

# Gender categories are regulated by natural and social mechanisms

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I argue that social constructivists should treat gender largely as a category of social science, in particular, as a homeostatic property cluster (HPC) regulated by both natural and non-natural homeostatic mechanisms. The analytical and descriptive approaches are the two active research programmes inquiring into gender (Haslanger, 2000: 33). The metaphysics of these approaches can be spelled out in terms of objective types (Haslanger, 2012) and HPCs (Mallon, 2016; Bach, 2016) respectively. Both approaches, the ameliorative and social scientific projects, yield appropriately anti-essentialist theories of gender. I argue that if a social constructivist adopts an HPC theory of gender, the theorist should treat gender as regulated by a natural mechanism: sexual dimorphism. Sex is plausibly responsible for the bodily traits that gender gives arbitrary social significance to. The proposed HPC also involves the social mechanisms that maintain separate gender roles for women and men, which I argue are selected by social science to be the direct causes of gendered phenomena. To address an objection from Hawley (2018), I present and further support Bach's (2016) argument that treating gender as an HPC is empirically adequate in a way that the objective types of Haslanger's ameliorative project may fail to be, so an HPC theory has better prospects for advancing feminist aims. I strengthen his argument by providing evidence that a natural-and-social HPC project has better prospects to advance feminist aims in responding to sexism and androcentrism in evolutionary psychology. Social constructivists, therefore, should adopt a multi-mechanical social scientific approach to theorising about gender.

## Introduction

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I argue that if a social constructivist adopts an HPC theory of gender, the theorist should treat gender as regulated by a natural mechanism: sexual dimorphism. Sex is plausibly responsible for the bodily traits that gender gives arbitrary social significance to. The proposed HPC also involves the social mechanisms that maintain separate gender roles for women and men, which I argue are selected by social science to be the direct causes of gendered phenomena.

Hawley (2018) has objected that enquiry motivated by feminist values favours ameliorative over social scientific projects. To address this objection, I present and further support Bach's (2016) argument that treating gender as an HPC is empirically adequate in a way that the objective types of Haslanger's ameliorative project may fail to be, so an HPC theory has better prospects for advancing feminist aims. I strengthen his argument by providing evidence that a natural-and-social HPC project has better prospects to advance feminist aims in responding to sexism and androcentrism in evolutionary psychology.

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## Social Constructivist Theories of Gender and Anti-Essentialism

Social constructivists share an acceptance of Simone de Beauvoir's ([1949]/1956: 273) claim that "[o]ne is not born, but rather becomes, a woman", in the sense that social norms and structures are what account for gender, not biological sex.

Sally Haslanger (2000: 33) suggests that there are three approaches to arriving at accepting social constructivism—conceptual, descriptive, and analytical. The conceptual project investigates what our concept of gender is, that is, how this concept figures in propositional attitudes formed by subjects. She suggests that this is not a promising strategy for enquiring into gender because our existing concept of gender is laden with sexist and androcentric assumptions (Haslanger, 2000: 34), so I will not consider it further. Haslanger instead pursues an analytical approach, or ameliorative project. This involves interrogating and replacing our concept of gender with one more suited to feminist aims of addressing the oppression and marginalisation of women (Haslanger, 2000: 40). By contrast, the descriptive approach treats gender as an appropriate subject for empirical research (Haslanger, 2000: 33). This involves gathering data about gendered phenomena, like hiring discrimination (Neumark, 2018), and using these to form descriptions and explanations.

There are different metaphysics appropriate to these approaches to enquiring into gender. Haslanger (2012: 149) suggests that on the ameliorative project, gender is an 'objective type', that is, a stipulated set of properties that obtain in observer-independent ways. The analytical theorist stipulates this set from what is most conducive to achieving the above feminist aims. For Haslanger (2000: 42), this involves the following stipulation: a woman is a subject who is regularly perceived or imagined to have a female body, such that this body "marks" the subject to have a subordinate social position within the society in question, and such that these conditions being satisfied is responsible for the subject being systematically subordinated in some respect.

