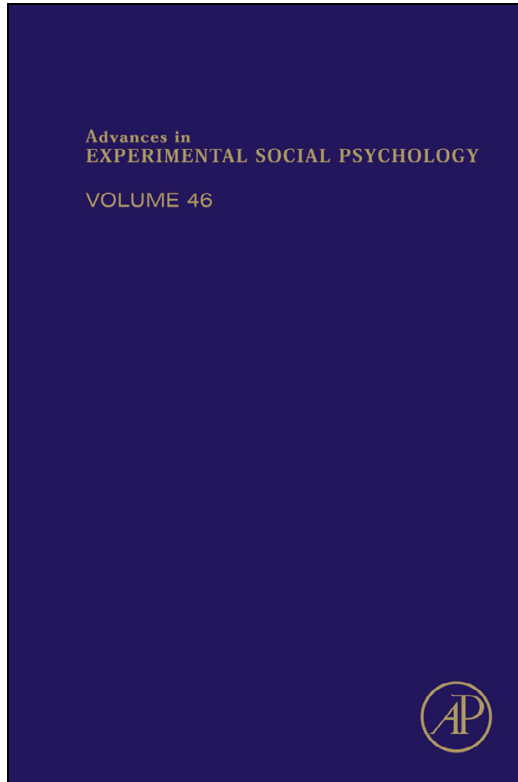


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BIOSOCIAL CONSTRUCTION OF SEX DIFFERENCES AND SIMILARITIES IN BEHAVIOR

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Abstract

The behavior of women and men varies greatly depending on situations, cultures, and historical periods. This flexibility emerges as men and women tailor their division of labor to local ecological and socioeconomic demands. The resulting division is supported by childhood socialization practices that, in interaction with sex differences in child temperament, help boys and girls to develop psychologies suited to their likely adult activities. Although responsive to local conditions, the division of labor is constrained by women's childbearing and nursing of infants and men's size and strength. Because these biological characteristics influence the efficient performance of many activities in society, they underlie central tendencies in the division of labor as well as its variability across situations, cultures, and history. Gender roles—that is, shared beliefs about the traits of women and men—track the division of labor because people infer these traits from their observations of the sexes' behaviors. Social perceivers often essentialize these traits by regarding them as inherent in the biology or social experience of women and men. Gender role expectations, which tend to be consensual within cultures, influence behavior through proximal social psychological and biological processes, whereby (a) other people encourage gender-typical behavior and individuals conform to their own gender identities and (b) hormonal, reward, and cardiovascular mechanisms enable masculine and feminine behaviors.

1. INTRODUCTION

In asking, “Why can't a woman be more like a man?” Professor Higgins in “My Fair Lady” (1964) was drawing on his knowledge of female and male behavior in British Victorian society. In that society, as in all other known societies, men and women differed in their daily activities and presumably in their psychological dispositions. Yet, if Professor Higgins had been savvier about world cultures, then he would have known that sometimes, a woman *is* more like a man. That is, women have undertaken masculine activities under many circumstances. In some nonindustrialized societies, for example, women have served in combat troops (e.g., [Alpern, 1998](#)) and as large game hunters (e.g., [Goodman, Griffin, Estioko-Griffin, & Grove, 1985](#)). In industrialized societies, large numbers of women have entered occupations such as attorney and manager that were once dominated by men (e.g., [U.S. Bureau of Labor Statistics, 2011](#), Table 11).

Professor Higgins did not inquire why a man cannot be more like a woman. Yet, a man sometimes *is* like a woman because he undertakes activities that are considered feminine in the great majority of societies. For example, in some hunter-gatherer societies, most fathers perform substantial infant care ([Fouts, 2008](#); [Gettler, 2010](#)). In many industrialized societies, some men pursue female-dominated occupations such as nurse

and social worker, and others are stay-at-home dads or secondary wage earners whose wives serve as main breadwinner (Sayer, Cohen, & Casper, 2004; U.S. Bureau of Labor Statistics, 2011, Tables 11 and 25).

The evidence that men and women sometimes engage in gender-atypical activities suggests a flexible psychology that is not rigidly differentiated by sex. Flexibility refers not to random variation of behavior, but to the capacity to vary behaviors to enable reproduction and survival under changeable situational demands. For example, both sexes can be socially sensitive or aggressive, given appropriate socialization and support from social normative, self-regulatory, and hormonal processes. This responsiveness to cultural and situational demands arises from humans' evolved capacities to innovate and share information with others and thereby to produce a *cumulative culture* in which beliefs and practices are shared and subsequently modified (Richerson & Boyd, 2005; Tennie, Call, & Tomasello, 2009). This flexibility is organized by a collaborative division of labor between the sexes that varies in form across societies. In this chapter, after briefly explaining the origins of the division of labor, we elaborate the psychological processes by which it organizes the behavior of men and women within societies.

The division of labor is evident in the specific activities performed by men and women in a society. As shown in Fig. 2.1, this division emerges flexibly given two sets of causes: (a) the cultural, socioeconomic, and ecological environment in which people live and (b) the distinctive physical attributes of women and men, especially women's reproductive activities and men's size and strength (Eagly & Wood, 2012; Wood & Eagly, 2002, 2010). Because of the physical specialization of the sexes, some activities in a given environment are more efficiently performed by one sex or the other. For example, women's childbearing and nursing facilitate infant care in most societies and conflict with many other activities, especially those that require specialized training and other extended absences from home. The physical attributes that underlie divided labor reflect evolutionary pressures on human ancestors, as does the flexibility with which this division shifts to correspond to humans' contemporaneous conditions. This behavioral flexibility is enabled by the sophisticated cognitive abilities of the evolved hominin brain.

Within societies, the division of labor sets in place a cascade of psychological and social processes. These processes, in turn, stabilize the current division by making it seem sensibly tailored to the attributes of women and men. Thus, people infer the traits of men and women from observing their behaviors, and they generally regard these traits as intrinsic to each sex. For example, if women care for children, they are thought to be nurturing and caring, and if men fight wars, they are thought to be tough and brave. Such gender role beliefs, shared within a society, promote socialization practices that encourage children to gain the skills, traits, and preferences that support

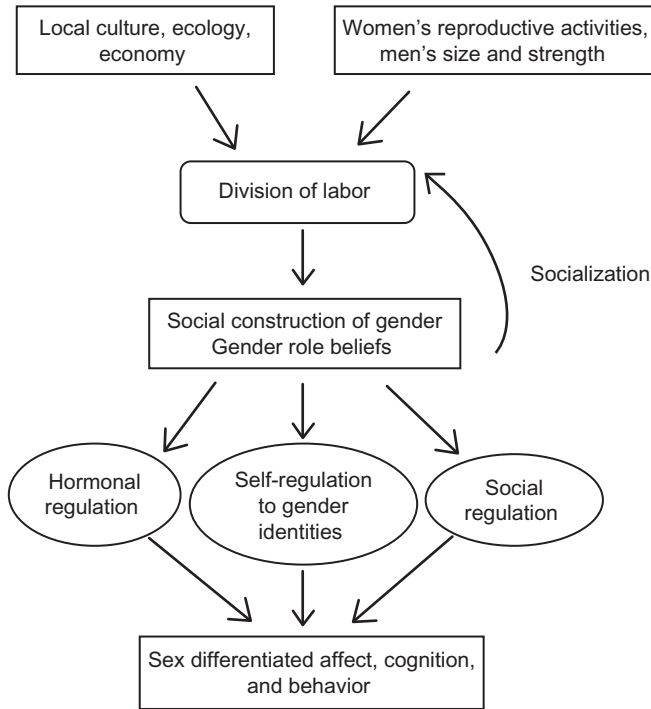


Figure 2.1 Biosocial construction model.

their society's division of labor. Gender roles encourage most adults to conform to these shared beliefs by confirming others' expectations and by internalizing them as personal standards for their behavior. In addition, biological processes such as hormonal activation support gender role behaviors. By this confluence of biosocial processes, individuals within a society dynamically construct gender in patterns that are tailored to their time, culture, and situation.

As this brief description of our theory implies, the causes of male and female behavior range from more proximal, or immediate, to more distal, or ultimate. In Fig. 2.1, the more distal causes appear above the division of labor and the more proximal appear below.

Our biosocial constructionist account offers a sharp contrast to evolutionary psychology theories, which attribute sex-related differences to the activation of predetermined behavioral repertoires (see Buss & Schmitt, 2011). In these alternative evolutionary theories, sex differences emerge in domains in which women and men experienced different selection pressures in evolutionary history. According to this view, current social and cultural contexts serve simply as triggers to activate particular preformed

responses. In contrast, in our biosocial construction model, sex differences and similarities in behavior emerge from the division of labor in a society, which itself is a product of social and cultural forces in interaction with the biological features characteristic of each sex. In this chapter, we explain this model and review research that supports it, with special emphasis on the research that we have contributed.

2. DIVIDED LABOR

The flexible human division of labor did not arise with any single evolutionary development but was built on a set of social, cognitive, behavioral, and physical components, each of which may have evolved separately. In particular, humans' advanced cognitive skills and sociality enabled them to form complex and malleable bonds of cooperation with family members and other members of their communities (Kramer, 2010). These cooperative bonds included a marked male–female division of labor that likely arose with cultural developments of hunting and other intensive foraging strategies. The specialization of these strategies by sex probably developed during the late Pleistocene (Kuhn & Stiner, 2006), enabling complementary provisioning activities that often took the form of female specialization in gathering and male specialization in hunting.

The evolved propensity to form attachment bonds between individual women and men facilitated this social practice of a sex-based division of labor (Bowlby, 1982). Such affective bonds promote paternal investment and protection (Fraleigh, Brumbaugh, & Marks, 2005; Miller & Fishkin, 1997; Quinlan & Quinlan, 2007). Also, close relationships among family members enable the coordinated performance of complex tasks such as the acquisition, processing, and sharing of food and the protection and socialization of children of varying ages (Becker, 1991).

Why do the cooperative bonds between women and men entail a sex-based division of labor? The logic of this division comes from the ways that humans' evolved physical attributes influence performance of the varied tasks critical to human survival in diverse environments. One such fundamental attribute consists of women's reproductive activities, which constrain the other activities that women typically perform. In societies not practicing birth control, fertile women on average have a child every 3.7 years and nurse each child for 2.8 years, with very frequent suckling being the norm (Huber, 2007; Sellen, 2007). Therefore, one aspect of the division of labor that is relatively stable across traditional societies is mothers' role as primary caretaker for infants, no doubt because of the reliance on lactation for infant sustenance (Ivey, 2000; Wood & Eagly, 2002). Nevertheless, other individuals contribute to nurturing activities—a practice known as

cooperative breeding among anthropologists. In foraging societies, these others include family members such as grandmothers and older siblings, with increasing reliance on other caretakers as children mature past infancy. Shared childrearing likely was adaptive for hominins because it enhanced mothers' fertility by reducing intervals between births (Hrdy, 2009; Kramer, 2010; Mace & Sear, 2005).

Women's reproductive activities are intrinsically time-consuming and energetically demanding and, in addition, limit the ease with which mothers can undertake other kinds of tasks (Huber, 2007; White, Burton, & Brudner, 1977). Therefore, women more than men have difficulty performing tasks requiring uninterrupted periods of activity and training or long-distance travel away from home. Women's nurturing activities also limit their participation in tasks that would pose risks to the infants and children who often accompany women as they work (Kelly, 1995). Therefore, in nonindustrial societies, women generally eschew tasks such as hunting large animals, plowing, and conducting warfare and instead perform tasks such as gathering and cooking that are more compatible with reproduction and childcare (Murdock & Provost, 1973).

A second fundamental determinant of the division of labor is men's evolved physical endowment of greater size, speed, muscle-to-fat ratio, oxygen-carrying capacity, and upper-body strength. These physical differences reflect prior selection pressures on both sexes (Wood & Eagly, 2002). Men's attributes shape the division of labor because they promote performance of tasks requiring high levels of strength, especially bursts of force and speed (see Archer, 2009; Wells, 2007). In nonindustrial societies, such activities can include lumbering, hunting large animals, clearing land, and plowing, although women carry out some strength-intensive work such as fetching water (Murdock & Provost, 1973).

Direct evidence that women's reproductive activities and men's strength organize the division of labor comes from a study of Tsimane forager-horticulturalists of Bolivia (Gurven, Winking, Kaplan, von Rueden, & McAllister, 2009). This research evaluated whether each activity performed in the society required physical strength, combined easily with childcare, and required skilled training. Consistent with our biosocial construction model, men specialized in tasks that were strength intensive (e.g., chopping trees), and women in tasks compatible with childcare (e.g., cooking) and in tasks that did not require intensive, uninterrupted training, given that this training was itself incompatible with childcare.

2.1. Division of labor in foraging societies

Even within foraging societies, the specific tasks performed by women and men vary considerably (see review in Wood & Eagly, 2002). The division of labor varies because it is influenced by local conditions in interaction with

the fundamental physical attributes of female's reproduction and male's size and strength. Thus, despite a predominant division of labor that cedes hunting to men and gathering to women (Gurven & Hill, 2009), the specific divisions in each society depended on ecological conditions. In some societies, tasks such as harvesting, crop planting, crop tending, and burden bearing were performed mainly by men, but in others, these tasks were performed mainly by women (Murdock & Provost, 1973). Also, the primary provisioners tended to be women in societies that relied on gathering plant foods and small animals and to be men in societies that relied more on hunting and fishing larger game (Ember, 1978; Kaplan, Hill, Lancaster, & Hurtado, 2000; Whyte, 1978).

In striking evidence of the influence of local environments on the division of labor, women and men performed similar foraging tasks in some societies. In one well-documented example, women hunted large game in some Philippine Agta groups (Estioko-Griffin & Griffin, 1981; Goodman et al., 1985; Headland & Headland, 1999). Women's strength and speed disadvantage was lessened by their use of hunting dogs, and their reproductive constraints were lessened by their taking infants along on the hunt and finding game relatively close to home. Somewhat similar conditions prevailed among Central African forest foraging groups such as the Mbuti, Aka, Bakola/Bagyeli, and Bongo, in which both women and men hunted with nets (Noss, 1997; Noss & Hewlett, 2001). With hunting conducted relatively close to camp, both sexes carried infants and toddlers along with them on the hunt (Fouts, Hewlett, & Lamb, 2005).

