

The Neuroscience Behind Sexual Desire: Authors of *A Billion Wicked Thoughts* Answer Your Questions



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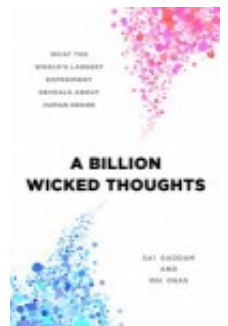
On May 5, we asked readers [to submit questions](#) for **Ogi Ogas** and **Sai Gaddam**, authors of the recent book *[A Billion Wicked Thoughts: What the World's Largest Experiment Reveals About Human Desire](#)*.

The response was, well... passionate. Many of the comments expressed anger over the authors' research and resulting book. While some readers called into question the validity of their methodology, others complained that some of the terms they use in their book ("MILF," e.g., and "Shemale") were derogatory and insensitive. In the end, one thing was clear: when it comes to sex research, people tend to have strong opinions.

Now, Ogas and Gaddam respond, first with an opening summary of their methodology and results, and then with detailed responses to some of your questions.

A Billion Wicked Thoughts Freakonomics Q&A By Ogi Ogas and Sai Gaddam

Since we've written a book offering new ideas about a very intimate and politicized subject—sexual desire—you may be wondering about our identities and ideologies. We're both heterosexual males. Ogi is 40 and half-Latino, Sai is 30 and all Indian. We kicked off our controversial research project with one overriding principle partially inspired by *Freakonomics*: no agenda, no ideology, just follow the data wherever it leads.



And the data led us to some very strange places. Here are some of our findings: heterosexual men like shemale porn, large-penis porn, and fantasies of their wives sleeping with other men. Gay male sexuality is almost identical to straight male sexuality. Women prefer stories to visuals, though women who do prefer visuals tend to have a higher sex drive, exhibit greater social aggression, and are more comfortable taking risks. Men prefer overweight women to underweight women. Heterosexual women like stories about two masculine men sharing their tender side and having sex. Porn featuring women in their 40s, 50s, and 60s is popular among men both young and old. For women, online erotica is often a social enterprise, while for men it's almost always a solitary one. Most men are wired to be aroused by sexual dominance and most women are wired to be aroused by sexual submission, though a large minority of straight men (and a majority of gay men) prefer the sexually submissive role, and a small minority of women prefer the sexually dominant role.

Onto your questions:

Q. How do you say things like “the largest experiment ever” with a straight face when all you did was “analyze” millions of pieces of media on whatever shallow, facile level you were able to analyze them? - **Linka**

A. In 1973, [Kenneth Gergen](#) conducted a social psychology experiment that asked, “What do people do under conditions of extreme anonymity?” Men and women who had never met were escorted into a small, furniture-less room that was pitch dark. What did these completely anonymous strangers do? At first they talked, but conversation soon slacked off. Then the touching began. Almost 90 percent of subjects touched someone else on purpose. More than half hugged someone. A third ended up kissing. Almost 80 percent of the men and women reported feeling sexual excitement.

The Internet is like a much, much, *much* larger version of the Gergen study. Put a billion anonymous people in a virtually darkened room. See what they do when their desires are unleashed. As we say in the book, “This is the world’s largest experiment on human behavior: the Internet.”

We studied the results of this experiment by analyzing as much Internet behavioral data as we could get our hands on: Web searches, individual search histories, paid porn site subscription statistics, erotic stories and videos, digitized romance novels, online personal ads, almost 50,000 of the world’s most popular adult sites, and much more. We combined all this sexual data with findings from neuroscience, animal studies, clinical psychology, biology, neurological damage, and sex research, as well as with ideas from our own field of computational neuroscience, to reveal a new portrait of human desire.

