

Personality and Gender Differences in Global Perspective

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### Abstract

Men's and women's personalities appear to differ in several respects. Social role theories of development assume gender differences result primarily from perceived gender roles, gender socialization, and socio-structural power differentials. As a consequence, social role theorists expect gender differences in personality to be smaller in cultures with more gender egalitarianism. Several large cross-cultural studies have generated sufficient data for evaluating these global personality predictions. Empirically, evidence suggests gender differences in most aspects of personality—Big Five traits, Dark Triad traits, self-esteem, subjective well-being, depression, and values—are conspicuously *larger* in cultures with more egalitarian gender roles, gender socialization, and sociopolitical gender equity. Similar patterns are evident when examining objectively measured attributes such as tested cognitive abilities and physical traits such as height and blood pressure. Social role theory appears inadequate for explaining some of the observed cultural variations in men's and women's personalities. Evolutionary theories regarding ecologically-evoked gender differences are described that may prove more useful in explaining global variation in human personality.

## Personality and Gender Differences in Global Perspective

“That human males and females should have evolved to be psychologically identical...is a theoretical impossibility, and, indeed, turns out to be untrue”

(Vandermassen, 2011, p. 733)

Men's and women's basic personality traits appear to differ, on average, in several respects. For instance, gender differences in characteristics related to negative emotionality (e.g., neuroticism, anxiety, depression, rumination) have been documented across systematic reviews (Ellis, 2011a; Hyde et al., 2008; Russo & Green, 1993), formal meta-analyses (Feingold, 1994; Johnson & Whisman, 2013; Twenge & Nolen-Hoeksema, 2002), and large cross-cultural surveys (Bodas & Ollendick, 2005; Costa et al., 2001; De Bolle et al., 2015; Hopcroft & McLaughlin, 2012; Lynn & Martin, 1997; McCrae et al., 2005; Lippa, 2010). In 2014, Hyde reviewed extant studies of gender differences in personality across a wide variety of psychological traits and concluded moderate to large gender differences are consistently observed in agreeableness, sensation seeking, physical aggression, interests in things versus people, attitudes toward casual sex, and certain sexual behaviors (e.g., masturbation and pornography use). Smaller, but still persistent, gender differences in personality were found for measures of negative affectivity, conscientiousness, gregariousness, reward sensitivity, and self-esteem (see also, Zell, Krizan, & Teeter, 2015).

In contrast to examining personality gender differences a single trait at a time, some researchers have utilized multivariate approaches to quantify the overall degree of gender differentiation within a delimited psychological space. Del Giudice and his colleagues (2012)

documented across 15 traits of Raymond Cattell's personality theory—traits ranging from dominance and liveliness to perfectionism and tension—that overall gender differences in personality are quite large. Within the realm of Cattellian personality space, there is a scant 10% overlap in men's and women's personalities. Similarly, Conroy-Beam et al. (2015) examined gender differences across 18 mate preferences simultaneously and found only 23% overlap in men's and women's overall mate preference distributions. It appears many psychological gender differences, from a multivariate perspective, are actually quite large—larger than they seem when examining one trait at a time.

### *Origins of Gender Differences in Personality*

Among the more likely forces behind large and pervasive gender differences in personality are the specialized designs of men's and women's evolved psychology, universal gender role socialization processes (generated, in part, by evolved psychology; see Low, 1989; Pirlott & Schmitt, 2013), and a wide range of other biological and cultural factors (Archer & Lloyd, 2002; Mealey, 2000). According to the *organizational* hypothesis of gender differentiation, a key origin of psychological gender differences is the prenatal experience (or lack thereof) of androgen-related brain masculinization. In humans, a critical period exists in the second trimester of gestation during which male brains, but typically not female brains, are permanently altered in function and structure in ways that produce masculinized personalities, cognitive abilities, and play preferences (Baron-Cohen, 2004; Berenbaum & Beltz, 2011).

Evidence supporting this organizational viewpoint arises from several sources, including:

- 1) the degree of prenatal androgen exposure within normal levels predicts gender differentiated psychology in girls and boys (Auyeung et al., 2009; Cohen-Bendahan et al., 2005; Hines, 2006);
- 2) girls prenatally exposed to male-typical levels of androgens (compared to their unaffected

sisters) express more male-typical psychology (Alexander et al., 2009; Nordenström et al., 2002; Tapp et al., 2011; Udry et al., 1995); 3) infants (as young as 5 months; Moore & Johnson, 2008) exhibit psychological gender differences before extensive socialization (Alexander & Wilcox, 2012; Geary, 2010); 4) children exhibit many psychological gender differences before they have a conception of what gender roles are or even what gender is (see Campbell, 2006; Campbell et al., 2004; Maccoby & Jacklin, 1980); 5) experimental and observational studies of neurological and hormonal substrates of adult gender identity, gender dysphoria, and transsexualism imply some degree of biological gender differentiation in men's and women's psychology (Olsson et al., 2016; Saraswat et al., 2015; Udry, 2000; Van Goozen et al., 1995; Zucker et al., 2016); and 6) experimental and observational studies of nonhuman animals (including closely related primates) implicate evolved origins for many gender differences in personality, cognition, and behavior (Alexander & Hines, 2002; Gosling & John, 1999; Hassett et al., 2008; Simpson et al., 2016). Gendered predispositions toward masculinity or femininity arising from prenatal experiences, if they do exist, in no way imply men's and women's psychologies form a simple dichotomous binary, nor are such gender differences fixed and unchangeable after birth (Fausto-Sterling et al., 2012).

Indeed, many psychological gender differences arise long after prenatal experiences, reliably emerging from *activational* effects that generate gendered personality during puberty or at other critical developmental stages and epigenetic sensitive periods (Ellis, 2004; Hines et al., 2015; Salk & Hyde, 2012). For example, gender differences in neuroticism do not reach their full adult form until around age 14 (De Bolle et al., 2015). Whereas some activational effects on personality are temporary (e.g., due to fluctuating hormone levels; Kimura & Hampson, 1994), others are more permanent and further depend on earlier organizational effects (Berenbaum &

Beltz, 2011; Cohen-Bendahan et al., 2005). Activational effects on gender differences may adaptively arise after predictable ontogenetic experiences such as pair-bonding, parenting, or menopause (Kim et al., 2016; Saxton, 2015). Some psychological gender differences, in other words, are specially designed to arise developmentally, and only after particular life experiences. As Salk and Hyde (2012) concluded, “gender differences in epigenetic mechanisms, especially during sensitive periods, are critical to our understanding of gender differences in complex phenotypes” (p. 404).

Beyond organizational and activational effects, some psychological gender differences result from *direct genetic* effects in which specific genes outside the sex chromosomes and affiliated sex hormones function differently in men’s and women’s brains (Hyde et al., 2008; Ngun et al., 2011; Trabzuni et al., 2013). For example, Hyde et al. (2008) noted several gene variants (e.g., 5-HTTLPR, MAOA, COMT genes) are more closely linked to neuroticism-related traits emerging in women than in men. Overall, it is likely many of these organizational, activational, and direct genetic effects (alongside other developmentally dynamic systems and life-history factors; Fausto-Sterling et al., 2012) play key causal roles in the reliable and culturally-pervasive emergence of psychological gender differences (Ellis, 2011b; Lippa, 2005).