In some ecologies, foraging men have undertaken childcare tasks. West African Aka fathers provide relatively high levels of childcare (Fouts, 2008; Noss & Hewlett, 2001). This pattern emerged because men and women cooperatively performed many subsistence tasks, including hunting. With this practice, children were together with both parents throughout the day so that fathers as well as mothers were an efficient source of care. In these various ways, the fundamental determinants of the division of labor, women's reproductive activities and men's size and strength, interacted with environmental conditions to produce differing divisions of labor across foraging societies.

2.2. Division of labor with socioeconomic developments

As societies developed greater numbers of complex and varied tasks, people could maximize skill acquisition and performance through greater task specialization, which often required long-term training and practice (Gottler, 2010; Kaplan, Hooper, & Gurven, 2009). Women and men generally focused their efforts on complementary sets of societal tasks. Through the division of labor, the sexes shared the results of these skill investments as they cooperated in family and social groups. Therefore, in

more socioeconomically complex societies, the division of labor continued to reflect the fundamental physical attributes of each sex, yet encompassed a wider range of activities than hunting and gathering.

With the advent of intensive agriculture, men specialized in agricultural production aided by plow technology (Harris, 1993) and women performed domestic chores including processing of food crops and the products of farm animals (Murdock & Provost, 1973). Women's domestic work increased as fertility escalated in agricultural societies. With industrialization, birth rates declined only slowly (Drake, 1969), and women's labor became even more confined to the private, domestic sphere because nondomestic work moved out of homes and farms and into factories and offices (Coltrane & Shih, 2010).

Despite the general trend toward increasing specialization of women in domestic tasks in agricultural and other more complex economies, striking exceptions to this pattern exist. For example, under certain environmental conditions, women also became warriors (Goldstein, 2001). In the African Dahomey Kingdom, which depended economically on the slave trade, endemic warfare had reduced the supply of male warriors, and a portion of the society's women assumed warrior roles comparable to those of men (Alpern, 1998; Goldstein, 2001). Warrior women were banned from reproduction, and their physical capabilities were honed through intensive training. Also, in the late twentieth century, the woman soldiers of Eritrea, a largely agricultural nation, fought in integrated combat units during their revolutionary struggle to win independence from Ethiopia (Bernal, 2000, 2001). These women received military training, and childcare was shared communally.

Demonstrating additional flexibility, still other influences on the division of labor are evident in most postindustrial societies. Given the low birthrates of these societies and shortened or optional lactation (Sellen, 2007), women's reproductive activities are a considerably weaker constraint on their activities than in earlier societies. Therefore, both sexes typically engage in paid labor, but men generally have longer employment hours and women continue to spend more time than men on unpaid domestic work (Casper & Bianchi, 2009; Pettit & Hook, 2009). Nevertheless, demonstrating differences between industrialized societies, time use surveys show that the male–female division of market work and domestic work varies across societies (e.g., World Bank, 2012). Also, despite a decrease over time in the sex segregation of occupations in many industrialized nations (Casper & Bianchi, 2009; Pettit & Hook, 2009), men continue to dominate blue-collar jobs, many of which have strength-intensive components (e.g., construction carpenter; U.S. National Center for O*NET Development, 2011). Yet, male's size and strength are far less influential overall because most paid occupations favor brains over brawn, and technology eases the physical demands of many kinds of work.

2.3. Variability in power relationships between the sexes

As the division of labor changed with differing socioeconomic and ecological conditions, so too did power relationships between men and women. As we explain, women generally lost power relative to men as societal socioeconomic systems transitioned from hunting and gathering to the more socially complex activities of agriculture and industry. Most recently, however, in societies that are in a postindustrial period, women are regaining some of their lost power and status.

In early societies, despite considerable sex-based task specialization, relations between the sexes were probably relatively egalitarian. The best insight into these societies comes from anthropological studies of modern foragers who live in simple societies that may be similar in many ways to those of early humans. As described in detail in relevant ethnographies of foraging and horticultural societies (e.g., Lepowsky, 1993), women likely controlled decision-making in some circumstances and men in others (see Schlegel, 1977, 1989; Whyte, 1978). A portion of these societies were quite gender egalitarian (Hayden, Deal, Cannon, & Casey, 1986; Sanday, 1981; Whyte, 1978), especially the simplest of small-scale societies existing as dispersed bands of nomadic foragers (Boehm, 1999; Fry, 2007; Salzman, 1999).

Flexible egalitarianism is evident in the structure of family relations in simple societies (Knight, 2008; Marlowe, 2004). Alvarez's (2004, Table 18.1) analysis of 50 hunter-gatherer societies found that only 12% qualified as patrilocal (where married couples reside near the husband's parents) and 21% as matrilineal (where married couples reside near the wife's parents), with 58% having a bilocal pattern of residences alternating between wives' and husbands' groups. Consistent with bilocal residence, the majority of simple hunter-gatherers trace kinship through both the mother's and the father's lines—that is, have bilateral descent (e.g., 64% in Marlowe, 2004; 59% and 71% for samples in Fry, 2007). Even forms of marriage were flexible, depending on factors such as women's ability to provision themselves in local contexts. For example, in foraging societies in which men contributed relatively little to subsistence, marriages tended to be less monogamous—presumably because women depended less for support on long-term dyadic bonds with mates (Marlowe, 2003). In summary, based on insights from modern simple foragers, power differences between men and women in early human societies were often minimal yet contingent on local circumstances.

Patriarchy, defined as greater male than female social power and status, emerged with the development of new roles in more complex societies. This complexity encompassed societal attributes such as sedentary residence, larger settlements, reliance on stored foods, greater population density, intensive agriculture, animal husbandry, and the accumulation and intergenerational transmission of resources (Bird & O'Connell, 2006;

Borgerhoff Mulder et al., 2009; Wood & Eagly, 2002). These conditions produced new economically productive roles that could yield prestige and power (e.g., blacksmith, warrior, herder, trader).

The fundamental human physical attributes that determine the division of labor largely excluded women from such productive, powerful roles: Women were disadvantaged in performing these new roles because of their reproductive activities, and men were advantaged because of their greater strength and speed. Although in foraging societies women's reproductive activities were compatible with the gathering that contributed to basic provisioning, they severely limited women's participation in the newly emerging occupations that required specialized training, the acquisition of complex skills, and extended, uninterrupted periods of task performance (Huber, 2007; Schlegel, 1977, 1989). Given high birthrates, it would have been difficult for women to take on roles such as herding, plowing fields, or conducting warfare. Moreover, many of these roles had strength-intensive components and so were more efficiently performed by men than women.

In general, in more complex societies, because women did not typically occupy the primary roles of economic production, they acquired few resources valuable for trade in the broader economy. Although women specialized in secondary aspects of economic production (e.g., carding wool, grinding grain), men generally owned the resources and had the ability to trade them in marketplaces. Therefore, women typically lost influence outside the household (Wood & Eagly, 2002; for examples of such transitions, see Holden & Mace, 2003; Jordan, Gray, Greenhill, & Mace, 2009). Conditions are remarkably changed in contemporary postindustrial societies because women undertake a wide range of nondomestic roles, some of which yield considerable money, power, and prestige.

Despite women's general loss of power and status with increasing socioeconomic complexity, the result has not always been a patriarchal social structure. For example, the Khasi of northeastern India, a tribal group engaged in agriculture, animal husbandry, and foraging, have had a matrilineal and matrilocal social structure in which men did not hold property or exert much control in the family. Instead, women headed families, with inheritance going to the youngest daughter. Nevertheless, men were expected to provide for their families (Nakane, 1967; Stirn & van Ham, 2000) and could be chosen by women for political roles external to the village (e.g., as government ministers). The Khasi's own theory for this unusual social structure is that men's traditional activities of waging war and hunting had yielded high mortality that ceded many leadership roles to women (Stirn & van Ham, 2000). This striking example demonstrates variation in the overall trend for societal complexity to decrease women's status.

In many contemporary societies, gender equality has increased on a number of dimensions. As we explain in more detail at the end of the chapter, in the latter half of the twentieth century in many nations,

especially Western industrialized nations, women have entered the paid workforce in increasingly large numbers and now hold many traditionally masculine positions (e.g., doctor, lawyer). Women increased their enrollments in tertiary education (i.e., post-high school) so that they now earn the majority of tertiary degrees overall in many nations and increasingly are recipients of degrees in traditionally male disciplines such as business, law, medicine, engineering, math, and science. Women also increased their participation in political offices. However, these changes have not been uniform across industrialized societies (World Bank, 2012). International rankings based on social, political, and economic indicators show considerable variability in gender equality across world societies (Hausmann, Tyson, & Zahidi, 2011; United Nations Development Programme, 2011, Table 4).

In summary, the division of labor between women and men and their relative social power vary enormously across cultures and time periods, sometimes changing rapidly. Change in how labor is divided ordinarily involves a social process whereby innovative arrangements are tried out and shared so that they gradually influence cultural beliefs about the sexes and the socialization of children for societal tasks. Reflecting these processes, U.S. women's labor force participation rose in the twentieth century as women learned about combining paid employment and childcare in part from observing their neighbors' experiences (Fogli & Veldkamp, 2010). In general, socioeconomic and ecological conditions interact with the fundamental human determinants of the division of labor—women's reproductive activities and men's greater size and strength—to affect the efficiency with which each sex can perform the activities that support survival and well-being within their society. As mediated by social psychological processes, the resulting divisions of labor have varying implications for power relationships between the sexes.

3. SOCIALIZATION

The considerable variation in the activities typically carried out by men and women across socioeconomic structures and local conditions that we demonstrated in the preceding section emerges as societies actively construct social roles that people believe will enable them to prosper in their local society. The psychological and social processes involved are depicted in Fig. 2.1. One important aspect of these processes is that the preparation of boys and girls for their adult responsibilities requires that societies exert considerable effort to socialize children for their adult roles. If children were innately predisposed to engage in these roles, then parents, schools, and other adults would need to exert only limited socializing influence. Instead, human societies undertake elaborate socialization

processes to shape boys' and girls' habits, skills, cognitive competencies, emotional tendencies, personality traits, and normative beliefs. As a result of this socialization, most children learn to function in the ways that women and men are defined in their society.

3.1. Socialization as a biosocial process

Socialization builds on characteristically human evolved traits such as the predisposition to imitate others and to engage in social processes of emulation, collaborative learning, and teaching (Hill, Barton, & Hurtado, 2009; Meltzoff, 2007). These predispositions orient children to be responsive to and quickly acquire skills and knowledge suited to the societal contexts in which they live. Extensive socialization is enabled by the long juvenile period of humans in comparison to other primates (Joffe, 1997; Sellen, 2007). Especially during this developmental period, socialization interacts with gene expression to influence behavioral patterns and biological outcomes (see Lickliter & Honeycutt, 2003).

The importance of socialization does not preclude biological influences on children's behaviors. In other words, socialization does not act on a blank slate. Temperamental differences between girls and boys emerge early in life. Boys' greater *surgency* (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006) suggests biological differentiation, including their greater motor activity as infants (Campbell & Eaton, 1999; Eaton & Enns, 1986) and even prenatally (Almli, Ball, & Wheeler, 2001). In childhood, this surgency pattern manifests as physical activity, approach, sociability, high-intensity pleasure, and lack of shyness. Males' greater exposure to prenatal androgens is presumed to induce greater surgency, which, in turn, fosters their preference for play and toys that involve movement (e.g., Auyeung et al., 2009; Hines, 2009), given additional input from social experiences of physical, rough-and-tumble play (e.g., Lindzey & Mize, 2001; Munroe & Romney, 2006). Less research attention has focused on girls' early-emerging advantage in *effortful control*, or self-regulatory skills (Else-Quest et al., 2006), which may enable them to act appropriately in the classroom when entering school and to achieve academically (Matthews, Ponitz, & Morrison, 2009).

What exactly are the biological mechanisms that create these early psychological differences between girls and boys? Many researchers maintain that the answer to this question lies in the organizational effects of prenatal hormones on the brain, specifically, prenatal androgenization of male fetuses (e.g., Berenbaum, Blakemore, & Beltz, 2011; Hines, 2009, 2011). However, the evidence is less than clear. Several narrative reviews have noted the elusiveness of evidence for the sex-differentiated neural structures that presumably result from early androgen exposure (Fine, 2010; Jordan-Young, 2010; Wallentin, 2009). Furthermore, meta-analytic reviews have found little systematic evidence of sex differences in such

neural structures or related cognitive processing (Bishop & Wahlsten, 1997; Pfannkuche, Bouma, & Groothuis, 2009; Sommer, Aleman, Somers, Boks, & Kahn, 2008). Supporters of prenatal androgenization theory often cite the masculine behavioral patterns of girls with congenital adrenal hyperplasia, a condition that involves prenatal exposure to high levels of androgens. However, this condition brings additional physical and anatomical abnormalities (e.g., genital masculinization) that prompt major medical interventions and doubtless influence girls' socialization and behavioral experiences—which, in turn, may affect their neural structures and behaviors (Jordan-Young, 2010; Saucier & Ehresman, 2010). Whether research has adequately addressed these criticisms is open to debate (e.g., Berenbaum et al., 2011). In general, research in this fast-developing area has yet to provide systematic evidence of the sex differences in brain structures and behaviors that may be associated with early androgen exposure or other biological factors. Although sex-differentiated social experience surely does not operate on a blank slate, what is written on that slate has not been adequately deciphered so far.

3.2. Socialization mechanisms

Extensive anthropological research on socialization illustrates how children are trained to participate in their family and social groups (e.g., girls' caring for siblings) and prepared for their adult lives (Best, 2010). Thus, socialization pressures on girls and boys correspond generally to their society's female–male division of labor (e.g., Barry, Josephson, Lauer, & Marshall, 1976; see Wood & Eagly, 2002, for review). This link between socialization and the division of labor is evident, for example, in findings that (a) girls were encouraged to be submissive in societies in which women did not own resources or exercise much power (Low, 1989) and (b) boys were treated harshly to instill aggressiveness in societies that practiced warfare (Ember & Ember, 1994; see also Ross, 1992). Furthermore, the socialization of girls and boys differed more in societies with productive activities known to promote patriarchy, such as intensive agriculture and animal husbandry (Barry, Bacon, & Child, 1957).

