, common to all women and to all men? If not, gender must be seen as an ever-changing fluid assemblage of meanings and behaviours. In that sense, we must speak of *masculinities* and *femininities* and consequently recognize the different definitions of masculinity and femininity that we construct. By pluralizing the terms, we acknowledge that masculinity and femininity mean different things to different groups of people at different times.

At the same time, we can't forget that not all masculinities and femininities are created equal. North American men and women must also contend with a particular definition that is held up as the model against which we are expected to measure ourselves. We therefore come to know what it means to be a man or a woman in our culture by setting our definitions in opposition to a set of "others"—racial minorities, sexual minorities. For men, the classic "other" is, of course, women. It feels imperative to most men that they make it clear—eternally, compulsively, decidedly—that they are unlike women. Robert McElvaine calls this the "notawoman" definition of manhood, linking it to both competition among men and the deprecation of all things feminine.[8]

Nevertheless, one form of masculinity reigns supreme. For most men, this is the **hegemonic** definition—the one that is held up as the model for all. Hegemonic masculinity is not defined simply as a rejection of the feminine. Indeed, we might say that in contemporary North American society, the "manly" man is defined against both the boy, the immature and powerless child, and the "fag," the effeminate sexual "other." For R.W. Connell, **hegemonic masculinity** is "constructed in relation to various subordinated masculinities as well as in relation to women."[9] The sociologist Erving Goffman once described this hegemonic definition of masculinity like this:

> In an important sense there is only one complete unblushing male in America: a young, married, white, urban, northern, heterosexual, Protestant, father, of college education, fully employed, of good complexion, weight, and height, and a recent record in sports. . . . Any male who fails to qualify in any one of these ways is likely to view himself—during moments at least—as unworthy, incomplete, and inferior.[10]

Goffman's definition makes it clear that like any ideal, the ideal of hegemonic masculinity is unattainable, based as it is on a version of virtually impossible competitive success. Even if a man manages to attain the status of Goffman's "unblushing male," he cannot remain young, fit, and employed forever. Not surprisingly, most of our ideals of hegemonic masculinity are media images—like the Marlboro Man—who can remain fixed in their stoic and perfect performance of masculinity without ever growing old, getting weak, feeling doubt, or losing control of their emotions, families, or careers.

Given the power of hegemonic masculinity and the growth, in modern societies, of protest and counterculture identities, we should not be surprised that not everyone subscribes to the ideals of hegemonic masculinity. Indeed, particular resistant forms of masculinity, including queer, skinhead, punk, emo, and female/trans masculinities contest the power of the hegemonic stereotype while sometimes reinforcing many of its definitions

Courtesy of The Advertising Archives

Independent, stoic, rugged, almost always alone, the Marlboro Man was introduced in the 1950s to counter the idea that filtered cigarettes were "feminine."[11] This emblem of American hegemonic masculinity became one of the most successful and recognizable images in the history of advertising, making Marlboro the top brand of cigarettes in the world. This suggests that while masculinity may vary from culture to culture, there are key attributes that appeal across cultures.

of manhood, particularly the "notawoman" definition. Hegemonic masculinity is accordingly an enormously powerful ideal despite, or because of, its unattainable and exaggerated quality.

There is no "hegemonic" version of femininity, according to R.W. Connell, because hegemonic masculinity arose through competition among men within patriarchal societies. In a sense, this made masculinity more important, in many societies, than femininity. We've all heard the exhortation "Be a man," but how many of us have ever used, or heard, the phrase "Be a woman"? What would that even mean? In fact, in most societies the transition to womanhood is perceived as much more natural and simple than the comparable transition for men. Masculinity must be earned, femininity simply grown into.

This does not mean that women face no gendered expectations, or that their lot is somehow easier. Indeed, women also have to contend with an exaggerated ideal of femininity, which Connell calls **emphasized femininity**. Emphasized femininity is organized around (real or apparent) compliance with gender inequality and is "oriented to accommodating the interests and desires of men." One sees emphasized femininity in "the display of sociability rather than technical competence, fragility in mating scenes, compliance with men's desire for titillation and ego-stroking in office relationships, acceptance of marriage and child care as a response to labour-market discrimination against women."[12] Emphasized femininity exaggerates gender difference as a strategy of "adaptation to men's power" stressing empathy and nurturance; "real" womanhood is described as "fascinating," and women are advised that they can wrap men around their fingers by knowing and playing by the "rules."

Courtesy of The Advertising Archives

Emphasized femininity (compliance with the desires and interests of men) is used here to sell Kelpidine Chewing Gum.

In one research study, an eight-year-old boy captured emphasized femininity eloquently:

> If I were a girl, I'd have to attract a guy wear makeup; sometimes. Wear the latest style of clothes and try to be likable. I probably wouldn't play any physical sports like football or soccer. I don't think I would enjoy myself around men in fear of rejection or under the pressure of attracting them.[13]

Gender Differences as "Deceptive Distinctions"

The existence of multiple masculinities and femininities dramatically undercuts the idea that the gender differences we observe are due solely to differently gendered people occupying gender-neutral positions. Moreover, that these masculinities and femininities are arrayed along a hierarchy, and measured against one another, buttresses the argument that domination creates and exaggerates difference.

The interplanetary theory of gender assumes that, whether through biology or socialization, women act like women, no matter where they are, and that men act like men, no matter where they are. Psychologist Carol Tavris argues that such binary thinking leads to what philosophers call the "law of the excluded middle," which, as she reminds us, "is where most men and women fall in terms of their psychological qualities, beliefs, abilities, traits, and values."[14] It turns out that many of the differences between women and men that we observe in our everyday lives are actually **deceptive distinctions**: not *gender* differences at all, but rather differences that are the result of being in different positions or in different arenas. It's not that gendered individuals occupy these ungendered positions, but rather that the *positions themselves* elicit the behaviours we see as gendered. The sociologist Cynthia Fuchs Epstein calls these "deceptive distinctions" because, although they appear to be based on gender, they are actually based on something else.[15]

Take, for example, the well-known differences in communication patterns observed by Deborah Tannen in her bestselling book, *You Just Don't Understand*. Tannen argues that men employ the competitive language of hierarchy and domination to get ahead; women create webs of inclusion with softer, more embracing language that ensures that everyone feels okay. When couples communicate, women talk more, using language to create intimacy while their husbands speak less and use language instrumentally. To understand the opposite sex, Tannen argues, one must understand its "genderlect."[16]

However, it turns out that men and women use language differently in different situations. The very same men who are silent at home may be more verbal at work, where they are in positions of dependency and powerlessness, and need to use conversation to maintain a relationship with their superiors; and their wives are just as capable of using language competitively to maximize their position in a corporate hierarchy. Education and class may also be a more important determinant of language use than gender. When he examined the recorded transcripts of women's and men's testimony in trials, anthropologist William O'Barr concluded that the witnesses' occupation was a more accurate predictor of their use of language than was gender. "So-called women's language is neither characteristic of all women, nor limited only to women," O'Barr writes. If women use "powerless" language, it may be due "to the greater tendency of women to occupy relatively

powerless social positions" in society.[17] Communication differences turn out to be "deceptive distinctions" because rarely do we observe the communication patterns of dependent men and executive women.

We could take another example from the world of education, explored in Chapter 7. Aggregate differences in girls' and boys' scores on standardized math tests have led people to speculate that whereas males have a natural propensity for arithmetic figures, females have a "fear of math." If you couple this with their "fear of success" in the workplace, you might find that women manage money less effectively—with less foresight, less calculation, less care. The popular writer Colette Dowling, author of the bestselling 1981 book *The Cinderella Complex*, interviewed 65 women in their late 50s about money matters and found that only two had *any* investment plans for their retirements. Broke and bankrupt after several bestsellers, and single again herself, Dowling argues that this relates to "conflicts with dependency. Money savvy is connected with masculinity in our culture," she told an interviewer. "That leaves women with the feeling that if they want to take care of themselves and are good at it, the quid pro quo is they'll never hook up with a relationship." Because of ingrained femininity, women end up shooting themselves in the foot.[18]

However, such assertions fly in the face of all available research, argues financial expert Jane Bryant Quinn, herself the author of a bestseller about women and money. "It *is* more socially acceptable for women not to manage their money," she told the same interviewer. "But the Y chromosome is not a money management chromosome. In all the studies, if you control for earnings, age, and experience, women are the same as men. At 23, out in the working world staring at a [retirement] plan, they are equally confused. But if those women quit working, they will know less and less about finance, while the man, who keeps working, will know more and more."[19] In sum, our *experience*, not our *gender*, predicts how we'll handle our retirement investments.

What about those enormous gender differences that some observers have found in the workplace (the subject of Chapter 8)? Men, we hear, are competitive social climbers who seek advancement at every opportunity; women are co-operative team-builders who shun competition and may even suffer from a "fear of success." However, a pioneering study by Rosabeth Moss Kanter indicated that gender mattered far less than opportunity. When women had the same opportunities, networks, mentors, and possibilities for advancement, they behaved just as the men did. Women were unsuccessful because they lacked opportunities, not because they feared success; when men lacked opportunities, they behaved in stereotypically "feminine" ways.[20]

Finally, take our experiences in the family, examined in Chapter 6. Here, again, we assume that women are socialized to be nurturing and maternal, men to be strong and silent, relatively emotionally inexpressive arbiters of justice—that is, we assume that women do the work of "mothering" because they are socialized to do so. Again, sociological research suggests that our behaviour in the family has somewhat less to do with gender socialization than with the family situations in which we find ourselves.

Research by sociologist Kathleen Gerson, for example, found that gender socialization was not very helpful in predicting women's family experiences. Only slightly more than half the women who were primarily interested in full-time motherhood were, in fact, full-time mothers; and only slightly more than half the women who were primarily interested in full-time careers had them. It turned out that marital stability, husband's

income, women's workplace experiences, and support networks were far more important than gender socialization in determining which women ended up full-time mothers and which did not.[21]

On the other side of the ledger, research by sociologist Barbara Risman found that despite a gender socialization that downplays emotional responsiveness and nurturing, most single fathers are perfectly capable of "mothering." Single fathers do not hire female workers to do the typically female tasks around the house: They do those tasks themselves. In fact, Risman found few differences between single fathers and mothers (single or married) when it came to what they did around the house, how they acted with their children, or even in their children's emotional and intellectual development—a finding that led Risman to argue that "men can mother and that children are not necessarily better nurtured by women than by men."[22]

These findings also shed a very different light on other research. For example, some recent researchers found significant differences in the amount of stress that women and men experience on an everyday basis. According to the researchers, women reported higher levels of stress and lower numbers of "stress-free" days than did men. David Almeida and Ronald Kessler sensibly concluded that this was not a biologically based difference, a signal of women's inferiority in handling stress, but rather (as discussed further in Chapter 6) an indication that women had more stress in their lives, because they had to juggle more family and work issues than did men.[23]

Based on all this research, you might conclude, as does Risman, that "if women and men were to experience identical structural conditions and role expectations, empirically observable gender differences would dissipate."[24] Still, there *are* some differences between women and men, after all. Nevertheless, this research suggests that those differences are not as great, decisive, or impervious to social change as we once thought. It is the task of this book to explore those areas where there appear to be gender differences (but where there are in fact few or no differences) as well as the areas where gender differences are significant and decisive.

The Meaning of Mean Differences

Few of the differences between women and men are "hardwired" into all males to the exclusion of all females, or vice versa. Although we can readily observe differences between women and men in rates of aggression, physical strength, math or verbal achievement, caring and nurturing, or emotional expressiveness, it is not true that *all* males and *no* females are aggressive, physically strong, and adept at math and science. Neither can we say that *all* females and *no* males are caring and nurturing, verbally adept, or emotionally expressive. What we mean when we speak of gender differences are **mean differences**, differences in the average scores obtained by women and men.

These mean scores tell us something about the differences between the two groups, but they tell us nothing about the distributions themselves, the differences *among* men or *among* women. Sometimes these distributions can be enormous: There are large numbers of caring or emotionally expressive men and of aggressive and physically strong women. (See Figure 1.1.) In fact, in virtually all of the research that has been done on the attributes associated with masculinity or femininity, the differences *among* women and *among* men are far greater than the mean differences *between* women and men. We tend to focus on the mean differences, but they may tell us far less than we think they do.

