

GENETIC INFLUENCE ON AGGRESSION

SANDBERG – identified the **47 XYY karyotype**.

Males with this have an extra Y chromosome.

Several researchers such as Sandberg and/or Cairns have found, using both animal research and observations of humans with XYY, that a greater number of aggressive behaviours tended to be reported.

A gene called **MONOAMINE OXIDASE A (MAOA)**

MAOA regulates the metabolism of serotonin in the brain and low levels of serotonin are associated with aggressive behaviour.

It was found that mice lacking the gene were excessively aggressive.

A study done by Cairns used selective breeding to produce highly aggressive strains of mice. These mice became aggressive during middle-age. Selective breeding is a quick way to select for specific traits and see those selected traits within a few generations of breeding. These characteristics make selective breeding an important tool in the study of genetics and aggressive behaviour.

EVALUATION

- ★ MAOA has been found to interact with the environment as children with high levels of the gene were more likely to grow up to act anti-socially only if they'd been maltreated as children. This shows that it is the interaction between genes and the environment.
- ★ It is difficult to determine as genes combine to contribute to behaviour and so the net effect of genes is complex, we cannot determine that it is only one.
- ★ **Brunner** – studied a Dutch family and found many of the men had a defective gene for the production of MAOA, these men were found to be abnormally violent. However, it is limited as it was a case study and so conclusions cannot necessarily be applied to a wider population. It could have also been that the family environment was influencing.
- ★ **THEILGAARD** researched the personality traits of XYY men and found that 1 in 1000 males are XYY. She found that it is not possible to conclude that XYY alone causes increased aggression as aggression levels fluctuated. She ultimately concluded that XYY males might seem more aggressive, but these tendencies did not mean that they would readily perform aggressive actions
- ★ **JACOBS** – prevalence of XYY gene was more in the prison population than the normal population – supports the idea as criminals are aggressive by definition. However, he did not take into account the fact that not all prisoners are violent.

- ★ Nature side of debate – in reality both environmental and internal biological influences are equally as important. It is difficult to entangle the influence of genetics from upbringing as an aggressive environment can also lead to aggressive traits being shown.
- ★ To disentangle environment and genetic factors we can use twin and adoption studies.
- ★ Identical twins are more genetically alike than non-identical twins. Studies using twins have found that nearly 50% of the variance in aggressive behaviour could be attributed to genetic factors.
- ★ However, Plomin found no difference between identical and non-identical twins.
- ★ With adopted children, if aggressive behaviour is seen between the adoptee and the rearing family, it can be concluded to be an environmental effect. One study of adoptions found that adopted boys with criminal convictions had biological parents with criminal convictions. Supporting genetic influence.
- ★ However, it is not as simple as adoption studies have shown that the highest rates of violence in adopted children occurred when both biological AND adoptive parents have a history of violent crime – supporting gene-environment interaction.
- ★ **Miles & Carey** – meta-analysis of 24 twin and adoption studies that supported the genetic basis. Results showed that age was important, with genes and environment being influential on aggression in youth but at later ages the influence of the environment decreased and influence of genes increased. Concluding that although genetic factors play a significant part, the influence of other factors affects their expression.
- ★ Some studies (e.g. Nelson) have found that aggression must be transmitted to generations genetically as selective breeding showed this to be true. While generalisation from animal studies is limited, it does still show the importance of genetic processes in the foundation of behaviour.
- ★ Reductionist – ignores influence of the environment or biostructure.
- ★ Explanations such as SLT, deindividuation and cue arousal show that there are clearly social/environmental influences that can't be ignored.
- ★ Methodological issues – many studies have used self-reporting or observations and these methods have produced different findings; self-reporting found greater evidence for a genetic effect while observation found a greater environmental influence. This questions the studies validity as, if they were valid, there would be no differences between the results. There is also the problem with how to operationalise aggressive acts. This could present a problem to inter-study reliability as measures may not be consistent.
- ★ Deterministic – argue that our aggression is pre-programmed, thus ignoring free will. States that we are passive victims of our own genes. Also, if aggression is purely biologically determined, people cannot be held responsible for their actions; this may have further implications for the legal system.