To demonstrate the importance of socialization, developmental psychologists identify how parents and other socializers treat girls and boys differently and convey gender to children in ways that foster sex differences in social behavior. Although most of these studies are correlational and thus do not preclude reciprocal influences, whereby children influence parents, research on socialization also includes experimental studies that provide strong evidence of the causal influence of socialization practices (e.g., Banerjee & Lintern, 2000; Hilliard & Liben, 2010; Kimball, 1986).

The differential reinforcement of children's behavior is one potential socialization mechanism. Confirming its importance, a meta-analysis by

Lytton and Romney (1991) found that parents encourage gender-typical activity and discourage gender-atypical activity, especially for sons (see also Fagot & Hagan, 1991; Kane, 2006). As part of this process, parents assign gender-stereotypical household chores and provide gender-typical toys, clothing, and room decorations, thereby creating affordances for culturally feminine or masculine behaviors (Blakemore, Berenbaum, & Liben, 2009; Ruble, Martin, & Berenbaum, 2006). Consistent with such parental influences, sons who reported that their fathers discouraged them from playing like a girl played more with tools and less with dishes than did other boys (Raag & Rackliff, 1998).

Despite demonstrating this differential reinforcement for gender-typical activities, Lytton and Romney (1991) found little evidence that parents encourage different, broadly defined psychological attributes (e.g., warmth, aggressiveness) in sons and daughters. However, evidence for sex-differentiated socialization relevant to such dispositions comes from research that has focused on narrower categories of behavior, critical periods in development, naturalistic settings, and varying family contexts (McHale, Crouter, & Whiteman, 2003). For example, when parents and children jointly reminisce about family events, they discuss emotional issues (especially sadness and negativity) more with preschool daughters than sons (Fivush, 1998). Also, mothers use more supportive speech and talk more with daughters than sons (see meta-analysis by Leaper, Anderson, & Sanders, 1998). Parents also allow sons more independence and autonomy but react to daughters by helping, monitoring, and controlling them and by discouraging their physical risk taking (see review by Blakemore et al., 2009).

Socialization mechanisms also include the pervasive nonconscious processes of social learning. In foraging societies, in particular, children absorb culturally appropriate behavior through emulation and imitation, initially of parents and subsequently of a wider range of individuals (Hewlett, Fouts, Boyette, & Hewlett, 2011). Even in agricultural and industrialized societies, gender is often transmitted indirectly and by example. Parents thus serve as prime role models for the division of labor. Suggesting such influences, children of parents with low commitment to gender equality or with fathers who are not involved in childrearing are faster to learn gender stereotypes and have less gender-egalitarian attitudes (see Blakemore et al., 2009; Leaper, *in press*). Also, mothers' employment is associated with their children's more gender-egalitarian attitudes (e.g., Gardner & LaBrecque, 1986; Riggio & Desrochers, 2005) as well as with their daughters' higher academic achievement, assertiveness, and self-efficacy (see meta-analysis by Goldberg, Prause, Lucas-Thompson, & Himsel, 2008; also Hoffman & Youngblade, 1999).

School experiences can convey gender through various means. For example, in a field experiment, teachers who made gender salient for their pupils produced stronger gender stereotypes, less positive attitudes toward

peers of the other sex, and less willingness to play with them (Hilliard & Liben, 2010). Also, in a field experiment that varied the textbooks used in schools within the same neighborhood, children assigned a more gender-stereotypic reader were less likely than those assigned a gender-neutral reader to identify activities as appropriate for both males and females and to believe that males can perform female-stereotypic activities (Karniol & Gal-Disegni, 2009).

Children in many societies are further socialized by television, movies, the Internet, and video games, which largely convey conventional gender arrangements and behaviors (e.g., Lauzen, Dozier, & Horan, 2008). Frequent television viewing thus is associated with more gender-stereotypical beliefs (Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002; Signorielli, 2001). The results of a field experiment tracking the effects of the introduction of television in a Canadian town are especially informative. That is, when children were exposed to television's gender-stereotyped media culture, their attitudes shifted in a gender-stereotypic direction compared with attitudes in a control town (Kimball, 1986).

In summary, socialization is an important building block in the social construction of gender. It not only orients boys and girls to interact appropriately within their family and social groups but also prepares them for their likely adult roles by conveying knowledge of the normative environment in which adults enact gender (Bussey & Bandura, 1999).¹ Although socialization promotes sex-related differences consistent with the division of labor in each society, nontraditional influences (e.g., employed mothers) are associated with nontraditional outcomes (e.g., assertive, achievement-oriented daughters).

Socialization does not directly cause sex differences in adult behavior. Instead, it sets the stage for adults' dynamic construction of gender within the framework that socialization has established. Through proximal psychological and biological mechanisms, adults create gender in ways that allow them to respond with considerable flexibility to a wide range of contemporaneous influences. As depicted in Fig. 2.1, sex differences in adult behavior reflect a layered set of causes beginning with male and female biological specialization that favors a division of labor tailored to the socioecological context. In turn, this division within a society structures not only socialization practices but also the psychological and biological mechanisms by which individuals collectively create gender within their society. Central

¹ Behavior genetics studies, which potentially could clarify the impact of family socialization, have generated only limited, inconsistent evidence of the shared environmental effects indicative of socialization (for possible reasons, see McIntyre & Edwards, 2009; van Beijsterveldt, Hudziak, & Boomsma, 2006). Nonetheless, animal studies that manipulate qualities of maternal socialization through, for example, exposing mothers to stress, have revealed shared offspring experiences consistent with such socialization (see Bjorklund, 2006).

to these mechanisms are cultural beliefs about gender, or *gender roles*, defined as the shared beliefs that members of a society hold about women and men. Given these beliefs, people then construct gender through the proximal biosocial processes we describe in the next sections of the chapter. This convergence of influences yields the considerable variability across cultures that we demonstrated in the first section of this chapter.

4. CULTURAL BELIEFS ABOUT GENDER

Cultural beliefs about gender are basically data driven by people's observations of the activities of women and men in their society. Because the prevailing division of labor determines these activities, cultural beliefs about the attributes of the sexes generally follow from the division of labor, and these cultural beliefs, in turn, affect the socialization received by boys and girls. Driving the match between the division of labor and gender beliefs is an important principle of human judgment, known as *correspondent inference*, or the belief that others' external behavior corresponds with their internal characteristics (Gawronski, 2004; Gilbert, 1998). If people observe women caring for children, then they think that women are correspondingly nurturing and kind. In general, people believe that each sex possesses dispositions that correspond to its activities in their society (Eagly & Steffen, 1984). Such beliefs form readily, fostered by quick and automatic categorization of people by their sex (e.g., Ito & Urland, 2003; Prentice & Miller, 2006).

People's correspondent inferences about men and women are the source of gender roles, and these inferences are a central tenet of social role theory (Eagly, 1987; Eagly & Wood, 2011). As people share these beliefs within a community, their individual mental representations take root in the culture as gender roles and are elaborated in cultural forms such as songs, legends, and, in industrialized societies, novels, film, and other media representations. People accept and transmit these cultural norms related to gender much as they do other cultural variants (Richerson & Boyd, 2005). Individually, people act on their beliefs, recognize that others think similarly, and know that others can act on this shared knowledge (Ridgeway, 2006; Rudman & Glick, 2008). Gender roles thereby provide an important pan-situational basis for organizing social relations (Brewer, 1988; Ridgeway, 2011). The descriptive aspect of gender roles, or gender stereotypes, indicates the attributes typical of each sex. Furthermore, these typical attributes tend to be viewed as desirable and admirable for each sex, thereby adding prescriptiveness to gender roles.

In line with correspondent inference, gender roles consist primarily of psychological traits that people infer from observed activities (Eagly &

Steffen, 1984; Hoffman & Hurst, 1990). To the extent that women are concentrated in domestic work and communally demanding employment, people infer that they are warm, caring, and socially skilled (Williams & Best, 1990). To the extent that men are concentrated in strength-intensive roles and in high-status roles, people infer that they are assertive, forceful, and dominant (Ridgeway, 2011; Williams & Best, 1990). Psychologists usually summarize these feminine and masculine personality traits in terms of Bakan's (1966) concepts of communion—involving warmth and concern for others, and agency—involving assertiveness and competitiveness. Men's agency is related to social status and power (e.g., Conway, Pizzamiglio, & Mount, 1996), whereas women's communion can be traced to their cooperative interdependence with other groups (e.g., men, children, the elderly; Fiske, Cuddy, Glick, & Xu, 2002). Along with these major themes of female communion and male agency, gender stereotypes include a variety of other attributes such as the sexes' differing cognitive abilities (Cejka & Eagly, 1999), emotions (Plant, Hyde, Keltner, & Devine, 2000), physical attributes (Cejka & Eagly, 1999; Deaux & Lewis, 1984), and negative personality traits and behavioral tendencies (Buss, 1990; Glick et al., 2004; Spence, Helmreich, & Holahan, 1979).

The predominant stereotypical themes of communion and agency ascribe positive attributes to both sexes, with feminine communal attributes being even more evaluatively favorable than masculine agentic attributes (Eagly & Mladinic, 1994; Rudman & Goodwin, 2004). This positive evaluation of the female stereotype can encourage women to take pride in their communal attributes, which are appropriate to many relatively subordinate roles in patriarchal social structures. By holding such *system justifying* beliefs (Kay et al., 2007), people can rationalize social inequalities and conclude that both women and men deserve their positions in the social structure. In evidence of these justification processes, complementary stereotypes of women as highly communal and men as highly agentic are more prevalent in societies with more extreme gender inequalities in status and resources (Glick & Fiske, 2001). Gender stereotypes thus serve to justify women's continued acceptance of their traditional social roles and of patriarchal social structures.

Stereotypic beliefs about the attributes of men and women thus reflect the division of labor as practiced in that society. Even in postindustrial societies, people express the belief that women are communal and men are agentic, as demonstrated by differing research methods. For example, such findings have emerged on (a) explicit measures derived from conscious retrieval of relevant traits (e.g., Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Deaux & Lewis, 1983) or from ratings of traits on scales (Diekmann & Eagly, 2000; Fiske et al., 2002) and (b) implicit measures derived from speed of associating traits with men and women (e.g., Implicit Association Test; Rudman, Greenwald, & McGhee, 2001).

4.1. Essentialism of beliefs about the sexes

The belief that women and men have different traits is a form of *essentialism*, or the tendency to infer that different human essences underlie differences in behavior (Prentice & Miller, 2006). People might assume that such trait essences follow from nurture—that is, from social factors such as socialization and social position in society, or from nature, that is, from biological factors such as genetic endowment and hormonal processes (Rangel & Keller, 2011). In other words, people might be thinking of nurture or nature (or perhaps both) when they ascribe differing essences to the two sexes.

Sex categorization itself necessarily implies beliefs about biology and nature. Thus, research on 40 social categories showed that female–male groupings were judged as the most natural, necessary, immutable, discrete, and stable, making gender the most extreme of human *natural kind* categories (Haslam, Rothschild, & Ernst, 2000). Yet, these judgments indicate only that the sex classification is viewed as a natural, inevitable result of sex following from sex chromosomes.

Beyond simple categorization into male and female groups, essentialist reasoning can highlight nurture or nature. Children typically focus on biological aspects of essentialism and believe that boys and girls are inevitably male and female regardless of their socializing environments, much as pigs and cows are inevitably different species (e.g., Taylor, Rhodes, & Gelman, 2009). However, older children and adults hold more flexible causal theories, and biological and social essentialism are relatively independent (Rangel & Keller, 2011). Thus, by invoking either social or biological causes, people are not necessarily rejecting the other theory.

Suggesting that people recognize that both nature and nurture contribute to the essences of male and female, college students estimated the extent to which sex differences were due to (a) the ways that the two sexes are treated by parents and others, (b) the kinds of opportunities they have had, and (c) biological factors such as hormones and chromosomes (Martin & Parker, 1995). In this research, the participants considered socialization a likelier cause than either biology or opportunities, but all three causes were judged to be greater in likelihood than the midpoint of the rating scale. These findings are consistent with Neff and Terry-Schmitt's (2002) study of middle school, high school, and college students, all of whom ascribed masculine and feminine traits more to social than to biological causes, and least of all to religious causes (i.e., God's plan).

Even though people often give credence to genetic causes of traits and behaviors (Dar-Nimrod & Heine, 2011), Americans generally seem to prefer nurture explanations for sex differences. For example, with respect to “the main reason that men and women are different,” a 1997 nationally representative poll found that 53% of the respondents endorsed nurture, 31% nature, 13% both, and 3% were not sure, with the preference for

nurture being stronger among women (58%) than men (47%; [National Broadcasting Company, 1998](#)).

4.2. Implications of essentialist beliefs

Given the nature and nurture of essentialist beliefs, people can reason in various ways about sex differences. Belief in a social basis for essentialism promotes the insight that sex differences would be other than they are if social conditions were different, such as boys and girls being reared more equivalently. Demonstrating belief in such malleability, [Diekman and Eagly's \(2000\)](#) experiments on *dynamic stereotypes* compared people's predictions of the traits of women or men at different time points, up to 50 years in the past or 50 years in the future. In student and nonstudent participant samples, women were judged as more masculine over time, yielding perceived convergence of the sexes on masculine but not feminine traits. That is, people believe that women and men have converged in agentic personality attributes and masculine cognitive abilities during the past 50 years and will continue to converge during the next 50 years (see [Fig. 2.2](#)). Moreover, Diekman and Eagly obtained similar findings when they asked participants to envision a future society described by differing distributions of social roles (extremely sex segregated, segregated about like the present, or not segregated at all). In the complete absence of sex-segregated roles, not only were women described in relatively masculine terms but also men in relatively feminine terms, especially in personality.