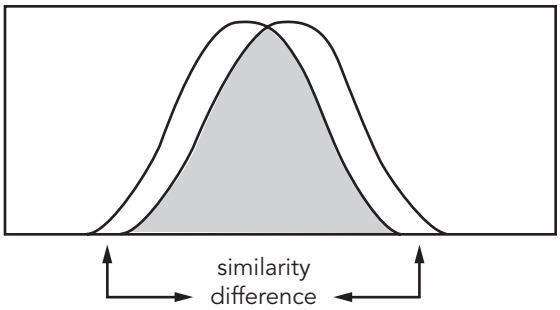

Figure 1.1 Schematic rendering of the overlapping distributions of traits, attitudes, and behaviours by gender.

Although mean differences might obtain on many characteristics, these distributions suggest far greater similarity between women and men and far greater variability among men and among women.

What we think mean differences tell us, of course, is that women and men are different, from different planets. This is the interplanetary theory of gender difference—that the observed mean differences between women and men are decisive and that they come from the fact that women and men are biologically so different.

For example, even the idea that we are from different planets—that our differences are deep and intractable—has a political dimension: To call the "other" sex the "opposite" sex obscures the many ways we are alike. As the anthropologist, Gayle Rubin, points out:

> Men and women are, of course, different. But they are not as different as day and night, earth and sky, yin and yang, life and death. In fact from the standpoint of nature, men and women are closer to each other than either is to anything else—for instance mountains, kangaroos, or coconut palms . . . Far from being an expression of natural differences, exclusive gender identity is the suppression of natural similarities.[25]

The interplanetary theory of gender difference is important not because it's right—in fact, it is wrong far more often than it is right—but because, as a culture, we seem desperately to want it to be true. That is, the real sociological question about gender is not the sociology of gender differences, which explains the physiological origins of gender difference. Rather, the real sociology-of-knowledge question explores why gender difference is so important to us, why we cling to the idea of gender difference so tenaciously, and why we shell out millions of dollars for books that "reveal" the deep differences between women and men, but will probably never buy a book that says, "Hey, we're all Earthlings!"

That, however, is the message of this book. Virtually all available research from the social and behavioural sciences suggests that women and men are not from Venus and Mars, but from planet Earth. We're not opposite sexes, but neighbouring sexes—we have far more in common with each other than we have differences.

Difference and Domination: Individuals in a Gendered Society

Whether we believe that gender difference is biologically determined or is a cultural formation, the interplanetary theory of gender difference assumes that gender is a property of individuals, that is, that gender is a component of one's identity. However, this is only half the story. We believe that individual boys and girls become gendered—that is, we learn the "appropriate" behaviours and traits that are associated with hegemonic masculinity and emphasized femininity—and then we each, individually, negotiate our own path in a way that feels right to us. In a sense, we each "cut our own deal" with the dominant definitions of masculinity and femininity. That's why we are so keenly attuned to, and so vigorously resist, gender stereotypes—because we believe that they do not actually encompass our experiences.

Nevertheless, we do not cut our own deal by ourselves in gender-neutral institutions and arenas. The social institutions of our world—workplace, family, school, and politics—are also gendered institutions, sites where the dominant definitions are reinforced and reproduced, and where "deviants" are disciplined. We become gendered selves in a **gendered society**.

When we say that we live in a gendered society, we imply that the organizations of our society have evolved in ways that reproduce both the differences between women and men and the domination of men over women. Institutionally, we can see how the structure of the workplace is organized around demonstrating and reproducing masculinity: The temporal organization and the spatial organization of work both depend upon the separation of spheres (distance between work and home and the fact that women are the primary child-care providers).

As with the invisibility of gendered identity, assuming **institutional gender neutrality** actually serves to maintain the gender politics of those institutions. Additionally, it underscores the way we often assume that if you allow individuals to express a wider range of gender behaviours, they'll be able to succeed in those gender-neutral institutions. We assume, then, that the best way to eliminate gender inequality in higher education or in the workplace is to promote sameness—that is, we're unequal only because we're different.

This, however, creates a political and personal dilemma for women in gendered institutions. It's a no-win proposition for women when they enter the workplace, the military, politics, or sports—arenas that are already established to reproduce and sustain masculinity. To the extent that they become "like men" in order to succeed, they are seen as having sacrificed their femininity. Yet to the extent to which they refuse to sacrifice their femininity, they are seen as different, and gender discrimination is therefore legitimate as the sorting of different people into different slots.[26] Women who succeed are punished for abandoning their femininity—rejected as potential partners, labelled as "dykes," left off the invitation lists. Consequently, gender inequality creates a double bind for women—a double bind that is based on the assumption of gender difference and the assumption of institutional gender neutrality.

Both difference and domination are produced and reproduced in our social interactions, in the institutions in which we live and work. Though the differences between us are not as great as we often assume, they become important in our expectations and observations. This book examines those differences—those that are real and important—and seeks to reveal those that are neither real nor important. We will explore the ways in which gender inequality provides the foundation for assumptions of gender difference. Finally,

we will endeavour to show the impact of gender on our lives—how we become gendered people living gendered lives in a gendered society.

Summary

Despite the persistence of the interplanetary theory of gender difference, men and women are more similar than different. Gender difference exists, of course, but it is neither complete nor absolute. Still, virtually every human society is founded upon assumptions of gender differences; most have also exhibited gender inequality in the form of male dominance. The frequency of both gender difference and gender inequality is often explained using arguments of biological determinism versus differential socialization, or "nature versus nurture."

While science provides evidence of significant biological differences between the sexes, definitions of gender differences vary greatly among cultures. This suggests that biological determinism ("nature") can't fully explain gender difference or domination. Developmental psychology provides ample evidence of differential socialization ("nurture"), suggesting that men and women are different because they are socialized to be different. While the differential socialization argument contests biological determinism, both arguments assume that men and women are dramatically different and that their differences produce gender inequality or domination. Nevertheless, men and women are not so dramatically different—and, what's more, this book argues that their differences do not produce inequality, but rather are produced by inequality.

To examine how inequality produces gender difference, we need to make gender visible in the way that feminist scholars have been doing it for the past 50 years. It's particularly important to stop acting as though only women have gender. We need to study masculinity to understand how some of our social norms are really "masculine norms," based on the yardstick of "universal" man. We also need to understand masculinity to assess truly some of the most important issues we face, most notably violence.

When we study masculinity and femininity, though, we need to keep in mind that there is not just one form or "essence" of manliness or womanliness that exists everywhere at all times. To be sure, each society holds up one version that is "hegemonic." R.W. Connell coined the term "hegemonic masculinity" to describe the version of masculinity most celebrated in a culture at a given time. For Connell, the feminine counterpart is "emphasized femininity," defined as a kind of exaggerated compliance with the desires of men and the system of gender inequality. So then, emphasized femininity and hegemonic masculinity are a kind of recipe for manliness and womanliness; though the recipe's ingredients vary from culture to culture, and change over time, the basic idea is that there is a recipe to which men and women need to adhere. Though not everyone in North American society—or any society—adheres to hegemonic masculinity, this gender ideology remains a force to be reckoned with in any society, organizing forms of masculinity in a continuum or hierarchy.

While we see hegemonic masculinity and emphasized femininity as powerful gender ideologies, it's important to recognize that many of the differences we attribute to being "masculine" or "feminine" may actually be "deceptive distinctions," that is, the result of being in different situations rather than of different genders. Many so-called "gender" differences—in language use, in financial habits, or in family roles—may be the result

of different experiences rather than gender differences per se. That is, when men are in "female" situations, they act more "like women"—and vice versa. This doesn't mean that gender differences don't exist, but it does mean that we need to use caution when we analyze gender difference.

Another reason we need to use caution when discussing gender differences is that we are generally talking about mean differences—differences between "average" men and "average" women. There are probably greater differences among men and women than between them, as Figure 1.1 suggests.

Finally, many of the gender differences we see around us are not the result of some intractable difference between the masculine and the feminine, but the outcome of individual people trying to make their lives in a gendered society. To understand gender differences, we therefore need to understand the way in which institutions and organizations are gendered—the way that they reproduce the differences between men and women and reinforce the idea of gender inequality. When we look at gendered institutions, as we do in the second part of this book, we can see how institutions, far from being gender-neutral, have been set up according to a set of gendered "rules." Therefore, even though we may not be from Mars or from Venus, when we engage with the institutions that constitute our social worlds, we come up against those rules—rules that make the "gendered society." In the pages that follow, we explore that gendered society through an examination of gender differences, an exploration of gender inequality and the way it creates difference, and an assessment of the impact of gender on our lives.

Questions for Critical Thinking

1. Can you think of examples of hegemonic masculinity or emphasized femininity in your own life or community?
2. How does the "invisibility of privilege" operate? How might you experience privilege based on gender, class, ethnicity, ability, and/or sexuality? When you think of "a Canadian citizen," what picture do you see?
3. Why do you think the interplanetary theory of gender difference appeals so strongly to people?

Key Terms

biological determinism
deceptive distinctions
differential socialization
emphasized femininity
gender
gendered society
hegemonic
hegemonic masculinity
institutional gender neutrality
interplanetary theory
invisibility of privilege
male dominance
mean differences
privilege
racialized
sex
sex differences
social constructionism

Part 1

Explanations of Gender

2

Ordained by Nature
Biology Constructs the Sexes

You may drive nature out with a pitchfork; she will nevertheless come back.

—Horace (65–8 BC)

It is not human nature we should accuse but the despicable conventions that pervert it.

—Denis Diderot (1713–84)

What is human nature? That's an ancient and thorny question. It's no simpler to understand the "nature" of men and women as gendered beings. Still, many people claim, with Sigmund Freud, "anatomy is destiny." Though it's not clear that Freud ever intended that this statement be taken literally, many researchers believe that the differences in male and female anatomy provide the basis for observable differences between men and women.

Biological explanations hold a place of prominence in our explanations of both gender *difference* and gender *inequality*. First, because they are based on "objective scientific facts," the arguments of natural scientists are extraordinarily persuasive. Second, biological explanations seem to accord with our own observations: Women and men *seem* so different to us most of the time—so different, in fact, that we often appear to be from different planets.

There's also a certain conceptual tidiness to biological explanations, because the social arrangements between women and men (gender inequality) seem to stem directly and inevitably from the differences between us. Biological arguments can be used to argue that inequality is inevitable, or that "genes hold culture on a leash," as E.O. Wilson famously stated.[1]

This chapter will explore some of the biological evidence that is presented to demonstrate the natural, biologically based differences between the sexes and the ways in which social and political arrangements (inequality) directly flow from those differences. Biological differences can tell us much about the ways in which men and women behave. The search for such differences can also tell us a lot about our culture—about what we want so desperately to believe, and why we want to believe it.

Biological Differences, Then and Now

The idea of essential origins of the differences between women and men is not new. What is new, at least for the past few centuries, is that scientists have come to play the central role in exploring the natural differences between males and females.

Prior to the nineteenth century, most explanations of gender difference had been the province of theologians. God had created man and woman for different purposes, and those reproductive differences were decisive. These theological explanations continued to have meaning well into the nineteenth century when, for example, the American abolitionist preacher Reverend John Todd warned against women's suffrage, which would "reverse the very laws of God."[2]

By the late eighteenth century, however, scientists were beginning to join the debate. After 1750, European anatomists—few of whom were women—published drawings of the male and female skeletons that exaggerated the pelvises of women and the crania of men, therefore arguing for the sexes' "natural" suitedness to their social roles.[3]

The debate intensified later in the nineteenth century under the influence of Darwin and the emerging science of evolutionary biology. In his path-breaking work *On the Origin of Species* (1859), Darwin posed several questions. How do certain species come to be the way they are? Why is there such astonishing variety among those species? Why do some species differ from others in some ways and remain similar in other ways? He answered these questions with the law of natural selection. Species adapt to their changing environments. Those species that adapt well to their environments are reproductively successful, that is, their adaptive characteristics are passed on to the next generation, whereas those that are less adaptive do not pass on their characteristics. Within any one species, a similar process occurs, and those individuals who are best suited to their environment pass on their genes to the next generation. Species are always changing, always adapting.

