

The Science of Stress, Orgasm and Creativity: How the Brain and the Vagina Conspire in Consciousness

by Maria Popova

“To understand the vagina properly is to realize that it is not only coextensive with the female brain, but is also, essentially, part of the female soul.”

“The more closely we analyze what we consider ‘sexy,’” philosopher Alain de Botton argued in his meditation on sex, “the more clearly we will understand that eroticism is the feeling of excitement we experience at finding another human being who shares our values and our sense of the meaning of existence.” But in his attempt to counter the reductionism that frames human sexuality as a mere physiological phenomenon driven solely by our evolutionary biology, de Botton overcompensates by reducing in the opposite direction, negating the complex interplay of brain and biology, psychology and physiology, that propels the human sexual experience. That’s precisely what Naomi Wolf, author of the 1991 cultural classic *The Beauty Myth*, examines in *Vagina: A New Biography* (public library) — a fascinating exploration of the science behind the vastly misunderstood mind-body connection between brain and genitalia, consciousness and sexuality, the poetic and the scientific. What emerges is a revelation of how profoundly a woman’s bodily experience influences nearly every aspect of life, from stress to creativity, through the intricate machinery that links biology and beingness.

Wolf writes:

Female sexual pleasure, rightly understood, is not just about sexuality, or just about pleasure. It serves, also, as a medium of female self-knowledge and hopefulness; female creativity and courage; female focus and initiative; female bliss and transcendence; and as medium of a sensibility that feels very much like freedom. To understand the vagina properly is to realize that it is not only coextensive with the female brain, but is also, essentially, part of the female soul.

[...]

Once one understands what scientists at the most advanced laboratories and clinics around the world are confirming — that the vagina and the brain are essentially one network, or “one whole system,” as they tend to put it, and that the vagina mediates female confidence, creativity, and sense of transcendence — the answers to many of these seeming mysteries fall into place.

A pivotal player in this mediation is the female pelvic nerve — a sort of information superhighway that branches out from the base of the spinal cord to the cervix, connecting the latter to the brain and thus controlling much of sexual response. But this information superhighway is really more like a superlabyrinth, the architecture of which differs enormously from one woman to another, and is completely unique for each one. This diversity of wiring in the highly complex female pelvic neural network helps explain why women have wildly different triggers for orgasm. (By contrast, the male pelvic neural network is significantly simpler, consisting of comparatively regular neural pathways arranged neatly in a grid that surrounds the penis in a circle of pleasure.) This biological reality, Wolf points out, clashes jarringly with the dominant culturally constructed fantasy of how sexual intercourse is supposed to proceed:

The pornographic model of intercourse — even our culture’s conventional model of intercourse, which is quick, goal-oriented, linear, and focused on stimulation of perhaps one or two areas of a woman’s body — is just not going to do it for many women, or at least not in a very profound way, because it involves such a superficial part of the potential of women’s neurological sexual response systems.

Another key component of sexual experience is the autonomic nervous system (ANS) — the puppeteer of arousal, controlling all smooth muscle contractions and affecting the body’s response beyond conscious control. It encompasses both the sympathetic and parasympathetic divisions, and ensures they work in unison. Because arousal precedes orgasm, the ANS first needs to do its own work before the complex pelvic neural network can work its own magic. Wolf writes:

For women, sexual response involves entering an altered state of consciousness. ... In women, the biology of arousal is more delicate than most of us understand, and it depends significantly on this sensitive, magical, slowly calmed, and easily inhibited system.

To be sure, Wolf reminds us that it’s not at all uncommon for women to have a physiological response during rape, despite the enormous psychological pain and stress of the assault, but this response is not the same as the transcendent, dimensional orgasm that takes place when brain and body work in harmonious bliss. This also holds true in sexual situations that aren’t as violent as rape but still assault the ANS in one way or another:

If a woman’s ANS response is ignored, she can have intercourse and even climax; but she won’t necessarily feel released, transported, fulfilled, or in love, because only a superficial part of her capacity to respond has been made love to, or engaged.