Meditational analyses in the [Diekman and Eagly \(2000\)](#) experiments suggested that the perceived changes in women's attributes over time were due to perceived differences in the division of labor. Specifically,

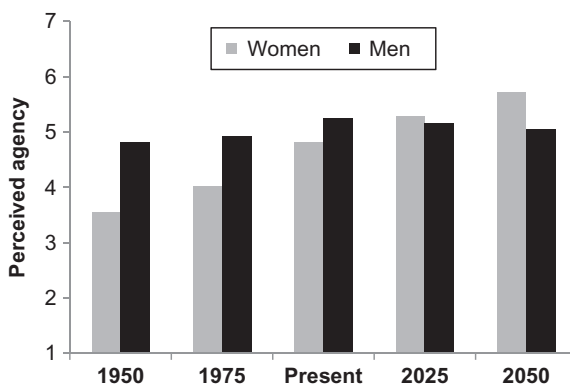


Figure 2.2 Agency ascribed to women and men of the past, the present, and the future. Means are on 7-point scales on which higher numbers reflect greater agency. Adapted from [Diekman and Eagly \(2000\)](#).

participants, in general, functioned as social essentialists by assuming that, as the social roles of women and men become more similar, their masculine attributes converge. Finally, in further evidence of a social essentialist mindset, research showed general approval of women's traits accommodating to their new, more agentically demanding social roles (Diekman & Goodfriend, 2006).

Exploration of dynamic stereotypes in other cultures has revealed responsiveness to the unique ways that the division of labor has changed in specific nations. For example, German participants accorded enhanced agency to German women of 1950, probably because these women had to take over many masculine roles due to the death of very large numbers of German men in World War II (Wilde & Diekman, 2005; see also Latin American findings in Diekman, Eagly, Mladinic, & Ferreira, 2005). In yet another demonstration of the close association between stereotypes and roles, stereotypes of women as communal and men as agentic were weaker in societies with more gender equality (Glick & Fiske, 2001).

People also can reason about sex differences using essentialist beliefs that invoke nature and thereby view these differences as inherent in the biology of men and women. In particular, men invoke such beliefs when faced with the threat of social change. Thus, men (but not women) were especially likely to endorse biological explanations of sex differences under conditions in which women were presented as gaining status in society (Morton, Postmes, Haslam, & Hornsey, 2009). Furthermore, when biological differences were presented as scientific fact, men supported more discriminatory practices against women (e.g., promoting men over women) and also increased in self-esteem (Morton et al., 2009). Also, greater explanation of group differences by genetic causes is linked to greater sexism (Keller, 2005), and greater belief in men's "natural" dominance is linked with belief in the stability of the existing gender hierarchy (Glick & Whitehead, 2010). In these ways, biological essentialist beliefs give people an especially strong foundation for endorsing their current societal division of labor and promote the maintenance of current social divisions (Haslam, 2011). Such beliefs seem to be activated strategically to bolster gender inequalities and resist social change. Whether essentialist beliefs that invoke social factors are also used strategically awaits investigation.

In general, people who hold more essentialist ideas about gender are likely to believe in larger stereotypic sex differences in personality and behavior, regardless of whether their essentialism derives from belief in nature or nurture as causal (Martin & Parker, 1995). Thus, gender stereotypes are linked with essentialist beliefs that men and women are socialized to be different and that they are innately different. Also, both social and biological essentialism are associated with prejudice and discrimination toward outgroups as well as with hierarchy-enhancing ideological tendencies such as right-wing authoritarianism and social dominance (Rangel &

Keller, 2011). Thus, both forms of essentialism undergird inferences that differences in the sexes' behavior correspond to their essential attributes.

Although social and biological essentialism both justify the current division of labor, they have different implications for long-term social change. Biological but not social essentialism was associated with belief in the stability of human characteristics (Rangel & Keller, 2011)—that is, with beliefs such as “Everyone is a certain kind of person and there is not much that can be done to really change that” (see Chiu, Hong, & Dweck, 1997, p. 22). Perhaps for this reason, biological essentialist beliefs are strategically invoked to reduce threats of change in the status of men and women (Morton et al., 2009). In contrast, social essentialism implies that social conditions markedly different from the present (e.g., more extreme sex segregation of social roles or an absence of segregation) would change men and women so that sex differences would be larger or smaller than what people currently observe (Diekmann & Eagly, 2000; Eagly & Diekmann, 2004). Therefore, social essentialism could support those who advocate social policies that further gender equality (e.g., equal access of girls to athletic participation).

4.3. Actual change in gender stereotypes

In postindustrial societies, women continue to be perceived as more communal and men as more agentic, despite women's rising labor force participation (Lueptow, Garovich-Szabo, & Lueptow, 2001; Spence & Buckner, 2000). Social role theory might be taken to imply that increases in women's employment rates would yield increases in their stereotypic agency. So far, this change in the female stereotype has been demonstrated only in some cultural contexts (e.g., in Spain, López-Sáez, Morales, & Lisbona, 2008) and on the specific attribute of intelligence, on which women have exceeded men in U.S. national surveys (Newport, 2001; Pew Research Center, 2008). A more subtle shift is evident in the effects of employment on the perceived agency of women and men. At least in the United States, where women are increasingly employed full time, employment no longer conveys the higher levels of agency and lower levels of communion that it did in earlier decades when such employment was less typical of women (compare Bosak, Sczesny, & Eagly, 2012, to Eagly & Steffen, 1984). Thus, employed women and men are perceived as similar to men and women in general.

Even though the general content of stereotypes of women may not have changed, the breadth of stereotypes may have increased due to the diversity of women's roles. Although some women have entered into male-dominated managerial and professional jobs, most women continue to be concentrated in traditionally female dominated, communally demanding jobs. In fact, women's most common occupations in the United States are secretaries and

administrative assistants; registered nurses; elementary and middle school teachers; cashiers; retail salespersons; and nursing, psychiatric, and home health aides (U.S. Department of Labor, 2011). Moreover, women's entry into management and the professions has not been accompanied by their commensurate entry into the upper-level leadership roles regarded as particularly demanding higher levels of agentic attributes (Eagly & Carli, 2007). Women are also more diverse than men in how much they are employed, with more women than men employed part time or not at all (U.S. Bureau of Labor Statistics, 2011, Tables 6, 7, and 20). Thus, the change in many women's occupational and family roles, along with the continuity in other women's roles, likely promotes the breadth of stereotypes of women.

In evidence of the broader stereotypes about women than men, college students judged that stereotypic women could move more comfortably across diverse situations than stereotypic men (Eckes, 1996). Also, stereotypes about specific subtypes of women (e.g., housewife; Deaux, Winton, Crowley, & Lewis, 1985) were more heterogeneous than stereotypes about specific subtypes of men (e.g., jock). Furthermore, social perceivers ascribed masculine characteristics to women to a greater extent than they ascribed feminine characteristics to men (see present time conditions in Diekmann & Eagly, 2000), and they approved of desirable counterstereotypical qualities in women more than in men (Diekmann & Goodfriend, 2006; Prentice & Carranza, 2002).

In summary, as descriptive and prescriptive expectations, gender roles apply to all women and men in a society (Ridgeway, 2011). Given these consensual social expectations, in conjunction with socialization that prepares girls and boys to have attributes appropriate to their adult roles, people come to view the division of labor in their society as reflecting the genuine attributes of men and women. By inferring different essential attributes of women and men, people justify current social arrangements as following from these differing attributes. Such essentialist beliefs appear to have multiple components reflecting both nature and nurture. Nurture theories—that is, social essentialism—allow people to believe in change in the division of labor across cultures and time periods in response to changing circumstances. Nature theories—or biological essentialism—act as a conservative force by suggesting a more rigid division of labor.

5. GENDER ROLES SHAPE SOCIAL BEHAVIOR

Beliefs about gender are important because they guide the behavior of women and men. As illustrated in Fig. 2.1, gender role beliefs guide behavior through a set of social, psychological, and biological processes. These processes are set in motion by the division of labor, which, in turn,

influences the more proximal causes involving gender role beliefs and socialization as well as the recruitment of hormonal and other biological processes. Gender roles then frame these social psychological and biological processes that are the proximal causes of sex-differentiated behavior, and socialization has created a readiness to be guided by these processes.

Specifically, gender roles create sex differences in behavior as people react to others' expectations and act on their own gender identities and as they activate biological processes involving hormonal and neural mechanisms. Because research testing these processes typically uses experimental paradigms involving manipulated variables, it provides especially conclusive evidence. Through these proximal causes, men and women tailor their responses to their local circumstances. In the first section of this chapter, we demonstrated how the female–male division of labor is influenced by local ecology, societal complexity, and other such circumstances.

5.1. Social psychological processes

Gender roles guide behavior because people experience social and personal pressures to conform to them (Eagly, 1987; Eagly, Wood, & Diekmann, 2000; Wood & Eagly, 2010). These pressures arise because gender roles are shared beliefs about what others are likely to think, and also because people internalize gender roles as *gender identities* constituting individuals' sense of themselves as female or male. When people accept, or internalize, cultural meanings associated with their sex, culture gets inside the person. In most contexts, the cultural emphases on male agency and female communion are evident in both social pressures and personal identities.

Social expectations influence behavior through social consequences, including social rewards for conformity to expectations and punishment or lack of rewards for nonconformity. Conformity to gender roles garners rewards because it validates shared beliefs about men and women and promotes social interaction that is easy to understand and communicate (Clark & Yoshima, 2007). People therefore *do gender* as they recurrently produce social behaviors stereotypical of their sex (Deaux & Major, 1987; West & Zimmerman, 1987).

Gender identities also influence behavior when people adopt gender roles as personal standards against which to regulate their responses (Wood & Eagly, 2009). People guide their behavior to correspond with their own standards for themselves as a man or woman (e.g., Carver & Scheier, 2008). Thus, even when others are not present to approve or criticize, individuals tend to behave consistently with their self-views.

An initial aspect of children's gender identities is their labeling themselves as a member of one sex and realizing that sex is a stable personal attribute (Halim & Ruble, 2010; Kohlberg, 1966). As one product of socialization, children then acquire social expectations and gender

identities. By building on the early development of a theory of mind, even young children become skilled at anticipating others' reactions (Tennie et al., 2009). As children interact with others, they further develop this skill and learn what beliefs are consensual in their society. As children expand their knowledge of gender roles, they learn to behave consistently with others' expectations and their own gender identity (Bussey & Bandura, 1992).

5.1.1. Effects of social expectations on behavior

By establishing expectations about others' beliefs and reactions, gender roles create sex differences in behavior that are tailored to the contexts in which children are embedded. Violating others' expectations about gender typically elicits backlash, or negative reactions. Children disapprove of peers' violation of gender role norms concerning, for example, clothing, hair styles, and styles of play (e.g., Blakemore, 2003). Adults' expectations are, in addition, likely to encompass sex-typical personality attributes of agency and communion.

Gender role sanctions are evident in people's approving, benevolent beliefs about women who conform to traditional gender roles and disapproving, hostile beliefs about women who violate them (Glick & Fiske, 2001). On individual difference measures, hostile and benevolent beliefs are correlated. That is, people who hold negative beliefs about nontraditional women (labeled *hostile sexist*s) also tend to hold positive beliefs about traditional women (labeled *benevolent sexist*s). An analogous set of benevolent and hostile beliefs about men are shared in cultures and similarly act to maintain traditional gender roles (Glick et al., 2004).

The social costs of women's agentic behaviors are especially well documented. For example, in experiments holding leader behavior constant and varying only leaders' sex, female leaders were evaluated less favorably than male leaders (see meta-analysis by Eagly, Makhijani, & Klonsky, 1992), as is consistent with the usual masculine, agentic connotations of leadership (Eagly & Karau, 2002; Koenig, Eagly, Mitchell, & Ristikari, 2011). This devaluation of women relative to men was especially evident when leaders acted in a directive and autocratic manner that conveys high levels of agency (Eagly et al., 1992). In general, people express more negative reactions when a woman attempts to lead or direct them than when a man does (e.g., Butler & Geis, 1990). Also, people respond more negatively to criticism from female than male leaders (Atwater, Carey, & Waldman, 2001; Sinclair & Kunda, 2000). Furthermore, when interacting in small groups, women who act in a dominant or extremely competent manner tend to lose likability and influence (Carli, 2001; Shackelford, Wood, & Worchel, 1996). Women who behave dominantly exert less influence over others than comparable men or more communal women (Copeland, Driskell, & Salas, 1995; Mehta et al., 1989 cited in Ellyson, Dovidio, & Brown, 1992).

In addition, women are penalized for manifesting high confidence and self-promotion (Rudman, 1998), appearing to seek power (Okimoto & Brescoll, 2010), or engaging in other high-status, dominant behaviors (Rudman, Moss-Racusin, Phelan, & Nauts, 2012). Women also receive greater recognition when they are modest than self-promoting (Giacalone & Riordan, 1990; Wosinska, Dabul, Whetstone-Dion, & Cialdini, 1996). Consistent with these findings, women, compared with men, are penalized for initiating negotiations for a higher salary (Bowles, Babcock, & Lai, 2007) and talking a lot in public settings (Brescoll, 2012). Women are also sanctioned for expressing angry emotions (Brescoll & Uhlmann, 2008) and for performing outstandingly in masculine domains (Heilman, Wallen, Fuchs, & Tamkins, 2004).

Women not only are punished for acting in strongly agentic ways but also may be required to act in communal ways. For example, in work settings, women are penalized for the failure to deliver altruistic good citizen behaviors to their coworkers, but men are not so penalized. In contrast, men are rewarded for such behaviors but women are not, because helpful behavior is normatively required for women (Heilman & Chen, 2005). Similarly, supportive, considerate behaviors were regarded as more important for female than male managers to achieve promotions, especially for promotion to senior management (Vinkenburgh, van Engen, Eagly, & Johannesen-Schmidt, 2011).