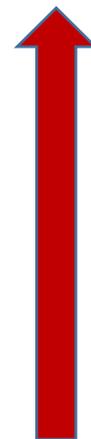
- ★ In fact, in 2009, a court in Italy reduced the sentence of a criminal with genes linked to bad behaviour.
- ★ Gender differences. Especially relating to the MAOA. Most of the studies are conducted on males because it is much easier to discover which alleles are acting as the males only have one copy of the gene. Thus there have been no in-depth studies of this gene in females so we do not know if it functions the same way.

HORMONAL/NEURAL INFLUENCE ON AGGRESSION

★ TESTOSTERONE (hormone)

It is the male sex hormone produced by the Leydig cells in the testes and the adrenal cortex. It's thought to influence aggression due to its action on brain areas involved in controlling aggression.

- THE BASAL MODEL OF TESTOSTERONE - suggests that the more testosterone a person has, the more competitive and dominant they will be. It therefore suggests dominance is the effect of testosterone but, often to achieve dominance, people use aggression.
- THE RECIPROCAL MODEL OF TESTOSTERONE – testosterone levels change according to the level of dominance a person has. Suggesting it is dominance that determines testosterone levels.



MORE
TESTOSTERONE
=
MORE
AGGRESSION

EVALUATION FOR TESTOSTERONE:

- ✓ There has been supporting animal research – **Wagner** showed that if a mouse is castrated, overall aggression levels decrease and, if that mouse then receives testosterone, aggression increased. The problem is it is a correlational study.
- ✓ **Nelson** found a positive correlation between testosterone levels and aggressive behaviour in prisoners. However, the levels were not measured during the aggressive act so we cannot conclude a causal effect.
- ✓ Scientists began researching it as it was found that, during puberty, aggression levels increase when the sex hormones are highest.
- ✓ **Lindman** found that males who behaved aggressively when drunk has higher testosterone levels.
- ✓ It could suggest a reason as to why males are generally more aggressive than females as they produce more testosterone.
- ✓ Research has shown that it is the exposure to certain stimuli that increases testosterone levels and thus aggression as **Klinesmith** found that when participants assembled a

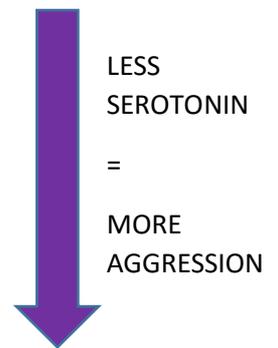
gun, they became more aggressive towards other participants. Could have real-world applications as, for example, the USA government is debating whether gun ownership increases or decreases violence.

- ✗ We should distinguish between dominance and aggression as aggression may just be one form of dominant behaviour. Perhaps much of research into aggression was actually measuring dominance.
- ✗ GENDER BIAS – most research has focused on males but studies suggest that the association between testosterone and aggression is higher for female samples than male samples. This shows there are gender differences so we cannot generalise.
- ✗ **Simpson** said “testosterone is only one of a myriad of factors [...] the effects of the environment stimuli have at times been found to correlate more strongly”. Factors such as temperature, noise and overcrowding have an influential role.

★ SEROTONIN

It is a neurotransmitter.

It's believed low levels of serotonin can result in impulsive behaviour, aggression, depression, alcohol abuse and violent suicide.



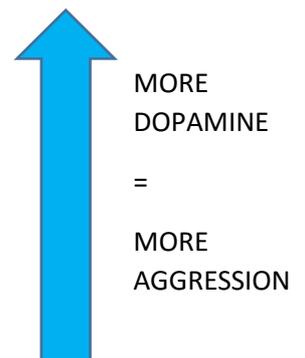
EVALUATION OF SEROTONIN:

- ✓ **Davidson** suggested that serotonin may provide an INHIBITORY FUNCTION as the levels of serotonin in violent criminals was lower than that in non-violent criminals.
- ✓ Reducing serotonin in Vervet monkeys resulted in an increase in aggressive behaviour.
- ✓ Tame domestic pets have much higher levels of serotonin. However this may not directly link to humans as we have different brain structures.
- ✓ **Mann** – 35 healthy subjects were given a drug that depletes serotonin levels and, using a questionnaire found that those who had taken the drug had higher hostility and aggression scores. This was not found to be the same in females though! Hinting at Gender bias.
- ✓ **Bond** – found that anti-depressants that increase serotonin levels reduced irritability and impulsive aggression.
- ✗ Most results are based upon correlational research.
- ✗ Contradictory evidence as both increases and decreases in serotonin have been linked to increased aggression.

