

## Against Dichotomy

Anne Fausto-Sterling

---

My remit: “In 1,500 words address the relative causal efficacy of biology and culture in forming gender.” My essay should fall somewhere along a spectrum of views “both for and against evolutionary conceptions of human behavior and culture.” I should expect that some authors “will emphasize the biological basis of gender identity” and my assignment is to offer “a counterweighted critique of such conceptions.”

The theory behind this remit baffles me because it insists on using dichotomous frameworks. This new journal, *Evolutionary Studies in Imaginative Culture* (ESIC) (which commissioned this commentary), uses these couplings in its opening gambit—a questionnaire that it hopes will tell us whether humanists and scientists own different sides of the posed dichotomies. The central qualification for contributing to the journal, by the way, is that one must regard works of imaginative culture as arising out of human nature—the evolved and adapted character of the human mind. I will return shortly to the question of human nature.

The following three dichotomies are false: (1) either one is *for or against evolutionary conceptions of human behavior*, including culture, a proposed division that seems to flow from whether or not (2) one believes *gender identity is caused by biology or caused by culture*. If you submit to the offered theoretical structure, then believing in cultural causation forces you to be against evolution. This creates a third dichotomy, *culture versus evolution* (3).

I reject these choices because I believe *both* in evolution (which for me is merely a tautology—humans evolved, so if humans exhibit a behavior, something in the material evolution of our

bodies must have evolved to the point where said behavior is possible)—*and* I believe that culture produces identity by shaping specific bodies in specific ways. I am neither against evolution, against biology, nor against culture.

The questionnaire *ESIC* circulated makes it hard for humanists not to appear as unbelievers. For example, in one of the questions, participants are asked to choose from among the following three (OK, this choice is trichotomous) possibilities: (1) Gender identities in humans are produced predominantly or exclusively by biological characteristics, that is, by genetically encoded behavioral dispositions mediated by anatomy, hormones, and physiology; (2) Gender identities in humans are produced predominantly or exclusively by environmental conditions, including cultural conventions; (3) Gender identities in humans are produced by an interaction between genes and environmental conditions, including cultural conventions.

The choice structure is wrong on several counts. First, it offers an either/or option for causality (rather than both inextricably together). Second, it reifies gender identity. Gender identity is not a thing that appears and remains as an unchanging feature of the body/mind. In fact, there is nothing in the body that can be said to be permanent and unchanging. Even the hard parts, such as bones, turn over completely every 10 years, and as they turn over they change, incorporating new states of internal physiology, new environmental inputs (food, exercise, sunshine, etc.) (Fausto-Sterling 2005). Believing that traits are static creates methodological conundrums. Which times in the life cycle would be the ones that we

analyze? Is the gender identity of a 3-year-old the same as that of a 13-year-old, a 25-year-old, an 80-year-old? If we understand human behaviors related to gender and sexuality as lifelong processes, then we need a processual theory and methodology. Third, the questionnaire offers a specific taxonomy (genes, hormones, etc.) of what biological mechanisms might produce “genetically encoded behavioral dispositions,” but it makes no attempt to elaborate the possible mechanisms by which environmental conditions might produce gender identities.

The questionnaire’s third choice—a nature–nurture interaction—does not solve the problem. Some interactionists merely add in a third term, thus continuing the idea that each part—nature, nurture, and the interaction—can be separated from one another as can the parts of, say, a car engine. This is often offered as a zero-sum game in which the three bits add up to a total of one. More sophisticated interactionists use the cake metaphor, in which one mixes the ingredients (nature), cooks them at a specific temperature (nurture), and a new thing—the cake—emerges. This still static metaphor, however, leaves out two critical concepts. The first—the idea of iterative development—is best elaborated by developmental systems theorists. Simply put, the state of the organism at developmental time  $x$  is the platform on which the events of time  $x + 1$  take place (Gottlieb 1997; Thelen 1988, 2005). The cake never finishes baking. Both random and predictable events at one time can change the outcome at another.

The second concept is that standard interactionism fails to examine the phrase “human nature.” What does it mean to say a behavior is part of human nature? One possibility is tautological: if even one human does it, then it must be human nature. *ESIC* seems to define it as “the evolved and adapted character of the human mind.” Here too, the evolved part is tautological, while the adapted part is an empirical question requiring evidence of evolutionary change that leads to increased fitness (West-Eberhard 1992). What, then, do we mean by a

human character? Are characters sets of Platonic ideals—for example, warlike or peaceful? Patriarchal or matriarchal? Kindness or brutality? These human behaviors and social structures certainly appear in different individuals, societies, and historical eras. Evan Thompson further raises the stakes by arguing that human nature—including subjective states such as identity—is not contained within an individual, but includes “unconscious structures and processes, even those describable as cognitive and emotional,” which perfuse the body and “loop through the material, social and cultural environment” (Thompson 2007, 12). Human nature, in other words, does not exist outside of specific cultural, historical, and evolutionary locations. It is not a separate thing cordoned off by the body’s epithelial coverings (Lutz and Thompson 2003).