Such an idea was heretical to those who believed that God had created all species, including human beings, intact and unchanging. Moreover, Darwin did believe that just as the species of the lower animal world show intrinsic sex differences, so, too, do human beings. "Woman seems to differ from man in mental disposition, chiefly in her greater tenderness and lesser selfishness," he wrote in *The Descent of Man*. Men's competitiveness, ambition, and selfishness "seem to be his natural and unfortunate birthright. The chief distinction in the intellectual powers of the two sexes is shown by man's attaining to a higher eminence, in whatever he takes up, than can woman—whether requiring deep thought, reason, or imagination, or merely the uses of the senses and the hands."[4]

No sooner had the biological differences between women and men been established as scientific fact than writers and critics declared all efforts to challenge social inequality and discrimination against women to be in violation of the "laws of nature." Many writers argued that women's efforts to enter the public sphere—to seek employment, to vote, and to enter colleges—were misguided because they placed women's social and political aspirations over the purposes for which their bodies had been designed. Women were not to be *excluded* from voting, from the labour force, or from higher education as much as they were, as the Reverend Todd put it, "to be exempted from certain things which men must endure."[5] This position was best summed up by a participant at an 1880 women's suffrage debate (Sacramento, California):

> I am opposed to woman's sufferage [*sic*] on account of the burden it will place upon her. Her delicate nature has already enough to drag it down. Her slender frame, naturally weakened by the constant strain attendant upon her nature is too often racked by diseases that are caused by a too severe tax upon her mind. The presence of passion, love, ambition, is all too potent for her enfeebled condition, and wrecked health and early death are all too common.[6]

Social scientists quickly jumped on the biological bandwagon—especially social Darwinists, who shortened the time span necessary for evolution from millennia to one or two generations and who extended Darwin's range from ornithology to human beings. In their effort to legitimize social science by allying it with natural law, social Darwinists applied Darwin's theory in ways its originator had never imagined, distorting his ideas about natural selection to claim decisive biological differences among races, nations, families, and, of course, between women and men. For example, the eminent French sociologist Gustav LeBon wrote in 1879:

> In the most intelligent races, as among the Parisians, there are a large number of women whose brains are closer in size to those of gorillas than to the most developed of male brains. . . . All psychologists who have studied the intelligence of women . . . recognize today that they represent the most inferior forms of human evolution and that they are closer to children and savages than to an adult civilized man. They excel in fickleness, inconstancy, absence of thought and logic, and incapacity to reason. Without doubt, there exist some distinguished women, very superior to the average man, but they are as exceptional as the birth of any monstrosity, as, for example, of a gorilla with two heads.[7]

Arguments about sexual difference were linked to assertions of the inevitability of racial and gendered inequality. "How did woman first become subject to man as she is now all over the world?" asked James Long (in an 1852 New York newspaper editorial). "By her nature, her sex, just as the negro is and always will be, to the end of time, inferior to the white race, and therefore, doomed to subjection; but happier than she would be in any other condition, just because it is the law of her nature."[8] Doomed to subjection to men of her own race, a white woman was still assured she had a role to play in upholding racial hierarchy. In Canada, "woman's nature" was yoked to the mission of populating the nation with the "right" sort of people. For Sophie Bevan, who wrote a letter to the (London) *Times* after a tour of North America, Canada would be lost to racial and class inferiors "unless we can induce the right sort of British women to emigrate"; were such women to fail in their mission, she warned, "we shall not have the Colonies peopled with our own race or speaking our own mother tongue."[9]

Biological arguments therefore became tied up not only with women's proper role but also with the hierarchical relationships among races and classes. The field of **eugenics** developed in the nineteenth century and spread its influence to Canada in the early twentieth century. Eugenics united feminists with social conservatives and progressives in the pursuit of biological improvement. Admired Canadians like Emily Murphy and J.S. Woodsworth were fellow travellers of the movement. Adhered to by many, though

discredited because of Nazi atrocities committed in its name, eugenics had significant influence in Canada, particularly in the West. British Columbia and Alberta enacted legislation permitting the involuntary sterilization of the "mentally defective" (a blanket term that covered many forms of disability and mental illness). Ultimately, between 1929 and 1972, more than 2,800 people were sterilized in this manner. Although Aboriginal people were only between 2 and 3 per cent of the population, they represented 6 per cent of the cases presented to the board that approved involuntary sterilization. Moreover, 70 per cent of Aboriginal people whose cases were presented to the board were ultimately sterilized, compared with approximately 47 per cent of cases involving those of Eastern and Western European descent. Women, teenagers, and young adults were also overrepresented among those sterilized. Shockingly, eugenics legislation in the West was only repealed in the 1970s. In 1996, Leilani Muir won a judgment against the province of Alberta for wrongful sterilization, which was followed by a class-action suit brought by survivors of similar medical "treatment."[10]

The discrediting of such historical (if recent!) forms of **biological determinism** should make us cautious about the conclusions we draw from biology. Nonetheless, past misconceptions of scientists and misuses of scientific knowledge shouldn't cancel out the continuing importance and interest of research on biological difference. Today, serious biological arguments generally draw their evidence from three areas of research: evolutionary theory—from sociobiology to "evolutionary psychology"; brain research; and endocrinological research on sex hormones—before birth and again at puberty.

The Evolutionary Imperative: From Social Darwinism to Sociobiology and Evolutionary Psychology

Evolutionary biologists since Darwin have abandoned the more obviously political intentions of the social Darwinists, but the development of the new field of **sociobiology** in the 1970s revived evolutionary arguments. Edward O. Wilson, a Harvard entomologist specializing in ants, helped to found this school of thought, which studies the biological basis of social behaviour in all animals, including human beings. All creatures, Wilson argued, "obey" the "biological principle," and all temperamental differences (personalities, cultures) derive from the biological development of creatures undergoing the pressure of evolutionary selection. The natural differences that result are the source of the social and political arrangements we observe today. Eventually, he confidently predicted, the social sciences and humanities would "shrink to specialized branches of biology."[11]

One of the major areas that sociobiologists have stressed is the differences in male and female sexuality, which they believe to be the natural outgrowth of centuries of evolutionary development. Evolutionary success requires that all members of a species consciously or unconsciously desire to pass on their genes. Therefore, males and females develop reproductive "strategies" to ensure that our own genetic code passes on to the next generation. Sociobiologists accordingly suggest that the differences and inequality we observe between women and men today have come from centuries of advantageous evolutionary choices. As Wilson's fellow sociobiologist Richard Dawkins put it, "[F]emale exploitation begins here."[12]

Take, for example, the size and the number of the reproductive cells themselves. Add to that the differential **parental investment** required to produce a healthy offspring, and—presto!—you have the differences between male and female sexual behaviour at a typical dorm party this weekend. "He" produces billions of tiny sperm; "she" produces one gigantic ovum. For the male, reproductive success depends upon his ability to fertilize a large number of eggs. Therefore, males have a "natural" propensity toward promiscuity. By contrast, females require only one successful mating before their egg can be fertilized. What's more, females must invest a far greater amount of energy in gestation and lactation and have a much higher reproductive "cost." Females, therefore, tend to be monogamous, choosing the male who will make the best parent.

From this theory, it's a simple matter to extrapolate in simplistic manners to the behaviour of modern men and women. This is particularly true when sociobiological research is digested by popular media. "A woman seeks marriage to monopolize not a man's sexuality, but, rather, his political and economic resources, to ensure that her children (her genes) will be well provided for," writes journalist Anthony Layng. As sociobiologist Donald Symons puts it, women and men have different "sexual psychologies" that drive women to be "more choosy and more hesitant," while men are "less discriminating, more aggressive, and have a greater taste for variety of partners."[13]

Other evolutionary arguments examine different aspects of the differences and inequality between men and women. For example, the separation of masculine and feminine spheres seems to have a basis far back in evolutionary time. Lionel Tiger and Robin Fox emphasize the social requirements for the evolutionary transition to a hunting-and-gathering society. First, the hunting band must have solidarity and co-operation, which require bonding among the hunters. Women's biology—especially their menstrual cycle—puts them at a significant disadvantage for such consistent co-operation, and the presence of women would disrupt the co-operation necessary among the men and insinuate competition and aggression. Women also are possessed of a "maternal instinct." Consequently, it would make sense for men to hunt and for women to remain back home raising the children. For Tiger, male bonding through the hunt produces the basis of human society, with effects that persist to this day.[14] Fair enough for early humans—but does that mean that separate spheres are actually "in our genes"? Yes, writes Edward O. Wilson, "In hunter-gatherer societies, men hunt and women stay at home. This strong bias persists in most agricultural and industrial societies, and, on that ground alone, appears to have a genetic origin. . . . My own guess is that the genetic bias is intense enough to cause a substantial division of labour in the most free and most egalitarian of future societies."[15]

Other evolutionary arguments have examined such behaviours as interspecies violence and aggression. As we shall see in Chapter 13, some sociobiologists have argued that rape is "natural," a result of men's failed competition for mates. The breathless interpretive rush from male scorpion flies to human rapists is one example of sociobiology's biological determinism.

The newest incarnation of sociobiology is called **evolutionary psychology**, which explains psychological traits, including differences between women and men, as evolutionary adaptations. One key insight of evolutionary psychology is clear: Our brains did evolve under vastly different conditions from those we live in today. Millions of years of evolution preceded what we think of as human history, and we are creatures produced by

that dimly understood period. Comparisons with other primates, as well as theories on hominid evolution, can help us understand many behaviours, from language use to play, from grandmothering to the choice of sexual partners. The key word here, however, is "help." Too often, however, evolutionary psychology falls into the reductionist patterns of sociobiology: men are aggressive, controlling, and managing by nature, while women are "programmed to be passive."[16]

According to evolutionary psychologists, these differences lead us to completely different contemporary mating strategies. Psychologist David Buss surveyed more than 10,000 people from 37 different cultures around the world and found strikingly similar things about what women and men want in a mate. It can't be culturally specific if they all agree, can it? In every society, females placed a high premium on signs of economic prosperity, whereas men placed their highest premium on youth and beauty, whose signal traits were large breasts and ample hips (i.e., signs of fertility). Does it interest you that although these traits were important, the single trait most highly valued by *both* women and men was love and kindness? [17] This suggests that when we choose mates, we are acting on a complex set of impulses derived at least as much from our cultural influences as from the demands of our genes. The best evolutionary psychology acknowledges this while insisting that we understand the evolutionary roots of behaviour as motivating significant sex differences. For example, Margo Wilson and Martin Daly write about the evolutionary roots of a number of features of male dominance, most notably "a sexually proprietary male psychology." Instead of offering reductive statements about women's psychological adaptation and consequent passivity, Wilson and Daly offer an analysis that recognizes that men and women might have distinctly different and conflicting interests—a key concept in evolutionary psychology—with women nowhere nearly so monogamous or passive as simplistic accounts might suggest.[18]

Indeed, studying women from an evolutionary perspective yields interesting questions that trouble the conventional narratives of monogamy on which sociobiology's view of women was built. Women are the only primate females who do not have specified periods of **estrus**. They are potentially sexually receptive at any time of their reproductive cycle, including when they are incapable of conception. Some have suggested that women's "concealed ovulation" is a unique feature, suggesting that women's evolutionary "strategy" may be not selectivity but promiscuity. More recently, Christopher Ryan and Cacilda Jethá have argued that women's selectivity is an innovation traceable to agricultural societies; they claim that our view of prehistoric hunter-gatherers has been "Flintstoneized"—coloured by our own sexual and social arrangements.[19]

This may not be so far-fetched. One recent study found that women reported that their partners increased their attentiveness and "monopolization" behaviour—calling them often to check on their whereabouts, for example—just as they began to ovulate. The women, however, found that they fantasized far more about cheating on their partners at the same time. (They reported no increase whatsoever in sexual thoughts about their partners—so much for their evolutionary predisposition toward fidelity.) Although this suggests that the men had good reason to be more guarding and jealous, it also suggests that women "instinctively want to have sex with as many men as possible to ensure the genetic quality of their offspring, whereas men want to ensure that their own genes get reproduced," according to a journalist reporting on the story. [20] Equally selfish genes and equally a "war

between the sexes"—but, nonetheless, one with a completely different interpretation. The variation in possible interpretations of evolutionary evidence should give us pause.

