DH-11 Violence, warfare and the sexes

The study of violence, warfare, and the evolutionary history of the sexes occupies a deeply contested space at the intersection of evolutionary biology, biological anthropology, and social psychology. To comprehend how human beings—and specifically men and women—navigate conflict, it is necessary to disaggregate the phenomenon into three distinct but interacting layers. The first layer is physiology, encompassing measurable anatomical and endocrinological traits sculpted by deep evolutionary time. The second is behaviour, consisting of statistical realities characterised by overlapping distributions, where evolutionary imperatives manifest as psychological propensities. The third is culture, representing the variable, highly plastic institutional responses to baseline human capacities.

In exploring this terrain, one must meticulously distinguish between what is known about statistical averages and what can be deduced about individuals. Human behavioural traits exist on overlapping normal distributions; a significant difference in the mean of a trait (e.g., physical aggression) between men and women does not preclude a substantial portion of women from being more aggressive than a substantial portion of men. Furthermore, one must actively guard against the naturalistic fallacy—the assumption that because a behaviour is evolutionarily "natural" or historically ubiquitous, it is therefore morally "good" or inevitable. The human narrative is neither exclusively one of Rousseauian peace nor Hobbesian perpetual war; rather, it is a complex record of ecological adaptation, reproductive competition, and cultural plasticity. This report provides an exhaustive analysis of the primary literature, systematic reviews, and meta-analyses to establish a foundation for how men and women can best structure their shared institutions.

Layer 1: Physiology (Measurable)

The physiological layer encompasses the anatomical, neurological, and endocrinological architecture of the human body. These are highly measurable, empirical traits exhibiting distinct sexually dimorphic profiles. They offer the most direct evidence of the divergent selection pressures that operated on male and female ancestors.

Morphological Dimorphism and Formidability

The physical capacity to inflict violence is profoundly sexually dimorphic in humans, but this dimorphism is not distributed evenly across the anatomy. In a seminal review published in *Evolution and Human Behavior*, Lassek and Gaulin (2009) demonstrated that while human males are, on average, only 15% to 20% heavier than females in total body mass, their upper-body muscle mass is approximately 75% greater, and upper-arm muscle volume is 78% greater[1]. Comparatively, sexual dimorphism in lower-body muscle mass is far less pronounced, with men possessing only about 50% more muscle mass in their legs[4].

The effect sizes for these dimorphisms are remarkably large, surpassing almost all other psychological or behavioural sex differences. Conroy-Beam et al. (2015, *Personality and Social Psychology Bulletin*) utilised the Mahalanobis distance (D) to measure multivariate dimorphism, noting that the sex difference in upper-body strength yields an effect size

equivalent to a Cohen's d of 2.0 to 2.8, representing nearly zero overlap between the male and female distributions at the extremes[6]. To contextualise this mathematically, an average human male possesses greater upper-body strength than 99.9% of females[3]. This finding has been robustly replicated across diverse global populations and developmental cohorts. In longitudinal models tracking children from age 11 to 17, male upper-body strength increases precipitously alongside the onset of puberty, supporting the hypothesis that physical masculinisation aligns with an adaptive congruence for intra-sexual competition during peak reproductive years[1].
Morphological specialisation for violence extends specifically to striking capabilities. Biomechanical research by Carrier and Morgan (2014) and Morris et al. (2020) in the *Journal of Experimental Biology* suggests that the proportions of the male hand, arm length, and upper-body musculature evolved specifically to enhance punching force and striking[7]. Data drawn from mixed martial arts contests ($N = 44$ open-weight fights and broader datasets of $N = 5,866$) indicate that heavier, more formidable males are 200% more likely to win against lighter opponents specifically via knockout power, which causes immediate sensory damage or incapacitation[7].
Evolutionary psychologists Sell et al. (2009, *Proceedings of the Royal Society B*) established that the human neurocognitive architecture includes specialized adaptations to assess this specific formidability. Both men and women can accurately assess a man's physical upper-body strength solely from facial cues and voice pitch, independently of height and weight[4]. This cognitive mechanism indicates an evolutionary environment where assessing the fighting ability of rival males was a continuous, vital survival requirement.

Endocrinology: Testosterone and Oxytocin

The endocrinological drivers of aggression are frequently misinterpreted in popular discourse. Folk wisdom dictates that testosterone is a simple "aggression hormone" that inevitably fuels antisocial violence. However, rigorous experimental economics and neurobiological research paints a much more nuanced picture, identifying testosterone as a driver of context-dependent status-seeking rather than indiscriminate violence.

In a landmark, double-blind, placebo-controlled experiment ($N = 120$) published in *Nature*, Eisenegger et al. (2010) administered a single sublingual dose of testosterone to women participating in an economic bargaining game (the Ultimatum Game). Contrary to the folk hypothesis, participants who actually received testosterone made significantly *fairer* offers than those given a placebo, thereby reducing conflict and enhancing the efficiency of the social interaction[11]. Intriguingly, participants who merely *believed* they had received testosterone—regardless of the actual dose—behaved more aggressively and unfairly, driven entirely by cultural expectations and prejudice[11]. Testosterone's biological function is therefore better understood through the "social status hypothesis": it promotes behaviours that secure and maintain status. If fairness and reciprocity secure status in a given socio-economic context, testosterone promotes fairness[12]. When status is directly challenged or provoked, however, testosterone reliably potentiates aggressive, punitive responses against the transgressor[11].