It is important to note that evolutionary psychologists do not expect evolved gender differences in personality—whether originating from organizational, activational, or direct genetic effects—to take precisely the same form and size across all cultures. Indeed, evolutionary psychologists expect human personality to be highly sensitive to ontogenetic and socioecological contexts (Lukaszewski & von Rueden, 2015; Simpson et al., 2012)—contexts that often affect men’s and women’s personalities very differently (James et al., 2012). For instance, socioecological contexts such as local pathogen loads (Gangestad, Haselton, & Buss,

2006), operational sex ratios (Schmitt, 2005), degree of sexual selection pressures (Schmitt & Rohde, 2013), and other environmental features have been shown to facultatively evoke (or suppress) evolved gender differences (Pirlott & Schmitt, 2013; Schmitt, 2015). From an evolutionary perspective, the precise manner in which psychological gender differences are expected to vary in size across cultures depends on the particular attributes and socioecological contexts under consideration (Schmitt et al., 2016).

In contrast to this view, social role theories of gender development contend any and all ostensible differences between men and women are primarily the result of perceived gender roles (Eagly, 1987), gender socialization processes (Bussey & Bandura, 1999), and socio-structural power differentials (Eagly et al., 2004) that act on the androgynously-gendered blank slated minds of boys and girls (Butler, 1990). For instance, Eagly and Wood (1999) have argued, “men and women have inherited the same evolved psychological dispositions” (p. 224), Wood and Eagly (2002) have proclaimed “it is likely that extensive socialization is required to orient boys and girls to function differently” (p. 705), and as second wave feminists have asserted since the 1970s, “social institutions produce observed social differences between men and women” (Fausto-Sterling, 2005, p. 1493). Given these foundational assertions, social role theorists expect gender differences should be conspicuously smaller in cultures with more egalitarian gender roles, gender socialization, and sociopolitical gender equity. As Eagly and her colleagues proclaimed in 2004, the “demise of many gender differences with increasing gender equality is a prediction of social role theory” (p. 289). Several cross-cultural research findings are relevant for evaluating this prediction of social role theory, including patterns revealed in studies of gender differences in personality.

*Gender and Big Five Traits across Cultures*

Most research looking into the links between gender and personality have found small to moderately-sized gender differences. In terms of the personality traits known as the Big Five, men tend to score lower than women in neuroticism and agreeableness, and to a lesser degree, certain facets of extraversion (e.g., warmth) and openness to experience (e.g., feelings; see Chapman et al., 2007; De Bolle et al., 2015; Feingold, 1994; Weisberg et al., 2011). As noted earlier, social role theory posits gender differences in personality will be smaller in nations with more egalitarian gender roles, gender socialization, and sociopolitical gender equity. Investigations of Big Five traits evaluating this prediction have found, in almost every instance, the observed cross-cultural patterns of gender differences in personality strongly disconfirm social role theory (see also Schmitt, 2015; Schmitt et al., 2016)<sup>1</sup>.

In a study of gender differences in Big Five traits across 55 nations, Schmitt and his colleagues (2008) found men reported lower levels than women did of neuroticism (overall  $d = -0.40$ )<sup>2</sup>, agreeableness ( $d = -0.15$ ), conscientiousness ( $d = -0.12$ ), and extraversion ( $d = -0.10$ ) across most nations. More egalitarian gender roles, gender socialization, and sociopolitical gender equity, however, were associated with *larger* gender differences. For example, the largest overall gender differences in personality were found in relatively high gender egalitarian cultures of France ( $d = -0.44$ ) and the Netherlands ( $d = -0.36$ ), whereas the smallest gender differences were found in the relatively low gender egalitarian cultures of Botswana ( $d = 0.00$ ) and India ( $d = -0.01$ ). The same pattern of findings—larger Big Five gender differences being found in more gender egalitarian cultures—had been previously documented by Costa et al. (2001) and has since been replicated across dozens of cultures by Lippa (2010a) and Schmitt et al. (2016).

*Gender and Dark Triad Traits across Cultures*



Most studies measuring people's Dark Triad personality traits have found significant gender differences (Grijalva et al., 2014; Jonason, Li, Webster, & Schmitt, 2009), with men typically scoring higher in Machiavellianism ( $d = 0.27$ ), Narcissism ( $d = 0.16$ ), and psychopathy ( $d = 0.67$ ; see Schmitt et al., 2016). In a study of 58 nations (Schmitt et al., 2016), measures of men's and women's Dark Triad traits were collected and the pattern of gender differences observed across cultures strongly disconfirmed social role theory. For instance, larger gender differences in Machiavellianism were found in relatively high gender egalitarian cultures of Iceland ( $d = 0.61$ ), New Zealand ( $d = 0.60$ ), Denmark ( $d = 0.55$ ), and the Netherlands ( $d = 0.53$ ). Smaller gender differences in Machiavellianism were found in less gender egalitarian cultures such as Malaysia ( $d = -0.10$ ), Ethiopia ( $d = -0.09$ ), South Korea ( $d = -0.07$ ), and Tanzania ( $d = -0.01$ ).

#### *Gender and Self-Esteem across Cultures*

Studies examining gender differences in global self-esteem typically find men report slightly higher self-esteem than women ( $d = 0.07$ ; Gentile et al., 2009; Kling et al., 1999). Schmitt et al. (2016) found across 58 nations that both men and women report higher levels of self-esteem in nations with more egalitarian gender roles, gender socialization, and sociopolitical gender equity. However, effects of cultural gender egalitarianism on men were stronger, leading to larger self-esteem gender differences in more gender egalitarian cultures (see also, Bleidorn et al., 2015).

#### *Gender and Subjective Well-Being across Cultures*

Researchers investigating gender differences in subjective well-being typically find men report higher levels than women, mainly due to women's heightened negative affect responsivity ( $d = -0.21$ ; Schmitt et al., 2016), though differences are sometimes negligible after controlling for

additional demographic factors (Lucas & Gohm, 2000; Pinquart & Sörensen, 2001; Tesch-Römer et al., 2008). Even so, Schmitt et al. (2016) found across 58 nations that both men and women reported higher levels of subjective well-being in more gender egalitarian cultures. The effects of gender egalitarianism on men were stronger, though, leading to larger gender differences in subjective well-being in more gender egalitarian cultures.

#### *Gender and Depression across Cultures*

Gender differences in depression have been documented suggesting women have about twice the rate of depression as men (Van de Velde et al., 2010). Hopcroft and McLaughlin (2012) found both genders report lower rates of depression in nations with more gender egalitarianism. However, the effects of gender egalitarianism on men's depression reduction were stronger, leading researchers to observe the largest gender differences in depression in the most gender egalitarian cultures (e.g., Austria). Similar cross-cultural results—larger gender differences in more egalitarian cultures—have been observed for other negative emotions, including sadness, fear, and anger (Fischer et al., 2004).

#### *Gender and Social Dominance Orientation across Cultures*

Gender differences in social dominance orientation have been identified, with men typically reporting significantly higher social dominance orientation than women ( $d = 0.31$ ; Sidanius & Pratto, 1999). Generally, these gender differences have been found to be invariant across cultures (Sidanius et al., 1994; cf. Batalha et al., 2011). Schmitt et al. (2016) briefly assessed social dominance orientation across 54 nations and found neither men's nor women's self-reported social dominance levels were related to gender egalitarianism across cultures.

#### *Gender and Values across Cultures*

Gender differences in personal values have been documented showing women report higher levels of benevolence ( $d = -0.36$ ) and universalism ( $d = -0.25$ ) values, whereas men report higher levels of power ( $d = 0.29$ ), achievement ( $d = 0.24$ ), and hedonism ( $d = 0.11$ ) values (Schwartz & Rubel-Lifshitz, 2009). Schwartz and Rubel-Lifshitz (2009) reported both men and women value benevolence more in nations with more gender egalitarianism. However, the effects of gender egalitarianism on women were stronger, leading to larger gender differences in in nations with more egalitarian gender roles, gender socialization, and sociopolitical gender equity. Similar findings were observed for universalism, power, achievement, and hedonism. According to Schwartz and Rubel-Lifshitz (2009), gender egalitarianism in a culture tends to “permit both sexes to pursue more freely the values they inherently care about more.” (p. 171). These conclusions mirror findings of Charles and Bradley (2009) who documented that within more egalitarian nations people especially value self-expression, and so men and women have more opportunities to indulge their gendered selves. Cross-cultural patterns of sexual differentiation in measured values, as with almost all personality measures, disconfirmed social role theory (see also, Inglehart, 1997).