Do the arguments of evolutionary psychology and sociobiology make sense? Can we explain human behaviour by recourse to biology? Critics say no. Ultimately, these theories may tidily describe the intricate mating rituals of fruit flies or brown birds or *seem* applicable to an urban singles bar or the dating dynamics of high school and college students, but the neatness of their explanations may obscure the distinctions between human behaviours and those of other organisms. Anne Fausto-Sterling notes the tendency of many sociobiologists to reason backward from human categories, like rape, adultery, and slavery, to non-human organisms, consequently obscuring the meanings and causes of these categories.[21]

Sociobiologists have been (sometimes unfairly) criticized for their inability to locate the genetic imperative for specific behaviours or for exaggerating the nature of genetic predisposition. Biologist Richard Lewontin, a passionate critic of sociobiology, argues that, "no evidence at all is presented for a genetic basis of these characteristics (religion, warfare, co-operation) and the arguments for their establishment by natural selection cannot be tested, since such arguments postulate hypothetical situations in human prehistory that are uncheckable." As well, fellow evolutionary biologist Stephen Jay Gould denies that there is "any direct evidence for genetic control of specific human social behaviour." "Genes don't cause behaviours," writes the neuroprimatologist Robert Sapolsky. "Sometimes, they influence them."[22]

Sociobiological arguments have also been condemned for selective use of species when making comparisons between animal and human behaviours. Which species should we use as the standard of measurement? Among chimpanzees and gorillas, for example, females usually leave home and transfer to new tribes, leaving the males at home with their mothers. Among baboons, macaques, and langurs, however, males are the ones to leave home to seek their fortune elsewhere. There are other species, however. For example, baboons seem to be female-dominant, with females determining the stability of the group and deciding which males are trustworthy enough to be their "friends." Then there is the female chimpanzee. She has sex with lots of different males, often up to 50 times a day during peak estrus. She flirts, seduces, and does everything she can to attract males—whom she then abandons and moves on to the next customer. Bonobos, with chimps our closest primate relatives, are remarkably communal, generous, and gender-egalitarian—and very promiscuous.

Sociobiologists have also tended to ignore same-sex sexual behaviour among primates, although sexual contact with same-sex others is "part of the normal sexual repertoire of all animals, expressed variously during the lifetime of an individual."[23] In fact, same-sex sexual contact is ubiquitous in the animal kingdom—ranging from bighorn sheep and giraffes—both of whom have what can be described only as gay orgies—to dolphins, whales, manatees, and Japanese macaques and bonobos, who bond through "lesbian" sexual choices. Regardless, few posit a natural predisposition toward homosexuality. "Simple-minded analogies between human behaviour and animal behaviour are risky at best," writes neurobiologist Simon LeVay.[24]

Sociobiology has often been used—particularly by media commentators—to provide us with what Rudyard Kipling called a "just-so story"—an account that uses some

evidence to tell us how, for example, an elephant got its trunk or a tiger its stripes. "Just-so stories" are children's fables, understood by the reader to be fictions, but convenient, pleasant, and, ultimately, useful fictions. Evolutionary psychology, though a relatively new field, has overcome many of the limitations of sociobiology, but remains committed to relatively monocausal explanations. While critiquing, perhaps justly, the sometimes fuzzy understandings of pure cultural determinists, evolutionary psychologists can be as determinist as any.

Does this mean that these fields have no value? Not at all. To be sure, human beings are not fruit flies. We *are*, however, the products of our biology and of millions of years of evolution. Nature undoubtedly plays a role, though few scientists would today claim that it produces anything stronger than a tendency that interacts with cultural influences to produce behaviour. As Richard Bribiescas states in his recent "evolutionary history" of men, "are men the product of nature or nurture? The answer is yes."[25] Both nature and nurture form us. The difficulty comes in interpreting the evidence, which has too often been yoked to simplistic—and, frankly sexist—biological determinism.

Testing the Gendered Brain: Sex Differences in Spatial and Verbal Skills

Gender differences on standardized tests have been the subject of debate for decades. At the turn of the twentieth century, women scored higher than men did on comprehensive examinations at New York University. Because scientists "knew" that women were not as smart as men were, some other explanation had to be sought. "After all, men are more intellectual than women, examination papers or no examination papers," commented the dean of the college, R. Turner. "Women have better memories and study harder, that's all. In tasks, requiring patience and industry, women win out. But when a man is both patient and industrious he beats a woman any day." (It is interesting to see that women's drive, ambition, and industriousness were used against them but that men were not faulted for impulsiveness, impatience, and laziness.) In the 1920s, when IQ tests were invented, women scored higher on those tests as well. As a result, the experimenters changed the questions.[26]

This early debate over women's intellectual fitness has been replaced by a discussion that debates not just aptitude but gender roles. For example, in 2005, then-president of Harvard University, Lawrence Summers, suggested in a speech that the underrepresentation of women in **sciences, technology, engineering, and mathematics (STEM)** might be the result of men's innately greater representation at the highest levels of mathematical ability. The controversy that followed led to Summers's resignation from his position in early 2006; in the aftermath, however, conservative commentator Christine Hoff Sommers argued that persistent gender differences in *interests* (which she traces to innate tendencies) are the cause of women's underrepresentation in STEM.[27]

Sommers refrained from arguing that women were less skilled in mathematics. Test scores have continued, however, to show gender differences in relation to certain abilities, generally summarized as verbal, visuospatial, and quantitative. In a recent international literacy study, fourth-grade girls were found to outperform boys significantly in all

33 countries in which the study was conducted. Similar results were found for 15-year-olds in a 2002 Programme for International Student Assessment (PISA) study. In Canada, 2003 PISA assessments of 15-year-olds revealed girls' significantly superior performance in reading (the gap persisted in the 2006 and 2009 measurements). Moreover, the difference between boys' and girls' averages is large—equivalent to one full grade level.[28] In the 2009 assessment, the reading average for girls was 40.54 points above the boys' average, and there was a statistically significant difference in all 63 participating countries. The gap in mathematical performance is relatively small by comparison; the boys' advantage is 8.64 points. Moreover, there is substantial variation in math scores from nation to nation. In some, such as Sweden, girls outperform boys by a small margin; in others, such as Colombia, the gap is large, with boys outperforming girls by 33.32 points.[29]

Mathematical abilities are not one ability but many. Differences in these abilities begin to appear early in life and persist into adulthood, though they are not always significant. Still, girls tend to outperform boys in all subjects, including math, until senior high school. Is this because puberty somehow impairs girls' development, or is it because senior-high math introduces advanced geometry and calculus, which demand superior visuospatial skills? Both arguments have been advanced. Sex differences do not appear on all mathematical tests, nor even on all spatial tasks. For example, there are small to non-existent differences between males and females when it comes to geometry tests. Some of the greatest gender differences, however, emerge when young adults are asked to perform mental rotation tasks that require a subject to imagine what a three-dimensional object looks like when rotated. Much has been made of this male advantage, because visuospatial tasks are considered central to success in science, math, and engineering. Young men perform these tasks significantly better, on average, than young women, and women exposed to testosterone in utero may perform them better than do non-exposed women.[30]

It is also true that males outnumber females at the genius end of the mathematical spectrum. Indeed, it seems that there is simply greater variability in male test scores; men outnumber women at *both* ends of the spectrum. Twenty years ago, boys outnumbered girls 13:1 among those precocious (gifted) 13-year-olds with SAT math scores of more than 700. (The SAT is the standard university admissions test used in the US.) Now there are only 2.8 boys for every girl in this group; still a distinct advantage for boys "at the genius end," but a dramatic change from the situation in the late 1980s.[31]

Faced with evidence from standardized testing, many people, including some scholars, are tempted to biological explanations: "[B]oys are better at math, and girls are better at reading." There is, however, strong reason to doubt this simple platitude. First, what are we to make of the fact that boys, until recently, continued to outperform girls on the verbal component of the SAT? Clearly, what is meant by "verbal" ability can vary.

Moreover, as can be seen from the data above, the "gap" in mathematical performance is far from stable and consistent across cultures. In fact, it is ever-changing and inconsistent. What's more, girls simultaneously have the *largest* advantage in reading, and the *smallest* disadvantage in math scores. For example, if one were to take the massive Colombian gap in math scores as evidence of these girls' hyperfeminine cognition, one would have to contend with the fact that Colombian girls score relatively poorly in reading.

In addition, what should one make of the fact that the differences between boys and girls on these assessments are dwarfed by the gaps from country to country? Shanghai-China,

for example, enjoys average math scores that are more than 35 points higher than any other country has, and reading scores that are similarly high. (In case you're wondering, Canada's scores are significantly above the average, but we still lag well behind China.) Would anyone seriously argue that the huge gaps among countries represent some innate difference in aptitude?

Even the much-vaunted male spatial advantage seems to ask more questions than it answers. Why do males perform better on rotation of 3D objects, but not on tasks that require mentally folding paper, which are also "visuospatial"? Why do women perform better on at least one spatial task, remembering object locations?[32] (No jokes about finding the TV remote, please.)

We are left with a bewildering number of studies that seem to confirm the existence of some sex or gender differences, but raise more questions than they answer. Do differences that emerge in early childhood reflect "nature" or "nurture"? In addition, what is the role of culture? How might having greater parental encouragement toward spatially oriented outdoor play (or indoor play, for example with Lego) affect boys' generally superior visuospatial abilities? We know, for example, that playing video games enhances a number of cognitive skills, especially spatial ones. In a study at the University of Toronto, the largest differences in performances on a spatial task were not between men and women, not between sciences students and arts students, but between gamers and non-gamers. Given that boys play more of the action games that seem to enhance spatial ability most, the effects of play are a logical source for the differences we see in young adults.

What is more, these differences are extremely malleable. The same U of T study showed that just 10 hours of play with an action video game could make a tremendous difference: "[f]emales showed larger improvements than males, such that prior gender differences were virtually eliminated."[33] In fact, many test-score differences seem to change in relatively short time periods—as reflected both in SAT scores (US) and in provincial skills assessments (Canada).[34] We know also that test performance is vulnerable to immediate and short-term fluctuations. For example, scholars have discovered the phenomenon called **stereotype threat**: reminding women of stereotypes about their mathematical ability immediately lowers their performance and even alters their brain activation.[35] And having a math-anxious female teacher for a given year can depress girls' math achievement.[36]

All of this being the case, why do we rush to claim that differences on test scores reflect innate ability rather than the effect of a lifetime of cultural conditioning? Additionally, why do we assume that test scores can explain complex phenomena such as the underrepresentation of women in a given field of employment? Obviously, when we assess gender differences in cognition, we should remain aware that the topic is as complex as the human brain and human society themselves. In the words of one careful recent metastudy,

> Just as there are many related questions about sex differences in test scores and career choices, there are many variables that work together to present a level of complexity that is inherent in understanding complicated questions about the way people think and behave. . . . There is no single factor by itself that has been shown to determine sex differences in science and math. Early experience, biological

> constraints, educational policy, and cultural context each have effects, and these effects add and interact in complex and sometimes unpredictable ways.[37]

Ultimately, we need to assess gender differences in cognitive ability in a way that respects complexity and avoids simplistic "sound-bite" stereotypes.