Similarly, oxytocin, traditionally labelled the "love drug" or "cuddle chemical," has been revealed to possess a dark, dualistic role in intergroup conflict. In a series of double-blind, placebo-controlled trials published in *Science* (2010) and the *Proceedings of the National Academy of Sciences* (2011), De Dreu et al. demonstrated that oxytocin promotes "parochial altruism"[15]. While intranasal oxytocin robustly enhances in-group trust, cooperation, and empathy, it simultaneously upregulates ethnocentrism, xenophobia, and defensive aggression against competing out-groups[15]. Oxytocin essentially triggers a "tend and defend" response, providing a physiological substrate for both the extreme self-sacrifice seen in coalitional warfare and the xenophobic derogation directed at rival groups[17].

It is necessary to note that the oxytocin findings have faced methodological scrutiny. In a 2012 response in *PNAS*, Chen et al. criticized De Dreu's interpretations, arguing that oxytocin promotes in-group love but does not directly *cause* out-group hate; rather, the out-group derogation is a secondary artifact of protecting the in-group during zero-sum competitions[22]. De Dreu countered that whether primary or secondary, the practical output of upregulated oxytocin in competitive environments remains intergroup bias and defensive aggression[20].

Trait / Mechanism	Primary Function	Effect Size / Finding	Primary Sources
Upper-Body Muscle Mass	Intra-sexual physical competition and striking power.	$d =$ to 2.8 (Mahalanobis D); 75-78% greater in males.	Lassek & Gaulin (2009); Conroy-Beam et al. (2015)[1].
Formidability Assessment	Gauging rival threat via facial/vocal cues.	High accuracy across cultures tracking upper-body strength.	Sell et al. (2009)[4].
Testosterone (T)	Context-dependent status-seeking.	T causes fairer bargaining if fairness yields status; increases punitive action if provoked.	Eisenegger et al. (2010, *Nature*)[12].
Oxytocin (OXT)	Parochial altruism ("Tend and Defend").	Increases in-group empathy/trust; increases out-group	De Dreu et al. (2010, *Science*)[15].

		defensive aggression.	

Layer 2: Behaviour (Statistical, Overlapping Distributions)

The behavioural layer translates physiological capacity into statistical frequencies of action. Behavioural traits between the sexes represent overlapping normal distributions. Consequently, differentiating between statistical averages and individual predictability is vital: knowing that men, on average, commit more violence provides zero predictive validity regarding whether a specific, randomly selected man will be violent.

Proactive vs. Reactive Aggression

To understand the behavioural architecture of human warfare, aggression must be parsed into distinct typologies. In an influential theoretical synthesis published in the *Proceedings of the National Academy of Sciences*, biological anthropologist Richard Wrangham (2018) distinguished between two discrete neurobiological pathways: *reactive* aggression and *proactive* aggression[24].

Reactive aggression is an impulsive, high-arousal response to immediate threat or frustration, designed to mitigate an immediate stimulus (e.g., a bar fight or a sudden lash-out)[24]. Proactive aggression is premeditated, goal-oriented, low-arousal, and calculated. It is employed to achieve a specific reward (resources, territory, status) when the goal is attainable at a remarkably low cost to the aggressor (e.g., an ambush or a planned assassination)[24].

Wrangham posits that during human evolution, selection acted on these two types of aggression independently. Compared to chimpanzees, modern humans exhibit exceptionally *low* rates of reactive aggression, sharing a docility and tolerance for crowding more akin to bonobos[26]. This reduction is theorised to be the result of a "self-domestication" process occurring approximately 300,000 years ago. During this period, the advent of complex language allowed subordinate males to form coalitions and utilize *proactive* aggression (targeted conspiratorial killings and capital punishment) to execute highly *reactively* aggressive, tyrannical alpha males[26]. By selectively culling reactively aggressive individuals, humans domesticated themselves. Conversely, humans retained and amplified an exceptionally *high* capacity for proactive aggression, a trait shared with chimpanzees[24]. Proactive aggression is the absolute behavioural foundation of warfare. It allows coalitions to plan lethal raids, exploit extreme imbalances of power, and systematically kill rivals without suffering serious costs[26].

Sex Differences in Aggression and the "Young Male Syndrome"

The statistical disparities in aggressive behaviour between the sexes are highly robust and cross-culturally universal. In exhaustive meta-analyses published in *Psychological Bulletin*, John Archer (2000, 2004) reviewed the global data on sex differences in real-world aggression[30]. Archer found that males consistently display higher levels of direct, physical aggression starting from early childhood, peaking sharply between the ages of 20 and 30[30]. The effect sizes for

physical aggression generally yield a Cohen's d ranging between 0.40 and 0.60, depending on the measurement and context[30]. Conversely, females utilize significantly higher rates of indirect and relational aggression (e.g., social ostracism, reputational damage, and gossip), particularly during adolescence[30].

A highly contested sub-field of this literature involves intimate partner violence (IPV). Archer's (2000) meta-analysis based on 82 studies found a surprising symmetry in the *frequency* of IPV perpetration among heterosexual couples (with women frequently reporting equal or slightly higher rates of initiating minor physical aggression, $d = 0.15$ to 0.05)[31]. However, there is a profound, structural asymmetry in the *severity* of the outcomes. Men are vastly more likely to inflict severe injury, choke, strangle, or murder their partners[32]. This behavioural data perfectly aligns with the morphological dimorphism previously noted: equivalent behavioural intent results in vastly disproportionate physical damage due to the male monopoly on upper-body formidability.