In fact, the most fascinating aspect of the ANS, absolutely critical yet poorly understood, is that it is profoundly impacted by the mental landscape, steering the immutable interdependence between brain and vagina. The ANS, which serves as the translator between the psychological and the physiological, is thus particularly vulnerable to what psychologists call “bad stress.” (By contrast, the “good stress” many women experience in exciting or mock-dangerous sexual scenarios which they still control can be compelling and pleasurable.) “Bad stress” stems from the perceived lack of safety, and the presence of safety is absolutely essential to catapulting the female brain into the kind of “high” orgasm that is only possible in this disinhibited trance state. Wolf explains:

This biological, evolutionary connection for women of possible ecstasy to emotional security has implications that cannot be overstressed. Relaxing allows for female arousal.

Just as being valued and relaxed can heighten female sexual response, “bad stress” can dramatically interfere with all of women’s sexual processes.

[...]

“Bad stress,” researchers have now abundantly confirmed, has exactly the same kind of negative effect on female arousal and on the vagina itself. When a woman feels threatened or unsafe, the sympathetic nervous system — the parasympathetic nervous system’s partner in the ANS — kicks in. This system regulates the “fight or flight” response: as adrenaline and catecholamines are released in the brain, nonessential systems such as digestion and, yes, sexual response, close down; circulation constricts, because the heart needs all the blood available to help the body run or fight; and the message to the body is “get me out of here.” Based on [research insights], we now know that threatening

environment — which can include even vague verbal threats centered on the vagina or dismissive language about the vagina — can close down female sexual response.

This notion that biology conditions consciousness and vice versa, of course, isn't new. But the research Wolf cites presents compelling evidence that "bad stress," especially rape and early sexual trauma, can have profound biological effects:

There is growing, if still preliminary, evidence that rape and early sexual trauma can indeed "stay in the body" — even stay in the vagina — and change the body on the most intimate, systemic level. Recovery is possible, but treatment should be specialized. Rape and early sex abuse can indeed permanently change the working of the sympathetic nervous system (SNS) — so crucial for female arousal; and, if she is not supported by the right treatment, it can permanently alter the way a woman breathes, the rate of her heart, her blood pressure, and her startle reaction, in a manner that is not under any conscious control.

Even more strikingly, some studies have found that elevated SNS activation is linked to a variety of health hazards seemingly unrelated to sexual trauma, including vertigo, motor control and balance issues, visual processing problems, and elevated startle response. In other words, sexual abuse alters the brain in a way that sabotages multiple body systems and damages healthy stress response. Wolf recapitulates the implications poignantly:

Understood in this way, and with this significant evidence, rape and sexual assault, with their attendant trauma, should be understood not just as a form of forced sex; they should also be understood as a form of injury to the brain and body, and even as a variant of castration.

Demonstrating just how strong the connection between mind and body is, Korean researchers discovered that stress and sexual trauma actually affect, on a biological level, the very functioning of the vagina. Studying female rats, they found that "chronic physical stress modifies [sexual behavior] through a mechanism believed to involve complex changes in sex hormones, endocrine factors, and neurotransmitters." What's more, they were able to identify the precise biological mechanism responsible for this deep-seated interplay:

Evidently nitric oxide (NO) and nitric oxide synthase (NOS) play important roles in vaginal and clitoral engorgement — helping the smooth muscle of the vagina relax and the vaginal tissues swell in preparation for arousal and orgasm — and these chemicals and their actions are inhibited when females are negatively stressed.

The researchers found that the stressed-out female rats were less receptive and more hostile to their male partners, displaying measurable aggression and irritability, and ultimately refusing to copulate. Stress, it turns out, diminished the female rats' ability to reach arousal by greatly impairing their genital blood flow. The scientists concluded:

In animal model studies, mental or physical stress increases the level of serum catecholamines, thereby causing vascular contraction, which in turn reduces blood flow and leads to sexual dysfunction. . . . Since stress is concomitant with an increased output of catecholamines in blood . . . it is reasonable to assume that blood flow to the genital organs reduces during periods of stress. . . . [W]e measured norepinephrine as an indirect index of catecholamine level and found that it increased in the stress group and decreased in the recovery group. This result indirectly supports the suggestion that stress affects female genital blood flow.