"His" Brain and "Her" Brain

As we've seen, discussions of cognitive gender differences have often explained them as the result of men's and women's different brains. Focusing on the brain to explain cognitive and other differences between women and men has a long history. The late nineteenth century was the first heyday of brain research, as researchers explored that spongy and gelatinous three-pound blob in order to discover the differences between whites and blacks, Jews and non-Jews, immigrants and "normal" or "real" Americans, criminals and law-abiding citizens. For example, the great sociologist Emile Durkheim succumbed to such notions when he wrote, "with the advance of civilization the brain of the two sexes has increasingly developed differently. . . . [T]his progressive gap between the two may be due both to the considerable development of the male skull and to a cessation and even a regression in the growth of the female skull." Another researcher argued that the brain of the average "grown-up Negro partakes, as regards his intellectual faculties, of the nature of the child, the female, and the senile White." These findings, obviously, satisfied sexist and racist assumptions.[38]

Contemporary brain research has moved beyond craniology, and in recent years has been able to study images of living brains rather than merely dissecting dead ones. While overall brain size and intelligence remain a topic of debate,[39] much of the past research focused on three areas: the differences between right hemisphere and left hemisphere; the ways in which males and females use different parts of their brains for similar functions; and the differences in the tissue that connects those hemispheres. More recently, differences in brain volume have been studied; men have larger absolute brain volume, but there is also variation in the volume of various regions of the brain, along with distinctions in brain density.[40]

The right and left hemispheres of the brain appear to be associated with different cognitive functions and abilities. Right-hemisphere dominance is associated with visual and spatial abilities, such as the ability to conceive of objects in space. Left-hemisphere dominance is associated with more practical functions, such as language and reading skills. Norman Geschwind and Peter Behan observed that sex differences begin in the womb when the male fetus begins to secrete testosterone that washes over the brain, selectively attacking parts of the left hemisphere and slowing its development. Therefore, according to Geschwind, males tend to develop "superior right hemisphere talents, such as artistic, musical, or mathematical talent." Geschwind argued that men's brains are more **lateralized**, with one half dominating over the other, whereas women's brains are less lateralized, with both parts interacting more than in men's.[41] However, Ruth Bleier reanalyzed Geschwind and Behan's data and found that in more than 500 fetal brains from 10 to 44 weeks of gestation, the authors had found no significant sex differences—this despite the much-trumpeted testosterone bath.[42]

In contrast to Geschwind, Buffery and Gray found that female brains were more lateralized than male brains, which, they argued, interfered with spatial functioning, and made women less capable at spatial tasks. That same year, neuroscientist Jerre Levy found that female brains were *less* lateralized than male brains, and so he argued that *less* lateralization interferes with spatial functioning.[43] Given these contradictory findings, perhaps it is not surprising that the nature and existence of gendered lateralization remain highly controversial.[44]

However, what if it's not the differences between the hemispheres, or even that males and females use the same hemispheres differently? Perhaps it's the structural connections *between* the hemispheres. Some researchers have explored the bundle of fibres known as the corpus callosum (CC) that connects the two hemispheres and carries information between them. A sub-region of this connecting network, the splenium, was found by one study of 14 brains to be significantly larger and more bulbous in shape in females, consequently affecting visual and spatial functioning. However, subsequent research failed to confirm this finding. What's more, in magnetic resonance imaging (MRI) tests on living men and women, small or no differences were found between women and men.[45]

Nevertheless, that didn't stop popular writers from dramatic and facile extrapolation. *Time* magazine claimed that women's wider CCs were "possibly the basis for women's intuition." As well, *The New York Times* science editor claimed that women's big CCs discredited "feminist ideologues" who linked girls' poor math performance to environmental factors. In *The Wonder of Girls* (2002), Michael Gurian claims that only females with "boys' brains" can grow up to be architects because girls' brains are organized to promote nurturing, love, and caring for children.[46] In this manner, enormously complicated research is boiled down through popular culture to become definitive "proof" of gender stereotype. The CC's function and structure are still not perfectly understood, the visual identification of a "tubular" or "bulbous" CC isn't as straightforward as it might seem, and recent research has demonstrated that there are no significant differences in CC size once sex differences in brain size are taken into account; nonetheless, the popular stereotype of the "sexed brain" remains.[47]

One of the most recent brain-sex studies to make a splash is Louanne Brizendine's popular study *The Female Brain*, a bestseller already translated into many languages and sold around the world. Despite Brizendine's credentials, this book (not peer-reviewed) offered questionable data such as the canard that women used 20,000 words per day against men's 7,000. Withdrawn from subsequent editions, this erroneous claim nonetheless exemplifies the sloppiness that characterizes what Cordelia Fine calls "our crude attempts to locate social pressures in the brain."[49] Unfortunately, the "20,000 words-per-day" statistic is still being repeated in the media.[50] Some errors apparently appeal to us more than others do—enough to persist a decade after their first appearance!

If these arguments rest on flimsy evidence and flimsier interpretations, why do they persist? Neuroscientist Lise Eliot suggests that the answer relates to our desire to justify current social arrangements:

> Research findings about sex differences have been distorted and exploited by nonscientists to an extraordinary degree—perhaps second only to research on

> weight loss. Beginning with the wildly popular 1992 book *Men Are from Mars, Women Are from Venus*, public discourse has been saturated with faulty factoids about men, women, boys, and girls that have settled deeply into society's collective understanding of gender roles. From education and parenting to corporate leadership and marital harmony, so-called scientific findings about the male and female brain have been used to validate various stereotypical practices that are discriminatory to both sexes.[51]

Accordingly, we might laugh at Brizendine's assertion that the female brain is "a high performance emotion machine," but this "neurosexism," as Fine calls it, is no laughing matter. She points out that the **palliative system justification motive** allows us to justify and rationalize existing social arrangements. At their best, studies of the sexed brain offer intriguing food for thought; at their worst, as Fine warns, theories of brain sex offer "a tidy justification for accepting the status quo with clear conscience."[52]

Estrogen and Testosterone: Hormonal Bases for Gender Differences

The term "hormone," despite its ubiquity in contemporary culture, is only about one hundred years old. The word means "I excite" or "I arouse" and is a relic of a very important discovery: that certain secretions are chemical messengers that produce responses in the body. There are many hormones, but we are here concerned with those that produce or influence the differences between the sexes.

Sex differentiation faces its most critical events at two different phases of life, fetal development and puberty. During fetal development, the primary sex characteristics are determined by a combination of genetic inheritance and the biological development of the embryo that will become a boy or a girl. Then, during puberty, the bodies of boys and girls are transformed by a flood of sex hormones that causes the development of all the secondary sex characteristics. Breast development for girls, lowering of voices for boys, the development of facial hair for boys, and the growth of pubic hair for both are among puberty's most obvious signs.

The effects of hormones in producing these transformations are obvious. Much research has gone farther to explore the complex effects of hormones in shaping other real or purported areas of gender difference, from sexual expression to aggression to emotion. Summarizing his reading of this research, sociologist Steven Goldberg writes that because "men and women differ in their hormonal systems" and "every society demonstrates patriarchy, male dominance, and male attainment," it is logical to conclude that "the hormonal renders the social inevitable."[53]

We've all heard the arguments about how testosterone, the male sex hormone, is not only the driving force in the development of masculinity in males but also the biological basis of human aggression, which is why males are more prone to violence than women. While there may be some validity to this, we should remember that women and men have both testosterone *and* estrogen, although typically in dramatically different amounts. On average, men do have about 10 times the testosterone level that women have, but the level

among men varies greatly, and some women have levels higher than those of some men. Men also have about twice as much estrogen as do post-menopausal women.

Testosterone levels also vary from culture to culture and from man to man, and often in surprising ways. For example, a finger-length study was conducted at the University of Bath (UK) in 2004. (As further discussed below, relative ring–index finger length is thought to correlate with prenatal hormone exposure.) In the study, male "hard" scientists unexpectedly had significantly higher levels of estrogen and lower testosterone levels than did male social scientists. Female social scientists were also found to have higher-than-average testosterone levels. Interesting research, but surely not proof, as one online news source trumpeted, that male scientists aren't so manly after all![54]

This perception of testosterone as the "masculinity hormone" pervades the media and less-careful research. In recent years, research has suggested correlations between levels of testosterone and body mass, baldness, self-confidence, and even the ability and willingness to smile. Some wildly inflated claims about the effects of testosterone have led to both popular misconceptions and a variety of medical interventions to provide remedies. In one recent book, for example, psychologist James Dabbs proclaims, "testosterone increases masculinity," which was translated by a journalist into the equation that "lust is a chemical" as he looked forward to his "biweekly encounter with a syringe full of manhood." Of course, today men can purchase testosterone patches or AndroGel, a product that seems to promise masculinity in a tube.[55]

Although the claims made for testosterone are often ridiculous—ministering less to science and more to men's fears of declining potency—there are some experiments on the testosterone–aggression relationship that appear convincing. Males have higher levels of testosterone and higher rates of aggressive behaviour than females do. What's more, if you increase the level of testosterone in a normal male, his level of aggression will increase. Castrate him—or at least a rodent proxy of him—and his aggressive behaviour will cease entirely. Though this might lead one to think that testosterone is the cause of the aggression, Stanford neurobiologist Robert Sapolsky warns against such leaps of logic. He explains, "testosterone isn't causing aggression; it's exaggerating the aggression that's already there."[56]

It turns out that testosterone has what scientists call a "permissive effect" on aggression, enabling it rather than causing it. What's more, testosterone is produced *by* aggression, so that the correlation between the two, in fact, may have the opposite direction than previously thought. In his thoughtful book *Testosterone and Social Structure*, Theodore Kemper notes several studies in which testosterone levels were linked to men's experiences. In studies of tennis players, medical students, wrestlers, nautical competitors, parachutists, and officer candidates, winning and losing determined levels of testosterone. The levels of the winners rose dramatically, whereas those of the losers dropped or remained the same. Kemper suggests that testosterone levels rise when men experience either *dominance*, "elevated social rank that is achieved by overcoming others in a competitive confrontation," or *eminence*, where elevated rank "is earned through socially valued and approved accomplishment." Significantly, men's testosterone levels prior to either dominance or eminence could not predict the outcome of competition; experiencing success was what led to the elevation of their testosterone levels. (These same experiences lead to increases in women's testosterone levels as well.)[57]

As we have seen, men's experiences of aggression, competition, success, and failure alter their levels of testosterone. There are also huge variations in normal testosterone levels within individual men, among men in industrialized nations, and between men in industrialized nations and men in other parts of the world (whose average levels, for unknown reasons, are much lower). We simply don't know what a globally "normal" level of testosterone might be and what causes the vast variations. We also don't know what an optimal level of testosterone might be, given the mixed effects of the hormone and its apparent potential to increase risks of certain illnesses.

Despite this, some therapists prescribe testosterone for men as a sort of chemical tonic. Happy consumers swear by the results, and some therapists have even diagnosed a malady called "andropause" or "male menopause," treatable by hormone-replacement therapy for men. Health Canada's 2002 approval of Androgel was trumpeted as bringing relief to the "one million Canadian men [who] have testosterone insufficiency," described as a "medical condition linked to depressed mood and fatigue, reduced lean body mass and muscle strength, decreased bone density—which can lead to osteoporosis—lower interest in sex, and erectile dysfunction." Despite the documented horrors of this widespread "pathology," few Canadians were able to either identify the medical condition (andropause) associated with low testosterone or the condition's many symptoms. Fortunately, Solvay Pharma's educative efforts seem to have convinced physicians, at least if the claim that 46 per cent of polled physicians treat andropause can be believed.[58]

Meanwhile, body builders, athletes, and men seeking fat loss consume testosterone in the form of anabolic steroids. Testosterone in this form is a controlled substance, and its distribution or purchase without a prescription is illegal. Moreover, as most Canadians know, anabolic steroid use is banned in amateur sport. In 1988, one of Canada's greatest track athletes of all time, Ben Johnson, was stripped of his Olympic gold medal after testing positive for stanozolol, a steroid taken orally. Such steroids remain widely available across Canada despite their illicit status.

Testosterone's effect on male sexual drive has been discussed almost as much as its effects on aggression and muscle mass. Clearly, testosterone has some effect: castrate a male guinea pig, and he stops mounting females. Administer testosterone, and he embraces his old role with enthusiasm. However, some intact male guinea pigs, in one classic experiment, showed much less interest in mating than others, despite similar levels of the manly hormone. Moreover, when the unenthusiastic breeders received more testosterone, they didn't get any sexier. As has been proved by experiments on men with normal levels of testosterone, having more of the hormone doesn't necessarily equal a stronger sex drive. (There is, however, some evidence that testosterone increases sex drive in men with extremely low levels as the result of various traumas or disorders.)[59]

Despite its reputation as the "masculinity hormone," testosterone is now seen as a panacea for women. Low testosterone levels have been linked to low libido in women, despite little understanding of what might constitute a "normal" female libido. Barbara Sherwin of McGill University has also conducted research linking testosterone to increased libido in women. Though Sherwin currently focuses on estrogen and its relationship to cognition, her research on the positive effects of testosterone supplementation has encouraged physicians to add a "tiny dose" of testosterone to estrogen-based hormone replacement regimes for women, as *The New York Times* reported.[60]

Some have also suggested that competition and aggression in women are linked to testosterone. Patricia Schreiner-Engel, for example, has found higher testosterone levels in successful executive women than in homemakers. She even suggested that Queen Elizabeth I, England's sixteenth-century "Virgin Queen," may have been a "High-T" woman![61] Once again, the assumption is that extra "T" made Schreiner-Engle's executive women competitive and successful, while it is more likely that their testosterone levels rose with their experience of success.

As Natalie Angier writes, "the male body gave birth to hormone research, but the female body reared it to maturity."[62] The first sex hormone isolated, in 1929, was one of many forms of estrogen. (The first hormones isolated, epinephrine and secretin, were discovered at the turn of the century.) Estrogen remains, of course, the hormone most associated with women. (Interestingly, when the male and female sex hormones were named, male hormones, including testosterone, received the name "androgens," roughly translatable as "man-builder." The female equivalent was termed estrogen or "estrus-builder.")