The demographic reality of direct, lethal violence is best encapsulated by the "Young Male Syndrome," articulated by evolutionary psychologists Martin Daly and Margo Wilson (1985, *Ethology and Sociobiology*)[37]. By analysing homicide statistics globally (starting with a seminal analysis of Detroit police records), Daly and Wilson demonstrated that both the perpetrators and the victims of lethal violence are overwhelmingly young, unemployed, unmarried men between the ages of 15 and 35[38].

Daly and Wilson argued that this demographic clustering is an evolutionary consequence of intense intra-sexual reproductive competition. In species with a historical variance in male reproductive success (effective polygyny), natural selection favours males who engage in high-risk, high-reward behaviours to secure status, resources, and mates[37]. Risky impulsivity is significantly higher in men ($d = 0.34$), acting as a common proximate mechanism for both aggression and sociosexuality[38]. Consequently, many homicides that police categorize as resulting from "trivial altercations" (e.g., an insult in a bar) are, in evolutionary terms, lethal contests over status, reputation, and honour among men who perceive they have little else to lose[38].

Female Self-Protection and Martial Plasticity

The evolutionary psychology of female aggression is fundamentally shaped by the asymmetrical, obligatory costs of mammalian reproduction. In her widely cited "Staying Alive" theory published in *Behavioral and Brain Sciences*, Anne Campbell (1999) proposed that because human infants are exceptionally altricial (helpless) and heavily dependent on extended maternal investment for survival, the evolutionary cost of physical injury or death is significantly higher for a mother than a father[41].

Consequently, human females evolved a lower threshold for fear, a lesser tolerance for physical pain, and a much greater aversion to physical risk[42]. This evolutionary imperative explains why female-female competition rarely escalates to lethal, physical violence, relying instead on low-risk indirect methods (relational aggression) that successfully mitigate the risk of bodily

harm[41]. Women take fewer impulsive physical risks because preserving their own physical integrity is historically the most critical factor in the survival of their offspring[41].
However, behavioural plasticity remains a hallmark of *Homo sapiens*, and recent archaeological data strongly caution against viewing women exclusively as passive non-combatants. Haas et al. (2020, *Science Advances*) and Anderson et al. (2023, *PLOS ONE*) have documented female big-game hunters in early Holocene sites in the Americas. Through probability analyses of burial sites, they indicated that female participation in big-game hunting (a vital precursor to martial proficiency) was historically non-trivial[46]. Furthermore, osteological evidence from Scythian kurgans (burial mounds) analyzed by archaeologists like Valeriy Guliaev and Adrienne Mayor indicates that up to a third of Scythian women bore battle trauma (e.g., arrow wounds, parry fractures) and were buried with full martial weaponry[50]. These findings demonstrate that while statistical averages for risk aversion hold across the species, female behaviour is highly adaptive; under specific ecological and cultural pressures (such as nomadic pastoralism), women readily and proficiently engaged in lethal warfare[46].

Layer 3: Culture (Variable)

The cultural layer involves how societies harness, institutionalise, or mitigate the baseline physiological and behavioural tendencies of the species. The debate over whether early humans were inherently peaceful or warlike—and how early societies managed male coalitional aggression—remains one of the most fiercely contested domains in modern anthropology.

The Evolutionary Roots of War: Coalitional Psychology

Is war an evolutionary adaptation or a relatively recent cultural invention tied to the agricultural revolution? Evolutionary biologists Richard Wrangham and Luke Glowacki (2012, *Human Nature*) advocate the "imbalance of power" hypothesis, suggesting that human warfare is homologous to the lethal raiding observed in chimpanzees[29].
According to this model, warfare requires two necessary and sufficient conditions: a state of baseline intergroup hostility, and a sufficient asymmetry in numbers (e.g., a large raiding party catching a lone individual) such that one coalition can attack another with near impunity[26]. In ancestral environments, males who successfully conducted these low-risk, lethal raids expanded their territory and access to resources, conferring a massive reproductive advantage. Van Vugt et al. (2007) formalized this evolutionary logic as the "Male Warrior Hypothesis," arguing that men possess specialised, sexually dimorphic cognitive mechanisms designed specifically to form coalitions, dehumanise out-groups, and sacrifice for their in-group during intergroup conflicts[54].
The "Risk Contract Hypothesis," formulated by evolutionary psychologists Tooby and Cosmides (1988), explains the underlying mathematics of coalitional war. For lethal combat to be an evolutionarily adaptive strategy for an individual male, four strict conditions must be met: (1) the average long-term gains in reproductive success must be sufficiently large to outweigh the massive costs of potential death; (2) members must genuinely believe their coalition will emerge victorious; (3) the risk of death must be distributed across the coalition; and (4) there must be a "veil of ignorance" regarding exactly who will die in the clash[54]. This risk contract explains why male psychology is acutely sensitive to assessing coalitional formidability and why modern

military training relies heavily on artificially reinforcing these exact parameters.