★ DOPAMINE

The link is not as well established.

Increases in dopamine activity from the use of amphetamines have been associated with more aggressive behaviour. Whereas antipsychotics, which reduce dopamine activity, have been shown to reduce aggressive behaviour.



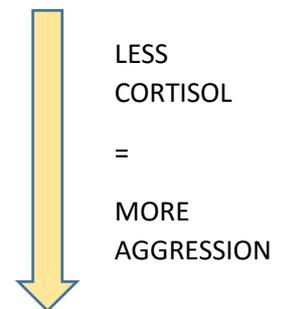
EVALUATION OF DOPAMINE:

- ✗ **Kennedy** found that in mice, a reward pathway in the brain is engaged in response to an aggressive event and that dopamine is a positive reinforcer in this pathway so people will instinctively seek out aggressive acts because of this rewarding sensation. This suggests dopamine might be more of a consequence and not a cause.
- ✗ A meta-analysis found lower levels of neurotransmitters in aggressive individuals but no difference in dopamine levels.

★ CORTISOL

Thought to inhibit aggression by having a mediating effect on other hormones that are related to aggression (e.g. testosterone).

It may be due to the fact that cortisol increases anxiety and the likelihood of social withdrawal.



EVALUATION OF CORTISOL:

- ✓ Studies have found low levels of cortisol in habitual violent offenders and in violent children.
- ✓ A study of boys with behavioural problems found that the ones with the lowest levels of cortisol began antisocial acts at a younger age and were 3 times more likely to show aggressive symptoms. However, these boys were also less afraid of punishment showing that low cortisol levels may reduce anxiety and the fear of being punished.

EVALUATION OF HORMONAL/NEURAL INFLUENCES AS A WHOLE:

- ✗ Reductionist – the complexity of human social behaviour means that a biological explanation is insufficient on its own to explain all the many different aspects of aggression.
- ✗ Deterministic – individuals have no free will if aggression is completely controlled by neural/hormonal levels.
- ✗ The studies rely a lot on animal research – there is obvious ethical issues and also the fact that we might not be able to generalise to humans.

EVOLUTIONARY EXPLANATIONS OF HUMAN AGGRESSION

The evolutionary approach takes the view that the behaviours and cognitive processes that enable an individual to survive will be passed on to the next generation.

- ★ Evolutionary psychologists therefore argue that all aggression is the result of sexual competition or individual survival.
- ★ Males compete for females to pass on their genes and so male aggression is to ensure their reproductive success.
- ★ In ancestry times, one way of eliminating competition for mates was through aggression. It therefore can be seen to have an adaptive purpose. These males would have reproduced and passed on these aggressive genes.
- ★ Men were generally the ones to provide resources and so needed aggression to do so.
- ★ Females more commonly use verbal aggression and this is thought to be aimed at reducing the 'attractiveness' of the competitors in the eyes of males

○ INFLUENCE OF INFIDELITY ON AGGRESSION:

Evolutionary psychologists argue that the act of infidelity triggers an emotional state within the individual as it is a perceived threat to the relationship. This would lead to the showing of behaviours that would reduce the threat, such as aggression.

The triggers may be different for males and females.

For MALES – infidelity brings paternal uncertainty and a sense of sexual jealousy.

For FEMALES – females that become pregnant after an act of infidelity, the associated sexual jealousy is influenced by the lack of time or economic resources that are given to her and her offspring.

○ INFLUENCE OF JEALOUSY ON AGGRESSION:

Jealousy is an adaptive response to help prevent infidelity.

Canary et. al. argues that couples with relationship conflict commonly report that the aggression was contributed to by jealousy.

The adaptive functions of sexual jealousy and the aggression which follows, for males, is to deter women from sexual infidelity and minimise the risk of cuckoldry. To do this they have evolved mate retention strategies to deter mates from infidelity. This includes direct guarding, violence, debasement, possessiveness and both intra- and inter-sexual threats.