*Nurture* also requires careful definition. In my own studies of gender acquisition in infancy, I refer mostly to sensory input within a specific unit of study—the caregiver–infant dyad. By age three it is common for the developmental literature to state that girls are more linguistically advanced than boys, while boys have more active play styles, including a preference for trucks over dolls (Zosuls et al. 2009). The emergence of these sex-related differences coincides with language acquisition and takes on a symbolic form (pink = female, for example) linked to emerging gender identity. But what happens during the first 18 months, in the presymbolic period that precedes language? Here are two suggestive examples from my lab. (1) Overall, during months 3 to 12 mothers of girls speak more to their daughters than do mothers of sons, even though the infant vocalization frequency and responsiveness is the same for infant boys and infant girls (Sung et al. 2013). But, mothers talk more to their sons than daughters when they are moving them or supporting motor activity, and more to their daughters during more passive interactions. (2) Especially during the first six months after birth, mothers of sons engage their male babies

in motor activities, such as standing and sitting, and shift them from one position to another strikingly more frequently than do mothers with daughters (Fausto-Sterling et al. 2015). All of which leads us to hypothesize that pre-symbolic sensory interactions and experiences create the groundwork for the symbolic materialization of gender identity and subjectivity, evidenced by age three years in activity differences and symbolically colored toy and clothing preferences.

Developments from within biology, developmental psychology, and feminist theory provide approaches to thinking about gender as a process uniquely, individually, and simultaneously produced by biology and culture. “The new materialism” describes recent feminist scholarship critical of older constructionist theory for ignoring the matter of the body (Jagger 2015). In their accounts of identity and difference, these feminist scholars consider the body to be active matter (Kirby 2011). Critical to such lines of thought and to the developmental systems approach I espouse is that the body’s matter responds to experiential input. The fact that neural connections in the cerebral cortex explode exuberantly in the first several years after birth, but *only if* there is adequate sensory

input from surrounding humans and the physical environment, exemplifies one meaning of the phrase “active matter.” Kitayama and Park (2010) generalize this argument, presenting evidence that culture—which they define as “an amalgam of values, meanings, conventions and artifacts that constitute daily social realities” shapes neural pathways in the brain “via recurrent, active and long-term engagement in scripted behavioral sequences”—which they call “cultural tasks” (112). Acquiring gender is, it seems to me, nothing if not a scripted cultural task that starts before birth and continues throughout the life cycle.

New journals such as *ESIC* often start with a set of abstract theoretical commitments and hope that enough scholars resonate with their statement of purpose to submit manuscripts that are good enough to attract attention, readers, and library purchases, ultimately permitting survival and an impact in the scholarly world. Inevitably, the actual content and quality will help the journal refine its intellectual tasks. So it is my hope that five years from now there will be articles in this journal that carefully define the biological effects of specific cultural tasks, and that prefer the study of developmental process over assumptions about fixed traits.

## WORKS CITED

- Fausto-Sterling, Anne. 2005. “The Bare Bones of Sex Part I: Sex and Gender.” *Signs* 30 (2): 1491–1527.
- Fausto-Sterling, A., D. Crews, J. Sung, C. Garcia-Coll, and R. Seifer. 2015. “Multimodal Sex-Related Differences in Infant and in Infant-Directed Maternal Behaviors during Months Three through Twelve of Development.” *Developmental Psychology* 51 (10): 1351–66. doi:10.1037/dev0000033.
- Gottlieb, Gilbert. 1997. *Synthesizing Nature—Nurture: Prenatal Roots of Instinctive Behavior*. Mahwah, NJ: Lawrence Erlbaum.
- Jagger, Gill. 2015. “The New Materialism and Sexual Difference.” *Signs* 40 (2): 321–42. doi:10.1086/678190.
- Kirby, Vicki. 2011. *Quantum Anthropologies: Life at Large*. Durham, NC: Duke University Press.
- Kitayama, Shinobu, and Jiyoung Park. 2010. “Cultural Neuroscience of the Self: Understanding the Social Grounding of the Brain.” *Social Cognitive and Affective Neuroscience* 5 (2–3): 111–29. doi:10.1093/scan/nsq052.
- Lutz, Antoine, and Evan Thompson. 2003. “Neurophenomenology.” *Journal of Consciousness Studies* 10 (9–10): 31–52.
- Sung, Jihyun, Anne Fausto-Sterling, Cynthia Garcia Coll, and Ronald Seifer. 2013. “The Dynamics of Age and Sex in the Development of Mother–Infant Vocal Communication between 3 and 11 Months.” *Infancy* 18 (6): 1135–58. doi:10.1111/infa.12019.
- Thelen, Esther. 1988. “Dynamical Approaches to the Development of Behavior.” In *Dynamic Patterns in Complex Systems*, edited by J. A. S. Kelso, A. J. Mandell, and M. F. Shlesinger, 348–69. Singapore: World Scientific.
- . 2005. “Dynamic Systems Theory and the Complexity of Change.” *Psychoanalytic Dialogues* 15 (2): 255–83.

- Thompson, Evan. 2007. *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*. Cambridge, MA: Harvard University Press.
- West-Eberhard, Mary Jane. 1992. "Adaptation: Current Usages." In *Keywords in Evolutionary Biology*, edited by Evelyn Fox Keller and Elisabeth A. Lloyd, 13–18. Cambridge, MA: Harvard University Press.
- Zosuls, K. M., D. N. Ruble, C. S. Tamis-LeMonda, P. E. Shrout, M. H. Bornstein, and F. K. Greulich. 2009. "The Acquisition of Gender Labels in Infancy: Implications for Gender-Typed Play." *Developmental Psychology* 45 (3): 688–701. doi:10.1037/a0014053.