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The Primacy of Gender: Gendered Cognition Underlies the Big Two Dimensions of Social Cognition

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Abstract

It is notable that across distinct, siloed, and disconnected areas of psychology (e.g., developmental, personality, social), there exist two dimensions (the "Big Two") that capture the ways in which people process, perceive, and navigate their social worlds. Despite their subtle distinctions and nomenclature, each shares the same underlying content; one revolves around independence, goal pursuit, and achievement, and the other revolves around other-focus, social orientation, and desire for connection. Why have these two dimensions emerged across disciplines, domains, and decades? Our answer: gender. We argue that the characteristics of the Big Two (e.g., agency/competence, communion/warmth) are reflections of psychological notions of masculinity and femininity that render gender the basis of the fundamental lens through which one sees the social world. Thus, although past work has identified the Big Two as a model to understand social categories, we argue that gender itself is the social category that explains the nature of the Big Two. We outline support for this theory and suggest implications of a gendered cognition in which gender not only provides functional utility for cognitive processing but simultaneously enforces gender roles and limits men and women's opportunities. Recognizing that the Big Two reflect masculinity and femininity does not confine people to act in accordance with their gender but rather allows for novel interventions to reduce gender-based inequities.

Keywords

gender, gender schema, social cognition, social roles, Big Two

From developmental, to personality, to social psychology, the way one perceives, processes, and understands the self, other people, social groups, and even cultures often falls along two primary dimensions (i.e., the "Big Two"; Abele, Cuddy, Judd, & Yzerbyt, 2008; Abele et al., 2016; Bem, 1981; Diehl, Owen, & Youngblade, 2004; Fiske, Cuddy, & Glick, 2007; A. E. Martin & Slepian, 2017). Throughout history and across disciplines, the Big Two have received distinct pairs of labels: from the early labels *tough-minded* and *tender-minded*, used by the father of American psychology, William James (1907), to terms that now grace the latest pages of psychology journals, such as *agency* and *communality* (Eagly, 1997; Fournier, Moskowitz, & Zuroff, 2011; Rucker, Galinsky, & Magee, 2018) and *competence* and *warmth* (Fiske, Cuddy, Glick, & Xu, 2002). Across distinct research traditions, multiple pairings reminiscent of the Big Two can be found, including *masculinity* and *femininity* in gender research (Bem, 1981; Terman & Miles, 1936) and *self-profitability* and *other-profitability* in research on human values (Abele & Wojciszke, 2007; see also Lovibond, 1994). Furthermore, in personality research, factor analyses and dimension reduction of personality traits fit a similar Big Two structure, with dimensions termed *plasticity* and *stability* (DeYoung, Peterson, & Higgins, 2002), or simply *beta* and *alpha* (Digman, 1997; see also Foa, 1961; Leary, 1957; Lippa, 2001; Moskowitz, 1994; Pincus & Ansell, 2003; Wiggins, 1996).

Across independent subfields and diverse theories, we see similar Big-Two-like pairs, but such research has been largely siloed and disconnected (spreading across multiple disciplines of psychology). And yet it is notable that these fields have converged on two dimensions with the same underlying content. Despite different nomenclature, which varies across time and

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discipline, the former (agency, competence, toughness) revolves around self-interest, goal pursuit, and achievement. The latter (warmth, communality, tenderness) revolves around other-focus, social orientation, and desire for acceptance, connection, and community (Ybarra et al., 2008). Although the different labels diverge in subtle manners, they clearly converge in their content and their relevance to self-perception and social perception. Why? Why two? Why *these* two? Of all the possible clusters through which people could understand themselves and others, why have these two emerged across domains, disciplines, and decades? Our answer: gender.

In this article, we argue that the underlying structure of social cognition, as reflected in the Big Two—seen across diverse domains—is based in a gender schema through which people categorize, conceptualize, and comprehend their social realities. That is, masculinity and femininity are not just *one set* of labels for the Big Two, as characterized in past research, but rather explain the underlying connection among different conceptualizations of the Big Two. In other words, the Big Two dimensions do not just correspond to gender: They *are* gender. The observation that the characteristics of the Big Two—agency/competence and communion/warmth—are essentially reflections of masculinity and femininity, as we outline here, leads to the present theory of gendered cognition, which proposes that gender is the basis of a fundamental lens through which people see their social world. We argue that these universal dimensions of social cognition stem from gender roles that have their roots in evolutionary pressures—roles that need not be gendered in the modern world—but still are reinforced all the same through cultural transmission and cognitive heuristics.

In the following sections, we theorize that the functionality of gender (or more specifically, sexual dimorphism) for human survival leads gender to be a primary schema through which people perceive, process, organize, and understand information about their social worlds, even when gender is seemingly irrelevant and not explicitly on the mind. We outline the connections between the content of the Big Two and their inherent link to human survival (for which sex is a necessary component and highly bound to gender and gender roles). We draw from social role theory and gender schema theory to identify the implications of a gendered cognition, one that is so basic and fundamental that it provides the basis for the two primary dimensions of social cognition.

A Theory of Gendered Cognition

In the following section, we argue that social cognition has been structured around gender because of its relevance to and importance for human life and survival. We begin from a functional, historical perspective, fully zoomed out on the role of gender/sex in the survival of our species, and then work our way in toward a psychological theory of how gender infiltrates the human mind, influencing self, social, and mind perception.[1]

Reproduction and survival: the role of sex differentiation

If you are reading this, there is a good chance that you are a human being who is the result of reproduction. Creating new individuals typically involves combining the genetic material of two individuals (male and female), and most species are specialized into two sexes, each having distinct cells specialized for reproduction. Because of a fascinating set of evolutionary conditions, this specialization can extend far beyond sexual organs; many species across the animal kingdom exhibit sexual dimorphism, whereby males and females can look and act very differently. Human males and females may look more similar to each other than peacocks and peahens, but notable differences still do exist between the sexes, specifically in domains in which they have faced different adaptive problems (e.g., childbirth; for review, see Buss, 1991, 2015). That is, reproduction (with variation) sets the stage for evolution, and obstacles to reproduce represent an organism's greatest adaptive problem. Thus, organisms with features that make it or its genetic relatives more likely to pass on genes can be said to have found solutions to adaptive problems (Tooby & Cosmides, 2005). The ability to distinguish males from females is an essential component of this process.

Humans have developed psychological mechanisms that help them overcome reproductive obstacles (e.g., avoiding predators, protecting children) and take advantage of reproductive opportunities (e.g., finding fertile mates), which historically have been based on gender-differentiated roles (e.g., hunter, protector, nurturer; Buss, 2015). Thus, evolutionarily speaking, fundamental differences between males and females, as well as cognitive adaptations to identify them, have conferred benefits to the survival of the human species (Buss, 1991). These distinctions exist today (even if maintained entirely in cultural practices) and can be traced to these historical gender roles. Indeed, even as technology advances in fertilization, an egg and sperm are still required to create a new human, which makes the distinction between male and female critical to survival of human genes.

From sex differentiation to social roles

With the interdependence and specialization of male and female reproductive roles comes a historical bifurcation

into specialized social roles. The most notable of the biological differences between males and females is that the female bears the child, and the male does not; hence, evolutionarily speaking, the female has been in a role that requires engagement in prenatal and postnatal care, and the male has been a role in which he is (one hopes) on hand for help and protection (Eagly, 1987, 1997; Wood & Eagly, 2012). Thus, across history, men and women have had different roles in nourishing and defending themselves against the elements and against others, taking different roles in the maintenance of their communities (Wood & Eagly, 2012). This strategy is not unique to humans and explains the continued existence of many different mammalian species (see Bodenhausen & Morales, 2013; Kenrick & Luce, 2000). Thus, for the human species to survive, role differentiation has been necessary not only at a species level (reproduction) but also at an individual level (protection and provision; Eagly, 1997).

Men's greater size and strength made them historically more suitable for roles involving hunting and defending, whereas women's childbearing ability and smaller size made them more suitable for roles involving child rearing, gathering, and managing community (Wood & Eagly, 2002, 2012). These roles extend to a variety of behaviors, dispositions, skills, and cognitive processes. Hunting and defending are enhanced by specific skills, dispositions, and goals that involve agency: assertiveness, competitiveness, dominance, and independence. Child rearing and community building are enhanced by roles that involve communality: nurturance, warmth, and expressiveness. These gender roles look remarkably similar to Big Two pairs such as *agency* and *communality* (Eagly, 1987, 1997).

Although the biological components of sex have largely remained required for reproduction, the particular gender roles that follow are of course not required to survive today. Women need not be in roles requiring communality, and men need not be confined to roles involving agency. Yet, in the long history of the human species, this change is a relatively recent development, and these gender roles (and stereotypes) continue to exist (Eagly, Nater, Miller, Kaufmann, & Sczesny, 2019; Heilman, 2001; Heilman & Eagly, 2008).