Q. Having learnt that you had no Internal Revenue Board approval from any scientific institution for conducting your research and would most likely never have been able to obtain any... how do you have the temerity to try and pass this book off as science? -**Isagel**

A. We presume you’re referring to the Institutional Review Board, rather than the taxing authority. (Though we admit writing off our porn site subscriptions on our Schedule C.) IRB oversight applies to human subjects research with federal funding, or that takes place at an institution with federal funding. We intentionally conducted our research outside of academia, without federal funding, in order to remain independent from the fierce tempest of ideological, social, and political pressures that besets the contemporary study of sexuality. Even though our research explores human behavior, we did not directly study human subjects. All our data was acquired from the public domain or shared with us by private sources such as PornHub, OKCupid, Sssh.com, etc. There is no original survey data in our book, and all the original data that is included, both public and private, was entirely anonymous: we neither requested nor received identifying information about individuals.

Regarding temerity, our book has been endorsed by several scientists we respect and admire, including [Steven Pinker](#), [Donald Symons](#), [Roy Baumeister](#), [Simon LeVay](#), [Paul Vasey](#), [Catherine Salmon](#), [J. Michael Bailey](#), and the most cited researcher on the topic of sexual psychology, [David Buss](#).

Q. Hmm, so the Jezebel article about your book says that plenty of guys watch Granny porn. This might be more of a 2girls1cup (do google that girls:)) sort of a thing where I might look at something out of sheer fascination. How can you tell? - **RobbRedFord**

A. We can see that sexual interests in unconventional types of pornography (such as granny porn, shemale porn, BBW porn, and forced feminization porn) are both common and genuine from several convergent lines

of evidence. Most importantly, we know from individual search histories that people tend to search for these interests over and over, week after week.

The patterns of searches for unconventional interests does not match the search patterns for “curiosity” content like 2 Girls 1 Cup (such as “Paris Hilton Sex tape” in the 2006 AOL data set). Many commercially successful websites are devoted to these interests, with consistently high levels of traffic and paid subscriptions. The webmasters of commercial sites devoted to these interests know the content their customer base appreciates. We also personally spoke to individual fans of many kinds of unconventional erotica, and their interests are just as authentic as more conventional interests.

People tend to react to unfamiliar sexual interests with fear, hostility, self-righteousness, or by dismissing them as mere curiosity. This seems to reflect a basic truth about human nature: we generally tend to think our own interests are natural, normal, and widely-shared, and that others’ interests are deviant, dangerous, or disorders.

For more, read our [Psychology Today blog](#).

Q. I hope you didn’t take out your thoughtful conclusions about how women who like male pairings parallels male fetishization of trans women (you used some more technical terms there – what were they again?) but bears no relationship to men liking female pairings. – *Alexandra Erin*

A. In our book we do compare shemale porn to slash fiction (romantic and erotic stories featuring two men). Both are *eretical illusions*.

Just as our brains come wired to respond to a finite set of taste cues—sweet, salty, sour, savory, and bitter—our brains come wired to respond to a discrete set of sexual cues. Though male and female brains respond to the same taste cues, the male brain responds primarily to visual cues, and the female brain responds primarily to psychological cues. One of the main goals of our book was to identify the full range of male and female sexual cues and how they are processed in our brains.

In the same manner that optical illusions combine visual cues into a unified stimulus that dupes our brain’s visual system, eretical illusions combine sexual cues into novel stimuli that trick our brain’s sexual systems, triggering heightened arousal. Though men’s and women’s brains respond to the same optical illusions, male eretical illusions (primarily visual) affect the male brain, while female eretical illusions (primarily psychological) affect the female brain.

One example of a male eretical illusion that is popular with heterosexual men all around the world is shemale porn. Many transsexuals find the term “shemale” derogatory, though this is the term most commonly used for this genre within the adult industry and in fans’ Web searches. In porn, so-called shemales combine the body of a woman with a penis. By combining them, heterosexual men often report inexplicable sexual arousal; one fan muses on the adult site Fantasti.cc: “I like her soft looks, sexy body. Very nice long legs. And then there’s that added bonus . . . I can’t really explain why it affects me.”