Men also experience costs from counterstereotypical behavior, given that they lose social status for failing to act in an agentic manner, that is, for behaving passively, unassertively, and anxiously (e.g., Anderson, John, Keltner, & Kring, 2001). Modest and unassuming men are viewed as insufficiently competent for leadership roles (Rudman, 1998; Rudman & Glick, 2001). Men also are penalized for pursuing feminine interests and activities (e.g., ballet), in part because these challenge the cultural image of a strong, agentic, heterosexual male (Bosson, Vandello, Burnaford, Weaver, & Wasti, 2009). Also, men who were successful at a female gender-typed job (employee relations counselor) were judged as more ineffectual and less deserving of respect than women successful at the same job or men successful at a male gender-typed job (financial advisor; Heilman & Wallen, 2010). Finally, men who are communal in the sense of scoring high in the personality trait of agreeableness—that is, “nice guys” (Costa & McCrae, 1992)—appear to suffer an income penalty compared with less agreeable men. Suggesting a backlash against agreeable men for their challenge to gender norms, in both experimental and correlational studies, this penalty for agreeableness was greater for men than women (Judge, Livingston, & Hurst, 2012).

People are especially likely to act in gender-typical ways when they expect that such behavior yields social rewards (see review by Geis, 1993). However, conformity to gender role norms does not require overt rewards

and punishments. In an illustrative study, women students reacted to a desirable man with traditional (vs. nontraditional) views about women by presenting themselves as more traditional and “playing dumb” on an aptitude test (e.g., Zanna & Pack, 1975). Such behavioral confirmations typically emerge when perceivers convey expectations to a target based on gender stereotypes or behave toward that person as if the stereotypical beliefs were true, thereby eliciting the stereotypic response. The perceiver then experiences yet another example of stereotypic behavior and thus strengthens his or her stereotypes.

Even without an explicit statement of gender norms, people may conform to others' presumed gender-stereotypical expectancies (Leander, Chartrand, & Wood, 2011). Specifically, mimicry from an interaction partner apparently increased participants' desire to affiliate and therefore enhanced their conformity to gender stereotypes that presumably were shared with their partner. In another example, task partners negotiated a more traditional division of labor when they believed that their (unseen) partner was of the other sex (Skrypnik & Snyder, 1982). Also showing that gender norms are activated through subtle situational cues, women speed daters were choosier than men only when following the active-male and passive-female convention that women stay seated and men rotate—when women rotated, this sex difference disappeared (Finkel & Eastwick, 2009).

Anonymity shields people from negative sanctions for their gender-incongruent behavior, and thereby increases such acts. For example, the usual tendency for men to aggress more than women in a competitive game situation disappeared when participants were deindividuated—that is, made anonymous (Lightdale & Prentice, 1994). Similarly, a meta-analysis of negotiation experiments showed that women (but not men) were more hostile in virtual compared with face-to-face negotiations (Stuhlmacher, Citera, & Willis, 2007). Also, the usual tendency for men to intervene in emergencies and to engage in chivalrous helping weakened when they were alone (and therefore more anonymous) compared with joined by an audience of onlookers (see meta-analysis by Eagly & Crowley, 1986).

Both sexes try to mitigate others' negative responses to counterstereotypical behavior by reclaiming a conventional gender identity. After performing well in a task typical of the other sex, women and men attempted to hide their success from others, falsely claimed success on a task typical of their own sex, and expressed greater interest in same-sex activities (Rudman & Fairchild, 2004). Also, after performing the feminine task of braiding hair, men reduced their discomfort by publicly claiming a conventional, heterosexual orientation (Bosson, Prewitt-Freilino, & Taylor, 2005). In addition, after being likened to a “girl,” men apparently tried to compensate by showing increased strength on a handgrip task (Funk & Werhun, 2011). Masculinity may be especially precarious, as suggested by findings that men's actions that threatened their manhood caused them to

attempt to reclaim it through aggressiveness, assertion of heterosexuality, homophobia, and belief in male dominance (e.g., [Bosson et al., 2009](#); [Willer, Rogalin, Conlon, & Wojnowicz, 2011](#)). These compensating strategies were stronger among those who expected reprisals for gender nonconformity ([Rudman & Fairchild, 2004](#)).

In summary, one way in which gender roles guide behaviors is through the anticipated or enacted social consequences of conformity or nonconformity to others' expectations. Implicit or explicit awareness of others' likely reactions channels people into gender-stereotypical behavior, and escape from these expectations frees them to behave less stereotypically.

5.1.2. Effects of gender identity on behavior

Gender roles also create sex differences in behavior when people adopt them as gender identities. Masculine and feminine identities guide behavior through self-regulatory processes. That is, people use their gender identity as a personal standard by against which to evaluate and guide their behavior ([Moretti & Higgins, 1999](#); [Wood, Christensen, Hebl, & Rothgerber, 1997](#)).

Just as agency and communion are typical themes of social expectations, people commonly internalize aspects of gender roles involving agency and communion ([Wood & Eagly, 2009](#)). Men on average describe themselves as relatively agentic, and women on average describe themselves as relatively communal, as shown by [Twenge's \(1997b\)](#) meta-analysis of gender identity measures that assess self-reports in these traits (e.g., [Bem, 1974](#); [Spence & Helmreich, 1978](#)). People also may adopt other aspects of gender roles. For example, women may think of themselves as bonded to others in close relationships, whereas men may think of themselves as independent yet linking to others through teams and organizations ([Cross & Madson, 1997](#); [Gardner & Gabriel, 2004](#)). In addition, people define themselves by sex-typical vocations, activities, and interests ([Lippa, 2005](#)).

On average, men's and women's behavior corresponds to their gender identities. For example, [Athenstaedt \(2003\)](#) found that women more than men engaged in feminine behaviors (e.g., taking care of a friend, telling partner about troubles at work) and men more than women engaged in masculine behaviors (e.g., fixing the car, paying for dinner). In addition, for both sexes, having a communal identity was associated with feminine behaviors and having an agentic identity with masculine behaviors (see also meta-analysis by [Taylor & Hall, 1982](#)). Also, in experience-sampling diary research of everyday social interactions, more masculine individuals showed greater agency in their interactions and more feminine individuals showed greater communion ([Witt & Wood, 2010](#)). In other research, people with gender-stereotypical vocational and leisure interests preferred hobbies and activities typical of their own sex ([Lippa, 2005](#)).

Self-regulation of gender identities proceeds in stages, beginning with testing the extent to which current behavior is progressing toward gender

standards (e.g., Carver & Scheier, 2008). Consistent with Bem's (1981) gender schema theory, people may be especially sensitive to information relevant to their own gender identities and may closely attend to, process, and recall gender-related behaviors and other information. When they perceive closer matches between their behavior and standards, people experience positive emotions and increased self-esteem. In contrast, acting so as to increase mismatches produces negative emotions and decreased esteem.

In evidence of the role of emotions in regulation, people with stronger gender identities experienced a boost in positive affect and self-esteem when they conformed more to their gender standards (Witt & Wood, 2010; Wood et al., 1997). Specifically, men with a stronger masculine identity felt better about themselves after recalling recent interactions in which they acted dominant and assertive, whereas women with a stronger feminine identity felt better after recalling interactions in which they acted nurturant (Wood et al., 1997, Study 1). A similar pattern emerged in this research when participants vicariously imagined themselves in a series of pictures depicting dominant and assertive interactions (e.g., directing others at a task) or nurturance (e.g., comforting a friend). The self-concept plays a central role in this process. When asked to describe themselves, participants with stronger gender identities endorsed self-attributes (e.g., being powerful, being sensitive) that were less discrepant from the attributes they ideally would like to possess or believed they ought to possess (Wood et al., 1997, Study 2). These discrepancy scores between individuals' actual and ideal or ought selves appear in Fig. 2.3. Thus, acting in gender-typical ways reduced the discrepancy between actual self-concepts and self standards.

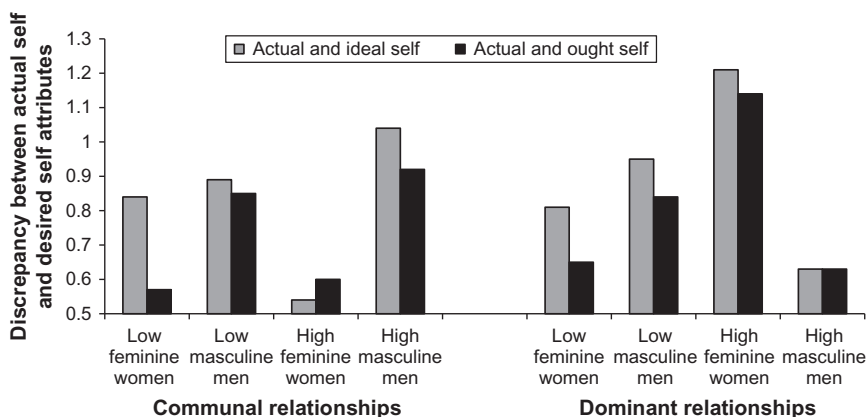


Figure 2.3 Masculine men and feminine women have smaller discrepancies between actual self and desired selves after acting in gender-consistent ways. Adapted from Wood et al. (1997).

Emotion is important in self-regulation because it serves as a signal to guide future behavior. When behavior is discrepant from desired standards, the resulting bad feelings signal the need to shift behavior to bring it more in line with the standard. People thus use emotions as feedback about whether they need to change their behavior in the future. To illustrate this change in behavior, [Josephs, Markus, and Tafarodi \(1992\)](#) provided men and women with feedback that they had failed at an initial task. When the task was gender typical (compared with a gender-atypical task), high self-esteem men predicted greater success at future competitive achievement tasks, and high self-esteem women predicted greater success at future interpersonal tasks ([Josephs et al., 1992](#)). By channeling their subsequent behavior in this way, high self-esteem people could ensure that they more closely matched their favorable gender self-concept in the future.

Subsequent research indicated that people spontaneously make comparisons between their gender identities and their behavior in daily life ([Witt & Wood, 2010](#)). In a diary study conducted across 2 weeks, participants with a strong agentic identity increased self-esteem and positive feelings following social interactions in which they acted in agentic ways. Similarly, participants with a strong communal identity showed heightened self-esteem and positive feelings after interactions involving communal actions. Thus, for participants with strong gender identities, acting in line with that identity—communion for feminine identities and dominance for masculine ones—boosted positive emotions and aligned their actual selves more closely with their desired selves. In this way, positive feelings can signal regulatory success from acting in accord with a valued gender identity, and negative feelings can signal failure from acting inconsistently with the identity.

Gender standards do not, however, always enhance well-being. People may feel that gender role standards are imposed by others so that they are pressured to act in gender-typical ways ([Sanchez & Crocker, 2005](#)). Children also may feel pressured by peers and parents to conform to gender role expectations ([Egan & Perry, 2001](#)). These external pressures are linked to lowered self-esteem and well-being in adults and children ([Egan & Perry, 2001](#); [Good & Sanchez, 2010](#)). In contrast with this potential for gender role standards to have a negative influence on individuals, stronger feminine identity typically is associated with greater well-being among women, and stronger masculine identity with greater well-being among men ([DiDonato & Berenbaum, 2011](#)). Nonetheless, masculine identity in the form of a greater personal sense of agency promotes well-being in both women and men ([DiDonato & Berenbaum, 2011](#); [Whitley, 1983](#)). In [Witt and Wood's \(2010\)](#) research, the highest levels of self-esteem were reported when people with either a strong masculine or feminine identity acted consistently with this identity. Thus, gender identities function like other self-regulatory guides to behavior, and especially when the motivation to conform to them arises from personal, autonomous sources, they can promote well-being.

Consistent with the logic of self-regulation, the greater importance that women place on close relationships links their identity especially closely to the standards of valued others. Girls are likely to develop self-standards based on parents' and close friends' evaluations and self-regulate to these standards, whereas boys are more likely to develop self-standards that are independent of close others (Moretti & Higgins, 1999). As these researchers found, women experienced more negative affect than men when their personal behavior was discrepant from valued others' standards. Women's reliance on others for self-definition is part of the larger phenomenon in which women's well-being is closely tied to the quality of their close relationships. Thus, being married is beneficial for both sexes, but women experience more emotional lows with poor relationships and emotional benefits from good ones than do men (Wood, Rhodes, & Whelan, 1989). Physical health outcomes yield the same pattern: Both sexes benefit from marriage, but women show especially negative outcomes from marital distress (Kiecolt-Glaser & Newton, 2001).

Even though gender identities, on average, foster sex-typical behavior, they also promote variability in sex differences because these identities differ across individuals and situations. The strength of gender identities can be affected by situational cues such as the sex of an interaction partner (e.g., Leszczynski & Strough, 2008) or being a solo representative of one's sex in a group (e.g., Sekaquaptewa & Thompson, 2002). Also, identities based on other group memberships intersect with gender identity. Therefore, some researchers now emphasize how identities pertaining to qualities such as race, ethnicity, social class, disability, and sexual orientation intersect gender identities and account for individual differences among women or men (Cole, 2009; Landrine & Russo, 2010; Shields, 2008). In general, research on gender identities has illuminated not only general trends for women to display communion and men agency but also contexts in which some women behave in masculine ways and some men behave in feminine ways. Gender identity thus contributes, along with social expectations, to variation in masculine and feminine behaviors.

5.2. Biological processes

Gender roles also create sex differences in behavior tailored to individuals' own cultural contexts through the hormones and associated neural structures that guide male and female behavior. Research has only recently begun to identify the effects of role expectations and performances on hormonal fluctuations—that is, the downstream effects of roles on hormones and neural responses. Such effects, which can be considered aspects of the activational effects of hormones on behavior, were anticipated by the classic model of testosterone effects, which allowed for behavior to influence hormones as well as for hormones to influence behavior (Mazur &

Booth, 1998). These downstream behavior-to-hormones effects are critical to understanding human behavior, especially sex differences and similarities.

The relations between hormones and behaviors were shaped in part through ancient selection pressures associated with perceptual, sensory, and motivational processes that humans share with other animals. In humans, these relations are also shaped by neural systems that evolved within complex social groups. Living in such contexts required understanding the self in relation to others, along with detecting and regulating actions to avoid social exclusion (Heatherston, 2011). With the evolution of sophisticated neural and hormonal systems, men and women are motivated and able to understand gender-typical expectations, form gender identities, and regulate their behavior accordingly. Complex neurohormonal systems enable people to tailor masculine and feminine behaviors to the demands of the societies in which they live.