Ron Mallon (2016) and Theodore Bach (2016), who follow descriptive approaches, account for the metaphysics of gender using an HPC—a collection of properties that are co-instantiated in almost every member of the population such that there are mechanisms responsible for maintaining the co-occurrence (Boyd, 1991: 141). Mallon (2016: 93) theorises that practices of representing humans as women or men is initiated and sustained by psychological and environmental mechanisms that entrench separate gender roles responsible for gendered phenomena. Suppose a chess club allows men or women to join but almost every member of the club is a man. In this case, the club entrenches the gendered expectation that chess players are men. Entrenchment of gender roles plausibly provides the stability necessary for the proposed mechanisms regulating gender to be causal generalisations within the relevant contexts (Mallon, 2016: 181). On Bach's (2016: 193) view, the mechanisms governing gender are replicated social practices that reproduce differences in behaviour and treatment between women and men. The above seem to obtain, for example, when social conditioning excuses or encourages assertiveness in some—men—but prohibits it in others—women (Kelly *et al.*, 1980). The difference between the metaphysics here is that objective types explain only what they are stipulated to explain (social subordination in Haslanger's case) and HPCs seek to explain any pattern of co-occurrence in the cluster that empirical evidence bears on.

Neither of these approaches yields an essentialist theory of gender in every case. A category has an essence just in case its membership conditions explain certain properties of every one of its members, always (Putnam, 1975: 241). For example, silver plausibly has atomic number 47 as its essence because every silver atom has and will always have 47 protons in its nucleus (Mosher and Kelter, 2023: 70). Some social constructivists are essentialists because they theorise that the category woman is observably constituted by a single phenomenon, for example, differential treatment (Millet, 1971: 31) or sexual objectification (MacKinnon, 1989: 113). However, these essentialisms encounter problems in forming these strict generalisations in a way that accommodates the diverse positions of women at the intersection of different structures of power (Crenshaw, 1989). For example, a woman from a wealthy background may have been afforded a better education than a woman from a working-class background, so quality of education in this case is not an instance of differential treatment that supports Millet's (1971) essentialism. It is also not clear on these theories how gender categories could undergo significant changes. If, for example, a culture of men objectifying women could be curtailed without destabilising the distinction between men and women, then this fact

goes unexplained on MacKinnon's (1989) view. A standard move that social constructivists have made in response to these problems is to adopt anti-essentialism (Mikkola, 2017: 171), that is, to deny that there are universal, unchanging membership conditions for gender categories.

Haslanger's (2000; 2012) ameliorative project does not give strict generalisations about properties shared by all and only women. Instead, its objective type adverts to relations of how certain humans are perceived or imagined by others, marked by social forces for subordination or superordination, and in fact subordinated or superordinated by these forces (Haslanger, 2000: 42). So, Haslanger's (2000) ameliorative project is anti-essentialist.

Likewise, HPCs as used by Mallon (2016) and Bach (2016) do not require an essentialist account of gender.<sup>1</sup> Boyd (1991) developed HPCs to offer a better account of the evolution of species than the essentialist accounts Kripke (1980) and Putnam (1975) had offered. Kripke (1980: 120), for example, claimed that being a tiger involves having a certain "internal structure", an essence, common to all tigers. However, evolutionary biologists do not classify species according to an internal structure because there are no organismic traits strictly shared by con-specifics and on Darwinian theory, we expect there to be variation in all such traits (Okasha, 2002: 196–197). HPCs lack these problems. First, HPCs do not have strict membership conditions; properties co-occurring in *almost every* member of a population is sufficient (Boyd, 1981: 142). Second, the co-occurring properties and mechanisms regulating them can undergo change (Boyd, 1981: 142). So, the offspring of tiger parents can be a tiger even if it lacks stripes. Mallon (2016: 89) argues these features make HPCs appropriate for a social scientific account of gender. Theorising that gender is an HPC permits that the gender roles that separate women and men do not require strict generalisations. So, even under social conditioning, for example, there are assertive women and unassertive men. Treating gender as an HPC also permits that mechanisms regulating gender can change. For example, the environmental features that plausibly entrench gender, like separate bathrooms, can be made gender-neutral (Mallon, 2016: 86). So, the social scientific project seems appropriately anti-essentialist.

At a first pass, both the ameliorative and social scientific projects yield anti-essentialist accounts appropriate for social constructivism about gender. I assume below that this claim holds.

