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Evolution and laboratory research on men's sexual arousal: What do the data show and how can we explain them?

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The Thornhills present an intriguing analysis of evolutionary factors that may have contributed to men's sexual arousal patterns, with particular relevance to rape. An important part of their analysis pertains to laboratory research on men's sexual arousal. As one of the contributors to that literature, I believe there is a need to clarify further some of the findings reviewed by the Thornhills. On the basis of such a clarification and on some theoretical inconsistencies, I question the current version of the "adaptation to rape" hypothesis. In addition, I suggest some building blocks that I believe need to be incorporated into a revised information processing model. Finally, I point to the need to account for individual-differences data, which have revealed contrasting sexual arousal patterns among substantial portions of the male population.

The findings of laboratory studies on men's sexual arousal. In the laboratory studies discussed by the Thornhills and in additional research in this area, there have been three primary dimensions manipulated in sexual portrayals. They are (1) indications (usually verbal) of the female's consent versus nonconsent, (2) her physiological reactions of sexual arousal versus disgust, and (3) the degree of violence (i.e., potentially injurious behaviors such as hitting, cutting with a knife, etc.), which has ranged from none at all to severe. Some studies varied these dimensions orthogonally, although unfortunately no study has systematically varied all three of them. Although space limitations preclude a detailed review of this literature, I am confident of the following conclusions, which differ in some instances from the impression created by the Thornhills' discussion.

Most studies have covaried these three dimensions in descriptions of rape versus consenting depictions, so the former included verbal nonconsent, disgust reactions, and violence while the latter included consent, woman's arousal, and no violence. It is clear that when such comparisons are made, most men show considerably more sexual arousal to the latter portrayals than to the former ones (e.g., Barbaree et al. 1979). When the "main" effects of these dimensions have been assessed separately, a high degree of violence was found to inhibit most men's sexual arousal relative to lower levels of violence or no violence at all (e.g., Quinsey et al. 1984), although there does not appear to be research that has included the critical test of the effects of high violence in the context of a depiction of consensual sex (e.g., a consenting sadomasochistic interaction in which the man brutalizes and bloodies the woman). Research that might be considered an exception to the generalization about the inhibitory effects of violence (e.g., Briddell et al. 1978) is

discussed below. Descriptions of women's disgust also appear to have an inhibitory effect (e.g., Malamuth & Check 1980b). In contrast, verbal nonconsent alone does not appear to inhibit sexual arousal, although it is obviously difficult to manipulate this dimension without also including some information about the means by which the male coerces the female into sex once she has indicated her nonconsent. Research that has attempted to systematically manipulate the consent dimension without confounding it with other variables has generally shown that it does not affect men's sexual arousal, however (e.g., Malamuth & Check 1980b).

The Thornhills' "adaptation to rape" hypothesis predicts interaction effects between the dimension of consent versus nonconsent and various other dimensions that are relevant to rape-specific risks. Such evidence would be consistent with "regulation specific to sexual coercion" (sect. 12), suggesting that men should be differentially sensitive to certain rape-specific risks. Although the Thornhills' target article itself will hopefully stimulate additional studies that systematically assess such interactions, there already appear to be some relevant findings. For example, the Thornhills emphasize that the "willingness to use force will be constrained by the countervailing desire of displaying sexual 'morality'" (sect. 6). This should lead to an interaction between the consent versus nonconsent dimension and the conditions of assessment (e.g., permissive instructions or being required to report arousal). As noted later, such an interaction does not appear to have been found. Yet an interaction has been found between the consent dimension and the woman's physiological responsiveness to the sexual advances (e.g., Malamuth & Check 1980b). As elaborated upon later, however, the Thornhills and I differ in our views of the woman's responses dimension.

In their review of the laboratory findings, the Thornhills make an important distinction between the role of violence and aggressive control of the sexual partner, but their discussion should be clarified somewhat. Although they conclude that "violence per se will not be sexually stimulating for most men" (sect. 9), literature actually demonstrates that the use of violence *inhibits* most men's sexual arousal (e.g., Quinsey et al. 1984). This may be relevant to the Thornhills' "rape adaptation" hypothesis, because if the use of violence could facilitate coercive sex, why would inhibition of arousal be found? In this same section of their article the Thornhills also refer to the Quinsey et al. (1984) study as showing that "men find the theme of nonconsenting bondage . . . sexually arousing despite the 'absence' of sexual content" (sect. 9). But the descriptions used by Quinsey et al. in these bondage stories included references to elements that could be considered "sexual," such as necking, having the woman with a slender, beautiful body undress and get "her ass high in the air." In addition, while the Thornhills consider the data from this part of the study consistent with the "adaptation to rape" hypothesis, the fact that these investigators did not find any significant differences in arousal to the consenting versus nonconsenting versions of these bondage depictions would seem instead to contradict this hypothesis.