Like men's testosterone levels, women's estrogen levels naturally fluctuate. Through a woman's menstrual cycle, they rise and decline in relatively standard ways. This has led to interesting studies regarding estrogen's role in cognition and sexual desire throughout a woman's monthly cycle.

By far the greatest interest in estrogen, however, has come from its precipitous decline in post-menopausal women. These women, by the middle of the twentieth century, were diagnosed as "estrogen-deficient." In the late twentieth century, North American women by the millions were prescribed "estrogen replacement therapy" (ERT), which promised women an end to the symptoms of menopause along with protection from heart disease, improvement in mental clarity, and, not least, a more youthful appearance. "Never before [had] a drug regimen been proposed on such a scale," writes Angier.[63] In 2002, the US National Institutes of Health prematurely halted a long-term trial of ERT because of alarming evidence that it significantly increased women's risk of heart disease, invasive breast cancers, stroke, and blood clots.[64]

Since then, ERT has been prescribed more cautiously; we still need to know more about how estrogen works. Are women over 50 actually "estrogen-deficient"? Why do women outside North America seem to need replacement therapy so much less than we do? Much attention is now being paid to the perimenopause, the time preceding the cessation of menstruation, which some researchers believe may begin as early as the age of 35. Once again, the culprit is estrogen. This time, declining levels aren't the problem, but perhaps, an erratic and surging supply of the hormone.

Research on premenstrual syndrome (PMS) has provided yet another example of the way that hormones work—or are presumed to work—within the female body. During the days just before menstruation, some women seem to exhibit symptoms of dramatic and wildly unpredictable mood changes, outbursts of violence, anger, and fits of crying. Alec Coppen and Neil Kessel studied 465 women and observed that they were more irritable and depressed during the premenstrual phase than during mid-cycle. Such behaviours have led physicians to label these symptoms "premenstrual syndrome." Under the name "Premenstrual Dysphoric Disorder" PMS was included in an appendix to the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*) of the American Psychiatric Association, which guides physicians (and insurance companies)

in treating illnesses. In the fifth edition (*DSM-V*), PMDD appears in the main body of the text—a sign of what the APA considers "strong scientific evidence" for the existence of the disorder.

Despite the relative rarity of pathological PMS, the term has entered popular culture, so that any woman who is irritable on a given day is said to be "PMSing." Young women now refer to the period of their menstruation (or immediately preceding it) as "Shark Week," a reference to the aggression and foul mood that supposedly herald or accompany the menses. PMS has even been used as a criminal defence strategy. Two British women, arguing that PMS is a form of temporary insanity, have used PMS as a successful defence in their trials for the murders of their male partners. If testosterone is seen as the "manly hormone," estrogen is seen as the emotional centre that makes women not only cuddlier than men but also occasionally hysterical. This phenomenon is accepted by many women, and society as a whole, as just a "natural" part of being a woman.

Recently, a firestorm was ignited when University of Toronto researchers published a study that found no clear relationship between women's moods and their menstrual cycles. The researchers noted that the estimated incidence of "true" PMS ranges from 1.3 per cent to 9 per cent, but that many scholars and members of the public alike believe there is a "well-defined PMS occurring in the female population as a whole." Through a systematic review, the researchers established that there is no clear evidence in support of "a specific premenstrual negative mood change occurring with any regularity in the general population."[65] Could the idea of widespread PMS be another "just-so story"? It seems likely.

Still, research on the "sex hormones" makes it clear that they have important effects throughout our lives. Once again, these effects are too often oversimplified in ways that ignore the complexity of human behaviour, sexuality, and health itself. We need to understand mood, sexuality, and behaviour as complex admixtures of *many* influences, including the hormonal.

"As Nature Made Him?"

One of the most famous cases that purports to prove how biological sex is the sole foundation for gender identity concerned a Manitoba boy, Bruce Reimer. In 1966, Bruce and his identical twin, Brian, underwent cauterization circumcisions in a Winnipeg hospital. Brian's circumcision went smoothly, but Bruce's went terribly wrong, and his penis was nearly burned off. His distraught parents brought him to Johns Hopkins University Medical Center where, at the age of 21 months and under the aegis of Dr John Money, he was surgically "transformed" into a girl. Throughout the next decades, the newly named "Brenda" was faced with several more aggressive (or abusive) surgical procedures, annual visits to Dr Money's clinic, and massive doses of female sex hormones, while her parents struggled to conceal Bruce's story and raise Brenda as a girl—and not just "a" girl, but a very frilly, feminine, and dainty girl at that. (Even though Brenda described herself as a

tomboy as a child, Brenda's mother was determined that her "daughter" be "polite and quiet" and "ladylike.")

This case, known as the "John/Joan" case, was the most famous of Dr Money's career. However, behind the scenes, things were difficult for the twins. Despite being poster children for Money's claims that gender identity can be changed, both twins grew up depressed and unhappy. Eventually, Brenda's situation was revealed to a sexologist, Dr Milton Diamond at the University of Hawaii, a long-time foe of John Money's unorthodox ideas and practices. Under Diamond's supervision, Brenda reclaimed his male gender identity, renamed himself "David," and became the man he said he felt he always was. "Suddenly it all made sense why I felt the way I did," he told a journalist who eventually wrote a best-selling book about his life. "I wasn't some sort of weirdo. I wasn't crazy." David eventually married and adopted three children. His story, passionately told by journalist John Colapinto, became a book, *As Nature Made Him: The Boy Who Was Raised as a Girl* (2000) and a TV documentary. Colapinto argues forcefully that David's case demonstrates that nature trumps nurture, that biology is destiny, and that meddling with "Mother Nature" is always disastrous. The case "provides stark evidence that a person's brain predetermines sexual identity—not one's anatomy or social environment" was how a writer in the *Los Angeles Times* put it, and this is how the story has been cemented in the public imagination: as proof that biology determines gender.[66]

Yet is the case that simple, that no matter how much tinkering one does, nature always trumps nurture? Any scientist should be wary of generalizing from a single case—especially a case with so many other factors that might have influenced the outcome. How would you feel about yourself, and your gender identity, if you were constantly being dragged to some hospital every few months throughout your early childhood, had your testicles removed while your damaged penis was left intact, and had your genitals poked and prodded and surgically "repaired." How would you feel if everyone paid an inordinate amount of attention to your genitalia and *every aspect of your behaviour* without ever telling you why? Drs Money and Diamond believed that a child without a complete penis could not possibly be a boy, and that a girl must be feminine: demur, restrained, and dressed in frilly clothes. Dr Money "coached" the children on appropriate gender behaviour in ways that seem to us bizarre to say the least. Despite their apparent belief in gender malleability, the doctors were rigid and doctrinaire in what they thought "appropriate" for boys and girls.

Were our gender roles more elastic, we wouldn't try so obsessively to coerce such behaviours from our children, who express far more variability than our norms about proper gender behaviour. Surely, our gender identity is the result of a complex interaction of genetics, brain chemistry, hormones, and our immediate familial environment, nestled within a more general social and cultural milieu. No *one* cause of something so complex and variable as gender identity could possibly be extracted, especially from one complex and deeply troubling case. What *is* clear is the tragic outcome for both brothers (and their parents); Brian, who was severely mentally ill, died of an overdose of his anti-schizophrenia medication in 2002, David of a self-inflicted gunshot wound in 2004. (Their father was an alcoholic and their mother was clinically depressed.)[67]

Gay Brains, Gay Genes, or Gay Hormones?

In the twentieth century, biological research emerged as central in the demonstration of the fundamental and irreducible differences between homosexuals and heterosexuals. In the 1970s, German researcher Gunter Dorner (director of the Institute for Experimental Endocrinology at Humboldt University in Berlin) and his associates claimed to have found that homosexual men possess a "predominantly female-differentiated brain," which is caused by a "deficiency" of androgen during the hypothalamic organizational phase in prenatal life. This deficiency may be activated to homosexual behaviour by normal or about-normal androgen levels in adulthood.[68]

In the 1990s, with homosexual rights a topic of great interest and activism, "gay-brain" studies attempted to locate homosexuality in the brain structure itself. Hoping that science can demonstrate "the origins of sexual orientation at a cellular level," Simon LeVay examined the brain tissues of 41 deceased people. These brains were treated and compared. Three of the four sections revealed no differences, but a fourth section, the anterior hypothalamus, a region about the size of a grain of sand, was found to be different among the groups. LeVay found that the size of this area among the presumably heterosexual men was approximately twice the size of that area for the women and the purportedly gay men.[69]

Several problems in his experiments give us pause, however. LeVay and his colleagues failed to measure the cell number or density because "of the difficulty in precisely defining the neurons belonging to INAH-3," the area of the brain involved. A number of the "homosexual" men (5 of the 19) and of the women (2 of the 6) appeared to have areas of the brain as large as those of the presumed heterosexual men. In addition, in three of the presumed heterosexual men, this area of the brain was actually very small. What's more, the sources of his data were widely varied. All the "gay" men in his sample died of AIDS, a disease known to affect the brain. (Reduced testosterone occurs among AIDS patients, and this alone may account for the different sizes.) All the brains of the "gay" men were preserved in a formaldehyde solution that was of a different strength than the solution in which the brains of the heterosexual men were preserved, because of the fears of HIV transmission, although there was no effort to control for the effect of the formaldehyde on the organs. It is possible that what LeVay may have been measuring was the combined effect of HIV infection and preservation in high densities of formaldehyde solution on post-mortem brain structure, rather than differences in brain structure between living heterosexuals and homosexuals. Efforts to replicate LeVay's findings failed, and one researcher went further, suggesting, "INAH-3 is not necessary for sexual behaviour in men, whether they chose men or women as their partners."[70]

Also in the 1990s, researchers found that the brains of male transsexuals more closely resembled the brains of women than of heterosexual, "normal" men. Dutch scientists at the Netherlands Institute for Brain Research examined the hypothalamus sections of 42 autopsied men and women, 6 of whom were known to be transsexuals, and 9 of whom were gay men, whereas the rest were presumed to be heterosexual. Again, they found that the hypothalamus in the transsexual men and women was smaller than in the heterosexual or homosexual men. Although they were careful *not* to interpret their findings in terms of sexual orientation because the heterosexual and homosexual men's brains were

similar, they did take their research to signal sex differences because the male transsexuals were men who felt themselves to be women. However, the brain difference may also be a result of transsexual surgery and the massive amounts of female hormones that the male transsexuals took, which might have had the effect of shrinking the hypothalamus, just as the surgery and hormones also resulted in other anatomical changes (loss of facial and body hair, breast growth, etc.). Again, these results were broadly publicized and accepted by the public as "proof" that both gender and sexuality are "written in the brain." A recent MRI study of 48 heterosexual men and women and 24 male-to-female transsexuals (non-hormone using) found *no evidence* of feminization of transsexual brain structure. This study has received little media attention.[71]

After 2000, MRI technology furthered neuroscience's move from neuroanatomical to brain functioning studies. Studies now focused on imaging living brains at work. A group of Swedish researchers exposed heterosexual men and women and gay men to chemicals derived from male and female sex hormones and recorded which parts of the brain were most visibly stimulated on a PET scan. When the subjects were presented with testosterone, the part of the brain most closely associated with sexual activity (the hypothalamus) was triggered, but only among women and gay men. When presented with estrogen, by contrast, the heterosexual men responded strongly in the hypothalamus. Gay men also responded to estrogen, though in different brain regions. Lesbians responded similarly to both estrogen and testosterone. Although the response among journalists was a collective "Eureka! The gay brain," the researchers themselves were far more circumspect. Lead researcher Ivanka Savic told a reporter "We cannot tell if the different pattern is cause or effect. The study does not give any answer to these crucial questions."[72]

Two members of the same team performed more research that measured brain asymmetry using MRI imaging in a group of 90 heterosexual and homosexual men and women. The functional connection of subjects' brains was also measured using PET scans that assessed blood flow during rest while breathing unscented air (no sexy hormones this time!). The researchers found that the brains of gay men resembled those of heterosexual women, while lesbian women's brains more closely resembled those of straight men. Again, the implications were unclear—unfortunately, the media didn't see it that way.[73]

"You can't assume that because you find a structural difference in the brain that it was caused by genes," says researcher Marc Breedlove, arguing that behaviour itself shapes the brain. "You don't know how the difference got there." Another adds that we "are still unsure whether these signs are causes or effects."[74] The mad rush to identify the brain's control over every aspect of human behaviour cheapens the value of basic research and, at its worst, provides support for tired stereotypes and questionable social policy.