The primacy of gender

At the most basic level, human cognition has developed and adapted, in part, to process information in a way to maximize survival and reproduction (see Bodenhausen & Hugenberg, 2009). For infants, differentiating mother (female) from father (male) has been essential for them to survive, and thus gender is often the first social category humans apply to themselves and others (Bem, 1981; C. L. Martin & Ruble, 2004).

From the earliest of ages, gender is the most salient social identity and the first category through which children learn to identify themselves and others (Bem, 1981; Mackie, Hamilton, Susskind, & Rosselli, 1996). Even before they have a recognition of their social realities, infants can almost immediately differentiate mother from father and subsequently male from female (Montague & Walker-Andrews, 2002). For instance, because of mothers' roles as nourishers and childbearers, their voices are almost immediately recognized by newborns after birth (DeCasper & Fifer, 1980) and their faces are recognized before fathers' faces are (Bowlby, 1969; Montague & Walker-Andrews, 2002). Given the importance of mother-father differentiation, and that mothers have historically provided nourishment, children quickly learn to distinguish male from female.

Extending beyond familial relationships, as young as 3 months, infants can distinguish between male and female faces (Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002). And at 6 months, infants can discriminate gender by voice (Miller, 1983; Younger & Fearing, 1999). At 10 months, infants even have associations between men and women and gender-typed objects (e.g., hammer, scarf; Levy & Haaf, 1994). Most children develop the ability to label gender groups (i.e., lady, man) by age 2, which is around the same age that children develop awareness of a "self" (Baldwin & Moses, 1996), a self that becomes tightly linked with gender (C. L. Martin & Ruble, 2004). Indeed, children use gender as a primary model of identification, often before other social categories, such as race or age (Bem, 1983; Maccoby & Jacklin, 1974; C. L. Martin & Ruble, 2004). This gendered self-concept shapes the way children perceive, process, and make meaning of themselves, others, and their external realities (Markus & Oyserman, 1989).

Thus, from an extremely young age and into adulthood, people readily agree that are two kinds of people, male and female (Gelman, 2004), and unlike other social categories (e.g., race, age), there is a clear biological division between the two. This is not to say that we (the authors) do not recognize the fluidity of gender or the increasing recognition that it need not be considered binary. Although gender roles are no longer strictly required for survival, such bifurcated roles have survived throughout the ages, and it is undeniable that human gender roles are all around us. Many laypeople are not even aware of a distinction between sex and gender (see Haig, 2004; Unger, 1979; Zurbriggen & Sherman, 2007). Gender very much remains bifurcated along two dimensions, maximally differentiating what is masculine/male and feminine/female.

The Gender Schema as the Basis of the Big Two

Given that a wealth of evidence suggests that humans' social cognitive processes are organized along seeing two kinds of people (male and female), it would make a good deal of sense that a history of factor analyses of how people perceive human traits would see them cluster into the same two groupings. The Big Two are a representation of which traits people see as occurring together. We argue that the coherence to the Big Two across the distinct series of labels they have been given is a reflection of the more basic division people see in humans, between that of male and female. We will first draw out these links and then integrate this research with the previous discussions to outline a formal model, which we then compare and contrast to another possible explanation for the Big Two.

Links between masculinity and femininity and the Big Two

Although developments in gender research contribute to the understanding of social cognition, and developments in social cognition aid in the understanding of gender, they stem from different historical and theoretical traditions. Thus, their synonymy may seem obvious in retrospect; however, many overlaps and relevant implications have gone undocumented. In the next section, we outline the different developmental histories and links between gender and the Big Two and argue that their overlap forms the theoretical foundation for the existence of the gender schema.

Gender research. Definitionally and operationally, masculinity and femininity are akin to agency and communion; even the earliest definitions of masculinity and femininity overlap with definitions of agency and communion. The earliest descriptions of masculinity describe it as a cluster of traits involving instrumental orientation and a focus on getting the job done, such as assertiveness, intelligence, and power (Parsons & Bales, 1955; Terman & Miles, 1936). Likewise, the earliest discussions of agency describe it in very similar terms, specifically referring to an individual's striving to master the environment, to assert the self, and to experience competence, achievement, and power (Bakan, 1966). With femininity, early scholars defined it as a cluster of traits representing expressive orientation and an affective concern for the welfare of others, such as sociability and warmth (Parsons & Bales, 1955; Terman & Miles, 1936). Likewise, communion, according to Bakan (1966), was said to represent a person's desire to closely relate, cooperate, and merge with others. As Abele and Wojciszke (2007) noted, "psychological masculinity versus femininity . . . on the operational level can be equated with agency versus communion" (p. 752).

Although these constructs, even from their inceptions, have overlapped substantially, the study of masculinity/femininity and agency/communion began from separate and disparate domains. Research on masculinity and femininity began inductively, not capturing stereotypes per se but rather qualities that maximally differentiated men and women (Terman & Miles, 1936; Wood & Eagly, 2015). Masculinity and femininity were originally conceived of as clusters of traits at two ends of a bipolar spectrum (Terman & Miles, 1936). Yet researchers came to recognize that this structure was problematic. In particular, because masculinity in this framework was akin to competence (Lippa, 2001), a bipolar structure required individuals to trade off their identification with masculinity for femininity (e.g., women were forced to choose between competence and femininity and men forced to choose between warmth and masculinity; Wood & Eagly, 2015). Thus, the original bipolar conceptualization of femininity-masculinity was later replaced with a two-factor model, whereby masculinity and femininity represented two dimensions (Bem, 1974; Constantinople, 1973; Spence & Helmreich, 1980), not unlike the two dimensions of the Big Two (Bruckmüller & Abele, 2013; Fiske et al., 2002).

Research thus began to move away from seeing gender as existing on a continuum to instead seeing it as a two-dimensional space. This enabled research on androgyny (Bem, 1974, 1981), or the ability for an individual to simultaneously possess both masculine and feminine qualities. Recognizing that femininity is not simply the inverse of masculinity enabled better understanding of these constructs. Moreover, recognizing that traits described as *masculine* can be held by both men and women, and likewise for *feminine*, is the very basis for the modern understanding of the distinction between gender and sex. That is, although people associate psychological masculinity with the male sex and psychological femininity with the female sex, it is now considered inappropriate to suggest that biological sex is synonymous with psychological characteristics, notwithstanding the obvious and tight link between the two (Bem & Lenney, 1976; Buss, 1991; Wood & Eagly, 2015).

Relabeling clusters of traits formerly known as *masculine* and *feminine* as *agency* and *communion* (or *competence* and *warmth*, etc.) clearly brings academic and societal benefits. These modern labels are appropriate to modern notions of gender. For every person, *agency* and *communality* represent two core challenges (and trade-offs) that underlie effective navigation of the social world they live in: the need to pursue goals (i.e., agency) and the need to be socially connected (i.e., communality; Abele et al., 2008; Ybarra et al., 2008).

Accordingly, as a final steppingstone in this progression, gender scholars began to drop the terms *masculine* and *feminine* from their work because such terms seemed only to reinforce the notion that *masculinity* was linked with the male sex and *femininity* with the female sex. Thus, they began using *agency* and *communality* as more gender-neutral terminology (Abele & Wojciszke, 2007). Currently, however, this is more an ideal than a reality; many gender researchers use the terms in conjunction, conflating the two (e.g., *masculine-agentic, masculine (agentic), masculine/agentic*; Abele, 2003; Martin & Phillips, 2017; O'Neill & O'Reilly, 2011).

Big Two research. Like masculinity and femininity, research on the Big Two similarly began in the early 20th century and continues to be studied today. An early example includes Rosenberg and colleagues, who found through multidimensional scaling that personality impressions boiled down to two factors, ranging from positive to negative on *intellectual* and on *social* (Rosenberg, Nelson, & Vivekananthan, 1968). Bales (1950), argued that *task* and *social* orientations can be used to describe group interactions. Peeters (1983) argued *self-profitability* and *other-profitability* represent the fundamental dimensions of social perception, as did Fiske et al. (2002) for *competence* and *warmth*. Furthermore, Wojciske, Bazinska, and Jaworski (1998) found that *competence* and *morality* accounted for more than 80% of variance in global impressions. It should be noted that these constructs are different. For example, the definition of competence (Fiske, 2018) is not synonymous with agency (Bakan, 1966), and the construct of patiency (Gray & Wegner, 2009) is not the same as communality (Abele & Wojciszke, 2007). Although the Big Two labels vary meaningfully with their context of study, Abele and Wojciszke (2007) demonstrated coherence across the different conceptualizations of the Big Two. Using 300 traits representing agency/communion, masculinity/femininity, warmth/competence, instrumentality/morality, individualism/collectivism, and the Big 5 personality dimensions, they found two distinct factors that represented almost 90% of the variance.