#### *Gender and Occupational Interests across Cultures*

Meta-analytic reviews have found robust gender differences in occupational interests, with women reporting more interest in people-oriented professions, and men reporting more interest in thing-related professions (overall  $d = 0.93$ ; Su et al., 2009). Lippa (2010a) examined gender differences in occupational interests and found women were more interested in people and men more interested in things across 53 of 53 studied nations. Contrary to social role theory, the sizes of gender differences in interests across cultures were largely invariant and were unrelated to measures of gender egalitarianism. In a related study of gender differences in

occupational education, Charles and Bradley (2009) examined gender differences in the pursuit of science, technology, engineering, and mathematics-related occupations across 44 nations and found the largest differences were observed in the most gender egalitarian nations (e.g., Finland, Germany, Sweden, and Switzerland) and the smallest gender differences were found in the least gender egalitarian nations (e.g., Bulgaria, Colombia, Indonesia, and Tunisia).

### *Social Role Perspectives and Gender Differences across Cultures*

A foundational assumption of social role theory is that psychological gender differences flow directly from perceived gender roles, gender socialization processes, and sociopolitical power differentials and that, as a consequence, psychological gender differences should be smaller in cultures with more egalitarian gender roles, gender socialization, and sociopolitical gender equity. As Butler (1990) has argued gender is “a politically neutral surface *on which* culture acts” (p. 7, italics original). This supposition is part of the bedrock upon which social role theory stands, but it is largely inconsistent with evidence of gender differences in personality as observed by psychological scholars around the world. Gender differences in most psychological traits—Big Five, Dark Triad, self-esteem, subjective well-being, depression, and values—are *larger* in cultures with more gender egalitarianism. Gendered socialization practices, sociopolitical institutions, and gender role stereotypes—some of which appear universal across cultures (Low, 1989; Nosek et al., 2009; Williams & Best, 1990)—undoubtedly influence men’s and women’s personalities to some degree (Kring & Gordon, 1998; Twenge, 1997). Nevertheless, the limited evidence reviewed here casts serious doubts on social role theory’s ability to accurately predict and explain *cross-cultural* variations in the relative size of psychological gender differences. Simply put, when the men and women of a nation perceive the most similar gender roles, receive the most similar gender role socialization, and experience the

greatest sociopolitical gender equity, gender differences in personality are almost always at their largest.

Beyond personality traits, similar disconfirmations of social role theory's cross-cultural predictions have been demonstrated across a variety of human attributes. For instance, gender differences in romantic attitudes and behaviors—including dismissing attachment, intimate partner violence, love, enjoying casual sex, and mate preferences for attractiveness—also appear noticeably larger in cultures with more gender egalitarianism (Schmitt, 2015; for notable exceptions, see Schmitt, 2005; Zentner & Eagly, 2015). Gender differences in many *objectively tested* cognitive measures—such as spatial location, spatial rotation, and episodic memory abilities—also appear larger in cultures with more gender egalitarianism (Silverman et al., 2007; Weber et al., 2014). Lippa et al. (2010) tested spatial rotation abilities in men and women across 40 nations, the largest gender differences in spatial rotation ability were found in Norway, the smallest were found in Pakistan. In a review of gender differences in mathematics test scores within and across cultures, Stoet and Geary (2013) concluded the evidence is mixed, but “If anything, economically developed countries with strong gender-equality and human development scores tended to have a larger sex difference in mathematics” (p. 4). Even gender differences in *physical characteristics* such as height, obesity, and blood pressure are conspicuously larger in cultures with more gender egalitarianism (Schmitt, 2015).

Despite the vast array of evidence documenting most psychological gender differences are larger in cultures with more gender egalitarianism, some critics have argued—at least when it comes to personality traits—that self-report surveys are too problematic for accurate evaluations of gender differences. For instance, Guimond et al. (2007) suggested gender differences in self-reported personality traits are suppressed in less egalitarian nations due to reference-group

effects (Heine et al., 2009). It may be men and women compare themselves only to their own gender when completing surveys in less egalitarian cultures, whereas in more egalitarian nations men and women compare themselves to everyone, resulting in more accurate and precisely measured gender differences in more gender egalitarian nations. If true, this claim has grim implications for gender similarities theory (Hyde, 2005). It would imply the moderate to large gender differences commonly observed in more egalitarian Northern European nations are accurate and “true” measures of psychological gender differences (because men and women appropriately compare themselves to all other people), whereas in less egalitarian cultures researchers are merely observing masked versions of what, according to the logic of social role theory, must be extraordinarily larger gender differences in personality (Lippa, 2010b). Finding so many gender differences in psychology—differences that evidently range from large in more egalitarian nations to relatively *colossal* in less egalitarian cultures—would provide strong refutation of the view that most psychological gender differences are merely trivial in size (Carothers & Reis, 2013; Hyde, 2014; Joel et al., 2015).

There are serious questions regarding social role theory’s logical challenge to gender similarities theory, and more generally to the claim cross-cultural variations of gender differences result solely from reference-group effects. For instance, if reference-group effects mask huge gender differences in less egalitarian cultures because each gender only considers same-sex others when completing scales, smaller standard deviations in men’s and women’s distributions should be observed in less egalitarian cultures compared to progressive cultures, men and women should be equally biased by reference-grouping in their responses, and all survey items should be equally effected. Generally, such patterns have been absent in large cross-cultural datasets (Fischer, 2010; Lippa, 2009; Schmitt et al., 2016). In addition, many

findings that robustly disconfirm social role theory transcend the limitations of reference-group effects; findings including gender differences on personal agreement scales (e.g., assessing personal agreement with the sociosexual statement: *I can imagine myself being comfortable and enjoying "casual" sex with different partners*) and on forced choice measures (e.g., the Narcissistic choice of which among two options is closer to one's feelings and beliefs: *A) The thought of ruling the world frightens the hell out of me, or B) If I ruled the world it would be a much better place*). Such measurement modalities are relatively immune to reference-group effects (one either is or is not comfortable enjoying casual sex or ruling the world, it matters little what others might think), yet these scales display the same disconfirming trends against social role theory. Moreover, gender differences in *objectively tested* measures of spatial abilities—as well as *physically* measured differences in height and blood pressure—are larger in cultures with more gender egalitarianism. This evidence casts serious doubt on the view that social role theory's repeated empirical disconfirmations merely stem from the statistical artifact of reference-group effects.

