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Super Size Orgasms?

by Marnia Robinson

Recently I listened to an Australian radio program called *The Orgasmic Brain*, hosted by Natasha Mitchell. One of the guests on the program was Gert Holstege, a Dutch scientist who has begun mapping events in the brain during orgasm using brain scans of the event. At the very end of their interview, Dr. Holstege said:

We are addicted to sex as you know, as everybody is. [It is the] orbital frontal cortex that is controlling whether we can do it or not. And for example people that don't have this part of the brain—and these people exist—these people really go for [orgasm] all the time.

Ms. Mitchell then ran out of time and did not ask about the significance of the addictiveness of sex for our intimate relationships. Questions certainly could be asked. Dr. Holstege—in his findings released a couple of years ago—compared the scans of men during orgasm to scans of people shooting heroin. Alas, sometimes the most obvious questions are overlooked or ignored—even by excellent journalists like Ms. Mitchell. In biology, what goes up must come down as the body seeks to rebalance itself.

Already science is beginning to map what could be called a sexual hangover, i.e., neurochemical shifts, mostly within the "reward" center of the primitive brain, which follow orgasm. For example, after sexual satiation there is a drastic reduction in androgen receptor density, which may take up to 7 days to return to normal—and meanwhile dampens libido and mood. Prolactin also rises after orgasm and high prolactin has been associated with anxiety, low libido, and other unpleasant side effects. Dopamine drops, fueling searches for more dopamine, i.e., kicking off an addictive cycle of quests for highs.

Science still largely ignores the wider significance of these natural shifts. Its

focus is upon the development of lucrative pharmaceuticals and procedures for forcing orgasm artifically. Yet this hangover may be affecting us in powerful ways. The ancient Chinese Taoists observed that violent crimes were often committed during the post-coital letdown.

If sex, like heroin use, has both a high and a low phase, is it really a good idea to create artificial ways to flood our brains with new drugs that stimulate the same pathways in the brain as heroin without considering the possible aftereffects? How might the low phase be interfering with sexual intimacy over the long-term? Or affecting the harmony in our relationships, as those natural ups and downs change how we feel about each other? After all, our neurochemical state has major repercussions for our moods, and thus for how we lovers perceive and treat each other. Do we have better options for sustaining and balancing sexual desire, as various sages of the past have suggested?

Excepting the familiar roll-over-and-snore phenomenon, humans seldom consciously make the connection between orgasm and a neurochemical hangover. Even so, these uncomfortable changes may linger for days, flattening libido—or priming our reward centers to seek another addictive neurochemical rush. We often seek that rush through anything that will raise our dopamine levels again: a new sex partner, a more intense sexual experience, alcohol, binge eating, recreational drugs—or pharmaceuticals that interact with the dopaminergic system (more below). Our distant ancestors didn't have these options for excess in the abundance we do today. Their lifestyles guaranteed a degree of balance we can no longer take for granted. Maybe we need to ask whether orgasm-on-demand could be a problem for our beleaguered reward centers. The experience of porn addicts suggests it would be.

Dr. Holstege has not taken his findings to the next step: assessment of the implications of the neurochemical hangover. Indeed, he hopes to develop "an orgasm pill" (as he said in an article at the time that his research on male orgasm came out). There can be no doubt that such a pill would certainly be enticing…priced expensively…and undoubtedly very profitable. Yet there is good reason to believe that it would also produce a neurochemical hangover...and foster addiction.

As Holstege explains earlier in the interview with Mitchell, orgasm occurs in the brain. It is nature's reward for engaging in an activity that furthers the genetic success of the species. A big part of the thrilling rush up to orgasm is a sharp rise in dopamine levels in the so-called reward center of the brain. This same rush is part of what makes all addictive substances or activities addictive. Any orgasm pill would probably have to raise dopamine levels, which would likely set off a hangover at least as severe as conventional sex.

In fact, science is already well on its way to developing such a thrill pill.

Pharmaceutical companies know how to duplicate the effects of dopamine artificially. The results, however, are already signaling that caution is more appropriate than unbridled enthusiasm. In recent years, pharmaceutical companies have marketed drugs known as dopamine agonists. An agonist is a substance that attaches to nerve cell receptors and imitates an existing neurochemical. A dopamine agonist drug, therefore, produces effects similar to dopamine in the brain.

These drugs were first developed to control the shaking that accompanies Parkinson's disease. Now Apomorphine HCl, a dopamine agonist that stimulates erection, is being approved, and is already for sale in Europe. And pharmaceutical companies predict that an even bigger market lies in drugs to excite women.

On July 12,2005, National Geographic News reported that the Mayo Clinic had found that the dopamine agonist drugs used to treat Parkinson's can boost patients' appetites for sex, food, alcohol and even gambling.

"This is a striking effect," said J. Eric Ahlskog, a neurologist at the Mayo Clinic. "Pathological gambling induced by a drug is really quite unusual." In one case, a 54-year-old married pastor gambled daily at the local casino, hiding his losses from his wife. In another, a 41-year-old computer programmer who had never gambled in his life became "consumed" with Internet gambling.

All 11 patients were taking a dopamine agonist drug, which affects the dopamine receptors highly concentrated in the reward center of the brain. Dopamine is thought to reinforce such compulsive behavior.

These patients … identified these behaviors as being uncharacteristic of their baseline behavior," said Maryellen Dodd, the Mayo Clinic psychiatrist who led the research. "Nearly all the patients who came to our attention had never gambled or gambled very infrequently."…

At least six patients also developed other problems, including compulsive eating, increased alcohol use, and hypersexuality. At least one patient developed an obsession with pornography and engaged in extramarital affairs. …"When our neurologists tapered the patients off the medication, several reported a dramatic resolution of their problem," Dodd said. "One patient said it was like a light switch going off."