It is clear that many scholars, across disciplines and domains, have isolated the Big Two in explaining self-perception and social perception. Given that terms such as *masculine* and *feminine* (used as early as in the 14th century) far predate terms such as *agency* and *communality* (20th century), it stands to reason that people thought about humans in these terms first.

Even beyond psychology, people see gender as coming first. When a baby is born, the very first question people ask, by far, is what is its gender (Slepian & Galinsky, 2016). This applies to interacting with adults as well. It is difficult to not mention a person's gender when describing someone (Critcher & Ferguson, 2014; West & Zimmerman, 1987). And unlike other psychological characteristics, gender can be seen at a mere glance with remarkable accuracy. Gender pervades social judgments, language, and identities in a way that other traits and dispositions do not. Hence, we argue that the gender schema is not a reflection of some lay notion of the Big Two (we are not aware of any evidence for the idea that people have lay notions of the Big Two). Rather, we suggest that the Big Two, which only appears in psychological articles, is instead a reflection of the entrenched gender schema that everyone uses. Stated another way, in asking why there are two dimensions of social cognition, it is plausible to believe that biological sex is a binary distinction through which people have organized their social realities and through which many psychologists have asked and answered their questions.

Trait Space as a Metaphor: Reconciling the Big Two's Across Psychology

As reviewed earlier, across multiple research traditions, there are similar Big Two dimensions of social cognition. Visually, these two dimensions (constellations of related traits) can be thought of as existing in a two-dimensional (2D) space, in which one axis (x-axis) represents one dimension and another (y-axis) represents the other dimension. As is often illustrated in multidimensional scaling studies, traits are scattered along these axes (dimensions) and thus scattered throughout the two-dimensional space (e.g., Bruckmüller & Abele, 2013; Rosenberg et al., 1968). The utility of this spatial metaphor helps not only to see how traits are scattered in a particular 2D space but also to recognize that the 2D spaces (across the different Big Twos) are related to each other (e.g., Kervyn, Fiske, & Yzerbyt, 2013). We can consider the different Big Two pairs as merely rotations within in the same trait space, just as in factor analysis, a slight rotation changes the meaning of the factor. For instance, a warmth axis or a morality axis cutting through the space would be rotated off a communality axis (in multidimensional space) but only slightly, given their high conceptual overlap (see Abele et al., 2016).

We argue that the different Big Two models all converge on the same space. Because of each tradition's theoretical focus, however, a particular rotation is favored and useful for a given line of inquiry. The dimension that will be useful very much depends on the context. For example, when interviewing someone for a sales position, sociability or even charisma may become the dimension most central to one's processing, rather than communality. Likewise, depending on the context, assertiveness may emerge as a salient factor, whereas in others, dominance may emerge as more important.

In the present article, we not only suggest that these dimensions are related to each other but also present a theory for why the space of person judgments is 2D (think of a circle) rather than three-dimensional (think of a sphere) or higher (good luck). In the preceding paragraphs, we suggested that a 2D space should first be thought of as a circle. As soon as you draw a straight line in the picture, you are forcing a particular rotation. Even if different rotations serve useful purposes, the most parsimonious explanation for a 2D space is that two forces are responsible for it, else the space would have a different number of dimensions. In the present article, we outline a theory suggesting that two driving forces explain the existence of having a 2D trait space.

Gendered Cognition: Origins and Implications

Many of psychology's Big Twos can be said to align with each other and overlap substantially with notions of masculinity and femininity (Abele & Wojciszke, 2007). Why might this be? One possibility is that it is a meaningless coincidence, but the overlap seems too substantial to give weight to that possibility, especially with the convergence of multiple independent research traditions.

We proposed a theory of gendered cognition founded on established and accepted evolutionary principles and outlined the origins of the Big Two dimensions of social cognition. Our theory, which is based in historical, functional, and evolutionary perspectives, has two core premises: First, male and female (i.e., gender) represent primary constructs people use in social cognition, and second, the processes underlying the primacy of gender are responsible for the Big Two dimensions of social cognition that are seen across domains. We propose that gender roles that exist still today explain the overlap of the Big Twos and can be traced to sexual dimorphism, a deeply embedded aspect of the human species. Having outlined the theory earlier (see the section, A Theory of Gendered Cognition), we next briefly summarize this theory, compare it with another prominent model, and then turn to implications of our theory along with novel predictions.

Our theory is briefly summarized as follows: Sex (in both senses of the word) is critical to the existence of the human species. The male sex and the female sex are required to engage in the act of sex to reproduce. Sexual dimorphism is a fact of human life; not only is it central to the reproductive process (it is how reproduction is achieved) but also it has led males and females to take historically different reproductive and functional roles (e.g., men hunting, women nurturing).

These distinct roles have existed for millennia and can be seen today in gender roles and gender stereotypes. The constellation of trait judgments and evaluations people make of other people consistently cohere along two dimensions, the content of which overlaps substantially with these gender roles (agency/masculinity: assertiveness, competitiveness, dominance, independence, self-interest, goal-pursuit; communality/femininity: nurturance, warmth, expressiveness, other-focus, social orientation). In short, historically there has been a very clear demarcation in the human species: two kinds of people, engaged in different and complementary roles. In addition, decades of research have consistently shown that individuals judge people along two highly related dimensions. We propose the former is the reason for the latter. That is, in the long history of humanity, people took on two different roles, and individuals distinguish between two different kinds of people.

Because of the necessity of two sexes for reproduction, humans should have clear mechanisms for detecting male and female. Indeed, this is the case (infants can distinguish between male and females at 3 months; Quinn et al., 2002). If this differentiation were historically a primary mode for survival, humans' basic social cognitive processes—which have been shaped by the same evolutionary pressures—should reflect this basic division; people should immediately at a glance detect gender, and they should organize their understanding of human traits around these two clusters. Indeed, not only does the reviewed evidence clearly indicate this, but also these gender roles and stereotypes persist even when one does not want them to (see Ellemers, 2018).

Origins of the Big Two: gendered cognition versus the stereotype-content model

Another suggestion for the origin of the Big Two is sketched out by the stereotype-content model (SCM; Fiske et al., 2007; Fiske et al., 2002). The SCM model suggests that *warmth* and *competence* are two fundamental dimensions of social perception, and although these terms are still gendered (as reviewed above), this model points to a different origin and evolutionary foundation and a different set of forces that creates the 2D space. By this model, warmth and competence became the two dimensions prioritized in social cognition because of their necessity in determining whether someone was friend or foe (the warmth dimension) and then their ability to enact good or ill intentions (the competence dimension).[2] According to the SCM, the ability to accurately assess each provides benefits for survival, which makes these primary (and fundamental) dimensions of social cognition. In contrast, a theory of gendered cognition proposes that gender roles—based in hundreds of thousands of years of humans' existence—is responsible for the notion that there are two kinds

of people and thus two primary dimensions of social cognition.

We compare the two theories, both of which make hypotheses about the origin of the Big Two. They both agree that if a dimension is to be one of the two primary dimensions of social cognition, then it should be a fundamental judgment in person perception. And so, we ask per each model, is each dimension truly fundamental? We argue that a fundamental dimension of person perception should be perceived in others with some degree of accuracy, appear early in development, and be based in widely accepted evolutionary pressures. Below, we argue that an evolution-based theory of competence as a primary Big Two dimension has several nonparsimonious elements that our present model does not.

Is competence a fundamental dimension?

Has competence been a primary and fundamental social cognitive dimension throughout humans' existence? If this were the case, humans should have a "competence-detection mechanism," and there should be high consensus regarding who looks competent. However, this is not the case. In judging others from their appearance, competence has one of the lowest degrees of consensus across raters (Hehman, Sutherland, Flake, & Slepian, 2017). In a comprehensive study of 700,000 trait ratings from faces (from 7,000 participants rating 3,000 stimuli), people reached the lowest degrees of consensus in rating faces on creativity, intelligence, and competence, whereas gender judgments had the highest degrees of correspondence (Hehman et al., 2017). When people reach consensus on judgments of competence, they do so by using cues that are confounded with masculinity (i.e., masculine facial features make a face appear more competent; Oh, Buck, & Todorov, 2019).