In a similar vein, Costa et al. (2001) have suggested cultural levels of egalitarian gender role socialization, sociopolitical gender equity, and individualism-collectivism may bias the interpretation of men's and women's personality-related behaviors in ways that generate these challenging results to social role theory. An act of agreeableness (e.g., kindness) exhibited by a man or woman in an egalitarian (and individualistic) culture would presumably be considered a freely chosen behavior and therefore a true reflection of the person's personality. Thus, the larger gender differences observed in Northern European cultures are "real" gender differences in personality, just as argued by Guimond et al. (2007). An act of agreeableness by a person in a less egalitarian (and collectivistic) culture might be assumed to reflect gender role norms for

women (but presumably not men). The lack of gender differences observed in more patriarchal and collectivistic cultures are, in this view, the result of individuals placing the causes of personality traits in the hands of gender roles, not people. Again, though, if this view is correct then the relatively large effects seen in egalitarian cultures are “real” and, assuming social role theory is correct, the true gender differences in more patriarchal cultures must be larger, astonishing large from a gender similarities view. Still, although addressing the specific interplay of collectivism on gender differences and gender roles is beyond the scope of this article, these remain intriguing possibilities for explaining gender differences in self-reported traits across cultures (less so for explaining why gender differences in personal agreement scales, forced choice scales, objectively scored ability tests, and physical attributes also get larger in more gender egalitarian cultures).

Overall, the vast weight of the extant evidence suggests the relatively large gender differences observed in Northern European nations are unlikely to be the result of psychological blank slates in boys and girls being written on by especially potent gender role socialization practices or especially strong sociopolitical patriarchy within Scandinavian cultures. Instead, psychological gender differences—in Big Five traits, Dark Triad traits, self-esteem, subjective well-being, depression, and values—are demonstrably the largest in cultures with the *lowest* levels of bifurcated gender role socialization or sociopolitical patriarchy. Ultimately, the view that men and women start from a blank slate simply does not jibe with the current findings, and scholars who continue to assert gender invariably starts from a psychological blank slate should find these recurring cross-cultural patterns challenging to their foundational assumptions.

From a Darwinian perspective, it would be truly miraculous for human evolution to have produced men and women who possess exactly the same psychological design (Vandermassen,



2011). The forces of natural and sexual selection acting on humans would have had to eliminate all previous gender differences stemming from our psychological lineage as mammals and primates (Weiss & King, 2015), actively select against sex-specific psychological adaptations developing over our hundreds of millennia as hunter-gatherers (with its associated gender-divided labor; Marlowe, 2007), and steadfastly maintain a perfectly androgynous psychology in men and women post-Pleistocene epoch (Buss & Schmitt, 2011; Carruthers, 2006). In essence, social role theory presumes something akin to an intelligent designer ideologically committed to allowing absolutely zero psychological adaptations that might reliably generate adaptive human gender differences. Even more biologically implausible is social role theory's assertion that all well-documented and culturally-pervasive gender differences in upper body strength, vocal characteristics, skeletal morphology, body fat distribution, physical aggression, early violent death, reproductive variance, pubertal timing, childbirth, nursing, menopause, and a long list of other gender-linked attributes (see Archer & Lloyd, 2002; Fraye & Wolpoff, 1985; Geary, 2010; Lippa, 2005; Low, 1998; Mealey, 2000) have been entirely disconnected from sexual selection pressures on human psychology. As Wood and Eagly (2002) declared with their version of social role theory, "Our biosocial model does not assume that any sexual selection pressures that contributed to *physical* dimorphism between the sexes are major influences on sex-typed *psychological* attributes" (p. 702, italics added). Such thinking is clearly at odds with how evolutionary biologists use Darwinian theories to understand all other sexually-reproducing animals on the planet. The notion that the origins men's and women's psychologies are entirely disconnected from the processes that created our evolutionary biologies is an extreme form of anthropocentrism and human exceptionalism (Ellis, 1996; van den Berghe, 1990), and it is extremely unlikely to be correct.

The cross-cultural disconfirmations of social role theory reviewed here are not the first serious challenges to the view that socialization, gender roles, and patriarchy are the primary sources of psychological gender differences in humans (Maccoby, 2000; Udry, 2000). For example, Maccoby (2000) has argued that children do not passively consume gender roles, but rather boys and girls actively seek out and generate some gender roles over others (particularly in same-sex groups; see also Pirlott & Schmitt, 2014). Udry (2000) documented among women who experienced particularly high prenatal androgen exposure (i.e., those with relatively masculinized brains), greater maternal encouragement of femininity typically leads to *less* adult femininity. That is, stronger feminine gender role socialization of girls not only fails to make them more feminine, it backfires among girls prenatally predisposed to be more masculine. The accumulated cross-cultural evidence reviewed here echoes these concerns with classic social role theory and in most cases directly refutes culturally-variable gender role socialization and degrees of patriarchy as the primary explanations of psychological gender differences. Even so, broader issues of measurement invariance and sampling equivalence have not been fully addressed in regard to many of the measures and findings in the literature, and as with all cross-cultural research caution is required so as not to over-interpret these results (Kuppens & Pollet, 2014). Of particular importance is the contrast of social role theories with competing theories of gender difference variation across cultures. If not social role theory, then what explains cross-cultural variation in the size of psychological gender differences?

#### *Evolutionary Perspectives and Gender Differences across Cultures*

Using evolutionary theory to guide researchers how and where to look for gender differences (versus when to expect no differences—namely in areas where ancestral men and women did not face different adaptive problems; Buss, 1995) yields a very different conclusion

from the view that men and women are largely indistinguishable in overall psychology (Budaev, 1999). From an evolutionary perspective, it is probably untrue that gender differences in personality are trivially small, especially if you know how to look—heuristically guided by evolutionary theories—and where to look—for patterned genderedness across diverse socioecological contexts. In some cases, evolutionary psychologists expect gender differences to be relatively uniform across cultures (e.g., sex drive; Lippa, 2009). However, sometimes evolutionary psychologists expect gender differences to be attenuated or accentuated due to facultatively adaptive responses to socioecological factors (e.g., local pathogens affect women's mate preferences more than men's; Gangestad et al., 2006). Other times evolutionary psychologists expect gender differences to vary in size across cultures due to the moderating effects of other psychological adaptations and socioecological factors (e.g., religious suppression of women's sexuality more than men's; Schmitt & Fuller, 2015). Several theories in nuanced combinations will be needed to explain the cross-cultural variations of psychological gender differences reviewed here, including sexual selection theory (Darwin, 1871), life history theory (Del Giudice et al., 2015; Low, 1998), strategic pluralism theory (Gangestad & Simpson, 2000), psychosocial acceleration theory (Belsky, 2012), and mismatch theory (Crawford, 1998) combined with key concepts such as facultative adaptation, evoked culture, phenotypic plasticity, reaction norms, and bounded rationality (for a review, see Schmitt et al., 2016).

As an example, culturally-universal gender differences in mate preferences for physical attractiveness have been observed in several large studies (Lippa, 2007; Zentner & Mitura, 2012). Lippa (2007) found gender differences in preferences for “good looks” were a pancultural universal across 53 nations, with a moderate average effect size of  $d = 0.55$ . Zentner and Mitura (2012) found gender differences in preferences for good looks were a pancultural universal

across 10 nations; counter-intuitively, gender differences were larger as egalitarian gender role socialization and sociopolitical gender equity increased across nations, with low gender egalitarian nations displaying smaller gender differences ( $d = 0.24$ ) compared to high gender egalitarian nations ( $d = 0.51$ ). Once again, increased gender egalitarianism across cultures did not reduce the gender difference, it appeared to amplify it.

In explaining why, from an evolutionary perspective, gender differences in preferences for attractiveness might vary across cultures, Gangestad et al. (2006) argued women's and men's mate preferences for good looks are closely linked to local pathogen levels, with good looks being functionally more important in relatively high pathogen cultures, a link confirmed even after controlling for income, geographical region, and latitude (see also, Little et al., 2007). To some degree, men already value attractiveness in female partners as many physical attributes of women are key indicators of female fecundity (Sugiyama, 2005). For women, however, the selection of physically attractive male partners in high pathogen environments is facultatively or socioecologically “evoked” because certain physical attributes such as facial symmetry are reliable indicators of men's ability to develop a healthy immune system, a trait that is more vital in high pathogen ecologies and could be passed on to women's offspring (Gangestad et al., 2006; Low, 1990). Hence, as women more than men increase their mate preferences for attractive partners in high pathogen environments, gender differences in preferences for physical attractiveness are attenuated in high pathogen environments (see also, DeBruine et al., 2010).