Not everyone will recognize the advantages of using intimate relations to balance brain chemistry. An orgasm drug, however, would push users to the opposite extreme. It would be one of the most addictive pills ever produced—and could be marketed more readily than super size fries. Recreational pharmaceuticals would no doubt swiftly follow—"for increased sexual desire to accompany those

ever-ready Viagra erections" and then "super size orgasms." (Viagra doesn't stimulate orgasm, just increased blood flow to the penis.)

Since sexual intimacy is so good for us, why is this a problem? At the risk of being branded a killjoy, I'll mention a few reasons, which—like the unanticipated experience of Parkinson's patients—are universally overlooked by journalists promoting the coming wonders of sexual enhancement drugs. First, people diagnosed as sex addicts already report a high incidence of co-morbidity, that is, addictions to additional substances or activities, such as alcohol, gambling or drugs. Second, scientists have shown that rodents who have sex are noticeably more susceptible to substance addiction than virgin rodents. Third, sexually active teens tend to use drugs and alcohol more. Clearly we need to ask a lot more questions before rushing to the marketplace with an orgasm drug that tinkers with the center of the brain that controls both sex and addiction. As Holstege emphatically states, we're all naturally sex addicts, so vulnerability to these drugs (and any side effects) may well be universal.

Scientists know that chronically high levels of dopamine have long-term effects on the brain. While dopamine is normally associated with feeling good, excess concentrations are associated with depression, schizophrenia, attention deficit hyperactivity disorder (ADHD), and other psychiatric conditions. Now scientists are discovering the mechanism by which prolonged exposure to high dopamine does its damage. This mechanism may also cast light on the sexual hangover. In any case, it suggests that a dopamine-agonist orgasm pill could be a very bad idea, with long-term repercussions.

Part of the lure of sexual enhancement pharmaceuticals is that we think of sexual passion as the best way to cement our intimate relationships—because sexual distance tends to develop as disharmony increases. Yet the hidden culprit in our unions may actually be the addictive cycle of highs and lows in sex itself—a problem that more orgasms will scarcely fix. Consider this honeymoon study from a few years back. Doctor Kiecolt-Glaser set out to discover whether stress hormones rose during marital conflict. To isolate her results to conflict-produced changes she chose 90 newlywed couples…out of the whopping 2000 newlywed couples she and her colleagues interviewed. Only the happiest, healthiest, wealthiest, most stable couples were selected.

She discovered that conflict indeed raised stress hormones (with possible implications for lowered immunity to disease). However, in following up with the couples, she also discovered that across the board, they reported decreased satisfaction in their marriages by the second year. By the time she reported the results of the study, a fifth of her blissful, highly healthy couples were already divorced. (The US Census Bureau reported a few years back that one in two new marriages is expected to end in divorce.) Newlywed couples are known to be the most sexually active (orgasmic) group of all married couples. With such

consistently depressing results, we can't rule out the possibility that humanity faces a biological program that pushes couples apart—a program to which the reward center in the brain and the natural (high/low, i.e., addictive) elements of frequent orgasm may, in fact, contribute. Among scientists, this program already has a name: The Coolidge Effect (the tendency of an animal to choose a new mate after sexual satiation with a first one).

Why not isolate the actual neurochemistry behind the widespread breakdown of sexual intimacy before we pour resources into creating orgasm junkies? Otherwise, we may unwittingly be making our problems worse.

In any case, there is much to be gained from learning to balance our brain chemistry during our lovemaking, thereby promoting harmony naturally. Long-term relationships are associated with both longevity and lower rates of illness. For example, HIV-positive patients in stable partnership progress to AIDS more slowly than those not in such relationships. And marital quality contributes significantly to the prediction of patient mortality for heart failure. With our health and longevity at stake in our intimate relationships, we may want to focus first on what neurochemistry could tell us about how to strengthen our unions, as opposed to our climaxes (and their potentially emotionally-alienating hangovers).

The neurochemical understanding of sex is in its infancy. Enthusiasm for an orgasm pill is reminiscent of an infant discovering its genitals. A baby's delight in its potential for unlimited sexual arousal (without the interference of its frontal cortex) is understandable, but does not represent sexual maturity. Maturity takes into account (1) what best keeps us making love contentedly throughout our unions, and (2) the potential downside of the addictiveness of sex and how best to cope with that natural phenomenon.

Like the sages of the past who carefully studied sex from the point of view of increased harmony and improved health, we may one day find that neurochemical balance is far more desirable than the neurochemical excess of an orgasm pill. Radical as the concept now strikes us at this early point in our understanding, touch, companionship and the careful cultivation of sexual energy during lovemaking may best improve our wellbeing. The belief that more conventional orgasms will do so is quite possibly a product of the reflex of the reward center of the brain, which is not equipped to realize that there can be too much of a good thing. As the Taoists once taught:

Sex is like fire or water.
Fire and water can aid a man...or kill him.

America's experience with cigarettes and fast food suggests that humans are very good at researching and exploiting what excites the reward center of the brain,

and very bad at acknowledging the addictions that follow from single-minded focus on short-term satiation. As recently portrayed in the documentary "Super Size Me," when big business caters to the profitable cravings of the human reward center, we should anticipate heavy marketing and lobbying of the addictive and the unhealthy. For example, Viagra is still on the market despite substantial evidence that it can cause sudden, irreversible blindness. It had also been blamed for over 600 deaths worldwide by 2001, mostly through heart attack and stroke.

Let's do what we can to prevent the reduction of sexual desire to the status and profitability of fast food, and learn to tap its full potential for health and happiness. In short, let's keep asking the hard questions of our scientists and their pharmaceutical sponsors. There is still much to learn.

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