Perhaps the most popular kind of female eretical illusion is paranormal romance, with *Twilight* being the premier example. Vampire **Edward Cullen** is ultra-alpha and features the sexy body of a youth governed by the experienced, confident mind of a century-old man. He endlessly desires Bella for her blood—but forever demonstrates the reality of his love by never giving in. He uses his supernatural strength and speed to protect his beloved from all manner of danger. Cullen consists of several female sexual “superstimuli” combined into

one erotic concoction, like a sexual version of Oreo cheesecake.

For more, read our [blog](#).

Q. Why do you call fanfiction.net “the most popular ‘erotic’ site for women”, when it (a) is mostly used by under-18s, and (b) does not accept explicit material? – **Doctor Science**

A. The modal demographic for fanfiction.net is age 18-24, according to [Experian Hitwise](#), [Alexa](#), and Quantcast (before they made demographic data unavailable for the site). This same age range, 18-24, is also the modal male demographic for the major adult video sites, such as Pornhub, XNXX, and YouPorn. But sexuality does not begin at 18: a couple of peer-reviewed surveys have found that about 40 percent of males age 16-17 intentionally visit porn sites, and there is evidence from fanfiction.net profiles that a substantial number of users of the site are under 18.

Though fanfiction.net stopped accepting NC-17 content in 2002, giving birth to the more explicit AdultFanFiction.net, it’s still easy to find sexual content on FanFiction.net, such as [this Harry Potter story](#).

One thing that’s clear from both online erotica and clinical research is that male and female sexuality are quite different, raising questions about whether we should apply male standards of “erotic” to women. For example, the most popular form of female erotica is the romance novel. The audience for the romance novel is 90 percent female, and there were almost as many purchases of English-language romance novels in 2008 as there were visitors to North American porn sites (~75 million vs. ~100 million). Though romance novels aren’t necessarily erotic in the same explicit way that porn is erotic—there are certainly plenty of romances that feature minimal, non-graphic sex—we’d argue that the romance novel reflects female sexuality in the same way that pornography reflects male sexuality: there is a very smooth literary continuum from non-sexual romance novels and romantic fan fiction (half the stories on fanfiction.net are tagged as “romance”), through erotic romance, slash fiction, literary erotica, all the way up to hardcore female-authored stories about bondage, rape, and sexual humiliation.

The sexual cues that tends to trigger arousal in women are mainly psychological, including a man’s social status, his confidence, his desire and ability to protect his family, his emotional availability, his emotional commitment, his strong sexual desire for her, and his popularity with other women—all common elements in romantic and erotic stories for women.

Q. [Messrs. Ogas and Gaddam] don’t know romances, either. Yet they use that same broad stereotype — romances feature alpha men who conquer women — without examining or proving it, and use that untested and invalid thesis to make conclusions.

- **Madame Hardy**

A. Two female psychologists, **Maryanne Fisher** and **Tami Meredith** (previously Anthony), analyzed the titles of 15,019 romance novels published from 1949 to 2009 by Harlequin, the world’s largest publisher of romance novels. Their list of the 13 most common hero professions in these titles: (1) Doctor, (2) Cowboy, (3) Boss, (4) Prince, (5) Rancher, (6) Knight, (7) Surgeon, (8) King, (9) Bodyguard, (10) Sheriff, (11) Soldier, (12) Lawman, (13) Pirate. All of these are alpha men. Only two novels featured truckers.

In romance titles on Amazon, there are 415 millionaires, 286 billionaires, and 263 sheiks, including *The Millionaire’s Secretary*, *The Billionaire’s Virgin Bride*, and *The Sheik’s Secret Harem Girl*. In our own sample of 10,344 digitized romance novels from 1983 to 2008, there were no heroes who were kindergarten

teachers, janitors, or accountants—except a lone accountant hero in the 1983 novel *Reckless Passion*.