In addition, a large body of research has clarified that the meaning of competence can shift dramatically with context. Competence can mean anything from "clever," to "creative," to "foresighted," to "efficient," among others (Fiske et al., 2007, p. 77). These markers of competence vary widely on the basis of context (and judgments of these traits show the least consensus; Hehman et al., 2017). We suggest that this explains why there is no clear marker for a competent-looking face; one must understand the context before being able to judge whether a person is competent (e.g., analytical skills, fighting ability; see Hehman, Flake, & Freeman, 2015; Oh et al., 2019). In contrast, people reach very high levels of consensus on which faces look dominant (the agency trait adjective studied extensively in face research; Todorov, Olivola, Dotsch, & Mende-Siedlecki, 2015). Yet this particular facial appearance is confounded with masculinity; it is impossible to increase the perceived dominance of a face without increasing its perceived masculinity (Oosterhof & Todorov, 2008; Todorov et al., 2015; Todorov & Oosterhof, 2011). The two go hand in hand.

Finally, we look to human development to see which dimensions are used earlier in the life span. Although children as young as 6 months have an early sense of friend and foe based on what is familiar and unfamiliar (Hamlin, Wynn, & Bloom, 2007), a notion of competence does not develop until much later (not until age 6 years can children separate competence from warmth; see Roussos & Dunham, 2016). In contrast, by 3 years, children believe that boys are more aggressive (i.e., agentic) than girls (Giles & Heyman, 2005), and far earlier in development (as young as 3 months), children recognize the difference between male and female (C. L. Martin & Ruble, 2010; Quinn et al., 2002).

Should competence be seen as a fundamental Big Two dimension? Conceptions of competence vary according to the demands of the environment and thus easily shift depending on the goals that become valued. We argue that competence is fundamental only to the extent that it is conflated with masculinity, dominance, and the agentic goals that have previously been needed and valued in the course of human evolution (Wood & Eagly, 2012). If competence were truly a fundamental dimension, it should be detected early in development and across contexts, and it should be perceived across individuals with a relatively high degree of consensus. However, this does seem to be not the case, which makes the fundamental nature of competence as a trait judgment questionable.

In contrast, the two dimensions we propose are clearly represented in sexual dimorphism and gender roles, which can be directly observed. People can easily detect males with ease (angular facial features, broad shoulders) as well as females (round facial features, wide hips), and this does not vary with context, time, or culture. The larger size of males and the ability for only females to carry a child to birth correspond directly to the different adaptive problems each sex has responded to throughout millennia. These differences have clearly developed into gender roles. Agency maps onto the masculine gender role and communality onto the feminine gender role, which can be observed in recorded history and today.

At this point, whether one is convinced that a particular subdiscipline's Big Two is due to a functional account of gender, it is impossible not to note the vast number of Big Twos that exist throughout the field and their similarities and overlap with gender. We have outlined a new theory for this convergence, one that parallels sexual dimorphism, gender roles, and gender stereotypes as well as the basic social and perceptual evidence that gender is a primary social category. We

suggest that alternate theories for the origin of the Big Two should not just point to two dimensions and explain why they are primary; they also must explain why there are specifically two dimensions, no fewer and no more. We suggest that our discussions outlined above situate the present theory as one that best achieves these requirements and welcome future inquiries into these suggestions.

Before moving onto implications of this model for modern gender dynamics as well as novel predictions, we briefly speculate on the implications of a gendered cognition for psychological science. Psychologists—who have discovered the Big Two, time and time again—are humans who ask questions, create theories, and design studies using their own schemas to organize and understand their social realities. If people are adapted and accustomed to seeing, at the most basic level, two kinds of people (men and women), then social science could be bound in this process. We suggest that it is abundantly clear that people carve humanity into two kinds of people. For this very reason, it may be that social science arrives at the conclusion that there are two basic kinds of social dimensions: dimensions that happen to overlap with gender.

Recently, Hyde, Bigler, Joel, Tate, and van Anders (2019) noted several implications of the gender binary that have permeated multiple domains of psychology. They outlined the implications of a binary understanding of men and women and noted the far-reaching consequences (e.g., psychological well-being, health) for men, women, and gender-nonconforming individuals. We can take this one step further; perhaps the gender binary has affected not only researchers' understanding of human beings but also the ways in which they understand and bifurcate all (human) psychological phenomena (e.g., culture, morality, and motivation; see Fotion, 1968; Gray & Wegner, 2009; Markus & Kitayama, 1991). If the social lens through which people see the world is one based on a two-dimensional space founded on the gender binary, then this might explain not only the bifurcations that are used across psychology but also the dualisms that are seen across human thinking more generally (e.g., yin and yang, opposites; see Chan, 2000; Lovibond, 1994).

Moving Beyond Men and Women: The Implications of a Gendered Social Cognition

Although the Big Two can explain person perception across many social groups (e.g., age, race, disability, socioeconomic status), gender is inextricably linked to the Big Two in a way that cannot be said of any other social category. Although the Big Two explain stereotypes about social categories, gender is the only social category that seems to explain the nature of the Big Two. This makes gender integral to social cognition. We thus argue below that if the Big Two dimensions structure social cognition and the gender schema underlies this Big Two, then taken to its logical extension, social cognition could be said to reflect a gender schema that is applied widely and broadly even when gender is seemingly irrelevant.

The breadth of the gender schema

Drawing the parallel between gender and the Big Two provides the basis for a new theory about the functional origins of the two primary dimensions of social judgments, as well as the processes by which people make social judgments and organize complex patterns of social associations through schemas. Schemas and their underlying network of associations facilitate the encoding, processing, and recall of information (Schank & Abelson, 1977; Taylor & Crocker, 1981). Through a schema, individuals can identify stimuli quickly, fill in missing information, simplify overly complex information, and make judgments along schema-relevant dimensions (Neisser, 1976; Taylor & Crocker, 1981). As noted above, because of its primacy and applicability, gender has been found to be a primary schema through which people process information (Bem, 1981; Markus, Crane, Bernstein, & Siladi, 1982; Starr & Zurbriggen, 2017). For instance, Bem (1981) found that people used the masculinity and femininity of nonhuman stimuli to categorize and remember information. Markus and colleagues (1982) found that people better remember gender-related words, compared with neutral words, suggesting that gendered terms are distinctive and meaningful. And in many cases, people process gendered language (e.g., *he, she*) more quickly than nongendered language (e.g., *they*; Foertsch & Gernsbacher, 1997).

Given that the world people populate and navigate is a social world, the gender schema might be accessible across diverse contexts, even those in which gender is irrelevant. For instance, children are likely to identify nonhuman entities such as toys, subjects, colors, and books by their gendered cues (Auster & Mansbach, 2012; Bem, 1993; Levy & Haaf, 1994). If such behavior feels childish, it must be stated that it is anything but. Even adults cannot help but see *butterfly* as feminine and *eagle* as masculine (Bem, 1981) when of course such a notion is biologically absurd. That people's notions of human gender extend so far out as to influence judgments of nongendered entities (e.g.,

classifying a thunderstorm as male, a pear as female; Martin & Slepian, 2018) suggests that the gender schema itself is quite broad. Along these lines, given the conceptual associations people have of men (e.g., tall, strong) and women (e.g., curvy, tender), people can effortlessly categorize numbers (Wilkie & Bodenhausen, 2012), species (e.g., eagle, butterfly; Bem, 1981), sounds (Slepian & Galinsky, 2016), touch (Slepian, Weisbuch, Rule, & Ambady, 2011), shapes (Stroessner et al., 2020), and even color (Semin & Palma, 2014) by gender.

People can even gender races (Galinsky, Hall, & Cuddy, 2013; Hall, Galinsky, & Phillips, 2015; Johnson, Freeman, & Pauker, 2012). That is, African Americans are seen as more "masculine" because of their association with dominance and aggressiveness, and Asians are seen as more "feminine" because of their association with passivity and collectivism (Johnson et al., 2012). Yet the converse is not the case: People do not ascribe race to genders; hence, we see gender as more primary. Thus, similar to the ability of the Big Two to provide dimensions through which one understands stereotypes about social categories, gender provides a similar model to organize the content of not only male/female social categories but also other social and nonsocial categories as well.

It is important to note that we do not mean to suggest that the gender schema is invariable across all human beings, only the distinction between male and female. There are sure to be individual differences in the content, activation, and network of one's gender schema that are based on multiple factors, such as biological sex, relevance to the self, and culture (see Boroditsky, Schmidt, & Phillips, 2003; Markus et al., 1982; Markus & Oyserman, 1989). Across these individual differences, however, we argue that the underlying organization of one's social reality is constructed around two dimensions and that the content of these two dimensions distinguishes what is historically masculine from what is historically feminine.

Above we presented data speaking to the primacy of the gender schema. When any feature of gender is available, people cannot help but note gender category membership. Even without any other information or an overriding goal, people will automatically seek to categorize someone by gender, which explains the discomfort people experience when they are unable to identify another's gender. We also spoke to the breadth of this schema, a network of associations including gendered occupations, activities, colors, foods, drinks, and hobbies as well as desires, inclinations, predispositions, and personality traits (Martin & Slepian, 2018). The gender schema covers so many attributes that numbers, sounds, and species can also be categorized as masculine or feminine (Bem, 1981; Slepian & Galinsky, 2016; Wilkie & Bodenhausen, 2012). And hence, people apply the gender schema broadly.