## Sexual Dimorphism Also Regulates Gender

If we were to pursue a social scientific project of enquiring into gender, as Mallon (2016) and Bach (2016) do, then we would expect there to be many mechanisms regulating gender categories. I argue that, in addition to social mechanisms, sexual dimorphism regulates gender. Sexual dimorphism is a feature of populations of organism by which there are two clusters with distinct morphological and physiological traits that are required for sexual reproduction (Fairbairn, 2016). Sexual dimorphism, I argue, is the naturally regulated difference that gender roles give arbitrary social significance.

Mallon's (2016: 58) social constructivism holds that the activity of a community representing a group of persons as belonging to a gender category creates that gender category when this representation is common knowledge for that community. One question we might ask about a theory like this is how that group of persons is picked out from others. If there were no non-social membership conditions for belonging to the categories *women* and *men*, then we would expect membership in these categories to be assigned randomly, on community whim, or otherwise not to persist through successive generations. We do not find this, however. As Haslanger (2000: 39) notes, the female body is marked by the ideology of patriarchal societies for social subordination. This 'marking' is plausibly also a descriptive hypothesis of how the category *women* came about and persists: some natural difference exists to which social construction gave and continues to give arbitrary social significance.

I suggest that sexual dimorphism supplies this natural difference. This is the standard approach to social construction of gender categories in anthropology (Upton, 2012). For example, consider Margaret Mead's ([1928]/2001) classic work on gender in the cultures of the Arapesh, Mundugumor, and Tchambuli

<sup>1</sup>Bach (2016: 178) uses the term 'essentialist' to pick out any account that has broadly explanatory membership conditions and so describes his own account using the term. By using HPCs constituted by social mechanisms in his metaphysics of gender (Bach, 2016: 193), his account qualifies as anti-essentialist in the weak sense used here of not claiming that the membership conditions on gender categories apply strictly to every member and cannot change.

in New Guinea. Mead ([1928]/2001: 279) observes that the Arapesh trains both sexes to be “co-operative, unaggressive, [and] responsive to the needs and demands of others”. By contrast, the Mundugumor expect everyone to be “ruthless [and] aggressive” and the Tchambuli encourage female persons to lead and male persons to be “emotionally dependent” on them (Mead, [1928]/2001: 279–80). A natural interpretation of this work is that human cultures mark the bodies of female and male persons for social significance in different ways—with universal feminine norms, universal masculine norms, or some assignment of feminine and masculine norms to female and male persons—resulting in different genders or none. Sex does not determine these roles, but it arguably establishes a naturally regulated foundation onto which the social construction of gender is built.

It could be objected that if gender categories are HPCs governed by natural mechanisms (sexual dimorphism) and social mechanisms (social conditioning, environmental influences, and structural sexism, among others), then this is not a social constructivist theory at all. It reduces to a sex theory of gender because arguably natural terms, like those describing sexual traits, are the terms necessary to offer a minimal description of the world (Lewis, 1983: 346).

However, HPCs as a theoretical device pick out all of the mechanisms causally relevant to the clustering of co-occurring properties, but some of these mechanisms arguably can be different types of causes than others. I argue that a social scientific account of gender can accommodate indirect natural mechanisms.

Woodward (2003) distinguishes between direct and contributing causes. Manipulating a direct cause of *X* and only that direct cause results in a change in *X* (Woodward, 2003: 42). Manipulating a contributing cause of *X* and only that contributing cause results in a change in *X* *along some path* (Woodward, 2003: 50).

Consider Figure 1 below. A, B, and C are contributing causes of D because there are paths (A, C, D), (B, C, D) and (C, D) to the effect D, but only C is a direct cause of D.

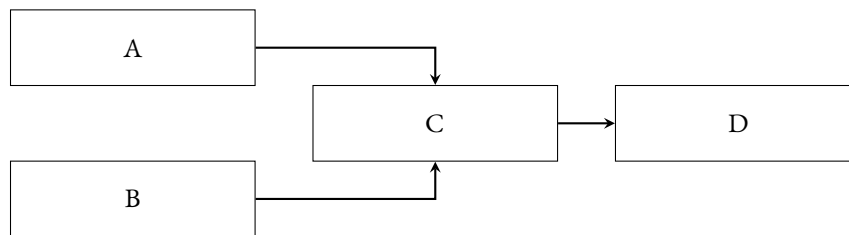


Figure 1. Direct and contributing causes.  
(The arrows represent causal relevance.)

