

# Why war evolved to be a man's game – and why that's only now changing

August 15 2018, by Alberto Micheletti

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Credit: AI-generated image ([disclaimer](#))

One pattern characterises every war that's ever been fought. Frontline fighting in warfare is primarily and often almost exclusively a male activity. From a numbers perspective, bigger armies obviously have greater chances of success in battles. Why then, are half of a community's potential warriors (the women) usually absent from the

battlefield?

Previous hypotheses have suggested that this is the result of fundamental biological differences between the sexes. But our new study, published in [Proceedings B](#), finds that none of these differences fully explain why women have almost never gone to war, and nor are they needed to do so. Instead, this state of affairs might have more to do with chance.

[Some researchers](#) have proposed that since men are on average stronger, taller, and faster than women, they are simply more effective in winning battles. [Others](#) have suggested that this pattern occurs because the costs of [warfare](#) are lower for men, as the risks of dying or being injured are offset by the opportunity to obtain more sexual partners in case of victory. This isn't true for women because they can only produce a limited number of offspring and so there's little or no evolutionary advantage to obtaining more partners.

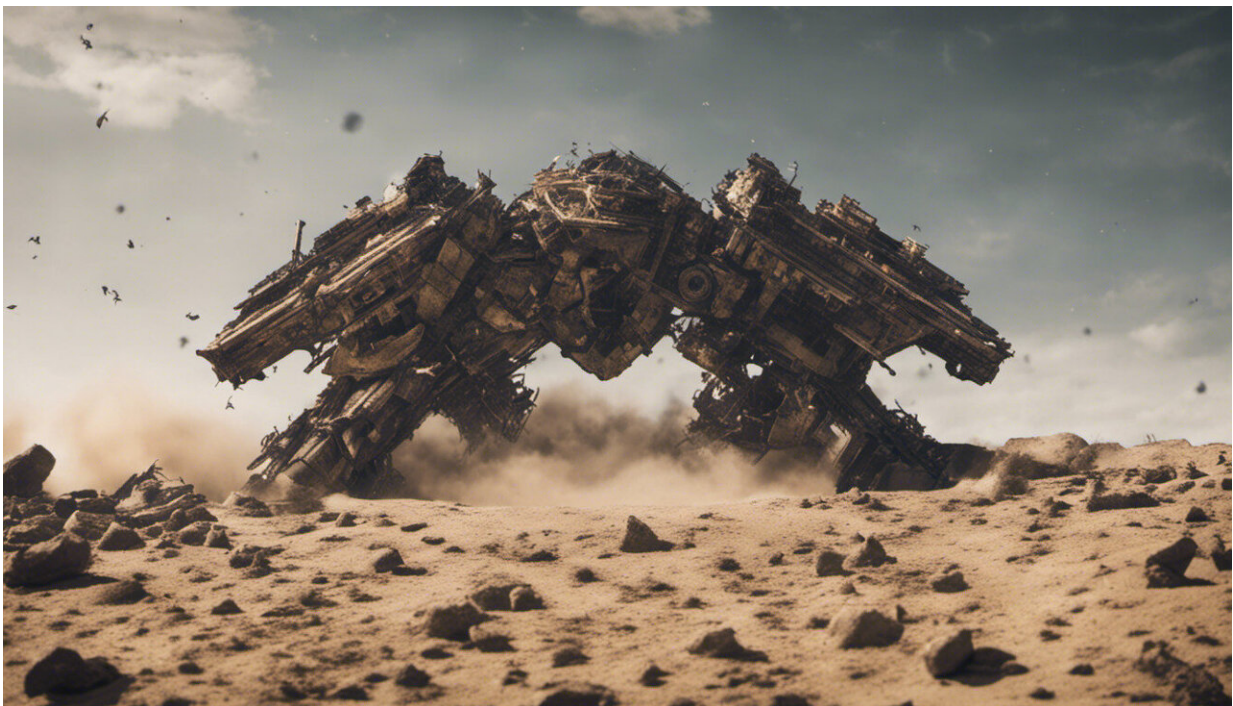
[Others still](#) have argued the answer can be found in the fact that females in groups of ancestral great apes and humans were more likely to migrate. This supposedly means that women are less genetically related to their social group than men, and so are less keen to risk their lives for their communities.

Granted, these hypotheses all suggest plausible reasons why more men than women participate in wars. But they fall short on explaining why the fighting is almost always done by men. We set out to answer this question, developing a mathematical model of the evolution of male and female participation in warfare, building on some of [our previous work](#) in this area. Our model looks at the consequences of going to war on a person's fitness, and for the fitness of their genetic relatives, to work out the probability that a person will join in the fighting.

## **Modelling the evolution of warfare**

Before investigating each of the proposed explanations in detail, we decided we should better understand the simplest case where there are no sex differences. We designed a model that looked at men and women as two identical groups, and didn't take account of the sexes' different characteristics when working out the probability of an individual joining in a war. To our surprise, we found that exclusively male warfare could still evolve in this case.

Instead, our model showed that what was important was how many members of a person's sex were already taking part in warfare at any given point, and how that affected sexual competition for mates with other people of the same sex. For example, if lots of men are already fighting, then the risks to an individual man would be lower and the potential rewards higher, but there would be much less incentive for a woman to take part.



Credit: AI-generated image ([disclaimer](#))

This evolutionary pressure means that, if there was then even a small reason why men might be more likely to fight, over many generations the incentives for men to join in would grow until warfare became an almost exclusively male practice.

But as our hypothetical model worked on the basis that men and women were identical, for every potential evolutionary trajectory that led to exclusively male warfare, there would be another that led to exclusively female warfare. Whether male-only war or female-only war evolved in our model depended only on the initial question of which sex was more likely to go to war to start with.

So, if both outcomes are equally plausible, why is warfare in fact almost exclusively male? Our study also suggests that male competition over mates and resources – an aspect of what biologists call sexual selection – might have caused men to evolve to be generally more aggressive than women. This was probably enough to make men more likely to go to war from the outset. And our model explains why this would ultimately lead to male-only war parties. Greater physical strength, together with lower costs and higher genetic links to the rest of the group, may have then helped reinforce this pattern.

But initial conditions could have – in theory – been different. Had women been naturally more aggressive, they would have become the warring sex and we would now live in a world of Amazon-like female-only wars. Interestingly, this is the case in some other animal societies that engage in inter-group conflicts. In [spotted hyenas](#), for example, only females attack other packs.



## The past and the future of war

One implication of our study is that past ecological conditions can have very long-lasting effects. The evolution of men as the more aggressive of the sexes led to a pattern of male-dominated warfare that was unlikely to be altered by changing technological or ecological forces.

Consider the role of weapons, for example. When warfare initially evolved, men were likely more aggressive and might have been more effective at fighting, because primitive weapons relied on brute force. As a result, they went on to become the warring sex. Later, inventions such as the bow and arrow made physical sex differences in strength less important. In more recent times, further technological advances have effectively equalised men and women in their ability to fight opponents. But, as male-only war has already evolved, these technological changes have little or no impact. Only initial conditions matter.

As such, this long-lasting effect of ancestral behavioural differences might help explain why women's presence in the armed forces today is still limited. Yet, perhaps culture is now having a greater role, at least partially overriding the biological basis for exclusively male warfare. The countries that have [opened military combat roles](#) to women in response to changing attitudes, and the recent reports of Kurdish [women](#) fighting Islamic State are testaments to that.

**More information:** Alberto J. C. Micheletti et al. Why war is a man's game, *Proceedings of the Royal Society B: Biological Sciences* (2018).

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