A Biological Perspective on Mating Dynamics in a Sex Ratio Imbalanced Population

Science Circle
January 1st 2022

Stephen Gasior, Ph.D.
a.k.a. Stephen Xootfly
Researcher

Company that has nothing to do with this talk
Former University Biology Instructor
On Words

Blanket Statements

not including every exception is not an attempt to suppress or ignore it or pretend it doesn’t exist
sexual reproduction cycle (and associated sexual dimorphism) is real, it is the force evolution works on that has explanatory power, the words male and female and associated behaviors (blanket) covers this factual concept
Why Sexual Reproduction?

Haploid/Diploid cycle

Genetic variation is good for survival

something good/bad

the dog-faced fruit bat

Red Queen hypothesis

"Now, here, you see, it takes all the running you can do, to keep in the same place." - Lewis Carroll
Sexual Reproduction Results in 50/50

the natural ratio between males and females at birth is slightly biased towards the male sex, being estimated to be about 1.05 or 1.06 or within a narrow range from 1.03 to 1.06 males/per female born.
Reproductive Strategies

Type I: humans, elephants
Type II: smaller mammals, reptiles, birds
Type III: insects, fish
mix: Trees (more developed for animals)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>r</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of offspring</td>
<td>high</td>
<td>low</td>
</tr>
<tr>
<td>Parental care</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Reproductive Maturity</td>
<td>early</td>
<td>late</td>
</tr>
<tr>
<td>Size of offspring</td>
<td>small</td>
<td>large</td>
</tr>
<tr>
<td>Independence at birth</td>
<td>early</td>
<td>late</td>
</tr>
<tr>
<td>Ability to learn</td>
<td>low</td>
<td>high</td>
</tr>
<tr>
<td>Lifespan</td>
<td>short</td>
<td>long</td>
</tr>
<tr>
<td>Early mortality</td>
<td>high</td>
<td>low</td>
</tr>
</tbody>
</table>
Sexual Dimorphism and Selection

Physical

Behavioral
Sexual Dimorphism and Selection

**Newsweek** Insect Sex: Watch Headless Praying Mantis Continue To Mate After Being Decapitated by Female

BY DANA DOVEY ON 11/17/17 AT 10:14 AM EST

“male mantises who are eaten after sex are actually more likely to have their sex result in viable young. This is because females who eat their partners produce far more eggs than those who aren't lucky enough to have a post-coital snack.”

“bros before does?”
Animal Societies

animal social behavior

Encyclopaedia Britannica

Sociobiology: The New Synthesis
E.O. Wilson (1975)

(1) group size
(2) distributions of different age and sex classes
(3) cohesiveness
(4) amount and pattern of connectedness
(5) permeability - intersociety
(6) compartmentalization - subgroups operate as discrete units
(7) differentiation of roles
(8) integration of behaviors within groups
(9) communication and information flow
(10) fraction of time devoted to social behavior as opposed to individual maintenance
Role Distinctions

Queen
lays eggs

Drones
mate with Queen

Worker Bee
- removing waste
- disinfecting
- feed the larvae
- secreting wax
- guard duties
- foraging for nectar and pollen
- fanning the hive
- removing dead
- carrying water

Drones
mate with Queen
Neurophysiology

Hormone influence on behavior

- prairie vole pair bond
- vasopressin receptor
  - +vasopressin affiliation behavior
  - no vasopressin

- oxytocin
  - lab mouse limited pair bonding
  - no change

Human Sexual Development

lessons from primates (Type I reminder, value K)

- gorillas: harem/Alpha male
- chimpanzees: male dominance, shifting/fluid subgroups
- bonobos: female led groups, something like Woodstock

Environmental influence?
- tribe competition for food
- food abundant
Early Homo Dimorphism

Hunters

Warriors

bigger

stronger

geometry?

