

## A social-cognitive model of human behavior offers a more parsimonious account of emotional expressivity

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**Abstract:** According to socio-relational theory, men and women encountered different ecologies in their evolutionary past, and, as a result of different ancestral selection pressures, they developed different patterns of emotional expressivity that have persisted across cultures and large human evolutionary time scales. We question these assumptions, and propose that social-cognitive models of individual differences more parsimoniously account for sex differences in emotional expressivity.

Imagine a hunter-gatherer society in which men hunt, facing dramatic surprises and life-threatening situations regularly. Men with facility in emotion regulation would be better hunters, promoting higher overall fitness; in contrast, women would face weaker selection pressure for emotion-regulation abilities. Such an evolutionary construction could predict why a functional magnetic resonance imaging (fMRI) study of cognitive reappraisal found neurophysiological evidence that men were more effective than women at down-regulating emotional responses to negative stimuli (McRae et al. 2008).

This evolutionary explanation is plausible. But, so is the following cultural explanation: Western societal norms and gender stereotypes differentially encourage men to down-regulate emotional responses to negative events (Brody 1997). Thus, adherence to societal norms of expressivity, which pervade everyday life (e.g., Simpson & Stroh 2004), rather than prolonged evolution favoring sensitivities, could also easily account for the fMRI findings.

Evolutionary accounts do provide a provocative lens through which to view modern human behavior. However, as the foregoing vignette illustrates, a concern with most evolutionary psychological theories, such as Vigil's socio-relational framework for expressive behaviors (SRFB), is that their hypotheses rely on a number of assumptions that are difficult, if not impossible, to examine empirically in human populations.

We question the validity of basic assumptions of the SRFB, specifically (1) evidence of patrilocality in the ancestral populations that gave rise to contemporary humans, (2) the extent to which patrilocality led to purported differences in emotional expressivity in ancestral populations, and (3) the likelihood that the selection pressures mediating these hypothesized sex differences have persisted across large human evolutionary time scales to result in modern sex differences. In light of these concerns, we question the SRFB's utility as an integrative framework for understanding emotion and sex differences. We propose that current social-cognitive models of human behaviors provide a more parsimonious explanation of emotional expressivity and any purported sex differences.

**1. How prevalent is patrilocality across cultures?** The SRFB's explanation of sex differences in emotional expressivity rests on the assumption that women and men faced different social ecologies, which imposed different evolutionary constraints. However, in nearly one-fourth of human societies included in Murdock's (1967) ethnographic database, which includes data from a myriad of societies, including preindustrial ones, the residence pattern in which men stay with kin and women move with non-kin (patrilocal residence) is not observed. Thus, these find-

ings cast doubt upon the SRFB's assumed universality of patrilocality and patrilocality-induced sex differences in emotional expression.

**2. Did patrilocality lead to adaptive sex differences in emotional expressivity in ancestral populations?** Even assuming that the majority of ancestral human populations exhibited patrilocal residence patterns, the adaptive value of Vigil's purported sex differences in emotional expressiveness is unsubstantiated. According to the SRFB, women had to advertise trustworthiness to non-kin through submissive emotions. However, other evolutionary arguments (Cosmides & Tooby, 2000) suggest that such displays might have also been associated with costs. As a result, the cost of expressing emotions in distant (non-kin) relationships might have been relatively more costly than expressing emotions in close (kin) relationships; in the latter, costs arising from emotional expressions might have been offset because of incurred inclusive (shared) fitness benefits. Thus, based on this account, it is unclear why women, who were moving into distant relationships, did not limit their emotional expressiveness, and why men, who remained near kin, did not exhibit greater emotional expression with kin and limit expression of vulnerabilities to competitors.

**3. Is there evidence that directional selection favoring sex differences in ancestral populations persisted throughout modern human evolution?** The SRFB rests on the assumption that men experienced prolonged selection pressures that favored less expressiveness, and that women experienced prolonged (and opposing) directional selection favoring more expressiveness. Prolonged directional selection is unlikely, because the environment for which this trait has evolved has changed over the long course of human evolution. However, neither hypothesis can be directly tested in extinct populations.

Moreover, prolonged directional selection would have resulted in relatively large sex differences in emotional expressivity (Grant & Grant 1992; Kocher 2004). This is clearly not the case. The empirical reality is that substantial sex differences in emotional expressivity are not observed; One comprehensive review of research on emotion as expressed through behavior, self-report, or physiology, unequivocally concluded that "sex differences in emotionality are small, inconsistent, or limited to the influence of specific situational demands. . . . Reviews do *not* support belief in sex-based affective differences" (Wester et al. 2002, p. 639, emphasis in original).

Furthermore, because sex differences in emotion facilities, when they appear, tend to be small (e.g., Montagne et al. 2005; see also Brody 1997; Wester et al. 2002), between-sex variability in emotion expressivity is actually *smaller* than within-sex variability. Indeed, men's and women's distributions of scores on a measure of emotional expressivity, assuming a small effect size of  $r = .1$ , overlap by 84.3%. Applied to the SRFB, this suggests that a substantial proportion of women display "masculine" patterns of capacity and trustworthiness cues, and a substantial portion of men display cues in "feminine" patterns. The high variance of this behavioral trait does not fit with expectations of prolonged, directional selection favoring sex-specific patterns of expressivity, as proposed by the SRFB.