EVALUATION:

- ✗ Much of the early research focused on animals. However, **Tinbergen** felt that animals might fight each other animals but for humans, they are the only species in which aggression is not necessarily for mating but is rooted in a deep desire to harm another.
- ✗ unfalsifiability – evolutionary psychology hypothesises on human behaviour from 1000's of years ago and so they cannot be scientifically tested.
- ✗ Reductionist
- ✗ Fails to accept individual differences. For example, different men behave differently when face with infidelity.
- ✗ Our current understanding of mate retention strategies is limited due to gender bias – most studies have focused on males and their aggression towards females, however studies have shown women can be as aggressive to their partner as males.
- ✗ CULTURAL DIFFERENCES in the importance of violence – among the Yanomamo of South America, male violence is required to attain status but among the !Kung San, aggression only leads to reputational damage.
- ✓ Looking that infidelity and jealousy from the perspective of both males and females takes steps to avoid gender bias.
- ✓ **Dell** concluded that sexual jealousy accounted for 17% of all cases of murder in the UK.
- ✓ **Camilleri** found that sexual assault of a female by her mate was directly linked with the perceived risk of her infidelity.
- ✓ **Daly & Wilson** – a high proportion of homicides are committed by men who have just been left by their partner.
- ✓ **Shackelford** – used a survey method to questions actual couples. Males answered about their use of mate retention techniques and were assessed on how often they performed violent acts against their partners. It was found that men's use of two retention strategies (intersexual negative inducements and direct guarding) were correlated with violence scores. This shows a relationship between sexual jealousy, mate retention strategies and violence.
- ✓ **Buss and Shackelford** found that men who suspected their wives to be unfaithful exacted greater punishment. This supports evolutionary psychology's claim that mate retention strategies are evoked only when a particular adaptive problem is faced.
- ✓ PRACTICAL APPLICATIONS – particular tactics of mate retention can be an early indicator of violence against the partner and so can alert friends to the danger signs.
- ✓ **Takashi** – men showed far greater activation of the brains areas associated with aggression when shows scenes depicting their mate's sexual infidelity than females.
- ✓ **Brownridge** – women abused while pregnant were more than likely to be carrying the child of another man.
- ✓ It is argued that because females have a lower fitness variance and it is more likely that a female will produce at least one offspring that they have less to gain from physical competition among each other and as a result do not engage in competition for mates. However Campbell argues that females compete with each other for access to high quality male mates using both physical and indirect aggression. Indirect aggression is characterized by ostracism, verbal harassment and rumor spreading. When high quality male mates are scarce females who are able to repel other female competitors, by physical means or by social ostracism, have a better chance of reproducing with the higher quality males and producing healthier and more successful offspring.
- ✓ In primates dominant females harass subordinate females and can sometimes cause enough stress that subordinate females fail to come into estrus or may spontaneously abort pregnancies, meaning that in some species dominant females have more chances to procreate and better chances at producing more young than subordinate females (Campbell, 1995).
- ✓ Campbell (1995) indicates that females also show an increase in aggression between the ages of 15 and 19. This peak, although a lot less severe, looks very similar to the peak in violence and aggression

exhibited by male teens. The teen years and early adult years are also prime reproductive years for females, if males increased their intrasexual competition in the interest of procuring mates at this time, it would make sense that females would also compete to procure high quality mates at this time.

- ✓ Although females have less to gain from physical assault, and possibly more to lose, female-female fights have been known to occur in populations where desirable male mates are scarce. Females that are willing and able to fight off rivals in order to gain access to these high quality mates have a better chance at producing healthy offspring and receiving resources from the male.
- ✓ in many countries there is evidence of females attacking males. In Norway 1 in 38 men admitted to emergency rooms for assault were attacked by women (Knut & Steinar, 2004). Half of the men who reported being attacked by women reported that their attacker was a current or former intimate partner; as such they were labeled domestic assaults (Knut & Steinar, 2004). In a U.K study, 13% of a sample reported experiencing physical assault by a female perpetrator (George)
- ✓ Approximately half of the men who report being assaulted by women report that the aggressor was a current or former intimate partner, similarly approximately half of the women who report being abused by men report the attacker was a current or former intimate partner.
- ✓ females who attack males are more likely to use a weapon of some sort and are less likely to cause severe damage to their victims as when males attack females (Campbell, 1995). Differences in the sheer numbers of males who commit violence versus females who commit violence are severe; males are far more likely than females to commit violence as well as to be victims of violence (Daly & Wilson, 1988).
- ✓ In domestic assaults perpetrated by women, the main reasons for the fights seem to be questions of infidelity on the part of their male partner (Campbell, 1995). Daly and Wilson (1988) suggest that many homicides perpetrated by males against their wives arise from questions of infidelity and also report at least one case of a woman murdering her husband when she caught him in the act of cheating.
- ✓ Females tend to inflict less damage because they have less to gain from putting themselves at risk to gain access to a particular male