The Great Debate: Rates of Violent Death in Prehistory

The controversy over prehistoric warfare features two deeply entrenched academic camps. The "Deep Rooters," most visibly championed by Steven Pinker (2011, *The Better Angels of Our Nature*), archaeologist Lawrence Keeley (1996, *War Before Civilization*), and economist Samuel Bowles (2009, *Science*), argue that early human life in the Pleistocene was exceptionally violent and that warfare is an ancient adaptation[57].

Aggregating archaeological and ethnographic data, Keeley and Pinker suggested that approximately 15% of all deaths in prehistoric and non-state societies were the result of lethal violence, with some specific sites (like Crow Creek in South Dakota, or Jebel Sahaba in Sudan) showing casualty rates approaching 60% of the population[57]. Bowles (2009) utilised these high estimates of violent death to construct evolutionary game-theory models demonstrating that high war mortality was the exact selective pressure necessary to evolve human parochial altruism; groups with highly cooperative, self-sacrificing individuals survived lethal conflicts, while selfish groups perished[59].

Conversely, the "Shallow Rooters," led by anthropologists Douglas Fry, Patrik Söderberg, and R. Brian Ferguson, vehemently dispute these statistics, arguing that warfare is a recent Holocene invention linked to sedentism and agriculture[59]. In a seminal 2013 paper in *Science*, Fry and Söderberg analysed 148 lethal aggression events across 21 Mobile Forager Band Societies (MFBS)—the closest ethnographic analogue to Pleistocene hunter-gatherers[59]. They found that 55% of lethal events involved only a single killer and a single victim, and 85% of all killings occurred *within* the same society[65]. Fry and Söderberg concluded that while interpersonal homicides and feuds were common, actual *warfare* (coalitionary violence against other independent groups) was exceedingly rare[65].

Ferguson (2013, 2015) systematically deconstructed "Pinker's List" of violent archaeological sites, arguing that massacres like Crow Creek represent specific, resource-stressed anomalies late in the timeline (1325 CE), not a universal baseline of Pleistocene life[63].

The Yanomami Controversy: Do Killers Have More Kids?

The intersection of cultural violence and evolutionary fitness reached its zenith in the controversy surrounding anthropologist Napoleon Chagnon's 1988 *Science* paper on the Yanomami of the Amazon basin. Chagnon reported a stunning statistic: Yanomami men who had participated in a killing (achieving the cultural status of *unokai*) had significantly more wives and over three times as many offspring as non-killers of similar age[70]. This provided explosive empirical support for the hypothesis that lethal violence is an evolved, reproductively rewarded adaptation[70].

However, this finding has faced relentless, multi-disciplinary critique, often referred to as the "Yanomami crisis"[72]. Ferguson (1995, 2015) and Bruce Albert (1989) argued that Chagnon entirely ignored the historical context[70]. Ferguson posited that Yanomami warfare was not a pristine "Stone Age" baseline, but a direct, localized result of Western contact—specifically, intense, violent competition over access to highly prized Western steel tools introduced by missionaries and the anthropologists themselves[71]. Furthermore, biological anthropologists

noted a severe methodological confound in Chagnon's data: *unokai* men were generally older than non-killers. Because older men naturally have more children in polygynous societies by virtue of having lived longer, age, rather than martial prowess, confounded the reproductive success data[71].

Society / Context	Estimated Rate of Violent Death	Primary Interpretive Source	Contextual Note from Critics
Crow Creek (Prehistoric)	~60%	Pinker (2011) / Keeley (1996)	Late period (1325 CE); severe ecological stress and fortification anomaly[60].
Yanomami (Amazonia)	~30% (Male deaths)	Chagnon (1988) / Keeley (1996)	Intensely debated; critics cite colonial disruption and the steel tool trade[60].
Average 21 Prehistoric Sites	~15%	Pinker (2011)	Contested by Ferguson as a cherry-picked "List" misrepresenting the Pleistocene[63].
Mobile Forager Bands (21 groups)	Very Low (Inter-group War)	Fry & Söderberg (2013, *Science*)	85% of lethal events were internal homicides/feuds, not inter-group war[65].

Homicide, Domestic Violence, and Channelling Aggression

Even if formal intergroup warfare was rare among nomadic foragers, interpersonal violence certainly was not. Ethnographic data reveal staggering homicide rates in small-scale societies, entirely refuting the myth of the perfectly peaceful savage. Bruce Knauft (1987) reported that the Gebusi of New Guinea had a homicide rate ranging from 200 to 326 per 100,000 people per year—exponentially higher than modern state societies[58]. Richard Lee (1979) found that the !Kung San of the Kalahari, often romanticised as the "harmless people," had a homicide rate of approximately 40 per 100,000 (comparable to the most violent modern inner cities in the 1970s)[58].

These statistics underscore the chronic stress of group living. Without state-level institutions and

third-party policing, small-scale societies frequently relied on self-help justice, leading to endless cycles of blood revenge and witchcraft accusations[74]. To survive, cultures had to engineer elaborate institutions to channel the inevitable presence of young male aggression and domestic friction.

Small-scale societies successfully mitigated internal violence by redirecting it through intense cultural scaffolding. Age-grade systems, brutal initiation rites, warrior societies, and aggressive inter-tribal sports served to absorb the high risk-taking propensities of young men[78]. These institutions bound young male status-seeking to the structural defense needs of the community rather than allowing it to fracture the group via internal homicide.