Cultural variation in the degree to which men and women differ in height also has been explored from multiple evolutionary perspectives (Lippa, 2009). For instance, gender differences in height are smallest in cultures with poor nutrition, possibly because the height-reducing effects of poor nutrition are more pronounced among men (Gaulin & Boster, 1992). Cultural differences

in altitude, degree of polygynous mating, and subsistence strategies also have been proposed as facultatively generating culturally-variable sex differences in height (Kanazawa & Novak, 2005). It is likely that depending on the precise attribute under consideration—whether Big Five traits, Dark Triad traits, self-esteem, subjective well-being, depression, values, interests, dismissing attachment, intimate partner violence, love, enjoying casual sex, mate preferences for attractiveness, spatial location ability, spatial rotation ability, or physical traits such as height, obesity, and blood pressure—several evolutionary theories will be required, often in combination with proximate theories, to fully explain cross-cultural variation in the size of gender differences. Social role theory, it appears, will play a limited role in many instances (for possible exceptions, see Else-Quest et al., 2010; Miller et al., 2014; Miller & Halpern, 2014; Zentner & Eagly, 2015).

### *Conclusions*

It is undeniably true that men and women are more similar than different genetically, physically, and psychologically. Even so, important gender differences in personality exist that likely stem, at least in part, from evolved psychological adaptations. Some of these adaptations generate culturally-universal gender differences, and many are further designed to be sensitive to local socioecological contexts in ways that facultatively generate varying sizes of gender differences across cultures. It is also true evolved gender differences in personality can be accentuated or attenuated by factors that have little to do with evolved sensitivities to socioecological contexts (Schmitt, 2015). Even gender differences in our bones can embody peculiarities of local cultural forms (Fausto-Sterling, 2005).

To shift away from the dominant gender difference paradigm in psychological science—the view that perceived gender roles, gendered socialization, and patriarchal sociocultural institutions are the *primary* causes of psychological gender differentiation (also called the

Standard Social Science Model; Tooby & Cosmides, 1992)—will no doubt take some time. In a recent survey of members of the Society of Experimental Social Psychology, the average member thought it about 33% likely that psychological gender differences in traits like aggression and nurturance “have very little to do with societal pressures or socialization practices” and instead are “based primarily on genetic differences between men and women” (von Hippel, 2015), with no trend for younger psychologists to be more receptive to evolutionary perspectives. Indeed, in a survey of social scientists across the United Kingdom, Perry and Mace (2010) found older professors were more likely to accept evolutionary principles can be fruitfully applied to humans. Unfortunately, researchers proffering evolutionary perspectives on psychological gender differences are sometimes met with vicious professional and personal attacks (Dreger, 2015). We would encourage all contemporary psychologists to be open to at least the possibility of evolved gender differences in personality. As scientists, it will be imperative to judge every proposed psychological adaptation based upon the most rigorous evidence available (paying particular heed to cross-cultural evidence of *special design*; Schmitt & Pilcher, 2004). The extreme alternative, a Semmelweis reflex whereby psychologists cling to gender blank slate-ism regardless of new evidence, will deleteriously hamper our ability to maximize everyone’s medical, mental, and relational health into the future (Cahill, 2006; Morrow, 2015). We believe the men and women of this world, different as they may be, deserve better.

Footnotes

<sup>1</sup> Portions of this article have been previously reported in Schmitt et al. (2016) and Schmitt (2015).

<sup>2</sup> According to Cohen (1988), effect sizes expressed in terms of the *d* statistic are considered small if 0.20, medium if 0.50, and large above 0.80.

## References

- Alexander, G. M., & Hines, M. (2002). Sex differences in responses to children's toys in a non-human primate (*cercopithecus aethiops sabaues*). *Evolution and Human Behavior*, *23*, 467–479.
- Alexander, G. M., & Wilcox, T. (2012). Sex differences in early infancy. *Child Development Perspectives*, *6*, 400-406.
- Alexander, G. M., Wilcox, T., & Farmer, M. B. (2009). Hormone behavior associations in early infancy. *Hormones and Behavior*, *56*, 498–502.
- Archer, J., & Lloyd, B.B. (2002). *Sex and gender* (2<sup>nd</sup> ed.). New York: Cambridge University Press.
- Auyeung, B., Baron-Cohen, S., Ashwin, E., Knickmeyer, R., Taylor, K., Hackett, G., & Hines, M. (2009). Fetal testosterone predicts sexually differentiated childhood behavior in girls and in boys. *Psychological Science*, *20*, 144-148.
- Baron-Cohen, S. (2004). *Essential difference: Male and female brains and the truth about autism*. New York: Basic Books.
- Batalha, L., Reynolds, K. J., & Newbiggin, C. A. (2011). All else being equal: Are men always higher in social dominance orientation than women? *European Journal of Social Psychology*, *41*, 796-806.
- Belsky, J. (2012). The development of human reproductive strategies progress and prospects. *Current Directions in Psychological Science*, *21*, 310-316.
- Berenbaum, S. A., & Beltz, A. M. (2011). Sexual differentiation of human behavior: Effects of prenatal and pubertal organizational hormones. *Frontiers in Neuroendocrinology*, *32*, 183-200.



- Bleidorn, W., Arslan, R. C., Denissen, J. J. A., Rentfrow, P. J., Gebauer, J. E., Potter, J., & Gosling, S. D. (2015, December 21). Age and Gender Differences in Self-Esteem—A Cross-Cultural Window. *Journal of Personality and Social Psychology*. Advance online publication. <http://dx.doi.org/10.1037/pspp0000078>
- Bodas, J., & Ollendick, T. H. (2005). Test anxiety: A cross-cultural perspective. *Clinical Child and Family Psychology Review*, 8, 65-88.
- Budaev, S. V. (1999). Sex differences in the Big Five personality factors: Testing an evolutionary hypothesis. *Personality and Individual Differences*, 26, 801-813.
- Buss, D.M. (1995). Psychological sex differences. Origins through sexual selection. *American Psychologist*, 50, 164-168.
- Buss, D.M. & Schmitt, D.P. (2011). Evolutionary psychology and feminism. *Sex Roles*, 64, 768-787.
- Bussey, K., & Bandura, A. (1999). Social cognitive theory of gender development and differentiation. *Psychological Review*, 106, 676-713.
- Butler, J. (1990). *Gender trouble*. New York: Routledge.
- Cahill, L. (2006). Why sex matters for neuroscience. *Nature Reviews Neuroscience*, 7, 477-484.
- Campbell, A. (2006). Feminism and evolutionary psychology. In J. Barkow (Ed.), *Missing the revolution: Darwinism for social scientists* (63-99). New York, NY: Oxford University Press.
- Campbell, A., Shirley, L., & Candy, J. (2004). A longitudinal study of gender-related cognition and behaviour. *Developmental Science*, 7, 1-9.
- Carothers, B. J., & Reis, H. T. (2013). Men and women are from Earth: Examining the latent structure of gender. *Journal of Personality and Social Psychology*, 104, 385-407.
- Carruthers, P. (2006). *The architecture of the mind*. New York, NY: Oxford University Press.