The implications of a gendered cognition

One implication of a gendered cognition becomes the inability of humans to disentangle elements of the Big Two from gender. The tight and inextricable link between masculinity and femininity and men and women makes gender inequality particularly challenging to combat through degendering or gender neutrality. Many proponents of equality have pushed toward degendering (see Lorber, 2000; Martin & Phillips, 2017, 2019), which suggests that placing emphasis on gender further reifies role distinctions between men and women and assigns them with different psychological qualities that are unequally valued in the modern world (Heilman, 2001). Because masculine (i.e., agentic) characteristics are highly valued in domains of power and prestige, associating men with masculinity ascribes greater value and status to men and penalizes women when engaging in the same behaviors that help men become successful (Rudman & Phelan, 2008). Thus, associating masculinity/agency with men and femininity/communality with women reifies and reinforces the gender roles that limit women's opportunities, as well as men's.

As a consequence, gender psychologists and feminist scholars have argued that one should minimize gender when evaluating agency and communality in all people. However, prior efforts to degender have come up short. Some parents have tried to practice gender-neutral parenting (Compton, 2018; Thompson, 2017), but with exposure to the outer world, this is almost always bound to fail. The push to develop oneself in terms of gender is a powerful force, and from the earliest theories of "the self," it is clear that the self develops according to gender (Bem, 1983; Freud, 1925; Mischel, 1970), which allows children to make sense of themselves and connect to others around them. Even individuals who reject traditional gender identities still form their identity compared with and juxtaposed against gender-schematic identities (Bem, 2001). It unfortunately cannot be ignored that all people largely come in two forms (male or female), and many people would struggle with the idea of a genderless human. Indeed, individuals face anxiety when confronted with an individual they cannot identify on the basis of gender (West & Zimmerman, 1987) and are more likely to stigmatize individuals who are gender-nonconforming (Lloyd, 2005).

The bifurcation of entities by gender has implications for the groups and other entities that people gender. For example, the gendering of races has implications for racial equality. Seeing Black targets as more masculine

(i.e., agentic) and Asian targets as more feminine (i.e., communal) has implications for the stereotypes and opportunities people associate with and give certain racial groups. That is, seeing Black targets as more masculine evokes threat, and seeing Asian targets as more feminine evokes expectations of submission or deference (Hall et al., 2015). Likewise, seeing cooperation as feminine and competition as masculine has implications for the propensity for leaders, groups, and nations to enact these behaviors or implement such organizational structures (Rosette, Mueller, & Lebel, 2015). Furthermore, that people process gender congruence more rapidly and effortlessly than gender incongruence (Foertsch & Gernsbacher, 1997) holds implications for the way in which nonhuman entities are presented and marketed. That is, gendered features (e.g., rough, soft) are used to market to male and female consumers. It is no coincidence that virtual assistants use female voices or that science, technology, engineering, and mathematics (STEM) toys use male mascots, which can encourage boys and girls toward developing different skills and choosing different occupations (Sherman & Zurbriggen, 2014). Thus, gendered cognition affects not only the way one sees and evaluates people but also one's goals, professions, and life course.

The evidence cited above suggests that people cannot escape gender in the structure of self-perception and social perception. Hence, a gendered cognition makes interventions that seek to minimize gender-based inequities difficult, with potential to backfire. Yet the current theory suggests another path. Instead of seeking to override the gender schema, below, we list several interventions that work with the gender schema, rather than against it, to combat inequality.

Novel Predictions

If the primary dimensions people use to think about their social world are reflections of the entrenched gender roles that bifurcate that social world into masculine/agentic and feminine/communal, then this suggests a number of novel interventions to reduce gender stereotyping.

Dehumanizing gender

Gender is clearly an important lens in understanding people and seems unlikely to go away, which explains why interventions that seek to degender humans have not been successful (Bem, 1993; Lorber, 2000). However, if the space of human behavior can be clustered along these two gendered dimensions, then if one can dehumanize a given trait, then consequently, it should be less tethered to gender. For instance, recall that people can categorize nonhuman entities (e.g., numbers, species, sounds) by gender. Although this reflects the breadth of the gender schema, recent research has demonstrated that this process can be leveraged to reduce gender stereotyping (Martin & Slepian, 2018). The process of having participants engage in classifying a series of human-abstracted entities (i.e., those with no real connection to men and women) as male or female highlighted the abstractness and seemingly illogical but widespread application of gendered qualities and how notions of masculinity and femininity extend beyond biology. Showing people that what is considered masculine and feminine can actually apply beyond people led to a reduction in biological (i.e., essential) attributions for gender differences and thereby reduced gender stereotyping.

Humanizing the degendered

Another novel prediction that follows from this idea is that a person without a gender may feel not just confusing to some (Stern & Rule, 2017; West & Zimmerman, 1987) but may even evoke dehumanization (Lloyd, 2005). That is, if agency and communality (i.e., masculinity and femininity) represent the fundamental components people use to process and understand human life (Abele et al., 2008), then those who are not easily assigned a gender should be less likely to be imbued with human characteristics (i.e., dehumanized), which may explain the increased prejudice toward and discrimination against transgender individuals (Lloyd, 2005; Norton & Herek, 2013). As a consequence, imbuing and assigning nongendered individuals with gendered qualities (e.g., warmth or agency) may decrease dehumanization. Reciprocally, we would predict that gendering is implicated in the process of anthropomorphism (i.e., the attribution of uniquely human characteristics to a nonhuman entity; Epley, Waytz, & Cacioppo, 2007). If gender provides the foundation for a schema people use to understand individuals they encounter, then to humanize might inevitably be to gender. Indeed, recent research has found that gender, more than any other social category (e.g., race, age, sexual orientation), is implicated in the process of anthropomorphism and attachment (Martin & Mason, 2020; see also Stroessner & Benitez, 2018). That is, the more people see their cars, electronics, or house plants as being like people, the more these objects seem like a "she" or a "he," shaping people's liking and attachment toward their products.

Regendering

Given that gender inequality is primarily driven by the congruence between men and high-status occupations

and skills (requiring agency/masculinity), one intervention that could prove useful would be to highlight different gendered aspects of high-status occupations/skills. As one example, STEM is seen as a masculine occupation because of its association with agency (independence, problem solving); however, when highlighting different elements of STEM skills, such as relationality and creativity, women are more likely to show interest (Cheryan, Master, & Meltzoff, 2015; Diekman, Clark, Johnston, Brown, & Steinberg, 2011). Thus, highlighting different aspects of a target (an object, a profession) may minimize the current links among gender and the occupations, skills, and hobbies men and women pursue.

We note one more intervention that follows from our theory. Given that people identify qualities such as assertive and competitive as "masculine," women are less likely to identify with these traits and therefore feel less comfortable enacting these behaviors (Rudman & Phelan, 2008). Problematically, these behaviors are the very ones rewarded in workplace contexts, which limits women's chances for leadership success. By simply relabeling these behaviors as *agentic* (a Big Two gender-neutral label) rather than *masculine*, as people tend to do, women become equally likely to identify with these traits and feel more confident taking action in workplace contexts (Martin & Phillips, 2018). Rather than trying to degender people, given the knowledge of the overlap between the Big Two and gender, people may be able to degender behaviors and actions, which is necessary to combat inequality.

Beyond Binary: The Future of Gendered Cognition and the Big Two

Although our current theory rests on the importance of biological sex and gendered social roles for the continuation of the human species, note that evolution is far from stagnant and that gender roles are not fixed. For example, the advances in contraception and reproductive technology may change the importance people place on having two sexes and as a consequence, the ways in which people dichotomize and polarize gender distinctions. Furthermore, major shifts in men and women's social roles are beginning to change typical social arrangements (Cejka & Eagly, 1999; Diekman & Eagly, 2000). Given these changes, there may also be a shift in the ways in which the Big Two is conceptualized altogether. That is, the characteristics themselves may shift as these roles shift. Indeed, although many stereotypes about men and women's agency and communality have not changed significantly over time (Haines, Deaux, & Lofaro, 2016), women's movement into higher education has changed stereotypes about women's competence and overall intelligence (Eagly et al., 2020). It may be no coincidence that these shifts align with a rapid increase in women's workforce participation and the changing stereotypes that accompanied that shift (Diekman & Eagly, 2000).