EVOLUTIONARY EXPLANATIONS OF GROUP DISPLAY

Aggressive group displays emerged among our distant ancestors due to the fact that they increased their fitness in some way. Nowadays, similar situations trigger the same response, even though the original function of the behaviour may no longer be relevant.

1. SPORTS

❖ XENOPHOBIA

Xenophobia is a fear and hatred of strangers of foreigners.

It is often exhibited in sport events through the use of racist chants and signals.

Natural selection seems to have favoured those genes that caused humans to be intolerant towards outsiders as this would have protected them from attack.

EVALUATION OF XENOPHOBIA;

- ✓ Real world application – the power of xenophobia to invoke violence has led to many football clubs to take steps to minimise its influence.
- ✓ **Balestri** analysed the behaviour of Italian football crowds and found evidence for xenophobic tendencies; group displays were characterised by racist chants and openly anti-Semitic banners.
- ✓ **Foldesi** found intolerance toward outsiders in a study of Hungarian crowds, with violent incidents based on racist or xenophobic attitudes being displayed across all stadiums.

❖ TERRITORIALITY

Territoriality is the protective response to an invasion of one's territory.

It can be seen in humans in the aggressive displays of sports teams prior to a match.

Territorial displays would have been adaptive by allowing ancestors to defend valuable resources.

EVALUATION OF TERRITORIALITY;

- ✓ **Lewis** found that, among football fans, crowd support was rated as the most significant factor contributing to a home advantage. However, it is not known whether the effect of the crowd is to psych up the home team or to distract the away team.
- ✓ The often found "home advantage" in sport events is thought to be due to territoriality.
- ✓ **Huntingford** found that animals show threat displays towards outsiders and attack with greater vigour when defending a home territory.

2. WAREFARE

BENEFITS OF AGGRESSIVE DISPLAYS:

- Displays of aggression and bravery are attractive to females.
- Displays of aggression by warriors would lead peers to respect them more. Therefore displays of aggression in battle mean that individuals are more likely to share the benefits associated with status, which would increase reproductive fitness.
- In warfare, group membership also gives the individual a greater chance of survival.

Battle would have been adaptive as men compete for mates and those who do well in battle will be rewarded with access to females.

EVALUATION OF WAREFARE:

- ✓ **Chagnon** – male warriors tend to have more sexual partners and more children, suggesting a reproductive benefit.

- ✓ **Leunissen** found that military men have greater sex appeal but only if they have been observed showing bravery in combat.
- ✓ The “haka” is used by the New Zealand rugby team to terrify their opponents.
- ✗ Gender bias – it does not adequately reflect the behaviour of women. Women would have less to gain from warfare and would have a lot to lose (loss of their reproductive capacity). Women’s reproductive fitness is therefore not increased in warfare.
- ✗ Prolonged warfare results in significant losses on both sides.

EVALUATION OF GROUP DISPLAYS AS A WHOLE:

- ✗ Crowds are not always aggressive. For example, the Mela Hindu festival is a peaceful rally.
- ✗ There are some non-aggressive cultures – the !Kung San tribe view aggression in a negative light and so aggression is rare. This suggests it may be learnt rather than an evolutionary response as the tribe demonstrates how, in the absence of any opportunity to learn aggression, it becomes rare.
- ✗ Cultural bias – based on select samples from specific cultures.
- ✗ Reductionist as it only takes account of the nurture side -
- ✗ Deterministic
- ✗ Not scientific.
- ✗ Explanations based on mating success fail to explain the extreme cruelty that is found in many human conflicts that is absent among non-human species. For example, it cannot explain why humans torture their opponents even once they no longer pose a threat. Instead, these events can be explained through deindividuation. Therefore aggression in warfare may be caused by other extraneous variables which are unaccounted for by the evolutionary explanation, making research into it low in internal validity.