

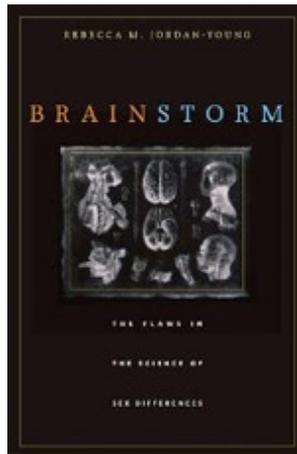
Slate

The Last Word on Fetal T

Rebecca Jordan-Young's masterful critique of the research on the relationship between testosterone and sex difference.

By Amanda Schaffer

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Try talking about whether single sex education is better for boys, or why there aren't more female science professors at Harvard, or whether male financiers are innately more aggressive, and sooner or later someone will evoke that handy, biological explanation of sex difference: fetal testosterone. The usual argument is that early hormonal exposures mold "male" and "female" minds. That is, a prenatal marinade helps shape men and women's later sexual desires, intellectual talents, personality traits and career interests—in ways that typically differ by gender. A loud chorus of researchers and popular writers, including psychologists

Simon Baron-Cohen, Susan Pinker and Steven Pinker, psychiatrist Louann Brizendine, and therapist Michael Gurian, frequently invoke prenatal hormones to explain male and female behavior.

At first glance, the science seems to offer strong backup: Hundreds of articles report a relationship between prenatal hormone levels and, say, which toys girls and boys like as kids or how aggressive they are or how easily they can mentally rotate objects or (when they're a bit older) how much they masturbate. The usual assumption is that since males have more prenatal T, and T is the male hormone, *of course* it must explain the hallmarks of maleness in the mind.

This view sucks up a lot of oxygen, and it takes painstaking effort to refute it. I

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tried to in a *Slate* series on psychological sex differences that sent me deep into the weeds for months. (Every writer I know who's taken on this literature shudders a little at the memory.) So it was with appreciation verging on glee that I read Barnard professor Rebecca Jordan-Young's devastatingly smart and definitive critique: *Brain Storm: The Flaws in the Science of Sex Differences*. Jordan-Young argues that the science of prenatal hormones, gender, and the mind "better resembles a hodgepodge pile than a solid structure." And she knows of what she speaks.

An expert on measures and study designs, Jordan-Young has spent the last 13 years combing the literature on brain organization, unpacking assumptions, questioning methods and statistical practices, holding one paper up against another. She stresses that fetal hormones must matter to the brain—somehow. But after picking apart more than 400 studies that try to understand the genesis of particular psychological sex differences (real or supposed), she concludes that fetal T looks like an awfully anemic explanation.

Prenatal hormones are, indisputably, important to genital development.



But the more controversial question has always been whether the mind is also shaped in categorically "male" or "female" ways, by testosterone or estrogen. For decades, a series of researchers have doggedly tried to prove that it is, treating the brain as an "accessory reproductive organ," as Jordan-Young writes.

This presumption has led to some strange contortions and flip-flopping. In the early 1970s, for instance, one study reported that boys whose mothers took a synthetic estrogen, which was thought to prevent complications in pregnancy, tended later on to show less masculine behavior like lower assertiveness or aggression. Soon, however, animal research found that testosterone converted to estrogen in the brain actually seems to do the opposite—to make boys act more typically masculine. And soon after that, the reversal showed up in human research, too: Another study suggested that boys exposed prenatally to a synthetic estrogen might show *more* masculine behavior, according to Jordan-Young. The data on synthetic estrogen and progesterone exposures are complicated. But what's striking, in Jordan-Young's telling, is that the researchers' findings tended to dovetail suspiciously well with their assumptions.

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