

Sexual Identity: Genetic Origin and Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ)

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Objectives

- Understand terms: Sexual Identity, Sexual Orientation, Lesbian, Gay, Bisexual, Transgender, and Queer
- Understand role of genetics in Sexual identity and orientation

Definitions

- **Sexual identity** is how one thinks of oneself in terms of to whom one is romantically and/or sexually attracted
- **Lesbian:** Women who are attracted to other women
- **Gay:** Men who are attracted to other men
- **Bisexual:** Someone who is attracted to more than one gender
- **Transgender:** Someone whose gender identity or gender expression does not correspond with their sex assigned at birth
- **Queer:** Once considered a demeaning slur for being gay, “queer” is being reclaimed by those who consider other labels restrictive

Sexual Identity versus Sexual orientation

- Sexual orientation: sexual preference for people of the same sex, the opposite sex, or both
- Sexual identity: label used to let others know who one is as a sexual being
- Sexual orientation is about who one is attracted to and who one feel drawn to romantically, emotionally, and sexually. Sexual identity isn't about who one is attracted to, but about who one is — male, female, genderqueer, etc.

Factors affecting Sexual Orientation

- Scientists do not know the exact cause of sexual orientation, but they theorize that it is the result of a complex interplay of genetic, hormonal, and environmental influences. They do not view sexual orientation as a choice
- Various biological factors—including prenatal hormones and specific genetic profiles—are likely to contribute to sexual orientation, though they are not the sole cause
- Scientific evidence suggests that biological and non-social environmental factors jointly influence sexual orientation

Sexual Orientation

- Whilst acknowledging that there is still much that is not known, the peer reviewed scientific literature clearly shows that a combination of genetic and environmental factors contribute to sexual orientation, with approximately one third of variance currently attributed to the former
- Much of the known environmental influence appears to be intra-uterine and there is no currently convincing evidence that social environment plays a significant part
- *Christopher C. H. Cook (2021) The causes of human sexual orientation, Theology & Sexuality, 27:1, 1-19*

Sexual Orientation

- Current findings regarding sexual orientation modulation by hormonal, genetic, maternal immune system, and environmental factors are documented in literature
- Future studies should recognize the differences between males and females and pay more attention to minor traits and the epigenetic regulation of sexual orientation

Wang Y, Wu H, Sun ZS. The biological basis of sexual orientation: How hormonal, genetic, and environmental factors influence to whom we are sexually attracted. Front Neuroendocrinol. 2019 Oct;55:100798

Sexual Orientation and Alcohol use

Lesbian and bisexual women veterans reported higher rates of some trauma exposures and mental health symptoms than their heterosexual counterparts, partly accounting for their higher rates of alcohol misuse

Lehavot K, Browne KC, Simpson TL. Examining sexual orientation disparities in alcohol misuse among women veterans. Am J Prev Med. 2014 Nov;47(5):554-62

Sexual Identity and role of Genetics

- Family, twin, and adoptee studies indicate that homosexuality and thus heterosexuality run in families
- Sibling, twin, and adoptee concordance rates are compatible with the hypothesis that genes account for at least half of the variance in sexual orientation

Pillard RC, Bailey JM. Human sexual orientation has a heritable component. Hum Biol. 1998 Apr;70(2):347-65

Sexual Identity and role of Genetics

- Twin and family studies have shown that same-sex sexual behavior is partly genetically influenced
- A genome-wide association study (GWAS) on 477,522 individuals, has revealed five loci significantly associated with same-sex sexual behavior
- In aggregate, all tested genetic variants accounted for 8 to 25% of variation in same-sex sexual behavior, only partially overlapped between males and females, and do not allow meaningful prediction of an individual's sexual behavior
- Overall, findings provide insights into the genetics underlying same-sex sexual behavior and underscore the complexity of sexuality

Ganna A, et al. Large-scale GWAS reveals insights into the genetic architecture of same-sex sexual behavior. Science. 2019 Aug 30

Homosexuality Gene

- Evidence for a "homosexuality gene" was claimed in the early 1990's on the basis of linkage studies that were underpowered
- Follow up studies gave contradictory results
- Modest heritability for homosexuality is confirmed
- No major locus is found and the genetic influence appears extremely polygenic
- Thus, there is no single gene, or even small set of genes, that have a strong influence on homosexuality

Jordan B. End of the road for the homosexuality gene. Med Sci (Paris). 2020 Feb;36(2):181-184.

Conclusion

- Sexual orientation and identity may have multifactorial basis for causation including genetic, epigenetic, and environmental factors
- No major locus is found and the genetic influence appears extremely polygenic
- Thus, there is no single gene, or even small set of genes, that have a strong influence on homosexuality
- Further research is needed to identify basis for Sexual orientation and identity

Thank you for your attention