Perhaps as gender roles change, so will the factor structure of the Big Two. Indeed, there has been a rise and change in gender categorizations, with multiple identities and expressions, which may change the need for a two-dimensional model altogether. Gendered cognition is not an inevitability but a product of humans' evolutionary history; this reliance on gender is a product of the past, but the future is bright. Recognizing the gender schema on which human cognition relies gives people the power to change it.

Conclusion

Across disciplines, the Big Two—which can take on labels that diverge with subtle distinctions—all converge on their gendered content, in which one dimension (agency/competence) maps onto the traditional male role and the other (communality/warmth) maps onto the traditional female role. This gender role bifurcation has evolved for human survival both in biological necessity (procreation) and gender role functionality (division of labor). The network of associations people have for what is masculine and what is feminine (i.e., the gender schema) is a primary lens through which they understand the social world around them, being the first feature they notice about another person (without having other information on hand or some specific goal in mind). From learning another person's gender, a broad set of interrelated traits, assumptions, and expectations come to mind.

Evaluating people along dimensions that align with these two different historical—but fundamental—social roles surely brought benefits when those roles were necessary for human survival. Today, likewise, when evaluating others, it is useful to do so along these two dimensions: to what extent will this person have socially oriented goals and to what extent will they have individually oriented goals. Both are of value, such as the adherence to moral norms inherent to the first dimensions and the self-expansion, growth, and independence inherent to the second dimension. We argue that the reason dimension reduction of so many diverse traits and person attributes consistently falls back onto two dimensions (i.e., the Big Two) is because a more basic schema already sees people as being of two kinds (male and female) and organizes diverse traits into two functional and efficient clusters, *masculine* and *feminine*.

Noting that the Big Two reflects the two broad and interdependent historical roles of humans throughout

millennia (i.e., male and female) not only parsimoniously explains why the ways in which individuals think about people just so happen to converge on two dimensions that have high overlap with what is masculine and feminine, but it also leads to a number of novel predictions aimed at seeking to reduce the tendency to see people through these gender stereotypes. A tight link between masculine and agency and feminine and communality brings problematic social inequities; yet to recognize one's tendency to bifurcate the social world along these lines gives one the power to combat them.

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Notes

1. Many people rightly argue that the language used around gender is important (e.g., *sex* to refer to biological categories and *gender* for identity). We agree and seek to maintain this distinction but also do use discipline-specific language for consistency with various literatures, which can occasionally use the word *gender*, whereas others might use the word *sex*. We also highlight that we agree with modern notions of the fluidity of gender and its nonbinary nature but also note that the entrenched gender schema today is still a binary one. Gender roles—even though they are less in force today than in the past—still very much exist and reinforce an intuitive binary view of gender.
2. It is important to emphasize that a social group may be perceived quite differently from an individual. Indeed, within the domain of group perception, a recent model suggests that two dimensions—specifically, groups' perceived ideological beliefs and agency—are shifted from warmth and competence (as predicted by SCM; see the earlier section Trait Space as a Metaphor; Koch, Imhoff, Dotsch, Unkelbach, & Alves, 2016). Follow-up work finds that an individual's perceived similarity to a group along these two dimensions determines the perceived communality/warmth of the group (Koch et al., 2020). Future work should more closely examine how models of person perception relate to models of group perception (and where they differ; cf. Phillips, Slepian, & Hughes, 2018), as well as explore the possibility that additional important dimensions emerge as a function of the Big Two dimensions.

References

Abele, A. E. (2003). The dynamics of masculine-agentic and feminine-communal traits: Findings from a prospective study. *Journal of Personality and Social Psychology*, *85*, 768–776.
Abele, A. E., Cuddy, A. J. C., Judd, C. M., & Yzerbyt, V. Y. (2008). Fundamental dimensions of social judgment. *European Journal of Social Psychology*, *38*, 1063–1065.
Abele, A. E., Hauke, N., Peters, K., Louvet, E., Szymkow, A., & Duan, Y. (2016). Facets of the fundamental content dimensions: Agency with competence and assertiveness—communion with warmth and morality. *Frontiers in Psychology*, *7*, Article 1810. doi:10.3389/fpsyg.2016.01810
Abele, A. E., & Wojciszke, B. (2007). Agency and communion from the perspective of self versus others. *Journal of Personality and Social Psychology*, *93*, 751–763.
Auster, C. J., & Mansbach, C. S. (2012). The gender marketing of toys: An analysis of color and type of toy on the Disney Store website. *Sex Roles*, *67*, 375–388.
Bakan, D. (1966). *The duality of human existence*. Chicago, IL: Rand McNally.
Baldwin, D. A., & Moses, L. J. (1996). The ontogeny of social information gathering. *Child Development*, *67*, 1915–1939.
Bales, R. F. (1950). *Interaction process analysis; a method for the study of small groups*. Oxford, England: Addison-Wesley.
Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, *42*, 155–162.
Bem, S. L. (1981). Gender schema theory: A cognitive account of sex typing. *Psychological Review*, *88*, 354–364.
Bem, S. L. (1983). Gender schema theory and its implications for child development: Raising Ge##nder-aschematic children in a gender-schematic society. *Signs: Journal of Women in Culture and Society*, *8*, 598–616.
Bem, S. L. (1993). *The lenses of gender: Transforming the debate on sexual inequality*. New Haven, CT: Yale University Press.
Bem, S. L. (2001). *An unconventional family*. New Haven, CT: Yale University Press.
Bem, S. L., & Lenney, E. (1976). Sex typing and the avoidance of cross-sex behavior. *Journal of Personality and Social Psychology*, *33*, 48–54.
Bodenhausen, G. V., & Hugenberg, K. (2009). Attention, perception, and social cognition. In F. Strack & J. Förster (Eds.), *Social cognition: The basis of human interaction* (pp. 1–22). New York, NY: Psychology Press.
Bodenhausen, G. V., & Morales, J. R. (2013). Social cognition and perception. In I. Weiner (Ed.), *Handbook of psychology* (2nd ed., Vol. 5, pp. 225–246). Hoboken, NJ: Wiley.
Boroditsky, L., Schmidt, L., & Phillips, W. (2003). Sex, syntax, and semantics. In D. Gentner & S. Goldin-Meadow (Ed.), *Language in mind: Advances in the study of language and cognition* (pp. 61–80). Cambridge, MA: MIT Press.
Bowlby, J. (1969). *Attachment and loss*. London, England: The Hogarth Press.
Bruckmüller, S., & Abele, A. E. (2013). The density of the Big Two. *Social Psychology*, *44*, 63–74.

Buss, D. M. (1991). Evolutionary personality psychology. *Annual Review of Psychology*, *42*, 459–491.

Buss, D. M. (2015). *Evolutionary psychology: The new science of the mind* (5th ed.). New York, NY: Taylor & Francis.

Cejka, M., & Eagly, A. H. (1999). Gender-stereotypic images of occupations correspond to the sex segregation of employment. *Personality and Social Psychology Bulletin*, *25*, 413–423.

Chan, S. Y. (2000). Gender and relationship roles in the analects and the mencius. *Asian Philosophy*, *10*, 115–132.

Cheryan, S., Master, A., & Meltzoff, A. N. (2015). Cultural stereotypes as gatekeepers: Increasing girls' interest in computer science and engineering by diversifying stereotypes. *Frontiers in Psychology*, *6*, Article 49. doi:10.3389/fpsyg.2015.00049

Compton, J. (2018, July 19). 'Boy or girl?' Parents raising 'theybies' let kids decide. *NBC News*. Retrieved from https://www.nbcnews.com/feature/nbc-out/boy-or-girl-parents-raising-theybies-let-kids-decide-n891836

Constantinople, A. (1973). Masculinity-femininity: An exception to a famous dictum? *Psychological Bulletin*, *80*, 389–407.

Critcher, C. R., & Ferguson, M. J. (2014). The cost of keeping it hidden: Decomposing concealment reveals what makes it depleting. *Journal of Experimental Psychology: General*, *143*, 721–735.

DeCasper, A. J., & Fifer, W. P. (1980). Of human bonding: Newborns prefer their mothers' voices. *Science*, *208*, 1174–1176.

DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2002). Higher-order factors of the Big Five predict conformity: Are there neuroses of health? *Personality and Individual Differences*, *33*, 533–552.

Diehl, M., Owen, S. K., & Youngblade, L. M. (2004). Agency and communion attributes in adults' spontaneous self-representations. *International Journal of Behavioral Development*, *28*, 1–15.

Diekman, A. B., Clark, E. K., Johnston, A. M., Brown, E., & Steinberg, M. (2011). Malleability in communal goals and beliefs influences attraction to stem careers: Evidence for a goal congruity perspective. *Journal of Personality and Social Psychology*, *101*, 902–918.

Diekman, A. B., & Eagly, A. H. (2000). Stereotypes as dynamic constructs: Women and men of the past, present, and future. *Personality and Social Psychology Bulletin*, *26*, 1171–1188.