Social mechanisms are arguably direct causes of gendered phenomena, and sexual dimorphism (the natural mechanism) is an indirect, contributing cause of gendered phenomena. This is because the existence of sexed bodies is causally relevant to how gender roles obtain, but is insufficient to explain why those roles are assigned the way they are.

This is represented in Figure 2.

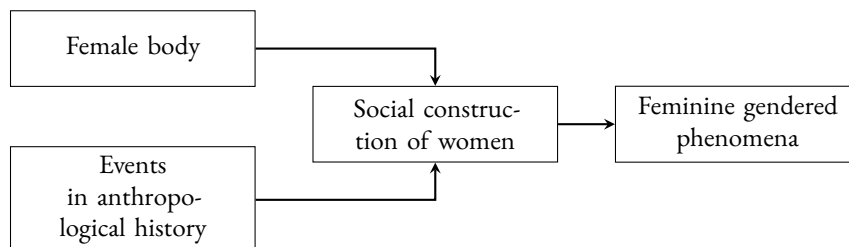


Figure 2. Homeostatic mechanisms for the category *women*.

The female body is presented here as an indirect cause of feminine gendered phenomena, and social construction is the direct cause. Gendered phenomena are the behaviours and roles that form clusters of people, which are the data that the HPC theory seeks to explain. For example, the expectation to be nurturing is a

feminine gendered phenomenon (Mikkola, 2017: 169). Also presented are the events in Western anthropological history by which certain people (those with female bodies) were marked to be the targets of feminine social conditioning and subordinate positioning within social structures, as above (Mead, [1928]/2001). When regularly reproduced in social practices, this marking plausibly contributes to constituting gender categories (Bach, 2016: 193).

Here, gender is presented as socially constructed, and not reducible to sex, because the social mechanisms are selected for best facilitating social scientific explanation of gendered phenomena.

For a typical case, consider studies of hiring discrimination on the basis of gender. In Neumark's (2018: 857) literature review of experimental research into hiring discrimination, he finds that there is strong evidence of discrimination against women in the legal, financial, and medical professions. This result is supplemented by Rich's (2014: 55) earlier finding of gender-stereotyping against men in hiring for hospitality and secretarial work. Taken together, these authors evince a gendered phenomenon of hiring discrimination that filters the workforce by gender into male- and female-dominated jobs. Socially constructed gender roles offer a compelling explanation of this pattern. Those doing professional work requiring expertise and socially significant decision making are expected to be men, whereas those doing customer-facing or assistant work are expected to be women. So, it is plausible that social mechanisms, like gender roles, are the direct cause for gendered phenomena; the natural terms referring to sexed bodies are not at work here.

The social construction of gender itself, however, still requires an explanation. Given the above anthropological evidence, sex is a good candidate for the natural difference which is marked by social practices, being a stable basis for assigning gender roles. If the basis were social, then how that social practice came about would require an explanation, which would bring about a theoretically vicious regress. Since a natural difference therefore needs to be identified, sexual difference is the best explanation for how 'marking' practices are initiated and reproduced (Bach, 2016: 193). So, sexual dimorphism is an indirect cause of gendered phenomena: it is a necessary part of the background for genders to be constructed. This hypothesis cannot be charitably interpreted as a sex theory of gender because sexual dimorphism has only an indirect effect on gendered phenomena. So, the objection that a natural- and social-mechanical HPC theory reduces to a sex theory fails.

This model is incomplete because it only accounts for cisgender women, but it can be extended to include transgender women. There is strong evidence that trans women exemplify feminine gendered phenomena. For example, trans women typically habituate to a feminine gender presentation, such as norms governing dress and voices (Anderson *et al.*, 2025: 2). Trans women are also subject to gender-based violence, including the sexual harassment of 'passing' trans women (Fiani and Han, 2019; Ussher *et al.*, 2022). Some trans women who do not 'pass' experience what writer Julia Serano (2007: 236) termed "transmisogyny", which involves both the sexual objectification typical of sexism and the belief that a person's gender is immutable which is typical of transphobia. These traits belonging to trans women therefore cluster as feminine gendered phenomena, so these need to be accounted for in HPC theory.

There are two available explanations: medical transition and social transition in isolation. Transgender women who medically transition are easily included in the above model.

This is represented in Figure 3 below with an additional box to indicate medical intervention.