Furthermore, as Glowacki (2020) and others point out, humans are unique in possessing the cognitive capacity for *peace-making*[80]. Unlike chimpanzees, whose intergroup relations are entirely zero-sum, human groups engage in positive-sum interactions, establishing inter-group trade, intermarriage, and diplomatic rituals that intentionally de-escalate the biological propensity for xenophobic conflict[79]. Cultural norms and institutions thus function as the vital, necessary buffer between humanity's baseline physiological potential for violence and the maintenance of peaceful coexistence.

Conclusion

Summary of Robust Findings

Human males exhibit extreme physiological dimorphism in upper-body strength and striking power (Mahalanobis $D \approx 2.0$), adaptively sculpting them for intra-sexual physical competition and coalitional aggression. Behaviourally, men across all known cultures commit the vast majority of direct, physical violence and homicides, driven by evolutionary pressures surrounding status and variance in reproductive success, heavily concentrated in the "Young Male Syndrome" demographic (ages 15–35). Conversely, women exhibit heightened physiological and psychological fear responses to physical threats ("Staying Alive" theory) to protect their immense, obligatory reproductive investments, thus favouring indirect, lower-risk aggression. Hormonally, testosterone acts primarily as a context-dependent driver of status-seeking rather than indiscriminate violence, while oxytocin promotes parochial altruism—pairing profound in-group love with out-group defensive aggression and xenophobia. Humans share a propensity for low-cost, proactive aggression (lethal raiding) with chimpanzees, while suppressing high-arousal reactive aggression through an evolutionary history of self-domestication via capital punishment. Though fierce debate rages over the exact rates of prehistoric coalitionary warfare, non-state societies undoubtedly experienced exceptionally high levels of interpersonal homicide, requiring the invention of complex cultural institutions to actively channel young male status-seeking away from internal disruption and toward community defense or ritualized sport.

Contested or Open Questions

Topic	Core Debate / Open Question

The Antiquity of War	Did coalitionary warfare exist as a continuous evolutionary selective pressure during the Pleistocene, or did it strictly emerge as a novel cultural artifact following the agricultural accumulation of defendable resources in the Holocene?
The Yanomami Paradigm	Does participation in lethal raiding genuinely confer long-term reproductive advantages (*unokai* success) in uncontacted societies, or are such findings statistical artefacts of age confounds and post-contact disruptions (the steel tool trade)?
Evolution of Altruism	Is human extreme self-sacrifice in war a product of multi-level (genetic group) selection driven by high war mortality (Bowles), or can it be entirely explained by individual fitness, kin selection, and cultural coercion?
Oxytocin's Mechanism	To what exact degree does oxytocin directly *cause* out-group derogation (hate) versus merely elevating in-group protection (love) that inadvertently harms out-groups as a secondary byproduct in zero-sum scenarios?
Female Martial Plasticity	How ubiquitous were female hunters and warriors (e.g., Scythian Amazons, early Holocene Andean hunters) before the advent of rigid, patriarchal agricultural states curtailed female physical autonomy?

The 5 to 10 Most Important Sources to Read in Full

Author(s) & Year	Title & Journal / Publication	Significance to the Field

Wrangham, R. W. (2018)	*Two types of aggression in human evolution.* Proceedings of the National Academy of Sciences.	Essential theoretical framework distinguishing proactive (raiding) vs. reactive (impulsive) aggression and self-domestication.
Archer, J. (2004)	*Sex differences in aggression in real-world settings: A meta-analytic review.* Review of General Psychology.	The definitive statistical breakdown of human aggressive dimorphism, direct vs. indirect aggression, and effect sizes.
Fry, D. P., & Söderberg, P. (2013)	*Lethal aggression in mobile forager bands and implications for the origins of war.* Science.	The leading empirical counter-argument against deep-rooted human warfare, analyzing 148 lethal events in MFBS.
De Dreu, C. K. W., et al. (2010)	*The neuropeptide oxytocin regulates parochial altruism in intergroup conflict among humans.* Science.	Crucial for understanding the physiological paradox of in-group love and out-group hate (the "tend and defend" mechanism).
Daly, M., & Wilson, M. (1985)	*Competitiveness, risk taking, and violence: The young male syndrome.* Ethology and Sociobiology.	The foundational text explaining the demographic clustering of violence among young men via reproductive variance.
Lassek, W. D., & Gaulin, S. J. C. (2009)	*Costs and benefits of fat-free muscle mass in men.* Evolution and Human Behavior.	Details the staggering physical dimorphism in human upper-body strength and its evolutionary costs/benefits.
Campbell, A. (1999)	*Staying alive: Evolution, culture, and women's*	The preeminent evolutionary theory

	intrasexual competitiveness. Behavioral and Brain Sciences.	explaining female risk aversion, fear thresholds, and survival strategies for offspring.
Eisenegger, C., et al. (2010)	*Prejudice and truth about the effect of testosterone on human bargaining behaviour.* Nature.	Dismantles the folk myth of testosterone as an indiscriminate aggression hormone, reframing it as a status-seeking driver.
Ferguson, R. B. (2015)	*Pinker's List: Exaggerating Prehistoric War Mortality.* In War, Peace, and Human Nature.	A rigorous methodological critique of the claim that prehistory was perpetually at war, deconstructing archaeological sites.
Van Vugt, M., et al. (2007)	*Male warrior hypothesis: Evolution of coalitional psychology.* Psychological Science.	Foundational reading on how male psychology specifically adapted to the cognitive demands of intergroup conflict.