**4. Social-cognitive models of human behavior: A parsimonious account of emotional expressivity and sex differences in emotional expressivity.** Key assumptions of the SRFB remain speculative. Specifically, the adaptive significance of sex differences in expressivity in ancestral human populations and the conservation of such purported differences both across cultures and throughout modern human evolution cannot be validated. Moreover, extant research suggests women and men are much more alike than different in their emotional expression. The large within-sex individual differences, relative to small between-sex differences, suggest that emotional displays are strongly influenced by contemporary context (e.g., Ambady & Hall 2002; Callahan et al. 2005) rather than ancestral sex differences in sensitivities (see Brody 1997).

A more parsimonious account of emotional expressivity, as well as any possible sex differences in emotional expressivity, is offered by current social-cognitive models of individual differences and human behavior (e.g., Zayas et al. 2002; see Mischel & Shoda 1995; Shoda & Mischel 1998). Such models highlight the adaptive value of flexible emotional expressivity for both women and men, and the importance of culture and contemporaneous situational influences in guiding appropriate emotional displays and behaviors.

By accounting for evolutionary constraints *and* empirical and theoretical contributions from broad areas of psychology and neuroscience, such social-cognitive models construe a person's behavior as a function of his or her processing system (e.g., sensitivity to displays) and the particular contingencies present in the situation. This position is in stark contrast to Vigil's current assumptions that sex differences in emotional expressivity reflect differences in ancestral selection pressures for men and women. Additionally, because social-cognitive models allow the generation of falsifiable hypotheses, they have broader potential for empirical scrutiny.

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## Author's Response

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### The socio-relational framework of expressive behaviors as an integrative psychological paradigm

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**Abstract:** This response shows how the socio-relational framework of expressive behaviors may be used to understand and predict social psychological processes, beyond sex differences in the expression of emotion. I use this opportunity to elaborate on several key concepts on the epigenesis of evolved social behaviors that were not fully addressed in the target article. These are: evidence of a natural history of masculine and feminine specialization (sect. R1); phenotypic plasticity and range of reactivity of social behaviors (sect. R2); exploitive and protective functions of social behaviors (sect. R3); and the role of cognition in some affective responses (sect. R4). I conclude by highlighting (in sect. R5) future directions for psychological research from a socio-relational basis.

I am pleased that my target article is largely viewed as controversial yet useful for understanding sex differences and broader organization of social behaviors in humans. My goal was to present an integrative theoretical framework of key social selection pressures that may have been involved in the evolution and contemporary development of cognitive and behavioral mechanisms for regulating interpersonal relationships. I specifically focused on sex

differences in masculine and feminine behaviors as an example of the many areas that the *socio-relational framework of expressive behaviors* (SRFB) may be applied. In the target article, I conceptualize just some of the cost-benefit fitness trade-offs that may have supported situation-based and condition-based variation in emotional expressivity. I use the current opportunity to comment on several key concepts that are fundamental to the commentary responses, but were necessarily truncated in the target article. I hope that by integrating these precepts into the existing framework, the reader is left with a broader conceptual basis with which to better understand and examine the human organism.

This response is divided into five sections to reflect the major themes of the commentaries. In the first section (R1), I discuss the commentators' concerns with some empirical and theoretical inferences from the target article. I then show how an evolutionary approach to studying sex differences may integrate many of the "alternative" models the commentators presented, while addressing corollary hypotheses that are difficult to explain from the discrete models themselves. In the second section (R2), I use the example of sex differences to describe how personal experiences operate within evolved ranges of reactivity to produce both evolved dispositions (e.g., overall group differences) and individual differences (e.g., within sex variability). In the third section (R3), I describe how social psychological mechanisms operate to exploit the reciprocity potential of others, while protecting the self from being exploited. In the fourth section (R4), I discuss the potential roles of some cognitive processes (e.g., emotional awareness, visceral sensations) for regulating affect. In the final section (R5), I describe how the SRFB may be useful for guiding some of the future research the commentators highlighted.

#### R1. Natural history of masculine and feminine behaviors

##### R1.1. Empirical issues related to the biology of sex differences

Of all the major findings that I described in the target article, a few empirical inferences were parsed by the commentaries. The first finding is greater facial expression-processing abilities in females, with the exception of anger, of which males are predicted to be more sensitive. Consistent with the SRFB, commentators **LoBue & DeLoache** show that females are better at detecting social, but not nonsocial, stimuli as compared with males. However, LoBue & DeLoache also present some data that suggest that both males *and* females detect threatening emotions (e.g., anger and fear) more efficiently than non-threatening emotions (e.g., happiness and sadness), leading the researchers to suggest that males and females may not differ in the ability to detect threat. I recently conducted a preliminary analysis that may shed light on the commentators' findings.

Using a large, representative sample of young adults ( $n = 808$ ), I found that women were just as likely as men to perceive threatening (i.e., anger, fear, disgust) versus non-threatening (i.e., joy, sadness, surprise) emotions from ambiguous facial stimuli. However,