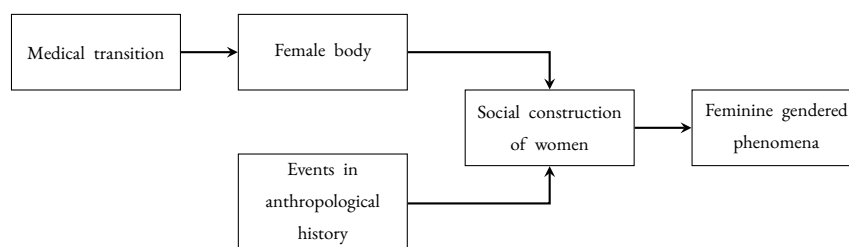


Figure 3. Homeostatic mechanisms for the category *women*, who medically transition.

Hormone replacement therapy together with gender-affirming surgery results in morphological and physiological changes to Assigned Male at Birth (AMAB) bodies (Fabris *et al.*, 2015; Stone, 2007: 44). Though

there is vagueness between male and female bodies with no strict boundary between the two, these changes are significant evidence that trans women who have medically transitioned are female (Maung, 2023: 46). The female bodies of these trans women are therefore ‘marked’ by existing social practices to be governed by feminine gender norms and to be socially subordinate to men.

Trans women who socially transition but do not medically transition are not so easily included in this class of models. In effect, socially transitioning without medical transition involves choosing to ‘mark’ one’s own body as someone who is subject to gender norms that otherwise sexed bodies are typically ‘marked’ for. This in turn leads to these women experiencing feminine gendered phenomena, but it also creates friction with existing social practices.

This result is explicable as a HPC theory, however, as represented in Figure 4 below.

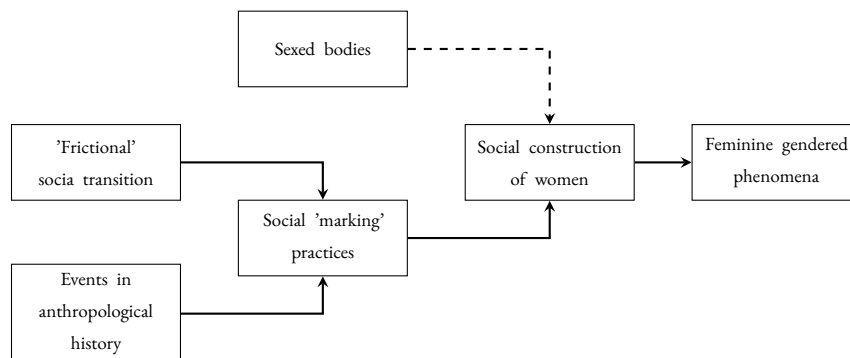


Figure 4. Homeostatic mechanisms for the category women, who only socially transition.  
(The dashed line indicates causal relevance that is dependent on other events.)

The category *women* as represented in Figures 2 and 3 provides background for how feminine gendered phenomena come to occur in a given culture. Social phenomena typically do not occur in isolation, however. Ian Hacking (1995) has argued that introducing or updating a human-kind term can cause a ‘looping effect’ that changes the category. For example, the introduction of “child abuser” lead some child abusers to become aware of the classification and change their behaviour to hide the abuse, which changes the traits that cluster to form child abuse and thus the membership conditions on the category (Hacking, 1995: 357). Likewise using the term “women” with the connotation of a category governed by certain norms changes who can conceivably be ‘marked’ to belong to the category. This has the ‘looping effect’ of trans women who only socially transition, introducing new ‘marking’ practices which disrupt those which have been maintained from anthropological history. Insofar as their efforts succeed in changing social practices, the membership conditions for the category *women* are changed by displacing the causal relevance of sexed bodies to gender. So, trans women who only socially transition have a causal profile that differs from other women. The class of models represented in Figures 2 and 3 accommodates almost every woman and is sufficient for gender to be a natural-and-social HPC. However, if trans women who undergo ‘frictional’ social transition were to become a sufficiently greater proportion of those exemplifying feminine gendered phenomena, then sexual dimorphism at that time would fail to regulate the category.

Both natural and social terms are required to explain how gender categories came to exist. Sexual dimorphism regulates gender at present, however, this could change without a loss of existing genders. If social constructivists pursue a social scientific approach, they should admit a natural mechanism into their gender HPC.