Another attempt to show that sexual orientation has its basis in biology involves the so-called gay gene. Research on pairs of monozygotic twins (twins born from a single fertilized egg that splits in utero) suggested that identical twins have a statistically far higher likelihood of having similar sexualities (either both gay or both straight) than do dizygotic twins (twins born from two separate fertilized eggs). One genetic study involved 85 pairs of twins in the 1940s and 1950s. All 40 pairs of monozygotic twins studied shared the same sexual orientation; if one twin was heterosexual, the other was also; if one twin was homosexual, so, too, was the other twin. Such data were so perfect that subsequent

scientists have doubted their validity, but other studies in the 1980s seemed to confirm the findings of this initial study.[75]

After 2000, these studies were revisited. Sociologists Peter Bearman and Hannah Bruckner examined all the studies that purported that opposite-sex twins are more likely to be gay than twins who are of the same sex. They concluded that there are no hormonal connections whatever and that the level of sex stereotyping in early childhood socialization is a far better predictor of behavioural outcome than whether or not one has a twin of the opposite sex. Predicting sexual orientation from that evidence is sort of like predicting penis size from shoe size—there's not even a correlation, but if there were, it would be specious.[76] Most recently, the largest-ever twin study was conducted in Sweden, involving more than 3,800 pairs of twins. While there seemed to be some role for genetics, the researchers found far more influence exerted by other factors. Interestingly, the "genetic effect" for women was much smaller than for men.[77]

The quest for a genetic link to homosexuality was predated by research on the relationship between hormones and homosexuality, which began almost as soon as "sex hormones" were identified. In the 1970s, Dorner and his associates argued that low levels of testosterone during fetal development, a rather tepid hormonal bath, would predispose males toward homosexuality. If rats did not receive enough of their appropriate sex hormone during fetal development, "then something would go wrong with the formation of the centres and with later sexual behaviour," reported two journalists. "Adult rats would behave in ways like members of the opposite sex. They would become, in a sense, 'homosexual.'"[78]

Could prenatal stress account for a disposition toward homosexuality? In another series of studies, Dorner and his colleagues argued that more homosexual men are born during wartime than during peacetime. Their evidence for this claim was that a high proportion of the 865 men treated for venereal disease in six regions of the German Democratic Republic were born between 1941 and 1947. They theorized that because prenatal stress leads to a "significant decrease in plasma testosterone levels" among rat fetuses, which also leads to increased bisexual or homosexual behaviours among the adult rats, why not among humans? Dorner theorized that war leads to stress, which leads to a lowering of androgens in the male fetuses, which encourages the development of a homosexual orientation. Based on this trajectory, Dorner concluded that the prevention of war "may render a partial prevention of the development of sexual deviation."[79]

The most interesting recent research on the relationship between prenatal hormones and sexual orientation has been carried out by University of California at Berkeley psychologist Marc Breedlove and his students. Breedlove is a far more careful researcher than most and is far more cautious in the claims he makes. Breedlove measured the lengths of the index and ring fingers (second and fourth digits) then calculated the ratios between them for both heterosexual women and lesbians and for gay and heterosexual men. It's now accepted that finger length serves as a marker for the effect of prenatal androgens. Breedlove found that the ratio between those two fingers was more "masculine" among lesbians than among heterosexual women (i.e., the lesbians' index fingers were significantly shorter than their ring fingers). He found no differences between gay and straight men (both were equally "masculine"). However, another study did find significant differences between the two, with gay men's finger ratios being somewhat more "masculine" than those of heterosexual men.[80]

Breedlove believed that the difference between lesbians and heterosexual women was due to the effect of increased prenatal androgens among the lesbians—therefore rendering them more "masculine." This corresponds with traditional stereotypes that suggest that homosexuality is related to gender nonconformity. Nevertheless, one must be careful about overstating these stereotypes, because Breedlove found the exact opposite among men. Breedlove also found a relationship between birth order and sexual orientation for men. The greater the number of older brothers a man had, the higher the likelihood that he would be homosexual. In fact, subsequent researchers have suggested that each additional elder brother that a man has increases the likelihood that he will be gay by about 30 per cent. Breedlove hypothesized that this also was the result of prenatal androgenization of subsequent children.

Although this might not appear controversial at first blush, it corresponds with other studies that find that gay men's levels of testosterone are significantly *higher* than are those of heterosexual men. That is, gay men are more "real men" than are straight men. (Other research supporting gay men's "hypermasculinity" includes studies that find that gay men's penis size is greater than that of straight men, despite the fact that gay men undergo puberty a bit earlier and are therefore slightly shorter than straight men; and that gay men report significantly higher amounts of sexual behaviour.) "This calls into question all of our cultural assumptions that gay men are feminine," said Breedlove in an interview.[81]

This sort of research does give us pause. Brock University psychologist Anthony Bogaert did a similar study in which he found that there was no effect on sexual orientation by unrelated siblings in the same household (they had to be biological) but that older brothers who did not live with a person did influence the chances of that person's being gay. This seems to rule out socialization effects (older non-related brothers "recruiting" the youngest through sexual coercion) or the outcome of seemingly harmless sexual play.[82]

Clearly, there is some evidence for biological factors in sexual orientation, particularly in men. Still, neither a gay brain, gay gene, nor gay hormone explanation fully satisfies, and we would be well advised to consider multiple factors, both biological and cultural, when we ponder what makes us gay—or what makes us straight.

Hormonal and Chromosomal Abnormalities: Research on Intersex People

Much of the research on the biological basis of sex difference has been done by inference—that is, by examining cases of chromosomal abnormality or cases where hormones did not work "properly," therefore giving a fetus too much of the "wrong" hormone or too little of the "right" one. These and other conditions result in some degree of sexual ambiguity, whether apparent at birth or evident only later in life. Once described as "hermaphrodites," people affected by hormonal and chromosomal abnormalities are now described as **intersex/intersexuals** and account for as many as 1.7 per cent of all births.[83]

In the twentieth century, it became possible to "correct" the structural differences sometimes seen in intersex children using both surgery and hormone therapy. By 1969, when Christopher Gordon and Ronald Dewhurst published *The Intersexual Disorders*, a uniform approach had developed; ambiguous children were "assigned" to the sex judged

appropriate. Despite consensus on the need to correct the abnormalities of these children, they were seen as an appropriate research group—in some ways an ideal group—through which to study "normal" sex differences. After all, if a baby girl's genitals were masculinized, perhaps she would exhibit other signs of masculinity, consequently "proving" that nature trumped nurture.

In some of the more celebrated research on fetal hormone development, Money and Ehrhardt reported on girls who had **androgenital syndrome (AGS)**—a preponderance of male hormones (androgens) in their systems at birth—and on another set of girls whose mothers had taken progestins during pregnancy. All 25 girls had masculine-appearing genitalia and had operations to "correct" their genitals. The AGS girls also were given constant cortisone treatments to enable their adrenal glands to function properly. Money and Ehrhardt's findings were interesting. The girls and their mothers reported a higher frequency of tomboy behaviour in these girls. They enjoyed vigorous outdoor games and sports, preferred toy cars and guns to dolls, and attached more importance to career plans than to marriage. However, they showed no more aggression or fighting than other girls did. Later research seemed to confirm the notion that "prenatal androgen is one of the factors contributing to the development of temperamental differences between and within the sexes."[84]

Appearances, however, can be deceiving. Anne Fausto-Sterling argues that several problems make Ehrhardt and her colleagues' research less convincing than it at first may seem. The research suffered from "insufficient and inappropriate" controls: Cortisone is a powerful drug, the AGS girls underwent calamitous surgery (including **clitoridectomy**), and there weren't any independent measures of the effects. Further, the "method of data collection [was] inadequate" because it was based entirely on interviews with parents and children, without impartial direct observation of the reported behaviours. Finally, "the authors [did] not properly explore alternative explanations of their results," such as parental expectations and differential treatment of their supposedly very "different" children.[85]

Androgenital syndrome is now more commonly described as **congenital adrenal hyperplasia (CAH)**, an enzyme disorder that impairs normal hormonal development and produces—in (chromosomal) females—masculinization or ambiguous genitalia. CAH is one of the most common causes of intersexuality. Though CAH girls have the potential to bear children, their genitals may look more like those of boys than those of "normal" girls. How else are they "like boys"? Between 1968 and 2000, according to Fausto-Sterling, approximately one dozen studies "looked for evidence of unusual masculinity in CAH girls." Such evidence included activity and masculine play, mathematical ability, and, of course, sexual orientation toward women.[86] Parents reported that CAH girls really enjoyed playing with boys' toys and showed decidedly masculine affective styles. However, does that mean that there was "something in them that's innately male," as John Stossel (libertarian television celebrity and advocate of biological determinism) claimed?[87] Methodological weaknesses and fragile results mark these studies. Although there is some evidence that girls with CAH have a visuospatial advantage, methodological issues make the evidence inconclusive. Finally, CAH girls seem to have little difficulty with their gender identity, according to multiple studies. In one recent study, though mothers reported that their CAH daughters exhibited "masculinized" play, the girls themselves were happy and

comfortable with their gender. The masculinized brains and genitals of CAH girls do not seem to correlate with masculine gender identity.[88]

A genetically male group of intersexuals are those affected by **androgen insensitivity syndrome (AIS)**, a defect on the X chromosome that impairs androgen reception, preventing the fetus from responding to the famous "testosterone bath" that converts it into an unambiguous boy. Then, because AIS children appear female at birth, their parents raise them as girls. At puberty, they develop characteristically feminine bodies, often with larger-than-normal breasts. AIS girls and women call into question many of the stereotypes about androgens and behaviour. In many cases, they find out about their condition only when they fail to menstruate—or, as in the case of Spanish hurdler María Martínez-Patiño, when they fail a sex test at an athletic competition.[89] Are AIS girls more masculine than one might expect? Are they more likely to experience problems in gender identity? No. Indeed, as María writes, "having had my womanliness tested—literally and figuratively—I suspect I have a surer sense of my femininity than many women."

A famous case of genetically male but "feminized" children comes from two relatively isolated villages in the Dominican Republic that seemed to produce a larger-than-expected set of genetically male hermaphrodites for at least three generations. These babies were born with internal male structures but with sex organs that resembled a clitoris more than they did a penis. Moreover, the testes had not descended at all. Their condition was the result of an extremely rare deficiency in a steroid, 5-alpha reductase. Eighteen of these babies, raised as girls, were studied by a team of researchers from Cornell University.[90]

These children had relatively uneventful childhoods, during which they played and acted like other little girls, but their adolescence became somewhat more traumatic. They failed to develop breasts and noticed a mass of tissue in their groins that turned out to be testicles beginning a descent. At puberty, their bodies began to produce a significant amount of testosterone, which made their voices deepen, their muscles develop, and facial hair appear. Suddenly, these youngsters were no longer like the other girls! Consequently, all but one of them switched and became males. One remained a female, determined to marry and have a sex-change operation. (Another decided he was a male but continued to wear dresses and act as a female.) All the others were successful in making the transition; they became men, found typically masculine jobs (as woodchoppers, farmers, and miners), and married women.

However, they didn't do it alone. While the other villagers had made fun of them, calling them *guevadoces* ("eggs [testicles] at twelve") or *machihembra* ("first woman, then man"), after they made the move to become males, their neighbours were more encouraging and offered advice and gifts to ease the transition. Moreover, one might argue that these children had a less fixed relationship between early gender development and adolescent gender patterns precisely because of their ambiguous genital development. After three generations, villagers might have come to assume that a girl does not always develop into a woman. Anthropologist Gilbert Herdt argues that such "gender polymorphic" cultures have the ability to deal with radical gender changes across the life cycle far more easily than do "gender dimorphic" cultures, such as the United States, where we expect everyone to be either male or female for his or her entire life.[91]

In fact, research on intersexuality suggests that while our biology has important effects, those effects are not easy to separate from the cultural contexts in which we grow

into men and women. Intersex people and their experiences do not prove the primacy of biology—or, conversely, its irrelevance. Indeed, the history of research and intervention on intersexuals suggests, rather, that we all need the same things: respect, fair and ethical treatment, and caution when entering the borderlands of biological sex.