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology*, *73*, 1246–1256.

Eagly, A. H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Erlbaum.

Eagly, A. H. (1997). Sex differences in social behavior: Comparing social role theory and evolutionary psychology. *American Psychologist*, *52*, 1380–1383.

Eagly, A. H., Nater, C., Miller, D. I., Kaufmann, M., & Sczesny, S. (2020). Gender stereotypes have changed: A cross-temporal meta-analysis of U.S. public opinion polls from 1946 to 2018. *American Psychologist*, *75*(3), 301–315.

Ellemers, N. (2018). Gender stereotypes. *Annual Review of Psychology*, *69*, 275–298.

Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, *114*, 864–886.

Fiske, S. T. (2018). Stereotype content: Warmth and competence endure. *Current Directions in Psychological Science*, *27*, 67–73.

Fiske, S. T., Cuddy, A. J. C., & Glick, P. (2007). Universal dimensions of social cognition: Warmth and competence. *Trends in Cognitive Sciences*, *11*, 77–83.

Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, *82*, 878–902.

Foa, U. G. (1961). Convergences in the analysis of the structure of interpersonal behavior. *Psychological Review*, *68*, 341–353.

Foertsch, J., & Gernsbacher, M. A. (1997). In search of gender neutrality: Is singular they a cognitively efficient substitute for generic he? *Psychological Science*, *8*, 106–111.

Fotion, N. (1968). *Moral situations*. Yellow Springs, OH: Antioch Press.

Fournier, M. A., Moskowitz, D. S., & Zuroff, D. C. (2011). Origins and applications of the interpersonal circumplex. In L. M. Horowitz & S. Strack (Eds.), *Handbook of interpersonal psychology: Theory, research, assessment, and therapeutic interventions* (pp. 57–73). Hoboken, NJ: Wiley.

Freud, S. F. (1925). Some psychological consequences of the anatomical differences between the sexes. *Standard Edition*, *19*, 248–258.

Galinsky, A. D., Hall, E. V., & Cuddy, A. J. C. (2013). Gendered races: For interracial marriage, leadership selection, and athletic participation. *Psychological Science*, *24*, 498–506.

Gelman, S. A. (2004). Psychological essentialism in children. *Trends in Cognitive Sciences*, *8*, 404–409.

Giles, J. W., & Heyman, G. D. (2005). Young children's beliefs about the relationship between gender and aggressive behavior. *Child Development*, *76*, 107–121.

Gray, K., & Wegner, D. M. (2009). Moral typecasting: Divergent perceptions of moral agents and moral patients. *Journal of Personality and Social Psychology*, *96*, 505–520.

Haig, D. (2004). The inexorable rise of gender and the decline of sex: Social change in academic titles, 1945–2001. *Archives of Sexual Behavior*, *33*, 87–96.

Haines, E. L., Deaux, K., & Lofaro, N. (2016). The times they are a-changing . . . or are they not? A comparison of gender stereotypes, 1983–2014. *Psychology of Women Quarterly*, *40*, 353–363.

Hall, E. V., Galinsky, A. D., & Phillips, K. W. (2015). Gender profiling: A gendered race perspective on person–position fit. *Personality and Social Psychology Bulletin*, *41*, 853–868.

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature*, *450*, 557–559.

Hehman, E., Flake, J. K., & Freeman, J. B. (2015). Static and dynamic facial cues differentially affect the consistency of social evaluations. *Personality and Social Psychology Bulletin*, *41*, 1123–1134.

Hehman, E., Sutherland, C. A., Flake, J. K., & Slepian, M. L. (2017). The unique contributions of perceiver and target characteristics in person perception. *Journal of Personality and Social Psychology*, *113*, 513–529.

Heilman, M. E. (2001). Description and prescription: How gender stereotypes prevent women's ascent up the organizational ladder. *Journal of Social Issues*, *57*, 657–674.

Heilman, M. E., & Eagly, A. H. (2008). Gender stereotypes are alive, well, and busy producing workplace discrimination. *Industrial and Organizational Psychology*, *1*, 393–398.

Hyde, J. S., Bigler, R. S., Joel, D., Tate, C. C., & van Anders, S. M. (2019). The future of sex and gender in psychology: Five challenges to the gender binary. *American Psychologist*, *74*, 171–193.

James, W. (1907). *Pragmatism: A new name for some old philosophy, old ways of thinking: Popular lectures on philosophy*. New York, NY: Longmans, Green.

Johnson, K. L., Freeman, J. B., & Pauker, K. (2012). Race is gendered: How covarying phenotypes and stereotypes bias sex categorization. *Journal of Personality and Social Psychology*, *102*, 116–131.

Kenrick, D. T., & Luce, C. L. (2000). An evolutionary life-history model of gender differences and similarities. In T. Eckes & H. M. Trautner (Eds.), *The developmental social psychology of gender* (pp. 35–63). Mahwah, NJ: Erlbaum.

Kervyn, N., Fiske, S. T., & Yzerbyt, V. Y. (2013). Integrating the stereotype content model (warmth and competence) and the Osgood semantic differential (evaluation, potency, and activity). *European Journal of Social Psychology*, *43*, 673–681.

Koch, A., Imhoff, R., Dotsch, R., Unkelbach, C., & Alves, H. (2016). The ABC of stereotypes about groups: Agency/socioeconomic success, conservative–progressive beliefs, and communion. *Journal of Personality and Social Psychology*, *110*, 675–709.

Leary, T. (1957). *Interpersonal diagnosis of personality*. New York, NY: Ronald Press.

Levy, G. D., & Haaf, R. A. (1994). Detection of gender-related categories by 10-month-old infants. *Infant Behavior and Development*, *1*, 7457–7459.

Lippa, R. A. (2001). On deconstructing and reconstructing masculinity–femininity. *Journal of Research in Personality*, *35*, 168–207.

Lloyd, A. W. (2005). Defining the human: Are transgender people strangers to the law. *Berkeley Journal of Gender, Law & Justice*, *20*, 150–195.

Lorber, J. (2000). Using gender to undo gender: A feminist degendering movement. *Feminist Theory*, *1*, 79–95.

Lovibond, S. (1994). An ancient theory of gender: Plato and the Pythagorean table. In L. J. Archer, S. Fischler, & M. Wyke (Eds.), *Women in ancient societies* (pp. 88–101). London, England: Palgrave Macmillan.

Maccoby, E., & Jacklin, C. (1974). *The psychology of sex differences*. Stanford, CA: Stanford University Press.

Mackie, D. M., Hamilton, D. L., Susskind, J., & Rosselli, F. (1996). Social psychological foundations of stereotype formations. In C. N. Macrae, C. Stangor, & M. Hewstone (Eds.), *Stereotypes and stereotyping* (pp. 41–78). New York, NY: Guilford Press.

Markus, H., Crane, M., Bernstein, S., & Siladi, M. (1982). Self-schemas and gender. *Journal of Personality and Social Psychology*, *42*, 38–50.

Markus, H., & Oyserman, D. (1989). Gender and thought: The role of the self-concept. In M. Crawford & M. Hamilton (Eds.), *Gender and thought: Psychological perspectives* (pp. 100–127). New York, NY: Springer.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224–253.

Martin, A. E., & Mason, M. F. (2020). *Gender is essential in seeing human* (Working paper). Stanford, CA: Stanford University.

Martin, A. E., & Phillips, K. W. (2017). What "blindness" to gender differences helps women see and do: Implications for confidence, agency, and action in male-dominated environments. *Organizational Behavior and Human Decision Processes*, *142*, 28–44.

Martin, A. E., & Phillips, K. W. (2018). Power of a label: When masculinity is replaced with agency women feel more confident and take more action. *Academy of Management Proceedings*, *2018*, Article 15534.

Martin, A. E., & Phillips, K. W. (2019). Blind to bias: The benefits of gender-blindness for STEM stereotyping. *Journal of Experimental Social Psychology*, *82*, 294–306.

Martin, A. E., & Slepian, M. L. (2017). The "Big Two." In V. Zeigler-Hill & T. Shackelford (Ed.), *Encyclopedia of personality and individual differences* (pp. 1–4). New York, NY: Springer.

Martin, A. E., & Slepian, M. L. (2018). Dehumanizing gender: The debiasing effects of gendering human-abstracted entities. *Personality and Social Psychology Bulletin*, *44*, 1681–1696.

Martin, C. L., & Ruble, D. N. (2004). Children's search for gender cues: Cognitive perspectives on gender development. *Current Directions in Psychological Science*, *13*, 67–70.

Martin, C. L., & Ruble, D. N. (2010). Patterns of gender development. *Annual Review of Psychology*, *61*, 353–381.