## Haslanger’s Ameliorative Project May Fail to be Empirically Adequate

Social constructivists should pursue a social scientific project because the ameliorative project risks empirical inadequacy. A theory is empirically inadequate if it fails to explain data relevant to its subject matter and the aims motivating the inquiry (Bach, 2016: 189). Firstly, I explain why a theorist would pursue an ameliorative project using Hawley’s (2018) objection to social scientific approaches. Secondly, I present

Bach's (2016) argument that Haslanger's (2000; 2012) use of objective types in her ameliorative project may fail to be empirically adequate because it risks 'screening off' political possibilities, which risks failing to achieve feminist aims. Finally, I strengthen Bach's (2016) argument by making the case that the above social-and-natural HPC better equips feminist philosophers of science to engage with sexist and androcentric assumptions in evolutionary psychology (Fehr, 2012) than do Haslanger's objective types.

Hawley (2018: 4) argues that social metaphysics cannot be 'read off' the results of social science. To sort through the multiple paradigms of social science to find those which have philosophical significance, say between the social psychological and structural mechanisms governing gender, the theorist needs to use the values of her enquiry (Hawley, 2018: 9). While peripheral to social scientific projects, these values are central to the critical analysis involved in ameliorative projects (Hawley, 2018: 9). Haslanger (2000: 35), for example, claims that "truths [about gender] are too easy to come by, there are too many of them". So, using objective types to stipulate what constitutes women and what constitutes men in terms of social subordination constrains enquiry in a way that is conducive to the feminist aims of addressing the marginalisation and oppression of women (Haslanger, 2000: 42; Haslanger, 2012: 149). As feminist philosophers, our motivations for inquiring into gender, among others, are to further these political goals, Hawley (2018) presents a strong objection to a social scientific project, *a fortiori* the account I have been developing here.

However, Bach (2016) argues that there is a limit to which values can be involved in successful inquiry that the ameliorative project risks breaking. Drawing on Elizabeth Anderson's (1995) feminist epistemology, he suggests that this limit is empirical adequacy (Bach, 2016: 187). Feminist philosophers have argued that values have a permitted use in inquiry (Longino, 1994: 481). There exist many theories that are consistent with the evidence we have, so values are useful grounds for the inquirer to accept a theory that is underdetermined, in this way, by its data. For example, though the Ptolemaic and Copernican models of the solar system made the same predications about the observable positions of stars in the night sky in the 16th and 17th centuries, the Copernican model was simpler and this value of simplicity lead Kepler to accept it (Lange, 2022: 94). These values motivating theory-choice can appeal also to our political interests. Anderson (1995: 30) suggests that empirical adequacy, for example, is supported by political interests because "an empirically inadequate theory cannot satisfy our practical interests in predicting and controlling phenomena". That is, if we are motivated to inquire into gender to address the social subordination of women, only a theory that offers robust explanations will be useful in pursuing that goal. So, Bach (2016: 187) infers that if a theorist is motivated by feminist values, the theory should be empirically adequate.

Bach (2016) argues that Haslanger's (2000; 2012) ameliorative project risks empirical inadequacy in this exact way. One empirical possibility that Haslanger rules out is the mutability of social subordination on present genders. Haslanger (2012: 149) uses an objective type to stipulate that women are structurally subordinate to men, so if there were no persons subordinate in some respect on the basis of perceived or imagined female bodies, then there would be no women. So, if existing gender categories can change with respect to social subordination, Haslanger's objective type theory would not explain this fact. Bach (2016: 194) argues that this risks empirical inadequacy because it involves an "empirical and political gamble": it rules out the empirical possibility of there being women who are not socially subordinate, so it rules out the political possibility of preserving existing genders while dismantling social subordination. The social scientific project, by contrast, does not stipulate social subordination as the only mechanism regulating the gender HPCs. So, it leaves open this empirical possibility and the more modest political strategy of pursuing equality between existing genders (Bach, 2016: 193). Since the ameliorative project endorses the more ambitious strategy of eliminating gender categories from social life, it is more likely to fail to advance its aims. This objection targets Haslanger's view of gender in particular. However, it generates a problem for ameliorative projects in general. Ameliorative projects interrogate and replace a concept with another that is more conducive to the inquirer's political aims; this replacement uses an objective type metaphysics to stipulate what the category under inquiry is for the sake of the project. However, social categories change in response to human activity (Hacking, 1995); some of which is motivated by the political aims of the ameliorative theorist (Bach, 2016: 196). So, this stipulative 'gamble' risks failing to explain this change (that is, risks empirical inadequacy) and *ipso facto* risk failing to investigate whether the corresponding political strategy is more likely to succeed. Suitably motivated descriptive projects do not take this risk. A social scientific project motivated by feminist values is therefore more likely to be empirically adequate than an

ameliorative project, and by Anderson's (1995) argument, more conducive to feminist aims.

