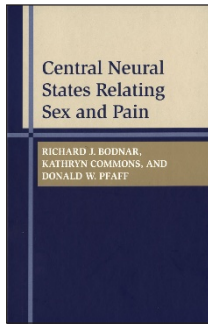




Love and pain meet in the brain



Central Neural States Relating Sex and Pain

By Richard J. Bodnar, Kathryn Commons & Donald W. Pfaff

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Reviewed by S. Marc Breedlove

Love brings us a good measure of pain. Artists struggling to decide whether this commingling of pleasure and discomfort is absolutely inescapable or merely commonplace might be surprised to learn that some scientists ask the same question. To what extent must an animal preparing to mate also prepare for the possibility of pain? For many species, such pain is not just psychological, but can be quite physical as well. Animals are often more vulnerable to predation when mating, and copulation itself may inflict minor tissue damage to the genitalia, usually the female's. In rats, for example, the male's penis sports cornified epithelial bars that stimulate the female's cervix enough to elicit bleeding. However rough this sex might appear to us, it is not simply a case of the male forcing himself upon the female. Indeed, her physiology requires the male to provide this stimulation before she will permit his embryonic offspring to implant in her uterus. Furthermore, in many mammals, such as cats and ferrets, the male bites the female's neck when he mounts. For any solitary species, finding a potential mate brings the risk of intraspecies aggression. This new volume, written by experts in pain signaling and hormonal action, explores the idea that the hormones that induce a female mammal to gather sperm for reproduction also prepare her to tolerate the male's rough handling.

Natural selection has provided some relief for the female who is obliged to sustain tissue damage during mating. For one thing, the male's stimulation of the cervix also activates an analgesic (painkilling) process to lessen her discomfort. Thus an experimenter can elicit some analgesia in a female rat by gently stimulating her cervix with a blunt glass rod. Lest you think this phenomenon is only of interest to rodents, vaginocervical stimulation also elicits modest analgesia in women. But before the male rat even touches the female, the steroid hormones that made her sexually receptive, causing her to lift her rump and swing her tail to one side (a posture known as lordosis) when the male mounts, have activated yet other analgesic systems in anticipation of cervical

stimulation. Again, the effect of ovarian steroids on pain responsiveness in rats can be seen in humans, where women approaching the time of ovulation produce more opiate receptors in key parts of the brain and activate them more vigorously in response to painful stimuli.

So these studies also reflect the growing awareness that there are times when the internal workings of men and women are just not identical—despite efforts for sexual equality in career opportunity and in protection under the law. A practical, and alarming, instance is the difference in the way women and men respond to the pain-killing properties of various drugs, including opiates. Such reports raised concerns about why human clinical trials do not routinely take sex of subjects into account, and whether laboratory studies of pain transmission in particular, which traditionally used only male subjects, might be blurring an important distinction. In addition to the proximate questions of how females and males might respond differentially to painful stimuli and to analgesic drugs, there is also the ultimate question of why they should do so. This volume suggests that sex differences in the pain system are not simply an epiphenomenon, but rather an integral part of the mating process in which, naturally enough, males and females have different roles.

In exploring this idea, the authors note commonalities between two powerful motivational systems—pain and sex—and suggest that exploring how these two systems interact can enrich our understanding of both. They are amply qualified to integrate these topics. Richard Bodnar has published extensively on pain transmission and endogenous opioid systems, Donald Pfaff has explicated the neural basis of the lordosis reflex in rats, and Kathryn Commons has published papers in both fields. Despite some unevenness in writing styles, they manage to cover a tremendous amount of literature and relate it to their several themes.

The book is definitely written for specialists, so there's no point in giving a copy to your aunt Joan who took a few biology courses in college; she'll never slog through the technical, dense prose. While there is ample discussion of the biological aspects of pain and sex, the authors wisely avoid trying to relate their findings to titillating topics such as sado-masochism, so don't buy a copy for your creepy uncle Fester, either. Perhaps the book is ideal for scientists who study reproductive behavior but want to learn about pain research, or for researchers who study pain signaling and want an update on research about mating systems. Even they will encounter some inelegant passages, where a copy editor might have done a service. The reader has to work pretty hard to extricate the meaning from, "both normal female and castrated male rats and mice display significantly less magnitudes of morphine analgesia than normal male rats and mice on somatic and visceral measures" (p. 135). And there are times when only a specialist in the field could follow some arguments that are filled with abbreviations and always seem to use technical terms even when everyday versions are available. Still, pain and sex are big, important topics and their confluence during mating is clearly more than a happenstance or the perverse confabulation of artists. This comprehensive review of the literature and discussion of the issues should help any future scientists who might tackle why love hurts so good. ■

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