Miller, C. L. (1983). Developmental changes in male/female voice classification by infants. *Infant Behavior and Development*, *6*, 313–330.

Mischel, W. (1970). Sex-typing and socialization. In P. H. Mussen (Ed.), *Carmichael's manual of child psychology* (pp. 3–72). New York, NY: Wiley.

Montague, D. P. F., & Walker-Andrews, A. S. (2002). Mothers, fathers, and infants: The role of person familiarity and parental involvement in infants' perception of emotion expressions. *Child Development*, *73*, 1339–1352.

Moskowitz, D. S. (1994). Cross-situational generality and the interpersonal circumplex. *Journal of Personality and Social Psychology*, *66*, 921–933.

Neisser, U. (1976). *Cognition and reality: Principles and implications of cognitive psychology*. New York, NY: WH Freeman.

Norton, A. T., & Herek, G. M. (2013). Heterosexuals' attitudes toward transgender people: Findings from a national probability sample of US adults. *Sex Roles*, *68*, 738–753.

Oh, D., Buck, E. A., & Todorov, A. (2019). Revealing hidden gender biases in competence impressions of faces. *Psychological Science*, *30*, 65–79.

O'Neill, O. A., & O'Reilly, I. (2011). Reducing the backlash effect: Self-monitoring and women's promotions. *Journal of Occupational and Organizational Psychology*, *84*, 825–832.

Oosterhof, N. N., & Todorov, A. (2008). The functional basis of face evaluation. *Proceedings of the National Academy of Sciences, USA*, *105*, 11087–11092.

Parsons, T., & Bales, R. (1955). *Family socialization and interaction process*. Glencoe, IL: Free Press.

Peeters, G. (1983). Relational and informational patterns in social cognition everyday conditional reasoning: A comprehensive account. In W. Doise & S. Mosocivici (Eds.), *Current issues in European social psychology* (pp. 201–237). Cambridge, England: Cambridge University Press.

Phillips, L. T., Slepian, M. L., & Hughes, B. L. (2018). Perceiving groups: The people perception of diversity and hierarchy. *Journal of Personality and Social Psychology*, *114*(5), 766–785.

Pincus, A. L., & Ansell, E. B. (2003). Interpersonal theory of personality. In T. Millon & M. J. Lerner (Eds.), *Handbook of psychology: Personality and social psychology* (Vol. 5, pp. 209–229). New York, NY: Wiley.

Quinn, P. C., Yahr, J., Kuhn, A., Slater, A. M., & Pascalis, O. (2002). Representation of the gender of human faces by infants: A preference for female. *Perception*, *31*, 1109–1121.

Rosenberg, S., Nelson, C., & Vivekananthan, P. (1968). A multidimensional approach to the structure of personality impressions. *Journal of Personality and Social Psychology*, *9*, 283–294.

Rosette, A. S., Mueller, J. S., & Lebel, R. D. (2015). Are male leaders penalized for seeking help? The influence of gender and asking behaviors on competence perceptions. *The Leadership Quarterly*, *26*, 749–762.

Roussos, G., & Dunham, Y. (2016). The development of stereotype content: The use of warmth and competence in assessing social groups. *Journal of Experimental Child Psychology*, *141*, 133–144.

Rucker, D. D., Galinsky, A. D., & Magee, J. C. (2018). The agentic–communal model of advantage and disadvantage: How inequality produces similarities in the psychology of power, social class, gender, and race. In J. Olson (Ed.), *Advances in experimental social psychology* (Vol. 58, pp. 71–125). San Diego, CA: Academic Press.

Rudman, L. A., & Phelan, J. E. (2008). Backlash effects for disconfirming gender stereotypes in organizations. *Research in Organizational Behavior*, *28*, 61–79.

Schank, R. C., & Abelson, R. P. (1977). *Scripts, plans, goals, and understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Erlbaum.

Semin, G. R., & Palma, T. A. (2014). Why the bride wears white: Grounding gender with brightness. *Journal of Consumer Psychology*, *24*, 217–225.

Sherman, A. M., & Zurbriggen, E. L. (2014). "Boys can be anything": Effect of Barbie play on girls' career cognitions. *Sex Roles*, *70*, 195–208.

Slepian, M. L., & Galinsky, A. D. (2016). The voiced pronunciation of initial phonemes predicts the gender of names. *Journal of Personality and Social Psychology*, *110*, 509–527.

Slepian, M. L., Weisbuch, M., Rule, N. O., & Ambady, N. (2011). Tough and tender: Embodied categorization of gender. *Psychological Science*, *22*, 26–28.

Spence, J. T., & Helmreich, R. L. (1980). Masculine instrumentality and feminine expressiveness: Their relationships with sex role attitudes and behaviors. *Psychology of Women Quarterly*, *5*, 147–163.

Starr, C. R., & Zurbriggen, E. L. (2017). Sandra Bem's gender schema theory after 34 years: A review of its reach and impact. *Sex Roles*, *76*, 566–578.

Stern, C., & Rule, N. O. (2017). Physical androgyny and categorization difficulty shape political conservatives' attitudes towards transgender people. *Social Psychological & Personality Science*, *9*, 24–31.

Stroessner, S. J., & Benitez, J. (2018). The social perception of humanoid and non-humanoid robots: Effects of gendered and machinelike features. *International Journal of Social Robotics*, *11*, 305–315.

Stroessner, S. J., Benitez, J., Perez, M. A., Wyman, A. B., Carpinella, C. M., & Johnson, K. L. (2020). What's in a shape? Evidence of gender category associations with basic forms. *Journal of Experimental Social Psychology*, *87*, 1–12.

Taylor, S. E., & Crocker, J. (1981). Schematic bases of social information processing. In E. T. Higgins, C. P. Herman, & M. Zanna (Eds.), *Social cognition* (pp. 89–134). Hillsdale, NJ: Erlbaum.

Terman, L. M., & Miles, C. C. (1936). *Sex and personality*. New Haven, CT: Yale University Press.

Thompson, H. (2017, October 30). 10 science-backed tips for bringing up your child gender neutral. *Forbes*. Retrieved from https://www.forbes.com/sites/helenthomson/2017/10/30/10-science-backed-tips-for-bringing-up-your-child-gender-neutral/#42d13c6798b8

Todorov, A., Olivola, C. Y., Dotsch, R., & Mende-Siedlecki, P. (2015). Social attributions from faces: Determinants, consequences, accuracy, and functional significance. *Annual Review of Psychology*, *66*, 519–545.

Todorov, A., & Oosterhof, N. N. (2011). Modeling social perception of faces [social sciences]. *IEEE Signal Processing Magazine*, *28*, 117–122.

Tooby, J., & Cosmides, L. (2005). Evolutionary psychology: Conceptual foundations. In D. M. Buss (Ed.), *Evolutionary psychology handbook* (pp. 5–67). New York, NY: Wiley.

Unger, R. K. (1979). Toward a redefinition of sex and gender. *American Psychologist*, *34*, 1085–1094.

West, C., & Zimmerman, D. H. (1987). Doing gender. *Gender & Society*, *1*, 125–151.

Wiggins, J. S. (1996). An informal history of the interpersonal circumplex tradition. *Journal of Personality Assessment*, *66*, 217–233.

Wilkie, J. E. B., & Bodenhausen, G. V. (2012). Are numbers gendered? *Journal of Experimental Psychology: General*, *141*, 206–210.

Wojciszke, B., Bazinska, R., & Jaworski, M. (1998). On the dominance of moral categories in impression formation. *Personality and Social Psychology Bulletin*, *24*, 1251–1263.

Wood, W., & Eagly, A. H. (2002). A cross-cultural analysis of the behavior of women and men: Implications for the origins of sex differences. *Psychological Bulletin*, *128*, 699–727.

Wood, W., & Eagly, A. H. (2012). Biosocial construction of sex differences and similarities in behavior. In M. Zanna & J. Olson (Eds.), *Advances in experimental social psychology* (Vol. 46, pp. 55–123). San Diego, CA: Academic Press.

Wood, W., & Eagly, A. H. (2015). Two traditions of research on gender identity. *Sex Roles*, *73*, 461–473.

Ybarra, O., Chan, E., Park, H., Burnstein, E., Monin, B., & Stanik, C. (2008). Life's recurring challenges and the fundamental dimensions: An integration and its implications for cultural differences and similarities. *European Journal of Social Psychology*, *38*, 1083–1092.

Younger, B. A., & Fearing, D. D. (1999). Parsing items into separate categories: Developmental change in infant categorization. *Child Development*, *70*, 291–303.

Zurbriggen, E. L., & Sherman, A. M. (2007). Reconsidering 'sex' and 'gender': Two steps forward, one step back. *Feminism & Psychology*, *17*, 475–480.