Most ominous of all was the projection that if such stress levels were sustained over time, the physiological changes they cause would eventually affect the vaginal tissue itself. Indeed, researchers tested those tissues after the female rats were dead and found “biologically measurable changes.”

Women, of course, are not rats, but this only means that the effects of such stress are even more profound. Wolf argues that besides impairing women’s ability to reach orgasm, “bad stress” also affects the overall capacity for joy, hopefulness, and creativity. Unlike rats, humans are also susceptible to forms of abuse beyond the physical — Wolf cites the tragically prevalent cultural tendency to deride the vagina and its owner, embedded even in the slang we have for female genitalia. She writes:

The role of manipulating female stress in targeting the vagina should not be ignored. This behavior—ridiculing the vagina—makes perfect instinctive sense. These acts are often impersonal and tactical—strategies for directing a kind of pressure at women that is not consciously understood but may be widely intuited, and even survive in folk memory, as eliciting a wider neuropsychological “bad stress” response that actually debilitates women.

She cites one particularly unsettling example:

In 2010, male Yale students gathered at a “Take Back the Night” event, where their female classmates were marching in a group, protesting against sexual assault. The young men chanted at the protesters, “No means yes and yes means anal.” Some of the young women brought a lawsuit against the university, arguing that tolerating such behavior created an unequal educational environment. Ethically they are in the right, and neurobiologically they are right as well. Almost all young women who face a group of their male peers chanting such slogans are likely to feel instinctively slightly panicked. On some level they are getting the message that they may be in the presence of would-be rapists — making it impossible to shrug off immature comments, as women are often asked to do. They sense there is a wider risk to them that is being threatened, and indeed there is, but it is not just the risk of sexual assault. If they are stressed regularly in this way, they will indeed depress the whole subtle and delicate network of neurobiological triggers and reactions that make them feel good, happy, competent, and as if they know themselves.

One study termed the complex and lasting effects of such stress, an increasingly recognizable medical pattern, “multisystem dysfunction” — and it can effect such a wide array of physical health issues as higher risk of diabetes and heart disease, hormonal imbalances, and fertility problems. But the most damaging consequences of these physical changes, Wolf argues, are cognitive and psychoemotional:

The female body reacts in the same way to “bad stress” whether the context is the birthing room or the university or the workplace. If the female brain senses that an environment is not safe, its stress response inhibits all the same organs and systems, regardless of setting. Many of the signals that either stoke or diminish female desire have to do with the female brain’s question: Is it safe for her?

So if a woman goes to work or to study in a sexually dangerous or threatening atmosphere day after day, she risks — because of the cumulative, long-term effect of that “bad stress” — having the letting-go, creative “relaxation response” inhibited even outside her work or school environment.

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If you sexually stress a woman enough, over time, other parts of her life are likely to go awry; she will have difficulty relaxing in bed eventually, as well as in the classroom or in the office. This in turn will inhibit the dopamine boost she might otherwise receive, which would in turn prevent the release of the chemicals in her brain that otherwise would make her confident, creative, hopeful, focused — and effective, especially relevant if she is competing academically or professionally with you. With this dynamic in mind, the phrase “fuck her up” takes on new meaning.

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The vagina responds to the sense of female safety, in that circulation expands, including to the vagina, when a woman feels she is safe; but the blood vessels to the vagina constrict when she feels threatened. This may happen before the woman consciously interprets her setting as threatening. So if you continually verbally threaten or demean the vagina in the university or in the workplace, you continually signal to the woman’s brain and body that she is not safe. “Bad” stress is daily raising her heart rate, pumping adrenaline through her system, circulating catecholamines, and so on. This verbal abuse actually makes it more difficult for her to attend to the professional or academic tasks before her.

Yet despite the compelling scientific evidence, the most moving and encompassing point Wolf makes is an anthropological one:

The way in which any given culture treats the vagina — whether with respect or disrespect, caringly or disparagingly — is a metaphor for how women in general in that place and time are treated.

<http://www.brainpickings.org/2013/09/23/naomi-wolf-vagina/>
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