Best of both worlds? How can this be? MHC-assortative facial preferences in humans

Psyc 132-SS1.2013

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MHC 101

- The major histocompatibility complex (MHC) is a cell surface molecule encoded by a large gene family in all vertebrates. MHC molecules mediate interactions of white blood cells, which are immune cells, with other leukocytes or body cells. MHC determines compatibility of donors for organ transplant.
- The MHC gene family is divided into three subgroups: *Class I, Class II, Class III*. Diversity of antigen presentation, mediated by MHC classes I and II, is attained in multiple ways: (1) the MHC's genetic encoding is polygenic, (2) MHC genes are highly polymorphic and have many variants, (3) several MHC genes are expressed from both inherited alleles.
- **Significance:** Presence of specific MHC in humans contribute to physiological health

In class…

- **Consequences of maladaptive mate choice**: contraceptive pills appears to interfere with natural mate preferences but it is currently unknown whether this also leads to altered mate choice decisions
- *Prediction*: use of the pill when choosing a partner for reproduction has consequences for actual mate choice and subsequent offspring survival
- If using the pill while forming relationships leads to a choice of an otherwise less-referred partner (ie less masculine phenotype), this can result in decreased genetic compatibility between mates through the choice of MHC-similar mates
  - Meaning: choosing MHC dissimilar mates= increased genetic compatibility
- One prediction is that offspring of pill users are more homozygous than expected, possibly related to impaired immune function and decreased perceived health and attractiveness
- Currenty there are no studies investigating the direct effect of the pill on such outcomes and whether genetic incompatibility between mates infleunces offpsring reproductive success in humans

Cited research assumptions…

- Individuals tend to choose mates who are sufficiently genetically *dissimilar* to avoid interbreeding
- Facial attractiveness is a key factor in human mate preferences
- Study investigated whether facial preferences were related to genetic dissimilarity.

Details of MHC-assortative study

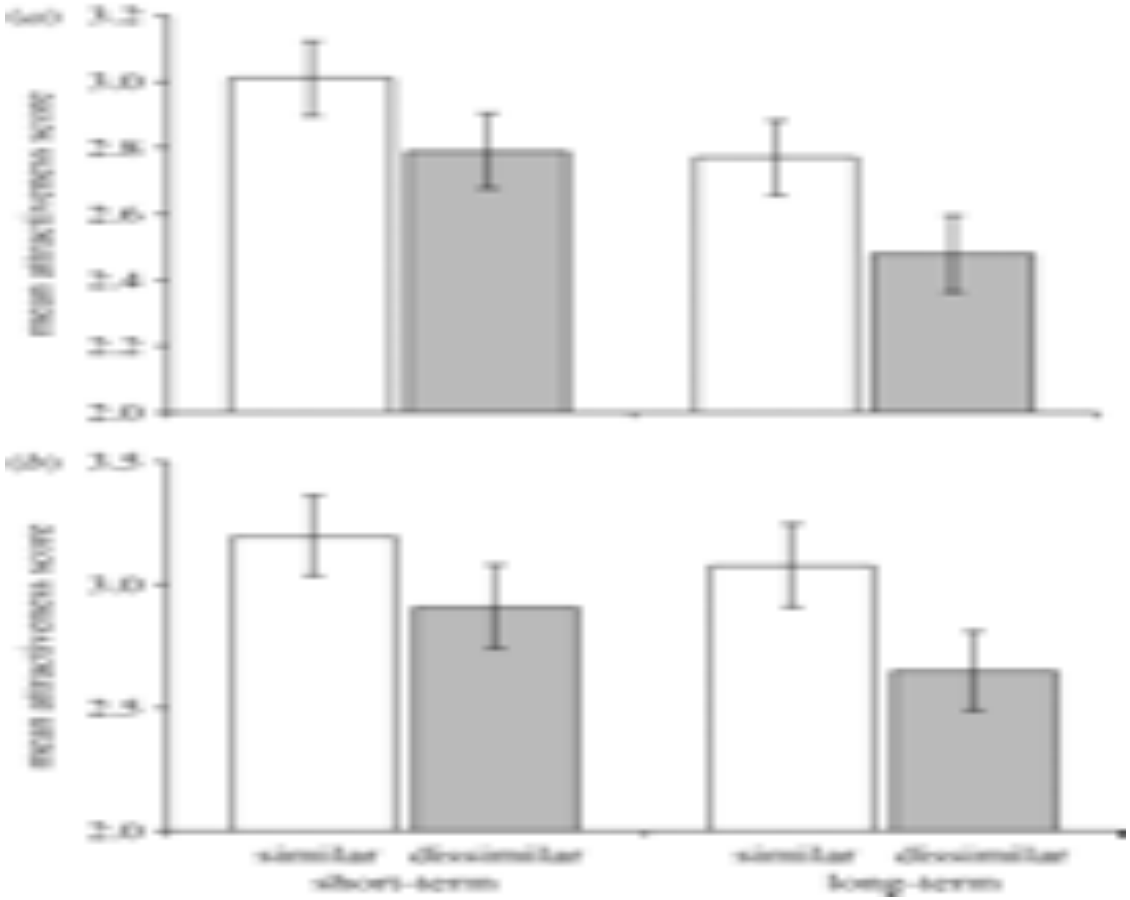
- Subjects: women
- Focus: rating on a 1-7 point scale of 1 being unattractive and 7 being attractive how attractive were men in digital photographs
  - Women rated in 2 different contexts: 1)those seeking short term vs those seeking long-term relationships
- Comparison point: compared rating results with individual genotypes at MHC

Materials and Methods

- Experimental Design: 75 beardless men and 92 women, aged 18-35, participated/students and staff of Newcastle University
- Specifically honed in on white and British origin participants
- Participants were genotyped by polymerase-chain reaction. Researchers pre-selected 3 MHC-similar and 3 MHC-dissimilar men

Results

- men received higher scores in the short-term than long-term context and when they were MHC-similar to the women raters



Take home message

- Results shows perceptual sensitivity to facial characteristics associated with allele-sharing at MHC loci
- One exlanation for assortative preference may be a contextual issue: preferences for similarity were more evident when women rated faces for long-term partnerships
  - Choosing mates that are caring, instead of attractive->secures prolonged paternal investment
- Reason why there is descrpancy between odor and facial preferences is that the two modalitites could combine to achieve an optimal level of genetic complimentary
  - Visible traits ie faces, are long-range cues of relative similarity to filter out individuals of extremely different genotype
  - Odor filters out individuals with similar genotype

Contradictory or Supportive?

- Original claim in target article:One prediction is that offspring of pill users are more homozygous than expected, possibly related to impaired immune function and decreased perceived health and attractiveness
- In cited research, *there was no mention of birth control affecting women's choices in mate preference*, yet there was still preference for assortative males, ie males that portray similar geno/phenotypes-> article was not supportive to claim.
- Overall: in discussion section-An intermediate level of heterozygosity is favored because high levels reduce T-cell organization