Implications for Living Together

Note: Human behaviour is a product of evolution, but what is "natural" does not equate to what is "good," "inevitable," or "moral." To assume otherwise is to commit the naturalistic fallacy. Our evolutionary inheritance provides a baseline set of psychological inclinations, but our immense cultural plasticity allows us to design environments that mitigate destructive outcomes and promote flourishing.

For families, organisations, and societies, understanding the evolutionary architecture of the sexes provides highly actionable insights. First, young male status-seeking and risky impulsivity (the Young Male Syndrome) are deeply ingrained, predictable features of human demographics. Rather than attempting to suppress this drive entirely through sheer prohibition—which historically leads to antisocial rebellion, gang formation, or clandestine violence—societies and organisations thrive when they actively build robust, high-status avenues for structured competition. Providing rigorous academics, demanding physical trades, competitive athletics, and structured leadership tracks effectively harnesses this energy, channelling it toward pro-social community building.

Second, acknowledging testosterone’s true neurobiological role as a *status* driver, rather than a violence driver, radically changes organisational management. It implies that if a corporate,

familial, or societal structure visibly rewards cooperation, mentorship, and fairness with high status, men will aggressively and passionately compete to be cooperative and fair. The environment dictates the behavioural output of the hormone.

In the context of couples and families, recognizing that men and women possess asymmetric physiological thresholds for physical threat can foster much deeper empathy. Because women are evolutionarily adapted to prioritize physical safety to protect reproductive investment, behaviours that men might perceive as minor physical posturing can trigger profound, biological distress in women. Consequently, intimate partner conflict must be managed with absolute zero-tolerance for physical escalation; the extreme dimorphism in upper-body strength (where the average man is stronger than 99.9% of women) dictates that equivalent behavioral escalation yields asymmetric, catastrophic harm to women.

Finally, at the macro-societal level, understanding our oxytocin-driven "parochial altruism" highlights our most vital vulnerability: our innate capacity for profound love and cooperation is easily hijacked by xenophobic tribalism when resources are threatened. To maintain peaceful, multi-ethnic societies, leaders must intentionally and continually expand the conceptual boundaries of the "in-group." By fostering overarching civic identities and positive-sum intergroup trade, societies can leverage our evolutionary neurobiology for collaborative peace rather than zero-sum, reactive conflict.

Works cited

1. Aggressive-antisocial boys develop into physically strong young men, https://pmc.ncbi.nlm.nih.gov/articles/PMC4398605/
2. Genetic Influences on the Development of Grip Strength in ... - PMC, https://pmc.ncbi.nlm.nih.gov/articles/PMC4061497/
3. Adaptations for contest competition in human males - Sign in, https://pure.manchester.ac.uk/ws/portalfiles/portal/205626547/FULL_TEXT.PDF
4. Human adaptations for the visual assessment of strength and ... - PMC, https://pmc.ncbi.nlm.nih.gov/articles/PMC2664345/
5. Strength is negatively associated with depression and accounts for, https://pmc.ncbi.nlm.nih.gov/articles/PMC8935202/
6. How Sexually Dimorphic Are Human Mate Preferences?, https://www.toddkshackelford.com/downloads/2015/Conroy-Beam-et-al-PSPB-2015.pdf
7. Human Male Body Size Predicts Increased Knockout Power, Which, https://www.researchgate.net/publication/381460170_Human_Male_Body_Size_Predicts_Increased_Knockout_Power_Which_Is_Accurately_Tracked_by_Conspecific_Judgments_of_Male_Dominance
8. Anthropometric correlates of human anger | Request PDF, https://www.researchgate.net/publication/251644403_Anthropometric_correlates_of_human_anger
9. Side preferences in human dyads when walking: the influence of, https://www.tandfonline.com/doi/full/10.1080/1357650X.2025.2501089
10. Accuracy of strength assessment from the male body, face, and voice,

https://www.researchgate.net/figure/Accuracy-of-strength-assessment-from-the-male-body-face-and-voice-Sell-et-al-2009_fig1_223959003
11. [PDF] Prejudice and truth about the effect of testosterone on human, https://www.semanticscholar.org/paper/Prejudice-and-truth-about-the-effect-of-on-human-Eisenegger-Naef/edb6b8f7025832c30b42ca7a46962dedb2217934
12. Prejudice and Truth About the Effect of Testosterone on Human, https://www.researchgate.net/publication/40483913_Prejudice_and_Truth_About_the_Effect_of_Testosterone_on_Human_Bargaining_Behaviour
13. Prejudice and truth about the effect of testosterone on human, https://pubmed.ncbi.nlm.nih.gov/19997098/
14. Prejudice and truth about the effect of testosterone on human, https://ideas.repec.org/a/nat/nature/v463y2010i7279d10.1038_nature08711.html
15. Oxytocin promotes human ethnocentrism - PNAS, https://www.pnas.org/doi/10.1073/pnas.1015316108
16. Gerben A. van Kleef - Google Scholar, https://scholar.google.com/citations?user=t7hUAi4AAAAJ&hl=en
17. The Neuropeptide Oxytocin Regulates Parochial Altruism in, https://www.behavioralethics.org/publication/de-dreu-2010/
18. Oxytocin promotes human ethnocentrism - PubMed, https://pubmed.ncbi.nlm.nih.gov/21220339/
19. Oxytocin increases liking for a country's people and national flag but, https://www.frontiersin.org/journals/behavioral-neuroscience/articles/10.3389/fnbeh.2014.00266/full
20. Oxytocin Conditions Intergroup Relations Through Upregulated In, https://www.mariskakret.com/wp-content/uploads/2015/10/De-Dreu-Kret-Manuscript.pdf
21. Oxytocin promotes altruistic punishment - PMC - NIH, https://pmc.ncbi.nlm.nih.gov/articles/PMC5714236/
22. Oxytocin and intergroup relations: Goodwill is not a fixed pie - PNAS, https://www.pnas.org/doi/10.1073/pnas.1101633108
23. Oxytocin-enforced norm compliance reduces xenophobic outgroup, https://www.pnas.org/doi/10.1073/pnas.1705853114
24. Aggressive Responding Under the Minimal Group Paradigm - OSF, https://osf.io/download/m6sx5
25. Human Aggression: The causes, effects, and what we can do about it., https://neblog.utdallas.edu/2025/08/12/humanaggression/
26. Two types of aggression in human evolution - PNAS, https://www.pnas.org/doi/10.1073/pnas.1713611115
27. Hypotheses for the Evolution of Reduced Reactive Aggression in the, https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2019.01914/full
28. Male-Male Alliances and the Evolution of Societal Patriarchy, https://ethicsinsociety.stanford.edu/news/male-male-alliances-and-evolution-societal-patriarchy
29. Evolution of coalitionary killing - PubMed,