The hormone, testosterone, is associated with agentic behaviors that involve gaining or maintaining status, including competition, risk taking, and aggression (Booth, Granger, Mazur, & Kivlighan, 2006). Also relevant to dominant, competitive behaviors are heightened levels of cortisol as well as arginine vasopressin for men and estrogen for women (Craig & Halton, 2009; Stanton & Edelman, 2009). In addition, communal behaviors of social bonding, nurturance, and intimacy are associated with oxytocin and estrogen (Campbell, 2008; Taylor, 2002, 2012). Although a review of research on hormonal influences is beyond the scope of this chapter, we report relevant findings concerning testosterone, the most widely studied of these hormones, to illustrate interactions between sociocultural and biological mediation.

In the classic model, testosterone and behavior are linked in reciprocal influence. In socially challenging situations, dominant, aggressive behaviors might activate testosterone and activation of testosterone might promote dominant, aggressive behaviors (Mazur & Booth, 1998), but the hormone might also lead to increased sociality if a more moderated response is appropriate (Bos, Panksepp, Bluthé, & van Honk, 2012). Given the first, behavior-to-testosterone link, the hormone is activated by and presumably enables performance of assertive, dominant behavior. Archer's (2006b) meta-analysis demonstrated that the anticipation of athletic and other competitive behavior (although not contrived laboratory competitions) caused men's testosterone to increase, apparently to energize and direct physical and cognitive performance. Also, women's anticipated and actual participation in rugby, wrestling, soccer, tennis, and volleyball matches increased their testosterone (Edwards & Kurlander, 2010; Hamilton, van Anders, Cox, & Watson, 2009; Oliveira, Gouveia, & Oliveira, 2009). Thus, the behavior-to-testosterone effect has been found to hold for both sexes, despite men having up to 10 times the circulating levels of testosterone as women.

These downstream effects of competition differ for victors and losers. In Archer's (2006b) meta-analysis, competition winners increased in testosterone more than losers, presumably enabling winners to engage in future defense of their status gains and enabling losers to act submissively and thereby reduce future costs. Winners and losers who experience these fluctuations in testosterone are especially likely to show the predicted downstream behavioral consequences. That is, those who show a competition-induced increase in testosterone are more likely to engage in subsequent competition (Carré, McCormick, & Hariri, 2011; see also Mehta & Josephs, 2011).

Relevant to the second, testosterone-to-behavior link in the classic model, a meta-analysis of 11 studies that experimentally injected men with testosterone or related synthetic androgens found no systematic rise in anger, aggression, or hostility (Archer, 2006b; see also McAndrew, 2009). In one explanation of these null findings, hormones affect people's underlying motivations and reactions to environmental conditions but do not ordinarily instigate specific behaviors such as directed aggression (Bos et al., 2012). In general, studies correlating basal testosterone and aggression (yielding mean $r = .08$, $k = 42$, in meta-analysis by Archer, Graham-Kevan, & Davies, 2005) are causally ambiguous and require additional investigation of the factors that underlie such relations.

Although less is known about the mediating role of hormones in behaviors other than aggression and dominance, some evidence suggests that hormone levels are affected by nurturing and competition in close relationships. For example, facilitating performance of caring roles, men and women in close relationships have lower testosterone levels (Booth et al., 2006; van Anders & Watson, 2007). Also, fathers' anticipation and vicarious experience of childbirth produce a fall in testosterone as well as other hormonal changes that mimic the changes that occurred in mothers (Berg & Wynne-Edwards, 2001, 2002; Gettler, McDade, Feranil, & Kuzawa, 2011). Testosterone decreases with nurturing activity and not simply with becoming a parent (Gettler et al., 2011). Thus, fatherhood lowered testosterone among Tanzanian foraging and pastoralist groups who practiced high levels of paternal care but not ones who provided minimal direct paternal care (Muller, Marlowe, Bugumba, & Ellison, 2009). Nurturing also influences women's hormones, with testosterone levels especially low among mothers of younger children (Kuzawa, Gettler, Huang, & McDade, 2010). Despite this trend for relationships to be associated with lowered testosterone, men and women seeking relationships show high testosterone levels, presumably because of the competition they experience (Gettler et al., 2011; van Anders & Goldey, 2010).

Research is thus consistent with the claim that hormonal mechanisms mediate the sexes' contingent responding to their social relationships. Also relevant are the hormonal and neural systems that enable social learning,

especially the learning of specific preferences and desires as people experience rewarding or punishing events within their society. Such learning is represented in neural systems involving dopamine and opioids (Montague & Lohrenz, 2007; Schultz, 2006). Depending on their environments, men and women may find similar or different types of experiences rewarding. In general, these various neural systems enable learning that supplements or even supplants the influences of testosterone and other hormones that underlie specific responding (e.g., oxytocin). For example, through reward learning, humans can develop parental attachments without the hormones of pregnancy, parturition, and lactation (Depue & Morrone-Strupinsky, 2005). Such bonding is triggered by rewards inherent in infants' vulnerability and need, physical sensations of tactile contact and smell, and societies' high valuing of children. According to Kendrick (2004), these learned rewards can account for much of the positive affect arising from human maternal behavior. The resulting plasticity of infant-caregiver attachment enables cooperative breeding, as fathers and other caretakers bond with infants.

Neural structures also are activated to support the performance of male and female behavior. These structures accommodate and support the continued or frequent activation of certain types of behaviors. Research has demonstrated changes in neural organization and activation as people engage in various specific activities, including singing, juggling, driving a taxicab, professional dancing, and meditating (e.g., Taubert et al., 2010). The experience of caring for young also may generate systematic changes in parents' neural structures, although evidence for such changes at this point comes largely from nonhuman mammals (Kinsley et al., 2008). Thus, much like competitive, dominant behavior activates testosterone, life experience modifies neural structures to promote the sexes' skilled performance at tasks that meet their personal goals, which are, in turn, influenced by social expectations. In this way, research observations of sex differences in adult brain structures may reflect, not intrinsic, inborn differences, but the sexes' training in certain social roles as they respond to the gender role expectations within their society.

In summary, agentic and communal behaviors are enacted flexibly through the mediation of hormonal and neural processes. Although testosterone and other hormones are associated with specific classes of behaviors, neurochemical processes that undergird social learning, along with associated neural structures, can promote a wide range of behaviors, depending on individual responses to gender role expectations within their society. These multiple biological processes guiding human behavior reflect the interaction between ancient biochemical systems that humans share with other animals and more recently evolved, cultural learning mechanisms that enable people to understand gender-typical expectations, form gender identities, and regulate their behavior accordingly. At an individual level, these processes undergird the societal-level variation in typical male and

female behavior that we presented earlier in this chapter as well as the large individual differences that occur within societies.

5.3. Social psychological and biological processes work together: Stereotype threat

We have presented both social psychological and biological processes that shape female and male behavior, and we summarized studies that singly examined such processes. However, in daily life, such processes work together in interactive fashion. To illustrate this interplay, we consider research on stereotype threat, which illustrates how social expectations and gender identities influence behavior by activating biological mechanisms involving hormones, cardiovascular reactivity, and neural structures.

The logic of stereotype threat research presumes that, because gender stereotypes specify task abilities, they can establish social and personal expectations for performance in culturally masculine or feminine domains. Stereotypically, men are believed to have advantage at masculine tasks involving, for example, mechanics, math, and leadership, and women advantage at feminine tasks involving social sensitivity, sewing, and emotional intelligence. Expectations about differential competence in these domains can impair the performance of the disadvantaged sex and enhance the performance of the advantaged one. Following our biosocial constructionist model, biological as well as social processes produce these performance decrements and gains in men and women.

Other people's negative expectations about the aptitudes of either sex can influence performance when such expectations are activated immediately before a test or competition. In a stereotype threat study by [Koenig and Eagly \(2005\)](#) illustrating the direct activation of such expectations, participants were casually reminded before they completed a standard test of social sensitivity that men do not score as well as women on this test. Expectations also can be activated indirectly, as in [Richman, van Dellen, and Wood's \(2011\)](#) research showing professional women pictures of a conference in their field that featured men and masculine interests. In a meta-analytic review of this literature, both direct and indirect activation of negative stereotypes impaired performance ([Nguyen & Ryan, 2008](#)).

Gender identities, as assessed or manipulated in experiments, also contribute to performance decrements in stereotype threat experiments. Threatened women thus performed worse at a math test only if gender was important to their self-definition ([Keller & Molix, 2008](#); [Schmader, 2002](#)) or if their sex was made salient by reminders prior to taking the test ([Neuville & Croizet, 2007](#)). People who are not especially identified with their gender do not show these performance effects, presumably because the performance stereotype is not personally relevant to them.

Gender stereotypes, in conjunction with gender identities, impair performance when individuals become anxious about confirming stereotypes about low task ability. Anxiety comes from the threat to self-integrity from the simultaneous activation of three conflicting beliefs (Schmader, Johns, & Forbes, 2008): (a) the group stereotype of inferior ability (e.g., men are not socially sensitive), (b) personal identification with the group (e.g., I am a man), and (c) knowledge of one's own ability (e.g., I am socially sensitive). Thus, in Koenig and Eagly's (2005) study, men's performance at an interpersonal perception test was impaired when the stereotype about women's advantage at social sensitivity was made salient (see Fig. 2.4). Women also showed a small boost in performance when the stereotype was salient. This research additionally provided insight into the mechanisms behind the performance decrements. Specifically, stereotype threat emerged only when men in this study were using a deliberative strategy to perform the task and not relying on their intuitions about relationships. This thoughtful strategy is most vulnerable to the decreased cognitive capacity that follows from anxiety and belief conflict. In this way, stereotype threats can impair performance at complex tasks.

Social- and self-expectations influence performance in part through the actions of biological processes associated with threats or challenges to dominance and status. In support, stereotype threat effects were found only among men and women with high basal-level testosterone, who may be more concerned with their status (Josephs, Newman, Brown, & Beer, 2003). Also, testosterone increased in the stereotype-advantaged sex as they maximized their performance (Hausmann, Schoofs, Rosenthal, &

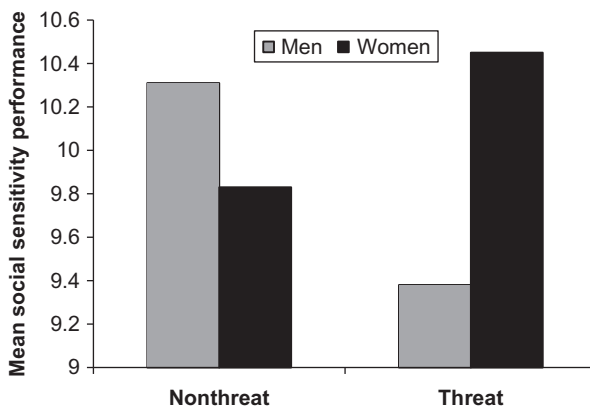


Figure 2.4 Stereotype threat: Mean social sensitivity performance when threatened or not by the stereotype of men's typical low performance. Mean performance on a 15-point scale on which higher numbers reflect greater interpersonal accuracy. Adapted from Koenig and Eagly (2005).

Jordan, 2009). Performance decrements also may be marked by neurochemicals associated with stress that are activated by stereotypical performance expectations. For example, women who were especially sensitive to sexism experienced heightened cortisol reactivity when evaluated by a male who might hold sexist expectations (Townsend, Major, Gangi, & Mendes, 2011).

Self and social expectations also influence performance through the effects of cardiovascular reactivity associated with experiencing tasks as either challenging or threatening—that is, when experiencing one's own resources as either sufficient or insufficient for a task (Vick, Seery, Blascovich, & Weisbuch, 2008). Thus, following exposure to the negative female leader stereotype, women showed cardiovascular threat responses when attempting to exert leadership (Hoyt & Blascovich, 2010), and such threat reactions persisted over time in women highly identified with their gender (Eliezer, Major, & Mendes, 2010). In contrast, men's stereotypical performance advantage at math produced cardiovascular indicators of challenge (Vick et al., 2008).

Performance decrements may emerge when people's attempts to cope with social and self-concept threat derail their focus on performing the task. This interference is apparent in the neural structures activated during task performance. For example, women reminded of gender stereotypes about math ability increased activation of the ventral anterior cingulate cortex, an area of the brain associated with processing conflicting information, but decreased activation of brain regions involved in higher-level mathematical reasoning (Krendl, Richeson, Kelley, & Heatherton, 2008). In further evidence that coping with stereotype threat consumes executive resources and derails task performance, women who were threatened performed worse on a task involving cognitive control, and these cognitive control losses were associated with neural markers (assessed by event-related potentials, or ERPs) of excessive vigilance and inefficient monitoring for errors at the task (Inzlicht & Kang, 2010). Thus, neural markers reveal that women's coping with threat can interfere with task performance.

Despite the many demonstrations of stereotype threat effects, performance is not always impaired by gender stereotypes when the lesser ability of one's sex is made salient. For example, women threatened with the idea that men are better leaders than women adopted a more masculine style of communicating with subordinates (von Hippel, Wiryakusuma, Bowden, & Shochet, 2011). In another demonstration, a counterstereotypic reaction to a leadership threat occurred among women who were especially confident of their leadership ability (Hoyt & Blascovich, 2007). Similarly, women engineering students showed enhanced performance at math tests after negative gender comparisons (Crisp, Bache, & Maitner, 2009). Also, women professional engineers did not experience any greater threat in male-dominated professional settings than in gender-equal settings, despite the tendency of academic women from other, more gender-equal fields to

believe that they would not belong in male-dominated settings (Richman et al., 2011). Specific career and personal experiences buffered successful women engineers from such threat. These included having strong social support outside their work settings and reporting that they did not experience gender discrimination in their careers.

In summary, stereotype threat research illustrates how people invoke both social psychological and biological processes to guide their behavior. Performance decrements and increments emerge as people respond to psychological and socially mediated threats and challenges by activating hormonal, cardiovascular, and neural mechanisms. Through these dynamic biosocial processes, the behavior of women and men usually aligns with socialization pressures and societal gender roles, although under some circumstances it diverges from these influences.