- Chapman, B. P., Duberstein, P. R., Sörensen, S., & Lyness, J. M. (2007). Gender differences in Five Factor Model personality traits in an elderly cohort. *Personality and Individual Differences, 43*, 1594-1603.
- Charles, M., & Bradley, K. (2009). Indulging our gendered selves? Sex segregation by field of study in 44 countries. *American Journal of Sociology, 114*, 924-976.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Cohen-Bendahan, C. C., van de Beek, C., & Berenbaum, S. A. (2005). Prenatal sex hormone effects on child and adult sex-typed behavior: Methods and findings. *Neuroscience & Biobehavioral Reviews, 29*, 353-384.
- Conroy-Beam, D., Buss, D. M., Pham, M. N., & Shackelford, T. K. (2015). How sexually dimorphic are human mate preferences? *Personality and Social Psychology Bulletin, 0146167215590987*.
- Costa, P. T., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology, 81*, 322-331.
- Crawford, C. (1998). Environments and adaptations: Then and now. In C. Crawford & D. Krebs (Eds.), *Handbook of evolutionary psychology: Ideas, issues, and applications* (pp. 275-302). Mahwah, NJ: LEA.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- De Bolle, M., De Fruyt, F., McCrae, R. R., Löckenhoff, C. E., Costa Jr, P. T., Aguilar-Vafaie, M. E., ... & Terracciano, A. (2015). The emergence of sex differences in personality traits in

- early adolescence: A cross-sectional, cross-cultural study. *Journal of Personality and Social Psychology*, 108, 171-185.
- DeBruine, L. M., Jones, B. C., Crawford, J. R., Welling, L. L., & Little, A. C. (2010). The health of a nation predicts their mate preferences: Cross-cultural variation in women's preferences for masculinized male faces. *Proceedings of the Royal Society B: Biological Sciences*, 277, 2405-2410.
- Del Giudice, M., Booth, T., & Irwing, P. (2012). The distance between Mars and Venus: Measuring global sex differences in personality. *PloS one*, 7, e29265.
- Del Giudice, M., Gangestad, S. W., & Kaplan, H. S. (2015). Life history theory and evolutionary psychology. In D. M. Buss (Ed.), *The handbook of evolutionary psychology – Vol 1: Foundations* (2nd ed.) (pp. 88-114). New York: Wiley.
- Dreger, A. (2015). *Galileo's middle finger: Heretics, activists, and the search for justice in science*. New York, NY: Penguin.
- Eagly, A.H. (1987). *Sex differences in social behavior: A social-role interpretation*. Hillsdale, NJ: Erlbaum.
- Eagly, A.H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, 54, 408-423.
- Eagly, A.H., Wood, W., & Johannesen-Schmidt, M.C. (2004). Social role theory of sex differences and similarities: Implications for the partner preferences of women and men. In A.H. Eagly, A.E. Beall, and R. Sternberg (Eds.). *The psychology of gender* (2nd ed.; pp. 269-295). New York, NY, US: Guilford Press.
- Ellis, B. J. (2004). Timing of pubertal maturation in girls: An integrated life history approach. *Psychology Bulletin*, 130, 920–928.

- Ellis, L. (1996). A discipline in peril: Sociology's future hinges on curing its biophobia, *American Sociologist*, 27, 21–41.
- Ellis, L. (2011a). Identifying and explaining apparent universal sex differences in cognition and behavior. *Personality and Individual Differences*, 51, 552-561.
- Ellis, L. (2011b). Evolutionary neuroandrogenic theory and universal gender differences in cognition and behavior. *Sex Roles*, 64, 707-722.
- Else-Quest, N. M., Hyde, J. S., & Linn, M. C. (2010). Cross-national patterns of gender differences in mathematics: A meta-analysis. *Psychological Bulletin*, 136, 103-127.
- Fausto-Sterling, A. (2005). The bare bones of sex: Part 1—sex and gender. *Signs*, 30, 1491-1527.
- Fausto-Sterling, A., Coll, C. G., & Lamarre, M. (2012). Sexing the baby: Part 2 applying dynamic systems theory to the emergences of sex-related differences in infants and toddlers. *Social Science & Medicine*, 74, 1693-1702.
- Feingold, A. (1994). Gender differences in personality: A meta-analysis. *Psychological Bulletin*, 116, 429-456.
- Fischer, A. H., Rodriguez Mosquera, P. M., Van Vianen, A. E., & Manstead, A. S. (2004). Gender and culture differences in emotion. *Emotion*, 4, 87-94.
- Gangestad, S. W., Haselton, M. G., & Buss, D. M. (2006). Evolutionary foundations of cultural variation: Evoked culture and mate preferences. *Psychological Inquiry*, 17, 75–95.
- Gangestad, S.W., & Simpson, J.A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, 23, 573-644.
- Gaulin, S. J., & Boster, J. S. (1992). Human marriage systems and sexual dimorphism in stature. *American Journal of Physical Anthropology*, 89, 467-475.

- Geary, D.C. (2010). *Male, female: The evolution of human sex differences* (2<sup>nd</sup> ed.). Washington, D.C.: American Psychological Association.
- Gentile, B., Grabe, S., Dolan-Pascoe, B., Twenge, J. M., Wells, B. E., & Maitino, A. (2009). Gender differences in domain-specific self-esteem: A meta-analysis. *Review of General Psychology, 13*, 34-45.
- Gosling, S. D., & John, O. P. (1999). Personality dimensions in nonhuman animals a cross-species review. *Current Directions in Psychological Science, 8*, 69-75.
- Grijalva, E., Newman, D. A., Tay, L., Donnellan, M. B., Harms, P. D., Robins, R. W., & Yan, T. (2014, December 29). Gender differences in narcissism: A meta-analytic review. *Psychological Bulletin*. Advance online publication. <http://dx.doi.org/10.1037/a0038231>
- Guimond, S., Branscombe, N. R., Brunot, S., Buunk, A. P., Chatard, A., Desert, M., Garcia, D. M., Haque, S., Martinot, D., & Yzerbyt, V. (2007). Culture, gender, and the self: Variations and impact of social comparison processes. *Journal of Personality and Social Psychology, 92*, 1118–1134.
- Hassett, J. M., Siebert, E. R., & Wallen, K. (2008). Sex differences in rhesus monkey toy preferences parallel those of children. *Hormones and Behavior, 54*, 359-364.
- Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales? The reference-group effect. *Journal of Personality and Social Psychology, 82*, 903-918.
- Hines, M. (2006). Prenatal testosterone and gender-related behaviour. *European Journal of Endocrinology, 155*(suppl 1), S115–S121.
- Hines, M., Constantinescu, M., & Spencer, D. (2015). Early androgen exposure and human gender development. *Biology of Sex Differences, 6*, 3-10.

- Hopcroft, R. L., & McLaughlin, J. (2012). Why is the sex gap in feelings of depression wider in high gender equity countries? The effect of children on the psychological well-being of men and women. *Social Science Research, 41*, 501-513.
- Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist, 60*, 581–592.
- Hyde, J. S. (2014). Gender similarities and differences. *Annual Review of Psychology, 65*, 373-398.
- Hyde, J. S., Mezulis, A. H., & Abramson, L. Y. (2008). The ABCs of depression: Integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. *Psychological Review, 115*, 291-313.
- Inglehart, R. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies* (Vol. 19). Princeton, NJ: Princeton University Press.
- James, J., Ellis, B. J., Schlomer, G. L., & Garber, J. (2012). Sex-specific pathways to early puberty, sexual debut, and sexual risk taking: Tests of an integrated evolutionary–developmental model. *Developmental Psychology, 48*, 687-702.
- Joel D., Berman Z., Tavor I., Wexler N., Gaber O., Stein Y., Shefi N., Pool J., Urchs S., Margulies D.S., Liem F., Hänggi J., Jäncke L., Assaf, Y. (2015). Sex beyond the genitalia: The human brain mosaic. *Proceedings of the National Academy of Sciences, 112*, 15468–15473.
- Johnson, D. P., & Whisman, M. A. (2013). Gender differences in rumination: A meta-analysis. *Personality and Individual Differences, 55*, 367-374.
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The dark triad: Facilitating a short-term mating strategy in men. *European Journal of Personality, 23*, 5-18.