https://pubmed.ncbi.nlm.nih.gov/10601982/
30. Does sexual selection explain human sex differences in aggression?, https://knowledge.lancashire.ac.uk/id/eprint/1155/1/archer_J_does_sexual_selection_explain_2009.pdf
31. Sex Differences in Aggression between Heterosexual Partners, https://www.researchgate.net/publication/12332749_Sex_Differences_in_Aggression_between_Heterosexual_Partners_A_Meta-Analytic_Review
32. (PDF) Gender Differences in Aggression - ResearchGate, https://www.researchgate.net/publication/346488585_Gender_Differences_in_Aggression
33. Sex Differences in Aggression in Real-World Settings - ResearchGate, https://www.researchgate.net/publication/45637197_Sex_Differences_in_Aggression_in_Real-World_Settings_A_Meta-Analytic_Review
34. Sex differences in physically aggressive acts between heterosexual, https://domestic-violence.martinsewell.com/Archer2002.pdf
35. Sex differences in aggression between heterosexual partners, https://pubmed.ncbi.nlm.nih.gov/10989615/
36. Sex differences in verbal aggression use in romantic relationships, https://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=5007&context=facpub
37. The Young Male Syndrome—An Analysis of Sex, Age, Risk Taking, https://pmc.ncbi.nlm.nih.gov/articles/PMC6473461/
38. Competitiveness, Risk Taking, and Violence: The Young Male, https://www.martindaly.ca/uploads/2/3/7/0/23707972/wilson___daly_1985_young_male_syndrome.pdf
39. Homicide Data from Hungarian and Australian Populations, https://www.researchgate.net/publication/311498214_The_Young_Male_Syndrome_Revisited_-_Homicide_Data_from_Hungarian_and_Australian_Populations
40. Competitiveness, risk taking, and violence: the young male syndrome, https://www.semanticscholar.org/paper/Competitiveness%2C-risk-taking%2C-and-violence%3A-the-Wilson-Daly/1a4f5431f200b82c6deb69f1f37fffe0238f05c4
41. Sex Differences in Same-Sex Direct Aggression and Sociosexuality, https://pmc.ncbi.nlm.nih.gov/articles/PMC10481047/
42. Self-protection as an adaptive female strategy, https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/self protection-as-an-adaptive-female-strategy/596ABFD521F358F1E8797C542084679B
43. Warriors and Worriers: Sex Differences | PDF - Scribd, https://www.scribd.com/document/688730189/Warriors-and-worriers-The-survival-of-the-sexes-by-Joyce-F-Benenson
44. Self-protection as an adaptive female strategy - ResearchGate, https://www.researchgate.net/publication/355999915_Self-Protection_as_an_Adaptive_Female_Strategy
45. Sex Differences in Fear Response - Taschenbuch - Hugendubel, https://www.hugendubel.de/de/taschenbuch/anne_campbell_lee_t_copping_catharine_p_cross-sex_differences_in_fear_response-39852792-produkt-details.html