6. SEX DIFFERENCES AND SIMILARITIES IN PSYCHOLOGICAL RESEARCH

The sex-stereotypical differences and similarities predicted by our model (see Fig. 2.1) can be evaluated in relation to psychological research. A massive number of studies have reported comparisons between women and men. For example, between the years 2000 and 2011, PsycINFO noted more than 22,000 journal articles reporting empirical comparisons between women and men (resulting in an index term classification in PsycINFO as *human sex differences*). Many literature reviews have tried to summarize the relevant research, with the earliest using narrative methods and the more recent using meta-analytic methods. In fact, PsycINFO logs 389 meta-analyses classified by the index term *human sex differences*.

Our claim is that stereotypes are data-driven representations of social reality that become consensual gender roles and, in turn, influence gender-stereotypic behavior. Support for this idea comes from studies that have related stereotypes to relevant psychological findings concerning sex differences. Specifically, researchers have computed correlations between student judges' beliefs about male and female behavior, or gender stereotypes, and findings of sex differences estimated across meta-analyses incorporating a wide range of psychological data (e.g., Briton & Hall, 1995; Hall & Carter, 1999; Halpern, Straight, & Stephenson, 2011; Swim, 1994). These projects have shown that beliefs about the direction and magnitude of sex differences are moderately correlated with the differences between the sexes on numerous personality traits, abilities, and social behaviors. In other words, gender stereotypes accurately predict sex differences demonstrated in psychological research.

Additional evidence for the accuracy of people's beliefs about women and men comes from individual studies that have related respondents'

stereotypes to their own behaviors. For example, participants with stronger gender-stereotypical beliefs also reported stronger sex differences in their experiences of emotions of anger, fear, love, joy, and sadness (Grossman & Wood, 1993). In addition, people seem to understand the specific social roles occupied by men and women in their society, as shown by their ability to successfully estimate the distribution of the sexes into occupations (Cejka & Eagly, 1999). Also, respondents successfully estimated the social attitudes held by men and women across a wide range of topics, as assessed by nationally representative surveys (Diekmann, Eagly, & Kulesa, 2002).

Research has also demonstrated that people's gender stereotypes are not confined to global, general notions about women and men (e.g., men are aggressive; women are kind) but instead can take into account situational moderators of sex differences. In particular, meta-analyses have obtained student judges' estimates of female and male behavior in a particular domain such as aggression—that is, their gender stereotypes—for each of the reviewed studies and related these estimates to the behavioral sex differences actually obtained in each study (e.g., Eagly & Crowley, 1986; Eagly & Steffen, 1986). These correlations were positive and significant, despite these studies' wide differences in their social contexts (e.g., public vs. private behavior; field vs. laboratory contexts).

Although people's beliefs about differences between women and men generally correspond to the sex differences established in psychological research, they may be biased and incorrect in some of their predictions (e.g., Diekmann et al., 2002; Wood & Eagly, 2010). In particular, motivations to defend oneself or one's own group may focus attention on the less positive aspects of stereotypes of other groups (e.g., Sinclair & Kunda, 2000).

The overall accuracy of gender stereotypes does not imply that sex differences are large. Examining the magnitude of sex differences in social psychological research, Richard, Bond, and Stokes-Zoota's (2003) summary of a large number of meta-analyses of social behavior concluded that sex differences were somewhat smaller ($d=0.26$) than effects averaged across social psychology as a whole ($d=0.45$). Yet, sex effects are comparable in magnitude to those in several foundational research areas in social psychology such as attribution ($d=0.28$) and social influence ($d=0.26$). The small size of most sex differences is a central theme of Hyde's (2005, 2007) review of 128 meta-analytical effects in personality, social, and cognitive psychology. Nonetheless, Hyde acknowledged that larger sex differences emerged in some situations and with certain categories of behavior (e.g., motor performance, sexuality, aggression).

To illustrate the typical pattern of gender-stereotypic behaviors, consider the domain of risk taking. Consistent with stereotypes about greater male than female agency, men take greater risks than women in a wide range of laboratory and natural setting tasks. However, when meta-analyzed,

this effect yielded a standardized mean difference (d) of only 0.13 (Byrnes, Miller, & Schafer, 1999). For an effect of this magnitude, the normal distributions of the two sexes' risk taking overlap to the extent that 45% of women are more prone to take risks than the average man and 45% of men are less prone to take risks than the average woman. Yet, men and women differ more in some types of risk taking—for example, men are more likely to perform games of risk involving physical skills, $d=0.43$. Although not included in the Byrnes et al. meta-analysis, women were slightly more likely than men to undertake risky actions such as holocaust rescuing of Jews or living kidney donation (Becker & Eagly, 2004). Larger sex differences have emerged in extremely dangerous bystander interventions. For example, excluding people whose parental or occupational roles involve rescuing, men were 91% of Carnegie Hero medalists (Becker & Eagly, 2004). Thus, the difference between men and women in risk taking, although small on average, reflects much larger sex differences under certain conditions. Careful study of particular classes of behavior thus can reveal considerable variability in the magnitude and even the direction of particular variants of the general class.

This variability of sex differences and similarities across contexts—a common finding in psychological research—emerges as men and women regulate their behavior through proximal social psychological and biological processes. Evidence that sex differences are organized by these proximal processes comes not just from psychological research findings but also from variation in sex differences across historical time and across cultures in contemporary nations. Our model thus anticipates flexibility in the attributes and behaviors of men and women due to historical and cultural changes in the roles of men and women in society, topics that we now address.

7. PSYCHOLOGICAL SEX DIFFERENCES AND SIMILARITIES IN CONTEMPORARY NATIONS

Psychological sex differences and similarities can shift across historical time within societies as well as across societies, as male and female psychology is influenced by the biosocial processes outlined in our model. Specifically, variations in ecological, economic, and technological factors that influence the roles of men and women in society also should influence psychological sex differences relevant to those roles. Men and women shift psychological attributes as they recruit biosocial processes to maximize benefits and minimize costs within their current environment.

To examine these predictions about changes in role-relevant psychological sex differences, we rely on several types of evidence. Most of the studies that we describe in this section consist of meta-analyses, each of which

integrates many psychological studies across recent historical time or across nations or both. We also review some cross-cultural studies involving single paradigms implemented at multiple time points or in multiple nations. These various studies report sex differences in personality traits, behaviors, attitudes, values, and cognitive skills. As we will explain, cross-temporal comparisons within nations provide the clearest tests of our biosocial constructionist model.

7.1. Changes in psychological sex differences across historical time

Psychological research has documented shifts in sex differences and similarities primarily in industrialized societies in the past 50 years. These changes demonstrate the rapidity with which alterations in societal roles can affect traits and behaviors. Women's social roles shifted as birth rates dropped and many women entered paid employment ([Organization for Economic Co-operation, 2011](#); [U.S. Census Bureau, 2012](#), Table 588). Although many women found employment in female-dominated occupations, other women entered high-status male-dominated occupations, especially management and professions such as law, medicine, and university teaching ([Catalyst, 2012](#); [England, 2010](#); [Hausmann et al., 2011](#)). This transition of women to paid employment, including high-status employment, has influenced beliefs about gender relations: On a worldwide basis, as women's paid employment increased, traditional gender norms and endorsements of gender inequality eroded ([Inglehart & Norris, 2003](#); [Seguino, 2007](#); [Twenge, 1997a](#)).

These changes in women's roles have encouraged new psychological competencies, especially increases in women's masculine attributes. Notably, in a meta-analysis of self-reported agentic traits from 1973 to 1993, the sex difference in favor of men decreased over time, with women showing sharp gains in agency ([Twenge, 1997b](#)). Similarly, a meta-analysis that focused on the agentic personality traits of assertiveness and dominance found little change in men over time, but women's scores mirrored the twentieth century fluctuations in women's employment by rising from 1931 to 1945, dropping from 1946 to 1967, and again rising from 1968 to 1993 ([Twenge, 2001](#)). Although a meta-analysis indicated that the tendency for men to use more assertive speech than women has declined over time ([Leaper & Ayres, 2007](#)), meta-analyses of sex differences on behavioral measures of aggression used in psychological research have not shown temporal trends ([Eagly & Steffen, 1986](#); [Knight, Fabes, & Higgins, 1996](#); [Knight, Guthrie, Page, & Fabes, 2002](#)). Nonetheless, criminologists have established a narrowing of gender gaps in U.S. violent crime even though rates have remained considerably higher in men than women ([Lauritsen, Heimer, & Lynch, 2009](#)).

Changes in women's roles also are reflected in sexual activities and partner preferences. Women engage in more assertive, permissive sexual

behavior than in the past, thereby narrowing sexual gender gaps (Peterson & Hyde, 2010). Preferences for mates also have changed between 1939 and 2008, with both sexes desiring attributes in a partner that suit the current division of labor in society. That is, men increasingly prefer women with attributes of good financial prospects, education, and intelligence and decreasingly prefer skills of good cook and housekeeper, whereas women increasingly desire men with good looks and decreasingly desire good financial prospects, ambition, and industriousness (Boxer, Noonan, & Whelan, 2012; Buss, Shackelford, Kirkpatrick, & Larsen, 2001). These preferences, at least for financial support, influence actual mate choices. Thus, the traditional tendency for men with higher earnings to be more likely to marry is now extended to women, with earnings now also predicting women's marital prospects (Sweeney, 2002; Sweeney & Cancian, 2004).

Male and female behavior has converged for other culturally masculine social behaviors, as revealed in a number of meta-analyses. Specifically, the tendency for men, more than women, to emerge as leaders in initially leaderless groups has diminished over time (Eagly & Karau, 1991). Similarly, the greater risk taking of men than women has decreased over time (Byrnes et al., 1999). Also declining is men's tendency to perform more assertive forms of prosocial behavior (bystander intervention and chivalrous behaviors; Eagly & Crowley, 1986). Similarly, the tendency for men to be more resistant to social influence and less conforming than women has become smaller over time (Eagly & Carli, 1981).

Other meta-analyses have demonstrated that women's career goals and vocational interests have become more similar to those of men. In preferences for various job attributes, women, much like men, have come to value leadership, prestige, power, and challenge (Konrad, Ritchie, Lieb, & Corrigan, 2000). Similarly, women's vocational interests have changed to become indistinguishable from those of men on the *enterprising* dimension of these interests, which includes leading, persuading, managing, and influencing (Su, Rounds, & Armstrong, 2009). Also, in yearly surveys from 1966 through 2006, first-year college women and men have become more similar in their aspirations for many traditionally male-dominated careers (Pryor, Hurtado, Saenz, Santos, & Korn, 2007).

Women's math skills and interests also have changed over time, consistent with the demand for at least moderate quantitative competence in many of the paid occupations to which women have gained access. The sex difference in mathematics favoring males has disappeared in the general U.S. population (Hyde, Fennema, & Lamon, 1990; Hyde, Lindberg, Linn, Ellis, & Williams, 2008). This change includes a decline in the male-to-female ratio in the top 0.01% of mathematical competence from 13.5 boys-to-girls in 1981–1985 to 3.8 boys-to-girls in 2006–2010 (Wai, Cacchio, Putallaz, & Makel, 2010). These changes are mirrored in increases in women's representation in mathematically demanding fields of study.

For example, in mathematics and statistics, women obtained 27% of bachelor's degrees in 1960 and 43% in 2009, and in physical sciences and science technologies, the comparable figures are 12% in 1960 and 41% in 2009 (U.S. Department of Education, 2010, Tables 323 and 324).

In contrast to the considerable evidence that sex differences are decreasing in most masculine attributes, sex differences are not shifting in feminine attributes. This lack of change makes sense, given that men have not greatly increased their participation in traditionally feminine roles, perhaps because of these roles' lesser pay and (sometimes) lower status (England, 2010). Women still predominate in domestic work, despite some increase in the hours that men devote to housework and childcare (Bianchi, Robinson, & Milkie, 2006; Kan, Sullivan, & Gershuny, 2011). Women also still greatly outnumber men in communally demanding occupations such as nursing and elementary school teaching (Cejka & Eagly, 1999; England, Budig, & Folbre, 2002; U.S. Bureau of Labor Statistics, 2011, Table 11). In general, female-dominated occupations have not shown much change in sex composition (Queneau, 2006).

Consistent with women's continued specialization in communal roles, Twenge's (1997b) meta-analysis of sex differences in self-reported communal personality traits found little change in these attributes over time (see also Feingold, 1994; Lueptow et al., 2001). Also stable is the greater support of women than men for social values that promote the welfare of others (Beutel & Marini, 1995) and for socially compassionate social policies and moral practices that uphold marriage, the family, and organized religion (Eagly, Diekman, Johannesen-Schmidt, & Koenig, 2004). Given the limited change in men's roles and the continued predominance of women in communal activities, it is no surprise that women continue to possess more communal attributes than men.

The increasing similarity of the sexes on masculine attributes but not on communal attributes—the overall trends that emerged in the psychological data we have reviewed—is apparent to everyday observers of social life. In the research on *dynamic stereotypes* that we already described, the agency ascribed to women increased as participants estimated their traits for past, present, or future years (Diekman & Eagly, 2000). Men's communion increased only when participants envisioned a society completely without sex-segregated roles.

7.2. Variability in psychological sex differences across nations

Many studies have examined female–male differences across contemporary nations to evaluate how sex differences may shift with the extent of gender equality in each nation. Such studies are potentially relevant to our prediction that societies with greater similarity between women's and men's roles

should also have greater similarity in role-relevant psychological attributes. That is, the sexes' traits should be more equivalent in societies in which both sexes occupy roles in more equal proportions.

In an initial demonstration that sex differences are smaller in more gender-equal nations, [Eagly and Wood \(1999\)](#) reanalyzed [Buss's \(1989\)](#) study of mate preferences across 37 cultures. In this research, men and women indicated the preferred age of a mate and rated and ranked the importance of a large number of personal attributes and skills of potential mates. When sex differences in these preferences were related to indicators of the relative status of women within each society provided by the United Nations, the preferences of men and women were more similar in countries with greater equality. That is, respondents indicated weaker mate preferences consistent with the traditional division of labor in which women sought an older mate with resources and men sought a younger mate with homemaking and childcare skills.