Disinhibiting manipulations. The Thornhills point to four main studies that they contend show that inhibition of men's sexual arousal in response to rape can be eliminated by altering the conditions of assessment. Unfortunately, in this part of their discussion they do not distinguish clearly enough between the nonconsent aspect of rape and the violence that frequently accompanies it. If we consider the former, then the Thornhills and I agree that men generally have been shown not to be inhibited by nonconsent alone. As I attempt to show below, however, I do not believe that these four studies (and related research) have demonstrated the elimination of the inhibitory effects of violence on sexual arousal.

First, Briddell et al. (1978) reported that when undergraduates believed they had ingested alcohol (even though they actually had not) they were as sexually aroused by a violent rape depiction as by a mutually consenting depiction (both read by a female). This study has not been successfully replicated, however (Barbaree et al. 1983), and research has shown that alcohol expectancy effects of the type used by Briddell et al. (1978) may be highly confounded with the demand characteristics of the experiment (e.g., Knight et al. 1986).

Second, Quinsey et al. (1981) focused on the effect of telling men that sexual responsiveness to unusual themes was expected in the testing situation. The Thornhills believe that this study indicates that the "community men who had received permissive instructions showed a significantly greater response to rape narratives than the community men with regular instructions." Also, the former community men "did not differ significantly from the rapists in their response to the rape narratives" (sect. 8.2). This community sample did show more sexual arousal to *both* rape and consenting depictions than those without permissive instructions, however. There was no differential effect of the instructions on responsiveness to rape themes. These data appear to be inconsistent with the "adaptation to rape" interaction effects described earlier in the target article. Moreover, even for these community subjects with permissive instructions, the overall pattern indicated that they were less aroused in response to the rape depictions than the mutually consenting ones. Given the relatively small size of this sample ($n = 10$), it is not surprising that some of the comparisons only approached conventional levels of statistical significance. Nevertheless, using sensitive indices such as the "rape index" (sexual arousal to rape depictions divided by arousal to consenting depictions) it was found that rapists had higher rape indices than the community subjects with permissive instructions. In addition, as the Thornhills note, other studies (e.g., Blader & Marshall 1984; Malamuth 1981b) have not found that normative versus nonnormative instructions significantly alter men's arousal to rape depictions.

Third, as the Thornhills correctly note, in the first phase of a study by Malamuth (1981b), males did not show significant differences in arousal to a rape versus a mutually consenting version of a slide-audio show narrated by a male voice. These two versions were created using a story from a popular erotica magazine, however, with little violence in either version and with the suggestion in the rape version that "she is enjoying the experience" (Malamuth 1981b, p. 37). In the second phase of this study, subjects were relatively highly aroused while listening to a rape portrayal depicting victim abhorrence, read by a female. It is, however, difficult to determine what the influence was of having been exposed only a few moments earlier to highly arousing visual images, despite the fact that time was allowed between exposures for arousal to return to baseline. The combination of hearing the female's description of sexual as well as violent content in the second story, particularly if her voice had subtly seductive qualities, might have led subjects to focus more on the sexual than on the violent content. To be fair to the Thornhills, I myself had speculated in this 1981 article that the use of the female voice might have "disinhibited" arousal. What I am pointing out now is that the use of a woman's voice may not necessarily allow for subjects' "true" arousal to be shown, but it may be a stimulant in the context of her describing sexual content. Systematic manipulations are needed in the relevant variables to assess these different interpretations.

Fourth, Blader and Marshall (1984) found that when men were required to report their arousal (via a lever) during assessment, they were less aroused by a violent rape depiction than when they were not required to report arousal; however, no such effect of reporting was evident for the rape-restraint depiction. The fact that this effect occurred as a function of the violence rather than the nonconsent-consent dimension seems inconsistent with the rape adaptation hypothesis. It is also important to note that under all testing conditions, the rape depictions, particularly the violent version, elicited less arousal than the mutually consenting portrayals.

A continuum versus "adaptation to rape." In attempting to provide some of the ingredients for a model that could account for the laboratory findings on men's sexual arousal, I begin by noting what I believe is an inconsistency between the Thornhills' description of a continuum perspective of mating tactics (in contrast to a dichotomy of forced vs. unforced copulations) and their development of an "adaptation to rape" hypothesis. If rape cannot easily be distinguished from varying gradations of other tactics because there are "only arbitrary boundaries between them" (sect. 7.1), how can there be a specific adaptation to rape? It would seem more consistent to hypothesize that information processing mechanisms affecting men's sexual arousal adapted to the costs versus the benefits of using different "mixes" of tactics (honest advertisement, deceptive advertisement, and coercion) under various conditions. Selection would have favored the inhibition of males' sexual arousal if the information processed suggested higher costs than benefits associated with sexual persistence in the face of female opposition to the male's advances.