46. The idea that men hunted and fought while women remained at, https://www.facebook.com/100088872893566/posts/the-idea-that-men-hunted-and-fought-while-women-remained-at-home-has-shaped-popu/1098360649803021/
47. The Myth of Man the Hunter: Women's contribution to the hunt, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0287101
48. The Myth of Man the Hunter: Women's contribution to the hunt ... - PMC, https://pmc.ncbi.nlm.nih.gov/articles/PMC10306201/
49. a comment on Anderson et al. (2023) The Myth of Man the Hunter, https://www.researchgate.net/publication/380417503_Female_foragers_sometimes_hunt_yet_gendered_divisions_of_labor_are_real_a_comment_on_Anderson_et_al_2023_The_Myth_of_Man_the_Hunter
50. Tomb Containing Three Generations of Warrior Women Unearthed, https://www.smithsonianmag.com/smart-news/tomb-containing-three-generations-amazon-warrior-women-unearthed-russia-180973877/
51. The Forgotten History of Amazon Warrior Women of Ancient Scythia, https://www.discovermagazine.com/the-forgotten-history-of-amazon-warrior-women-of-ancient-scythia-42703
52. Of Chimps and Men: War In Evolutionary Perspective, https://www.prosocial.world/posts/of-chimps-and-men-war-in-evolutionary-perspective
53. Luke Glowacki - Google Scholar, https://scholar.google.com/citations?user=DaCQ-UIAAAAJ&hl=en
54. The Male Warrior Hypothesis 1, https://sydneysymposium.unsw.edu.au/2010/chapters/VanVugtSSSP2010.pdf
55. Evolution and the psychology of intergroup conflict: the male warrior, https://pmc.ncbi.nlm.nih.gov/articles/PMC3260849/
56. Video: Understanding Warfare: An Evolutionary Approach, https://peabody.harvard.edu/video-understanding-warfare-evolutionary-approach
57. Steven Pinker: The Decline of Violence - Long Now Foundation, https://longnow.org/talks/02012-pinker/
58. ethnographic and archaeological evidence on violent deaths, https://ourworldindata.org/ethnographic-and-archaeological-evidence-on-violent-deaths
59. Comment on Fry and Soderberg “Lethal aggression in mobile, https://sites.santafe.edu/~bowles/Lethal_Aggression.pdf
60. War Before Civilization : r/Pessimism - Reddit, https://www.reddit.com/r/Pessimism/comments/otju7g/war_before_civilization/
61. War Before Civilization - Wikipedia, https://en.wikipedia.org/wiki/War_Before_Civilization
62. Evidence from over 30 studies suggests the existence of evolved, https://open-research-europe.ec.europa.eu/articles/6-78/v1/pdf?article_uuid=c11924fc-4998-4595-a425-7b94ea54ba18
63. Steven Pinker on Deaths by Violence in Pre-state Societies, http://socialdemocracy21stcentury.blogspot.com/2013/02/steven-pinker-on-deaths-by-violence-in.html

64. (PDF) Did Warfare Among Ancestral Hunter-Gatherers Affect the, https://www.researchgate.net/publication/26268380_Did_Warfare_Among_Ancestral_Hunter-Gatherers_Affect_the_Evolution_of_Human_Social_Behaviors
65. (PDF) Lethal Aggression in Mobile Forager Bands and Implications, https://www.researchgate.net/publication/250920560_Lethal_Aggression_in_Mobile_Forager_Bands_and_Implications_for_the_Origins_of_War
66. 1 The controversial origins of war and peace: apes, foragers, and, https://ecoevorxiv.org/repository/object/5201/download/14451/
67. You Might Have Missed: Were Early Humans Warlike?, U.S., https://www.cfr.org/articles/you-might-have-missed-were-early-humans-warlike-us-pakistan-relations-and-opinion-polls
68. Challenging Steven Pinker's Better Angels View of Human Nature, https://vridar.org/2019/12/30/challenging-steven-pinkers-better-angels-view-of-human-nature-and-the-history-of-war/
69. War, Peace, and Human Nature: Converging Evolution & Culture, https://www.livinganthropologically.com/war-peace-human-nature-evolutionary-cultural/
70. Economies of Violence - LSU Scholarly Repository, https://repository.lsu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1000&context=french_pubs
71. (PDF) History, explanation, and war among the Yanomami, https://www.researchgate.net/publication/285635568_History_explanation_and_war_among_the_Yanomami_A_response_to_Chagnon's_Noble_Savages
72. (PDF) Do Yanomami Killers Have More Kids? - ResearchGate, https://www.researchgate.net/publication/343267692_Do_Yanomami_Killers_Have_More_Kids
73. Anthropology's Science Wars Insights from a New Survey, https://www.journals.uchicago.edu/doi/10.1086/705409
74. Managing the stresses of group-living in the transition to village life, https://pmc.ncbi.nlm.nih.gov/articles/PMC10426039/
75. Warless Societies and The Origin of War Kelly C of Annas Archive, https://www.scribd.com/document/664927625/Warless-Societies-and-the-Origin-of-War-Kelly-c-of-Annas-Archive
76. Hunter-Gatherers and Human Evolution: New Light on Old Debates, https://www.annualreviews.org/doi/pdf/10.1146/annurev-anthro-102116-041448
77. Fry, D. P. (2007). Beyond war: The human potential for peace. New, http://kropfpolisci.com/peace.studies.fry.pdf
78. Male Aggression and Violence in Human Evolution, https://carta.anthropogeny.org/events/male-aggression-and-violence-human-evolution
79. Intergroup conflict: origins, dynamics and consequences across taxa, https://royalsocietypublishing.org/rstb/article/377/1851/20210134/108850/Intergroup-conflict-origins-dynamics-and
80. The roots of peace | Behavioral and Brain Sciences | Cambridge Core, https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/root

s-of-peace/4E8E5A5D3CFC02D18265914F4C450E90
81. The evolution of peace | Behavioral and Brain Sciences, https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/evolution-of-peace/B3B894C67CF392DB7A0F326E1AF15883
82. An evolutionary perspective on the current wars, https://www.cambridge.org/core/services/aop-cambridge-core/content/view/C16CD0CAAFF412F0407B83A1CC26AC60/S0730938425100075a.pdf/an_evolutionary_perspective_on_the_current_wars.pdf