Q. How does it escape your notice that you're trying to draw conclusions about male brains and female brains by studying the searches of anonymous users who aren't identified by gender?

- **Alexandra Erin**

A. We relied on other sources of information about gender, including credit card purchases (according to CCBill, the largest billing company of the adult industry, about 1 out of 50 porn site subscriptions are purchased with a woman's name—an incidence so rare that they used to flag female names as potential fraud, since an angry mother or wife so often called to demand a refund), demographic information from web analytics services, and demographic information collected about users by the adult sites themselves. In many cases, we also relied on academic research, including laboratory experiments, surveys, and observational studies.

As an example, we know that the primary audience for shemale porn is heterosexual men by talking with webmasters of shemale sites, shemale performers, examining adult marketing analytics, and examining comments by enthusiasts, in addition to analyzing search histories. We also considered a [2010 sociological study by Weinberg and Williams](#) that took place in a transsexual pick-up bar.

The online adult industry has become much more of a web analytics enterprise than a production enterprise. Though there are still some big gaps in their knowledge, they usually have a pretty good idea of who their customers are. Adult Video News said our data "[is no surprise to porners](#)."

But sometimes the gender of an AOL sex searcher is suggested from their search history:

User #256035	User #10268200
shemales	orlando bloom vampire fanfiction
hummer 2	vampire legolas
toyota trucks	321 sex chat
mixed wrestling	balian fan fiction
strapon	fairy tale wedding dresses
hot latina babes	go-go boots
baseball cards	gossip on orlando bloom
1989 topps	romantic corsets
women mixed wrestling	menstrual cycle

Q. So what does brain science tell us about those who don't like the opposite sex? What about brains attracts some of us to the same sex? – **Steph Lansing**

A. One of our most interesting findings was the striking similarities between the online interests of gay and straight men. In fact, we could only identify two significant differences between gay and straight erotic content: (1) gay men prefer men; (2) gay men are more likely to be aroused by the sexually submissive role than straight men.

In just about every other way, the sexual tastes of gay and straight men are extremely similar. Both favor

youth above all other qualities, though both have significant interest in older partners; both exhibit interest in heavy partners; both fetishize chests, butts, feet, and penises; both prefer visual erotica with anonymous, emotionless sex.

So why are gays and straights different at all? If you believe that homosexuality is a choice, then you might assert that all men are born with the same brains. After all, men are all born with the same bodies, right? It turns out that's not entirely true. All men are not created equal. Mother Nature has conspired to help gay men exceed straight men in one important respect: penis length.

[The average length of the gay penis is 6.32 inches](#). The average straight penis is 5.99 inches. If there is such a difference in their physical hardware, might there also be a difference in their brain software?

Though many male cues appear to get set in adolescence, two cues appear to be biologically wired from birth: gender preference, and a preference for dominance or submission. (Similarly, transsexualism also appears to have a strong biological component, [as Chaz Bono asserts](#).)

In fact, it appears that human sexual diversity is actually the result of the significant divergence of the sexual software of men's and women's brains. As men and women evolved to become more and more different in their sexual cognition and desires, the neural circuits supporting these differences diverged, meaning that there are more prenatal opportunities for these circuits to get swapped. Homosexuality, bisexuality, transsexuality, and just about everything else seem to be different combinations of male and female sexual software getting transposed. Regarding homosexuality, the fact that gay men have larger penises (along with a variety of other data) suggests that prenatal steroid hormones play a significant role.

The very divergence of male and female sexuality appears to have resulted in the remarkable and glorious diversity of human sexuality, more varied and sophisticated than in any other species.

Q. Do you see a big difference in cultural response to visual stimulation? It has been said that ankles and arms were very stimulating when they were first revealed by calf-length skirts and shorter sleeves in the 1900s. – **Quin**

A. We found very consistent results in men's anatomical preferences across cultures, specifically: chests, butts, feet, and penises. Across cultures, men prefer larger than average breasts to smaller than average ones, overweight women to underweight women, smaller than average feet (women prefer average size feet), and larger than average penises. With the exception of penises, these preferences probably reflect what biologists call *asymmetrical fitness*. Women with a few more pounds are more likely to be healthy and fertile than their underweight counterparts—if a woman loses enough weight, she will even stop ovulating.