Hearth

Home

short minimum reproduction time (expendable)

social IQ

reproduction

manual dexterity

2 years minimum dedicated to next generation
On Evolution of Society

Social Unit Evolution

Military Power
Institutional Stability
Economic/Market
Fecundity
<table>
<thead>
<tr>
<th>Epoch</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quadrupeds</td>
<td>Neurophysiology</td>
</tr>
<tr>
<td></td>
<td>dimorphism</td>
</tr>
<tr>
<td>Primate</td>
<td>social - small group</td>
</tr>
<tr>
<td></td>
<td>dimorphism-specific</td>
</tr>
<tr>
<td>Early Civilization</td>
<td>population dynamics</td>
</tr>
<tr>
<td></td>
<td>higher level cultural</td>
</tr>
<tr>
<td></td>
<td>food production</td>
</tr>
<tr>
<td>Modern Civilization</td>
<td>socioeconomic - status</td>
</tr>
<tr>
<td></td>
<td>more later</td>
</tr>
</tbody>
</table>
Early Human Civilization

Higher population density

Agriculture = food abundance/consistency

Higher disease spread (STDs)
Early Human Civilization

Higher population density (mate availability)

Agriculture = food abundance/consistency

Higher disease spread (STDs)

“Monogamy supports stability.”

“The First Political Order: How Sex Shapes Governance and National Security Worldwide”
Ms Hudson, Ms Bowen and Ms Nielsen
Traditional Eastern Civilizations-China

sancong - women were subordinate to first their fathers, then their husbands, and finally, in the case of being left a widow, their sons in a system known as the “three followings”

female (ying) inferior to male (yang): hard over soft, forceful over submissive, etc

a woman could not earn money and one day would leave the family and join her husband’s

Women were expected to excel in four areas: fidelity, cautious speech, industriousness, and graceful manners

In Chinese law, a man could divorce his wife for divorce failure to bear a son, evidence of being unfaithful, lack of filial piety to the husband's parents, theft, suffering a virulent or infectious disease, jealousy, and talking too much.

Women had no such right except if the husband particularly mistreated his wife's family.

upper-class women had only a very limited freedom of movement.

women of lower status, such as farmer's wives, were expected to work in the fields

concubines were common for those that could afford it
In feudal Japan, women were generally seen less important than men. No freedom of choosing whom they marry (lower class were not necessarily expected to marry).

Geisha women in feudal Japan role were to entertain guests during meals and other occasions.

Lower class women in feudal Japan were to serve their husbands, before serving their fathers before marriage. Their jobs included serving wealthier families, looking after their children, looking after animals and crops, cooking for the families, cleaning and carrying out other household tasks. Wives of tradesmen were there to help their family businesses and the roles for these women greatly varied.

Unlike men, no freedom to re-marry once they were widowed and could not request to be divorced. Because of this, feudal Japanese women often committed suicide to escape from marriage when they were not happy or were mistreated by their husbands.
Traditional Eastern Civilizations-India

The Early Vedic (1500 BC–1000 BC), Later Vedic Period (1000 BC–600 BC)

Women were dignified with a respectable status, honored as well as empowered in the affairs of the home and family.

Special attention to the female’s priority and satisfaction during sex observed (The Kāmasūtra)

Even more generally enhanced in Later Period including status outside the home, unconditional economic freedom

The Jainism and Buddhism Period (600 BC–200 BC)

persistent gender equity was observed, occupied esteemed positions in religion but, prohibited from political participation

The Age of Dharmaśāstras, Mānussmriti (200 BC–647 AD)

considered women to be impure as well as second class citizens, women’s right to education was fully withdrawn

self-sacrifice and the observation of social rituals for the welfare of the male members of their family was considered to be a woman’s duty.
Traditional Eastern Civilizations-India

Brahmanism (647 AD—)

dignity and fame of women’s status was entirely reduced to one of virtual subservience

Women are expected to be submissive to the men in their lives, and to be the perfect wife and mother