Using a more accurate indicator of national gender equality subsequently developed by the researchers associated with the World Economic Forum ([Hausmann et al., 2011](#)) in addition to a more reliable measure of sex-differentiated mate preferences, [Zentner and Mitura \(in press\)](#) found even stronger evidence that the mate preferences of women and men were more similar in the more gender-equal nations in the [Buss \(1989\)](#) sample. They further replicated this effect in a new, Internet sample of respondents. This research also ruled out a number of potential confounds in interpreting the differences across cultures, thereby demonstrating that nations' gender equality predicted mate preferences even after controlling for such factors as nations' geographic distance from the equator and gross domestic product. Yet, despite the strong influence of nations' gender equality on the magnitude of sex differences in mate preferences, in all nations, men placed more emphasis on mates' homemaker qualities and women placed more emphasis on mates' economic resources. Reversals of direction would not be expected given that women had somewhat lower status and power than men even in the most egalitarian nations in the samples.

A number of subsequent cross-national comparisons also found that the psychological attributes of men and women have converged as the status of women has risen. However, other studies failed to find this effect, and some instead reported the reverse effect—that sex differences are larger in more gender-equal nations. Overall, the results of cross-national comparisons have been strikingly inconsistent.

Evidence that the sexes are psychologically more similar in more gender-equal nations comes from a number of studies evaluating diverse domains. For example, greater equality was associated with the lessening or disappearance of the tendency for boys to score higher on mathematics tests than girls ([Else-Quest, Hyde, & Linn, 2010](#)). Also, respondents in nations with greater gender equality reported smaller incidences of men victimizing

women through intimate partner violence (Archer, 2006a). Greater gender equality was also associated with smaller sex differences in frequencies of several types of sexual activity, specifically, the tendencies toward greater male than female (a) promiscuity (Schmitt, 2005), (b) short-term mate poaching attempts (Schmitt & International Sexuality Description Project, 2004), and (c) casual sex, anal sex, oral sex, and masturbation (Peterson & Hyde, 2010).

Evidence suggesting that sex differences may be larger in more gender-equal nations comes from a number of other studies. For example, in more gender-equal nations, men and women differed *more* on self-reports of values (Schwartz & Rubel, 2005) and on personality traits included in the Five Factor Model (Costa, Terracciano, & McCrae, 2001; Guimond et al., 2007; Lippa, 2010; Schmitt, Realo, Voracek, & Allik, 2008). Greater equality also was associated with a greater tendency for men, more than women, to report a “dismissive” attachment style of valuing independence over close relationships (Schmitt, 2008). Also, in more gender-equal nations, tendencies were greater for women, more than men, to report intense emotions (Fischer & Manstead, 2000) and unfavorable attitudes and affect related to mathematics (Charles & Bradley, 2009; Else-Quest et al., 2010).

At first glance, these diverse findings might seem to challenge explanations in terms of gender roles and the division of labor. Why would sex differences in some psychological attributes be larger in more gender-equal nations? Answering this question requires scrutinizing the types of measures that researchers have used to assess psychological attributes. Larger sex differences with greater gender equality typically are found in studies that assess psychological dispositions by having people rate themselves on subjective rating scales. Such judgments require that respondents actively construct estimates of their dispositions. This process involves selecting a set of people against which to compare oneself. For example, a respondent judging her own aggressiveness on a scale ranging from not at all aggressive to very aggressive has to implicitly compare herself to others (Biernat, 2003, 2005; Guimond, Chatard, Martinot, Crisp, & Redersdorff, 2006). She has a variety of standards available and could compare herself, for example, just to other women or to people in general.

The comparison group or standard that people select when responding to rating scales probably varies with their own nation's gender equality. In gender-unequal nations, respondents likely rate themselves in comparison with others of their own sex. Such nations impose relatively rigid gender hierarchies and often severely restrict informal interactions between the sexes. When comparing themselves with others of their own sex, a masculine man and a feminine woman would view themselves as relatively typical or average, producing similar ratings (as “average” or “typical” of their own sex). This kind of comparison will obscure any actual sex differences. In contrast, in more gender-equal nations, respondents likely rate themselves

in comparison with others of both sexes. In these nations, people routinely interact freely with both sexes in more gender-equal contexts and thus may think spontaneously about both sexes when evaluating the self. In comparing themselves with all others, masculine men and feminine women would view themselves as somewhat different on sex-related dispositions such as aggressiveness or social sensitivity. This kind of comparison will reveal sex differences. These *shifting standards* (Biernat, 2003) fit the cross-national findings mentioned above in which larger sex differences in ratings of values, personality, emotions, and math attitudes are found in more gender-equal nations (for similar arguments, see Else-Quest et al., 2010; Guimond et al., 2007).

Other construal processes involved in responding to rating scales may also impair cross-cultural inferences. For example, building on ideas of correspondent inference, Costa et al. (2001) suggested that people in societies with high gender inequality ascribe their own sex-typed behaviors to gender norms, not to their underlying dispositions. Thus, even if men and women in unequal societies select a broad comparison group, they would fail to report sex-typical personality traits on rating scales if they attribute their own behavior to situational constraints. With the greater fluidity of gender roles that prevails in more gender-equal nations, men and women may ascribe their own masculine or feminine behaviors to their underlying dispositions, thus producing apparently larger differences in these dispositions.

Psychological attributes do not have to be assessed on subjective rating scales, which are vulnerable to the types of construal processes that we have described. Instead, researchers can use methods that impose a common standard across nations (see Biernat, 2003, for *common rule* measures). Such methods, for example, might administer the same performance test in all nations or require that respondents estimate the frequency of their own behaviors rather than judge themselves on rating scales. Studies using standard performance tests, such as for mathematics performance, or frequency measures requiring counting of one's own behaviors, such as for intimate partner violence and sexual behavior, typically have found *smaller* sex differences in more gender-equal nations.

Finally, we note one additional explanation proposed for the inconsistent cross-national findings. Some researchers have argued that self-expression, especially of gender-typical preferences, is less restrained in the wealthier, more gender-equal industrialized societies (Charles & Bradley, 2009) or that presumably natural, ingrained sex differences are freer to emerge in these societies (Schmitt & International Sexuality Description Project, 2004). These principles predict only an increase in sex differences with greater gender equality and cannot account for the studies that have shown decreases.

All in all, the cumulating research literature on cross-national comparisons of sex differences suggests that self-ratings, while deriving

from self-judgments that are subjectively genuine in all nations, are artifactual with respect to understanding whether sex-related differences actually vary across nations. These variations in people's construal of gender across cultures contribute to the cumulating evidence of the methodological pitfalls of cross-national comparisons of self-ratings of psychological attributes (e.g., Church, Alvarez, Mai, French, & Katigbak, 2011; Hamamura, Heine, & Paulhus, 2008). Yet, research has not provided definitive tests of the construal mechanisms that we believe underlie the diverse relationships between gender equality and the magnitude of psychological sex differences.² Given the methodological artifacts that can influence cross-national averages, especially on subjective rating scales, it is risky to interpret these sex differences as reflecting human nature.³

The continuing evidence of sex differences even on more objective indicators that impose a common standard is not surprising, and we do not expect these differences to disappear in the near future. Sex differences continue because no nation has attained gender equality, as shown by indices such as wages, power and leadership, occupancy of high-status occupational roles, and the division of domestic work. Instead, the roles typically held by women and men in world societies reflect patriarchal structures to lesser or greater degrees. Specifically, averaged across nations, 78% of men but only 52% of women are employed in the labor force (International Labour Office, 2010, Table 2d), and no contemporary society has achieved gender equality in the division between domestic and market work (World Bank, 2012). As employees, women earn less than men (Hausmann et al., 2011). In addition, women are underrepresented in politics, holding on average 20% of parliamentary seats (Inter-Parliamentary Union, 2011). Women also perform substantially more childcare and housework than do men, according to time use surveys (World Bank, 2012). These patterns changed remarkably in most industrialized societies in the late twentieth Century, but change has slowed in subsequent decades, with gender equality remaining a somewhat distant goal (Blau, Brinton, & Grusky, 2006). Therefore, we predict a slow, gradual erosion of role differences and of those psychological sex differences that are relevant to these roles in future progression toward gender equality.

² Providing initial evidence, sex differences in personality traits as assessed by self-reports on subjective rating scales were smaller in Malaysia, a nation high in *power distance*, which is manifested in a rigid social hierarchy that encourages comparisons confined to one's own group, than in nations with lower power distance and thus more fluid comparisons across groups (Guimond et al., 2007). Targeted assessment of gender inequality, which is more relevant to these hypotheses than power distance, would represent nations in terms of indexes such as the Global Gender Gap Index of the World Economic Forum (Hausmann et al., 2011).

³ Sex difference comparisons across time within nations also might be compromised by the ambiguities in rating scale use we have described with cross-national comparisons. However, the role shifts that have been documented thus far in industrialized countries may not be sufficiently large to influence ratings on subjective scales. Nonetheless, as the roles of women and men shift further in societies, these complexities may challenge interpretations of changes in subjectively rated psychological attributes over time.



8. CONCLUSION

In this chapter, we have assembled a large array of evidence from psychology and related disciplines to demonstrate that female and male psychology emerges from interactions across multiple biological and socio-cultural factors. In particular, the psychological attributes of men and women vary depending on the demands of their social roles. Also, because women's but not men's social roles have changed greatly in most industrialized nations since the mid-twentieth century, the psychology of women has changed more over time within these nations than the psychology of men. As expected, these changes have taken the form of women adopting many attributes associated with men, with little complementary tendency for men to adopt attributes associated with women.

The specific roles of women and men in a society depend primarily on how the physical differences between the sexes—women's childbearing and nursing of infants and men's size and strength—enable or constrain the efficient performance of everyday activities. A division of labor emerges that is tailored to ecological and socioeconomic demands, and socialization practices are organized to support this division. Women tend to perform activities compatible with childcare, and men tend to perform activities less compatible with childcare, including those that require bursts of strength and force. Female and male biological attributes exert less influence in industrialized societies with low birthrates, shortened duration of lactation, and employment roles that favor brains over brawn.

People within a society observe the activities of men and women and form corresponding beliefs about their psychological attributes. From the different activities of the sexes, they infer gender stereotypes—that is, shared expectations that women and men are intrinsically different. These gender role inferences, in turn, promote sex-differentiated behavior through the range of social psychological and biological processes we reviewed in this chapter. In short, guided by gender role beliefs that are shared within a society, children are socialized for the skills, traits, and preferences that support their society's division of labor. Also, most adults conform to these shared beliefs by confirming others' expectations and by internalizing them as personal standards for their behavior. In addition, biological processes such as hormonal activation support gender roles. By this confluence of biosocial processes, individuals within a society dynamically construct and share gender roles tailored to their time, culture, and situation. As a result, the observed division of labor within one's own society seems appropriate and desirable to most people, even though the specific activities of the division vary over time and cultures.

Although gender role beliefs generally stabilize the division of labor, other societal forces can foster change in the roles of men and women.

When existing roles of women and men in a society become less well aligned with fundamental socioeconomic changes, feminist social movements can arise to lessen the sex segregation of social roles and raise women's status (Eagly, 2004). Even in the current post-feminist era in contemporary industrialized societies, a portion of individuals have remained committed to furthering progress toward gender egalitarianism (Ridgeway, 2011). Women, in particular, are less accepting than men of the social hierarchies that subordinate women, and the gender gap in these attitudes is larger in more gender-equal societies (Lee, Pratto, & Johnson, 2011). Such findings suggest that women may be especially likely to advocate for social change that promotes gender equality and equal opportunity. In fact, women in legislatures are more likely than their male colleagues to advocate for changes that promote the interests of women, children, and families and that support public welfare in areas such as health care and education (for reviews, see Paxton, Kunovich, & Hughes, 2007; Wängnerud, 2009). Although women are not a monolithic political block, these tendencies in general transcend political parties and nations. Moreover, some governments increase gender equality through social policies that, for example, lessen women's reproductive labor through support for nonmaternal child-care (Pettit & Hook, 2009). Also, large-scale economic and political changes in postindustrial societies tend to foster universalistic, gender-blind treatment of people as employees and citizens because such rationalized procedures maximize profits, votes, and institutional power (Jackson, 1998). Through these multiple influences, the social roles of women and men are likely to integrate further. As our theory argues, this integration should produce greater similarity in the psychological attributes that facilitate performance of the occupational and family roles that women and men in fact share most equally.

At a social psychological level, our biosocial construction theory explains an important aspect of the processes that underlie both social change and resistance to change. Our theory builds on assumptions about evolutionary pressures on human psychology that are in stark opposition to those in evolutionary psychology. Instead of assuming, as do evolutionary psychologists, that flexibility in the behavior of women and men arises from the activation of various programs that were preformed due to selection pressures on ancestral humans, we explained how proximal biological and social psychological processes dynamically create sex differences through shared beliefs within a society. These constructive processes build on evolved human capacities for innovation, social learning, and cumulative culture. Our biosocial construction model is, however, compatible with some prominent evolutionary theories, especially human behavioral ecology's recognition that varying socioenvironmental factors shape the costs and benefits that men and women associate with different behaviors (Bird & O'Connell, 2006; Winterhalder & Smith, 2000). Our analysis also is

compatible with dual inheritance, coevolutionary theories' emphasis on human adaptive culture that augments biological inheritance (Laland, Odling-Smee, & Myles, 2010; Richerson & Boyd, 2005). In this approach, the transmission of culture arises from social learning processes in which simple imitation and observational learning undergird more complex learning associated with symbolic communication and language (Heinrich & McElreath, 2003). Also, congenial with our analysis are developmental perspectives invoking regulatory dynamics by which the products of evolution are repeatedly assembled from genes and environments (Caporeal, 2001; Lickliter & Honeycutt, 2003).

A melding of science across biological, psychological, social, and cultural levels of explanation is essential for understanding sex differences and similarities in social behavior. In this chapter, we have outlined an approach that emphasizes the centrality of social psychological processes in the construction of gender within societies. Yet, biology is also prominent in our perspective. Through the biosocial processes that we identified, women and men flexibly divide labor depending on biological constraints and the local context, share the beliefs resulting from this division, and thereby tailor their behavior according to the circumstances in which they live.

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