Nevertheless, cultural variations in men's anatomical interests are quite apparent. In Japan, men fetishize the “absolute territory” (*zettai ryouiki*): the exposed strip of thigh above a woman's stockings but below her skirt. In India, men search for stomachs more often than men in other countries. There are disproportionate searches for women's butts in Brazil and Latin American countries.

FINAL COMMENT

The only other scientist to attempt to conduct a comprehensive, large-scale study of ordinary folks' sexual

desires was [Alfred Kinsey](#). His reward? A thunderstorm of vitriol and vilification, as ideologues denounced him as a Communist and pervert, dismissing his research as distorted and unethical.

Though it's true that a number of Kinsey's conclusions have been overturned by subsequent research, his work was as pioneering and visionary as Galileo peering through his telescope: we could finally perceive, however dimly, the true shape of human sexuality.

But the savage treatment Kinsey experienced was not lost on his colleagues. In the half-century since Kinsey's work, no researcher has attempted to replicate or extend his systematic investigation of the diversity of desire. Bowing to ideological pressure, the Rockefeller Center dropped Kinsey's funding after the publication of his *Sexual Behavior of the Human Female* in 1953—the same year that **James Watson** and **Francis Crick** published their discovery of the double helix structure of DNA. Since then, geneticists have mapped the human genome, cloned sheep, and designed herbicide-resistant alfalfa. Sex research, on the other hand, has progressed like the proverbial tortoise: academics still argue about the purpose of female orgasm, whether sexual fantasies are innocent or dangerous, the prevalence of various fetishes, and whether there is such a thing as sex addiction.

If you're like us and wonder how in 2011 we can still be unsure of such basic sexual facts when we've built particle accelerators the size of a small city and landed a rover on Mars, all you need to do is look through the comments on this Freakonomics Q&A and see the kind of passions this subject stirs up.

Some comments contend that our alma mater Boston University disclaimed us, revoked our websites, and rescinded our emails. This is just plain silly. Though we're now alumni, we still maintain the same [BU web addresses](#) we've [always had](#), and still have access to our [same](#) BU [email](#) accounts, though we now rely on non-university accounts.

Neither the Boston University IRB nor our former department (nor any other BU entity) ever issued any reprimand because we did not violate any university policy or regulation. Though it's true that many colleagues in our former department were uncomfortable with our choice of research subject—some explicitly tried to dissuade us from studying sexual desire—there's an enormous gap between disliking our research and disclaiming it.

The landscape of contemporary sex research is scorched with ideological warfare, dug in along several battle lines: biology vs. culture, conservative vs. liberal, men vs. women. In Kinsey's day, the main forces opposing sex research were conservative. Today, conservatives still wield sizable influence in the political arena, restricting or rejecting research funds for studying homosexuality, transsexualism, and pornography. But within academic sex research, the ideological forces limiting research are primarily liberal. (As social psychologist **Jonathan Haidt** [points out](#), the ratio of liberals to conservatives in the social sciences may be more than 100 to 1, with liberals sharing a morality that both “binds and blinds.”) [Whereas conservatives tend to fear what homosexuals are going to do to children, liberals tend to fear what heterosexual men are going to do to women](#).

But human sexuality transcends and subverts ideology. The true face of desire unveiled by our research overturns conventional wisdom, political correctness, and contemporary science. When we peered into the galaxy of Internet sex data it was an experience like Galileo observing Saturn's rings for the first time: unexpected, startling, beautiful. In [A Billion Wicked Thoughts](#), we want to share this sense of discovery with you.

TAGS: [neuroscience](#), [pornography](#), [sex](#)