Women are revealed in the sacred scriptures as presenting a duality of being benevolent and malevolent exposing her with great contrasting powers. “In times of prosperity she indeed is Laksmi, [goddess of wealth] who bestows prosperity in the homes of men; and in times of misfortune, she herself becomes the goddess of misfortune, and brings about ruin”
The Gender Crisis—India and China

China and India have imbalance of males

female babies are not kept

sex-selective technology in the last 30 years (banned but still in widespread)

Out of China’s population of 1.4 billion, there are nearly 34 million more males than females


India has an excess of 37 million males
The Gender Crisis—India and China

China and India have imbalance of males

Younger mating population focus — 15-29 yo

Among men, loneliness and depression are widespread

Housing prices and savings rates

Human trafficking

Surge in sexual crime in India and concerns about a rise in other crimes in both countries.

Harassment of schoolgirls in India has in some towns
Human Trafficking

Teenage Brides Trafficked to China Reveal Ordeal: ‘Ma, I’ve Been Sold’

By Hannah Beech Aug. 17, 2019


The story of two teenage girls kidnapped from Myanmar with promise of jobs

A study by the Johns Hopkins Bloomberg School of Public Health and the Kachin Women’s Association Thailand estimated that about 21,000 women and girls from northern Myanmar were forced into marriage in just one province in China from 2013 to 2017.

In truth, it is poorer Chinese men who tend [missing the statistics] to buy trafficked women as wives. Nyo was sold for $26,000, said Myo Zaw Win, a police officer in Shan who tracked her case.

Both men were arrested and charged for crimes

Both girls returned home, one with a newborn son
Human Trafficking

Estimating trafficking of Myanmar women for forced marriage and childbirth in China, Johns Hopkins Bloomberg School of Public Health and the Kachin Women’s Association Thailand (2018)


Figure E.2: Rate of Forced Marriage and Forced Childbearing in the Study Area

Among women and girls who have migrated from Myanmar to China in the past five years...

- 11% (18,200 out of 171,000) will end up married to a Chinese husband.
- 4% (7,500 out of 171,000) will be in a forced marriage.
- 3% (5,100 out of 171,000) will be forced to bear children.
The Gender Crisis—Japan

www.indexmundi.com
Constrictive

www.worldometers.info
2020 TFR = 1.4
The Gender Crisis—Japan
University of Tokyo Study 2019 (data by the National Fertility Survey of Japan, designed and implemented approximately every five years by the Japanese National Institute of Population and Social Security Research)
The Gender Crisis—Japan

“Why have young people in Japan stopped having sex?” Abigail Haworth Oct 2013

A survey earlier this year by the Japan Family Planning Association (JFPA) found that 45% of women aged 16-24 "were not interested in or despised sexual contact". More than a quarter of men felt the same way.

Marriage has become a minefield of unattractive choices. Japanese men have become less career-driven, and less solvent, as lifetime job security has waned. Japanese women have become more independent and ambitious. Yet conservative attitudes in the home and workplace persist.

Japan's punishing corporate world makes it almost impossible for women to combine a career and family, while children are unaffordable unless both parents work.

Cohabiting or unmarried parenthood is still unusual, dogged by bureaucratic disapproval.

Married working women are sometimes demonised as oniyome, or "devil wives". Around 70% of Japanese women leave their jobs after their first child.
The Gender Crisis—Japan

Further exacerbating the problem?

“Sex robots could lead to population crisis as men opt for virtual girlfriends”

https://www.youtube.com/watch?v=TgbTrusgsqA
Summary Thoughts

Drive to procreate is both biological and cultural
  can override sympathy

Correlate to socio-economic status plays role
  some are more advantaged than others and drive increasing pressures and desperation down the scale

Sex drive biologically drives procreation
  archaically the inability to prevent fertilization, lack of female autonomy, lack of safe abortion technology helped drive fertility rates *(at same time, high childbirth mortality for both newborn and mother)*
  modern times change that equation
  modern times also drive “life purpose” away from strictly procreation both sexes
  increased female autonomy (in particular) can steer purpose away from procreation other “activities” or technologies that also satisfy sex in and of itself sans partner