The Politics of Biological Essentialism

Biological arguments for sex differences have historically tended to be politically conservative, suggesting that the social arrangements between women and men—including social, economic, and political discrimination based on sex—are actually the inevitable outcome of nature working in its mysterious ways. Political attempts to legislate changes in the gender order or efforts to gain civil rights for women or for gay men and lesbians have always been met with **biological essentialism**: Don't fool with Mother Nature! For example, sociologist Steven Goldberg, in his book *The Inevitability of Patriarchy*, argues that because male domination is ubiquitous and eternal, it simply has to be based on biological origins. There is simply too much coincidence for it to be social. Feminism, Goldberg argues, is therefore a war with nature:

> Women follow their own physiological imperatives. . . . In this, and every other society [men] look to women for gentleness, kindness, and love, for refuge from a world of pain and force. . . . In every society basic male motivation is the feeling that the women and children must be protected. . . . [T]he feminist cannot have it both ways: If she wishes to sacrifice all this, all that she will get in return is the right to meet men on male terms. She will lose.[92]

Unequal social arrangements are, in the end, ordained by nature.[93]

Still, the evidence—occasionally impressive, often uneven—is far from convincing. If male domination is natural, based on biological imperatives, why, asks sociologist Cynthia Fuchs Epstein, must it be coercive, held in place by laws, traditions, customs, and the constant threat of violence for any woman who dares step out of line? Why would women want to enter male spheres, like colleges and universities, politics and the labour force, the professions, and the military, for which they are clearly biologically ill-suited?

Ironically, in the past decade, conservatives who argue that biological bases account for both sex differences and sexuality differences have been joined by some women and some gay men and lesbians, who have adopted an essentialism of their own. Some feminists, for example, argue that women should be pleased to claim "the intuitive and emotional strengths given by their right-hemisphere, in opposition to the over-cognitive, left-hemisphere-dominated, masculine nature."[94]

Similarly, research on the biological bases of homosexuality suggests a dramatic shifting of positions. Gay-brain research may have shed little light on the etiology of sexual orientation, but it has certainly generated significant political heat. In a way, the promotion of gay essentialism has become seen as a political strategy to normalize gayness. "It points out that gay people are made this way by nature," observes Robert Bray, the director of public information of the National Gay and Lesbian Task Force. "It strikes at the heart of people who oppose gay rights and who think we don't deserve our rights because we're

choosing to be the way we are." Michael Bailey and Richard Pillard, the authors of one of the gay twin studies, opined in a *New York Times* op-ed essay that a "biological explanation is good news for homosexuals and their advocates." "If it turns out, indeed, that homosexuals are born that way, it could undercut the animosity gays have had to contend with for centuries," added a cover story in *Newsweek*. Such an understanding would "reduce being gay to something like being left-handed, which is in fact all that it is," commented gay journalist and author Randy Shilts in the magazine. Moreover, Simon LeVay, whose research sparked the debate, hoped that homophobia would dissipate as the result of this research, because its basis in prejudice about the unnaturalness of homosexual acts would vanish. Gays would become "just another minority," just another ethnic group, with an identity based on primordial characteristics.[95]

This political implication is not lost on conservatives, who took up the social constructionist, "nurture" theory of sexual orientation as firmly as they argued for intractable biologically based differences between women and men. Such thinking leads to the politically volatile though scientifically dubious "conversion" movement that holds that, through intensive therapy, gay men and lesbians can become happy and "healthy" heterosexuals.[96]

Conclusion

Biological research holds significant sway over our thinking about the two fundamental questions in the study of gender: the *differences* between women and men and the gendered *inequalities* that are evident in our social lives. Still, there are many problems with the research on biological bases for gender difference and more and greater problems with the extrapolation of those differences to the social world of gender inequality. Consider the problem of what we might call "anthropomorphic hyperbole." Simon LeVay writes that, "Genes demand instant gratification."[97] What are we to make of such an obviously false statement? Genes do not "demand" anything. Which genes is he talking about anyway? Some genes simply control such seemingly unimportant and uninteresting things as eye colour or the capacity to differentiate between sweet and sour tastes. Others wait patiently for decades until they can instruct a man's hair to begin to fall out. Still others are so undemanding that they may wait patiently for several generations, until another recessive mate is found after multiple attempts at reproduction. Genes may play a role in the sexual decision-making of a species or even of individual members of any particular species; they do so only through an individual's interaction with his or her environment. They cannot possibly control any particular decision made by any particular individual at any particular time. With whom you decide to have sex this weekend—or even whether you *do* have sex—is not determined by your genes, but rather by you.

Another problem in biological research has been the casual assumption that causation always moves from physiology to psychology. Just because one finds a correlation between two variables doesn't permit one to speculate about the causal direction. As biologist Ruth Hubbard argues:

> If a society put half its children into short skirts and warns them not to move in ways that reveal their panties, while putting the other half into jeans and

> overalls and encouraging them to climb trees, play ball, and participate in other vigorous outdoor games; if later, during adolescence, the children who have been wearing trousers are urged to "eat like growing boys" while the children in skirts are warned to watch their weight and not get fat; if the half in jeans runs around in sneakers or boots, while the half in skirts totters about on spike heels, then these two groups of people will be biologically as well as socially different.[98]

We know, then, what we *cannot* say about the biological bases for gender difference and gender inequality. What then *can* we say? We can say that biological differences provide the raw materials from which we begin to create our identities within culture, within society. "Biological sexuality is the necessary precondition for human sexuality," writes historian Robert Padgug. "But biological sexuality is only a precondition, a set of potentialities, which is never unmediated by human reality, and which becomes transformed in qualitatively new ways in human society."[99]

We seem to want desperately to believe that the differences between women and men are significant and traceable to biological origins in a simple line of causation. However, a better way to understand the influence of biology on our natures is through Anne Fausto-Sterling's simile that each of us is like a Russian nesting doll, with the smallest "doll" representing our being at the cellular level, the next doll our organism, etc. The largest "doll" is our own history as human beings. According to Fausto-Sterling, each one of these dolls is important and can be examined as significant, but each doll on its own is hollow: "Only the complete assembly makes sense."[100]

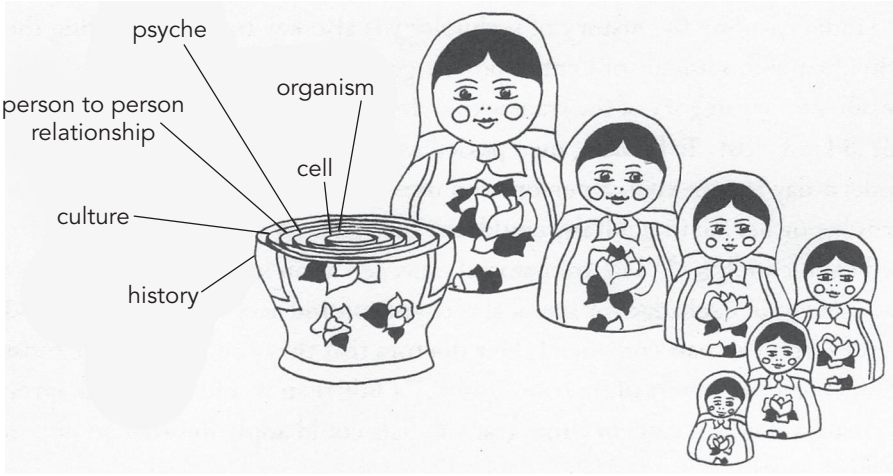

Figure 2.1 Anne Fausto-Sterling unpacks sex and gender.

Source: Drawing by Erica Warp for Anne Fausto-Sterling. Copyright 2000 Anne Fausto-Sterling, *Sexing the Body*. Reprinted by permission of Basic Books, a member of the Perseus Books Group.

The Russian doll:

Is there some easy way to envision the double-sided process that connects the production of gendered knowledge about the body on the one surface to the materialization of gender within the body on the other? While no metaphor is perfect, Russian nesting dolls have always fascinated me. As I take apart each outer doll, I wait expectantly to see if there is a smaller one within. As the dolls get tinier and tinier, I marvel at the delicacy of the craft that produces successively smaller dolls. . . .

I find the Russian nesting doll useful for envisioning the various layers of human sexuality, from the cellular to the social and historical. . . . Academics can take the system apart for display or to study one of the dolls in more detail. But each individual doll is hollow. Only the complete assembly makes sense. Unlike its wooden counterpart, the human nesting doll changes shape with time. Change can happen in any of the layers, but since the entire assembly has to fit together, altering one of the component dolls requires the interlinked system—from the cellular to the institution—to change.

While social and comparative historians write about the past to help us understand why we frame the present in particular ways (the outermost doll), analysts of popular culture, literary critics, and anthropologists tell us about our current culture (the second largest doll). They analyze our aggregate behaviours, think about how individuals and institutions interact, and chronicle social change. Other sociologists and psychologists think about individual relationships and individual development (the third largest doll), while some psychologists write about the mind or psyche (the fourth doll in). As the location (or as some would prefer, activity) that links events that occur outside the body to those that occur inside the organism (the second smallest doll), the mind plays an important and peculiar function. The brain is a key organ in the transfer of information from outside the body in and back again. And neuroscientists of many stripes try not only to understand how the brain works as an integrated organ but also how its individual cells function. Indeed, cells make the final, tiny doll found within the organism. In different organs, cells specialize for a variety of functions, They also work as systems, their history and immediate surroundings stimulating signals for particular genes—to contribute (or not) to cellular activities.

Using Russian nesting dolls as a framework suggests that history, culture, relationships, psyche, organism, and cell are each appropriate locations from which to study the formation and meanings of sexuality and gender. Developmental systems theory, whether applied to the assembled doll or to its subunits, provides the scaffolding for thought and experiment. Assembling the smaller dolls into a single large one requires the integration of knowledge derived from very different levels of biological and social organization. The cell, the individual, groups of individuals organized in families, peer groups, cultures, and nations and their histories all provide sources of knowledge about human sexuality. We cannot understand it well unless we consider all of these components. To accomplish such

> a task, scholars would do well to work in interdisciplinary groups. And while it is not reasonable, for example, to ask all biologists to become proficient in feminist theory, it *is* reasonable to ask each group of scholars to understand the limitations of knowledge obtained from a single discipline. Only non-hierarchical, multidisciplinary teams can devise more complete (or what Sandra Harding calls "less false") knowledge about human sexuality.[101]

How do we make sense of our totalities? How we do that, how we create identities out of our experiences, how we understand those experiences, and the choices we make—these are the province of social science, which tries to explore the remarkable diversity of human experience. Although biological studies can suggest to us the basic building blocks of experience and identity, it is within our cultures, our societies, and our families that those building blocks are assembled into the astonishingly diverse architecture that constitutes our lives.

Summary

Theories of "essential" gender difference predate modern science, but have been mainly the province of scientists since the nineteenth century. Today, theories of biological sex difference focus on three areas of research: evolutionary theory, brain research, and endocrinology.

The influence of Darwinian evolutionary theory strengthened biological determinism through the theory that men and women had evolved for different functions and that parallel evolution had produced gender roles, which were therefore "natural." Under the influence of **social Darwinism**, late-nineteenth-century scientific arguments about the nature of men and women became both sexist and racist. By the early twentieth century, these perspectives were forged into the eugenics movement, which, along with social Darwinism, was discredited after the Second World War. In the 1970s, evolutionary theory spawned the new field of sociobiology, which studies the biological basis of social behaviour. The key insights of sociobiology relate to differences in male and female sexual strategies, which sociobiologists see as reflective of evolution. Sociobiologists stress the distinct imperatives of men and women; men seek to maximize reproductive opportunities, while women are more discriminating and cautious. Other sociobiologists have explained such phenomena as the division of labour (Wilson) and male bonding (Tiger).

More recently, evolutionary psychology has explained psychological traits, including differences between men and women, as the result of evolutionary adaptation. Mating strategies have been of particular interest to evolutionary psychologists, but the field has yielded insights in a wide variety of areas. Evolutionary psychology is better than sociobiology at accounting for the different and sometimes conflicting interests of men and women in mating; however, it has sometimes fallen into similar reductive reasoning.

Criticisms of evolutionary theory, particularly sociobiology, include its teleological tendency to reason backward from human behaviours and categories to animal models or "causes"; the failure to locate genetic coding for specific behaviours; selective use of