- Kanazawa, S., & Novak, D. L. (2005). Human sexual dimorphism in size may be triggered by environmental cues. *Journal of Biosocial Science*, *37*, 657-665.
- Kim, P., Strathearn, L., & Swain, J. E. (2016). The maternal brain and its plasticity in humans. *Hormones and Behavior*. DOI: <http://dx.doi.org/10.1016/j.yhbeh.2015.08.001>
- Kimura, D., & Hampson, E. (1994). Cognitive pattern in men and women is influenced by fluctuations in sex hormones. *Current Directions in Psychological Science*, *3*, 57-61.
- Kling, K., Hyde, J., Showers, C., & Buswell, B. (1999). Gender differences in self-esteem: A meta-analysis. *Psychological Bulletin*, *125*, 470-500.
- Kring, A. M., & Gordon, A. H. (1998). Sex differences in emotion: Expression, experience, and physiology. *Journal of Personality and Social Psychology*, *74*, 686-703.
- Kuppens, T., & Pollet, T. V. (2014). Mind the level: Problems with two recent nation-level analyses in psychology. *Frontiers in Psychology*, *5*, 1-7.
- Lippa, R.A. (2005). *Gender, nature, and nurture* (2<sup>nd</sup> ed.). Mahwah, NJ: Lawrence Erlbaum.
- Lippa, R.A. (2007). The preferred traits of mates in a cross-national study of heterosexual and homosexual men and women: An examination of biological and cultural influences. *Archives of Sexual Behavior*, *36*, 193-208.
- Lippa, R.A. (2009). Sex differences in sex drive, sociosexuality, and height across 53 nations: Testing evolutionary and social structural theories. *Archives of Sexual Behavior*, *38*, 631-651.
- Lippa, R.A. (2010a). Sex differences in personality traits and gender-related occupational preferences across 53 nations: Testing evolutionary and social-environmental theories. *Archives of Sexual Behavior*, *39*, 619-636.

- Lippa, R. A. (2010b). Gender differences in personality and interests: When, where, and why? *Social and Personality Psychology Compass*, 4, 1098-1110.
- Lippa, R. A., Collaer, M. L., & Peters, M. (2010). Sex differences in mental rotation and line angle judgments are positively associated with gender equality and economic development across 53 nations. *Archives of Sexual Behavior*, 39, 990-997.
- Little, A.C., Apicella, C.L., & Marlowe, F.W. (2007). Preferences for symmetry in human faces in two cultures: Data from the UK and the Hadza, and isolated group of hunter-gatherers. *Proceedings of the Royal Society of London B*, 274, 3113-3117.
- Low, B.S. (1989). Cross-cultural patterns in the training of children: An evolutionary perspective. *Journal of Comparative Psychology*, 103, 313-319.
- Low, B.S. (1990). Marriage systems and pathogen stress in human societies. *American Zoologist*, 30, 325-340.
- Low, B.S. (1998). The evolution of human life histories. In C. Crawford & D.L. Krebs (Eds.), *Handbook of evolutionary psychology* (pp. 131-161). Mahwah, NJ: Erlbaum.
- Lucas, R. E., & Gohm, C. L. (2000). Age and sex differences in subjective well-being across cultures. In E. Diener & E.M. Suh (Eds.), *Culture and subjective well-being* (pp. 291-317). Cambridge, MA: The MIT Press.
- Lukaszewski, A. W., & von Rueden, C. R. (2015). The extraversion continuum in evolutionary perspective: A review of recent theory and evidence. *Personality and Individual Differences*, 77, 186-192.
- Lynn, R., & Martin, T. (1997). Gender differences in extraversion, neuroticism, and psychoticism in 37 countries. *Journal of Social Psychology*, 137, 369-373.



- Maccoby, E.E. (2000). Perspectives on gender development. *International Journal of Behavioral Development, 24*, 398-406.
- Maccoby, E.E., & Jacklin, C.N. (1980). Sex differences in aggression: A rejoinder and reprise. *Child Development, 51*, 964-980.
- Marlowe, F. W. (2007). Hunting and gathering the human sexual division of foraging labor. *Cross-Cultural Research, 41*, 170-195.
- McCrae, R. R., Terracciano, A., & 78 Members of the Personality Profiles of Cultures Project (2005). Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology, 88*, 547-561.
- Mealey, L. (2000). *Sex differences: Developmental and evolutionary strategies*. San Diego, CA: Academic Press.
- Miller, D. I., Eagly, A. H., & Linn, M. C. (2014, October 20). Women's representation in science predicts national gender-science stereotypes: Evidence from 66 Nations. *Journal of Educational Psychology*. Advance online publication. <http://dx.doi.org/10.1037/edu0000005>
- Miller, D. I., & Halpern, D. F. (2014). The new science of cognitive sex differences. *Trends in Cognitive Sciences, 18*, 37-45.
- Moore, D. S., & Johnson, S. P. (2008). Mental rotation in human infants a sex difference. *Psychological Science, 19*, 1063-1066.
- Morrow, E. H. (2015). The evolution of sex differences in disease. *Biology of Sex Differences, 6*, 5-11.
- Ngun, T.C., Ghahramani, N., Sanchez, F.J., Bocklandt, & Vilain, E. (2011). The genetics of sex differences in brain and behavior. *Frontiers in Neuroendocrinology, 32*, 227-246.

- Nordenström, A., Servin, A., Bohlin, G., Larsson, A., & Wedell, A. (2002). Sex-typed toy play behavior correlates with the degree of prenatal androgen exposure assessed by CYP21 genotype in girls with congenital adrenal hyperplasia. *Journal of Clinical Endocrinology & Metabolism*, *87*, 5119-5124.
- Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., ... & Kesebir, S. (2009). National differences in gender–science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences*, *106*, 10593-10597.
- Okami, P., & Shackelford, T. K. (2001). Human sex differences in sexual psychology and behavior. *Annual Review of Sex Research*, *12*, 186-241.
- Olsson, A., Kopsida, E., Sorjonen, K., & Savic, I. (2016). Testosterone and estrogen impact social evaluations and vicarious emotions: A double-blind placebo-controlled study. *Emotion*.
- Perry, G., & Mace, R. (2010). The lack of acceptance of evolutionary approaches to human behaviour. *Journal of Evolutionary Psychology*, *8*, 105-125.
- Pinquart, M., & Sörensen, S. (2001). Gender differences in self-concept and psychological well-being in old age a meta-analysis. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *56*, 195-213.
- Pirlott, A., & Schmitt, D.P. (2014). Gendered sexual culture. In A. Cohen (Ed.), *New directions in the psychology of culture* (pp. 191-216). Washington, D.C.: American Psychological Association Books.