The above social-and-natural HPC account provides further scope for empirical adequacy. Many results in evolutionary psychology are notoriously contested by feminist philosophers of science, who have questioned the sexist and androcentric assumptions behind these results (Fausto-Sterling, 1985; Hubbard, 1990). This includes, for example, those at work in explanations of male domestic violence in Wilson and Daly (1998). Carla Fehr (2012: 61) argues that feminist philosophers of science have not been effective in challenging these assumptions so far because they have failed to engage the scientists in these fields on their own terms by examining the empirical data. Evolutionary psychologists, whether feminist or not, are unlikely to be convinced by Haslanger's (2012) stipulation that gendered phenomena are explained only by social subordination. By contrast, the social-and-natural HPC, represented in Figure 2, takes *the female body* and *events in anthropological history* both to be causes of *the social construction of women*. It theorises that the marking events are more significant to how gendered phenomena arise from social construction than is sexual dimorphism. This is only a hypothesis, however. A descriptive approach leaves open the empirical possibility that some gendered phenomena are explained in evolutionary psychological terms. Fehr (2012: 54), for example, suggests it is empirically possible that (many) women, in virtue of being female, are disposed to be more selective in sexual partners than men because female organisms typically invest more resources in reproduction than male organisms (Trivers, 1972). Considering this disposition to be empirically possible allows feminist evolutionary psychologists to contest the scope of parental investment theory by gathering data that suggests it does not apply to many species (Hrdy, 1986; Hdry, 1999), and that there is evidence that humans evolved to parent collaboratively (Hrdy, 2009). So, inferring that parental investment theory applies to humans relies on a weak generalisation and fails to consider relevant counterevidence. This empirical investigation better disconfirms the sexist assumptions at work: that women are biologically coy and men biologically promiscuous. An ameliorative project could be formulated to target this exact source of sexist attitudes by stipulating a relationship between sex and gender. However, descriptive projects do not need to make this 'gamble': HPC theories can respond to empirical possibilities and take up corresponding political strategies as they present themselves. So, unlike the descriptive approach, ameliorative projects risk being empirically inadequate in failing to allow theorists to respond to sexist assumptions in evolutionary psychology.

So, Hawley's (2018) objection that ameliorative projects better respond to feminist values in inquiry fails. A largely social scientific approach has better prospects to further feminist aims by leaving open the possibility of dismantling social subordination while preserving gender categories (Bach, 2016), and allowing feminist engagement with evolutionary psychological explanations of gendered phenomena using a natural-and-social HPC. Though there are many research paradigms that examine gender and researchers with feminist values will target their enquiry at those paradigms most relevant to the subordination of women, an HPC theory has multiple mechanisms from which researchers can select to investigate.

## Conclusion

Social constructivism, therefore, should account for gender as a largely social scientific category which, at present, involves both natural and non-natural mechanisms. Such a project is appropriately anti-essentialist because it denies that gender categories have universal, unchanging membership conditions. HPC theory explains how genders came to exist by sexed bodies being 'marked' for social roles in anthropological history. It explains how genders persist though re-produced social 'marking' practices. It also explains how a gender category can undergo change by a 'looping effect' causing one or more of its mechanisms to fail to regulate the cluster of gendered phenomena. In addition, there are reasons to think the social scientific project has better prospects for advancing feminist aims than Haslanger's (2000; 2012) ameliorative project, because it leaves open more modest political strategies for pursuing gender equality and allows for feminist engagement with sexist and androcentric assumptions in evolutionary psychology.

The relationship between sex and gender is a contested issue in social ontology. The natural- and social-mechanical HPC model given here presents a different approach to this topic that uses directed graphs to represent that sexual dimorphism is an indirect mechanism on gender categories. If successful, this approach advances our understanding of how sex relates to gender without reducing to a sex theory of gender or

casting suspicion on transgender identities.

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