Communicating sexual interest. The three dimensions manipulated in the laboratory may be viewed as multiple informational sources communicating the potential costs and benefits to males of pursuing sexual advances. When signals from different "channels" conflicted, such as when the woman verbally denied her interest but became sexually aroused physiologically, men were confronted with the need to evaluate to which source they should give more credence.

When female resistance was anticipated or actually occurred, the means by which such resistance could be overcome would be likely to have different costs associated with them. Here it may be important to distinguish between nonviolent means of overcoming resistance (e.g., trickery or mere restraint) and violent means, by which I mean those that are likely to inflict physical injury (e.g., hitting, cutting with a knife, etc.). All else being equal, selection would have favored men who were sexually inhibited by the use of violence that was likely to seriously injure themselves or the woman (Malamuth et al. 1977). Males who were not sexually inhibited by actions causing serious injury, particularly death, to those with whom they copulated would have been less likely to bear offspring and would therefore be selected against. This does not mean I am suggesting that sex and all forms of aggression are necessarily incompatible. On the contrary, as also noted by Malamuth et al. (1977), selection may have favored males who sometimes used force instrumentally for sexual purposes and may have shaped the linking of male sexuality with status seeking and dominance tendencies. This analysis suggests that it may be critical to distinguish between men who use force or even violence instrumentally versus those for whom violence is sexually arousing in and of itself. The latter group would be considered relatively deviant from the arousal pattern of most men. This view is consistent with the observation that among most primates there is little injury producing aggression during copulation (Smuts 1992), particularly since human social evolution is uniquely characterized by "pair bonding" (i.e., long-term, relatively exclusive mating relationships; Alexander & Noonan 1979).

In keeping with the Thornhills' information processing approach, we might speculate about the evolutionarily based informational utility of the three dimensions used in the laboratory research. The most powerful signal indicating a high likelihood of injury and therefore high costs might be derived from the actual description of destructive, violent (i.e., potentially injury producing) behaviors. I believe that it is this dimension, rather than the consent dimension, that is the most important to focus on in developing "adaptational" hypotheses. The second most relevant dimension may be female repulsion or disgust, which could be a prelude to the onset of additional resistance or even violence on her part. We can speculate further, in light of the findings reported above, that the least informative dimension regarding "costs" might be verbal indications of nonconsent alone. As suggested earlier, however, the processing of information from these dimensions is likely to occur simultaneously, and the effects of certain combinations are likely to be very different from those of others. For example, if one were to pair somewhat ambiguous indications of male violence with the sexual arousal of a woman, the potential costs would not be perceived the same as if she responded with high revulsion and anger.

Women's arousal versus disgust. The ideas I have discussed provide a rather different interpretation from that given by the Thornhills to findings based on story manipulations of the woman's sexual arousal versus disgust. The Thornhills argue that this is just one of many variables (e.g., perceived alcohol intoxication, permissive instructions, etc.) that can be used to remove situational inhibitions and to reveal the "true" arousal patterns of men. I suggest that within the evolutionary context this is one of the crucial signals to which men became sensitized in order to determine the woman's likely responses (and the potential costs vs. benefits to them).

The Thornhills believe that a part of the Barbaree et al. (1979) study shows that manipulations of the woman's reactions are not crucial to stimulating men's arousal. They report that this study did not find variations in men's arousal as a function of different levels of a woman's arousal. I disagree with the implications they draw from this study. The three stories varying the woman's arousal were all mutually consenting depictions and varied only in whether the woman was relatively passive or highly aroused. None showed negative reactions such as abhorrence or disgust. The importance of portraying a woman as sexually aroused versus disgusted may depend on contextual information from other cues. As suggested earlier, if she has indicated her disinterest verbally, her nonverbal responsiveness might be interpreted as "discounting" her verbal indications while disgust in that context would reinforce the message. There is no reason to suggest however, that a varying degree of arousal in the context of consenting depictions, as in the Barbaree et al. (1979) study, would similarly affect men's perceptions of the "danger" signals and thereby influence their sexual arousal.

Individual differences. Before closing, it is also important to note that there are large individual differences that moderate the effect of manipulations in the depictions that may be masked in studies that do not take such differences into consideration. Using a variety of theoretically related variables (e.g., reported likelihood of raping, sex-role stereotyping, psychoticism, etc.) we have shown in a series of studies (Barnes et al. 1984b; Check & Malamuth 1983; Malamuth 1989; Malamuth & Check 1983; Malamuth et al. 1986) that there are powerful interactions between such individual-difference dimensions and manipulations in the type and degree of coercion depicted. The result is that different groups of men sometimes show opposite patterns of sexual arousal. In an evolutionary model such differential patterns might be accommodated by variations in the likely evolutionary costs and benefits to different men of using various "mixes" of copulation tactics, depending on variables such as their learning histories, access to resources, anticipation of female opposition to male's sexual advances, and so on. Although a full discussion of these is beyond the scope of this commentary, any model that attempts to explain laboratory findings in this area, including that of the Thornhills, should also account for these individual differences in arousal patterns.

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