- Russo, N. F., & Green, B. L. (1993). Women and mental health. In F. L. Denmark & M. A. Paludi (Eds.), *Psychology of women: A handbook of issues and theories* (pp. 379–436). Westport, CT: Greenwood.
- Salk, R. H., & Hyde, J. S. (2012). Contemporary genetics for gender researchers: Not your grandma's genetics anymore. *Psychology of Women Quarterly*, 0361684312461774.
- Saraswat, A., Weinand, M., & Safer, J. D. (2015). Evidence supporting the biological nature of gender identity. *Endocrine Practice*, 21, 1-20.
- Saxton, T. K. (2015). Experiences during specific developmental stages influence face preferences. *Evolution and Human Behavior*, 37, 21-28.
- Schmitt, D.P. (2005). Sociosexuality from Argentina to Zimbabwe: A 48-nation study of sex, culture, and strategies of human mating. *Behavioral and Brain Sciences*, 28, 247-275.
- Schmitt, D.P. (2015). The evolution of culturally-variable sex differences: Men and women are not always different, but when they are...it appears not to result from patriarchy or sex role socialization. In Weekes-Shackelford, V.A., & Shackelford, T.K. (Eds.), *The evolution of sexuality* (pp. 221-256). New York: Springer.
- Schmitt, D.P., Alcalay, L., Allik, J., Alves, I.C.B., Anderson, C.A., Angelini, A.L., Asendorpf, J.B., et al. (2016). *Psychological sex differences across cultures: Findings from the International Sexuality Description Project-2*. Manuscript in preparation.
- Schmitt, D.P., & Fuller, R.C. (2015). On the varieties of sexual experience: A cross-cultural exploration of the links between religiosity and human mating strategies. *Psychology of Religion and Spirituality*, 7, 314-326.
- Schmitt, D. P., & Pilcher, J. J. (2004). Evaluating evidence of psychological adaptation: How do we know one when we see one? *Psychological Science*, 15, 643-649.

- Schmitt, D.P., Realo, A., Voracek, M., & Alik, J. (2008). Why can't a man be more like a woman? Sex differences in Big Five personality traits across 55 cultures. *Journal of Personality and Social Psychology, 94*, 168-192.
- Schmitt, D.P., & Rohde, P.A. (2013). The Human Polygyny Index and its cultural correlates: Testing sexual selection theory at the cross-national level. *Social Science Quarterly*. DOI: 10.1111/ssqu.12030.
- Schwartz, S. H., & Rubel-Lifschitz, T. (2009). Cross-national variation in the size of sex differences in values: Effects of gender equality. *Journal of Personality and Social Psychology, 97*, 171-187.
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. New York, NY, US: Cambridge University Press.
- Sidanius, J., Pratto, F., & Bobo, L. (1994). Social dominance orientation and the political psychology of gender: A case of invariance? *Journal of Personality and Social Psychology, 67*, 998–1011. doi: 10.1037/0022-3514.67.6.998
- Silverman, I., Choi, J., & Peters, M. (2007). The hunter-gatherer theory of sex differences in spatial abilities: Data from 40 countries. *Archives of Sexual Behavior, 36*, 261-268.
- Simpson, E.A., Nicolini, Y., Shetler, M., Suomi, S.J., Ferrari, P.F., Paukner, A. (2016). Experience-independent sex differences in newborn macaques: Females are more social than males. *Scientific Reports*. doi: 10.1038/srep19669
- Simpson, J. A., Griskevicius, V., Kuo, S. I., Sung, S., & Collins, W. A. (2012). Evolution, stress, and sensitive periods: The influence of unpredictability in early versus late childhood on sex and risky behavior. *Developmental Psychology, 48*, 674-686.

- Stoet, G., & Geary, D.C. (2013). Sex differences in mathematics and reading achievement are inversely related: Within- and across-nation assessment of 10 years of PISA data. *PLoS ONE*, 8, e57988. doi:10.1371/journal.pone.0057988
- Su, R., Rounds, J., & Armstrong, P. E. (2009). Men and things, women and people: A meta-analysis of sex differences in interests. *Psychological Bulletin*, 139, 855–884.
- Sugiyama, L. S. (2005). Physical attractiveness in adaptationist perspective. In D. M. Buss (Ed.), *The handbook of evolutionary psychology* (pp. 292-343). New York: Wiley.
- Tapp, A. L., Maybery, M. T., & Whitehouse, A. J. (2011). Evaluating the twin testosterone transfer hypothesis: a review of the empirical evidence. *Hormones and behavior*, 60, 713-722.
- Tesch-Römer, C., Motel-Klingebiel, A., & Tomasik, M. J. (2008). Gender differences in subjective well-being: Comparing societies with respect to gender equality. *Social Indicators Research*, 85, 329-349.
- Tooby, J. & Cosmides, L. (1992). Psychological foundations of culture. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 19 - 136). New York: Oxford University Press.
- Trabzuni, D., Ramasamy, A., Imran, S., Walker, R., Smith, C., Weale, M. E., & North American Brain Expression Consortium. (2013). Widespread sex differences in gene expression and splicing in the adult human brain. *Nature Communications*, 4, 2771.
- Twenge, J. M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles*, 36, 305-325.

- Twenge, J. M., & Nolen-Hoeksema, S. (2002). Age, gender, race, socioeconomic status, and birth cohort difference on the children's depression inventory: A meta-analysis. *Journal of Abnormal Psychology, 111*, 578-588.
- Udry, J. R. (2000). Biological limits of gender construction. *American Sociological Review, 65*, 443-457.
- Udry, J.R., Morris, N. M., & Kovenock, J. (1995). Androgen effects on women's gendered behaviour. *Journal of Biosocial Science, 27*, 359-359.
- Vandermassen, G. (2011). Evolution and rape: A feminist Darwinian perspective. *Sex Roles, 64*, 732-747.
- van den Berghe, P.L. (1990). Why most sociologists don't (and won't) think evolutionarily. *Sociological Forum, 5*, 173-85.
- Van de Velde, S., Bracke, P., & Levecque, K. (2010). Gender differences in depression in 23 European countries. Cross-national variation in the gender gap in depression. *Social Science & Medicine, 71*, 305-313.
- Van Goozen, S. H., Cohen-Kettenis, P. T., Gooren, L. J., Frijda, N. H., & Van De Poll, N. E. (1995). Gender differences in behaviour: Activating effects of cross-sex hormones. *Psychoneuroendocrinology, 20*, 343-363.
- von Hippel, B. (2015, December 27). *SESP survey - ideology and evolutionary psychology* [data set]. Retrieved from <https://osf.io/ebvtq/>
- Weber, D., Skirbekk, V., Freund, I., & Herlitz, A. (2014). The changing face of cognitive gender differences in Europe. *Proceedings of the National Academy of Sciences, 111*, 11673-11678.

- Weisberg, Y. J., DeYoung, C. G., & Hirsh, J. B. (2011). Gender differences in personality across the ten aspects of the Big Five. *Frontiers in Psychology, 2*, 1-11.
- Weiss, A., & King, J. E. (2015). Great ape origins of personality maturation and sex differences: A study of orangutans and chimpanzees. *Journal of Personality and Social Psychology, 108*, 648-664.
- Williams, J. E., & Best, D. L. (1990). *Measuring sex stereotypes: A multination study*. New York: Sage Publications, Inc.
- 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.
- Zell, E., Krizan, Z., & Teeter, S. R. (2015). Evaluating gender similarities and differences using metasynthesis. *American Psychologist, 70*, 10-20.
- Zentner, M., & Eagly, A.H. (2015). A sociocultural framework for understanding partner preferences of women and men: Integration of concepts and evidence, *European Review of Social Psychology, 26*, 328-373. DOI: 10.1080/10463283.2015.1111599
- Zentner, M., & Mitura, K. (2012). Stepping out of the caveman's shadow: Nations' gender gap predicts degree of sex differentiation in mate preferences. *Psychological Science, 23*, 1176-1185.
- Zucker, K. J., Lawrence, A., & Kreukels, B. P. (2016). Gender dysphoria in adults. *Annual Review of Clinical Psychology, 12*, 20.1-20.3.