

Soci111 – Human Societies

Module 4 – Altruism & Relatedness

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Outline

Main Themes

Hamilton's Theory

Human Kinship

Incest Taboo

Main Themes

- ▶ William D. Hamilton's theory of the evolution of altruism based on *inclusive fitness*
- ▶ manifestations of nepotistic altruism among animals (e.g., kin-recognition)
- ▶ manifestations of nepotistic altruism in humans (e.g., nepotism, avuncular relationship, ethnocentrism, higher risk of children raised by unrelated adults)
- ▶ origin of incest avoidance (“incest taboo”):
 - ▶ traditional cultural explanations
 - ▶ sociobiological explanation (Westermarck effect)
 - ▶ “natural experiments” supporting the sociobiological explanation

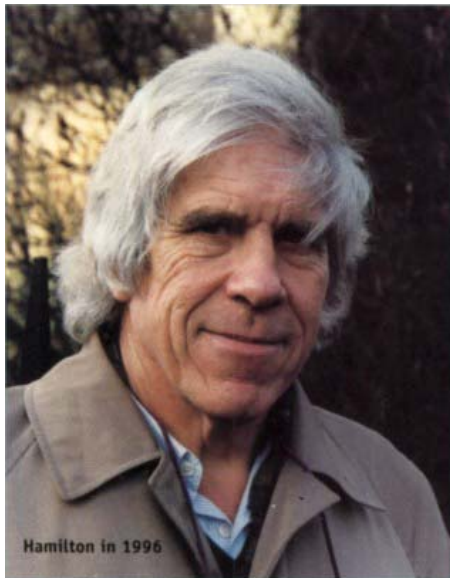
Hamilton's Theory

Edward O. Wilson Goes to the Florida Keys

- ▶ In 1965 Edward O. Wilson goes to the Florida Keys for his research
- ▶ he takes the overnight train because of a promise to his wife
- ▶ he brings along a pair of articles just published by British graduate student William D. Hamilton
- ▶ at first skeptical, he rereads the articles and is “converted” to Hamilton’s argument:
 - ▶ “By the time we reached Miami [...] I gave up. I was a convert, and put myself in Hamilton’s hands. I had undergone what historians of science call a paradigm shift.” (Edward O. Wilson, *Naturalist*, p. 320)

Hamilton's Theory

Hamilton's theory of inclusive fitness & kin selection



- ▶ William D. Hamilton
- ▶ evolution of a behavior depends on effect of behavior on inclusive fitness
- ▶ *inclusive fitness* of organism = own reproductive success + reproductive success of kin \times degree of relatedness
- ▶ altruistic behavior evolves if cost to individual is less than benefit to relatives weighted by relatedness

Hamilton's Theory

Hamilton's theory of inclusive fitness & kin selection

- ▶ Hamilton's theory states that altruistic gene will spread in gene pool if
 - ▶ $c < b \times r$
- ▶ where
 - ▶ c = cost of behavior to individual
 - ▶ b = fitness benefit to relative
 - ▶ r = coefficient of relatedness (probability that relative also carries the altruistic gene by common descent)
- ▶ e.g. emitting warning call when sighting predator represents cost c to individual (more likely to be spotted & attacked)
- ▶ represents benefit b for other birds in group (able to take cover)
- ▶ *inclusive fitness* of calling bird is increased to the extent that beneficiaries include close relatives (siblings, parents, offspring, ...)

Hamilton's Theory

Hamilton's theory of inclusive fitness & kin selection

- ▶ depending on group composition altruistic behavior can evolve in one sex (e.g. females) but not the other (why?)
- ▶ coefficient of relatedness r = proportion of genes identical by common descent
 - ▶ in diploid species including humans
 - ▶ *assuming random-mating*

Relationship	r
Parent-offspring	1/2
Full siblings	1/2
Half siblings	1/4
Uncle/Aunt-Nephew/Niece	1/4
First cousins	1/8

Hamilton's Theory

Consequences of Hamilton's Theory

- ▶ theory of inclusive fitness also called *kin selection*
- ▶ pervasive consequence of Hamilton's theory is evolution of *nepotistic altruism*
 - ▶ = tendency to favor relatives, from Latin *nepos*
- ▶ many examples including
 - ▶ *maternal instinct*, so conspicuous as to be taken for granted
 - ▶ *kin-recognition* = ability to evaluate relatedness of strangers
 - ▶ found in mammals, e.g. ground squirrels show more territorial aggression against non-relatives
 - ▶ found in insects, e.g. sweat bees guarding the hive recognize relatives
 - ▶ a triumph of Hamilton's theory: explanation of *eusociality* in hymenopteras (bees, ants, etc)

Hamilton's Theory

Evolution of Eusociality

- ▶ *eusociality* (Gr. “good sociality”) = females workers are sterile, only queen reproduces
 - ▶ puzzled Darwin: how can such total altruism evolve?!
 - ▶ because of special *haplodiploid* genetic system of hymenopteras
 - ▶ female shares 75% of her genes with sister but only 50% with own offspring (daughter or son)
 - ▶ \Rightarrow inclusive fitness greater if remains sterile & helps queen produce sisters

Coefficient of Relatedness (r) in Hymenopteras

Focal individual	Relative:					
	Mother	Daughter	Sister	Father	Son	Brother
Female	0.5	0.5	0.75	0.5	0.5	0.25
Male	1.0	1.0	0.5	—	—	0.5

Hamilton's Theory

Review questions

- ▶ Q – Under what conditions can altruistic behavior (i. e., a behavior that reduces the fitness of the individual but benefits others) evolve by natural selection?
- ▶ Q – What are the components of Hamilton's inclusive fitness?
- ▶ Q – What does *nepotism* mean?

Human Kinship

Importance of kinship & kin selection in human species?

- ▶ *nepotism* phenomenon
 - ▶ universal propensity
 - ▶ modern societies try to regulate (e.g. in hiring procedures)
- ▶ *avuncular relationship* phenomenon
 - ▶ maternal uncle has greater role than ostensible “father” (husband of mother)
 - ▶ more prevalent in societies with high rate of adultery
 - ▶ reduced certainty of paternity ⇒ greater fitness from devoting resources to children of sister than putative own
- ▶ *ethnocentrism* phenomenon
 - ▶ Pierre Van den Berghe in *The Ethnic Phenomenon*
 - ▶ ethnocentrism, patriotism, team loyalty, . . . manifestations of same propensity
 - ▶ extension to non-kin of evolved propensity to nepotism originally benefiting relatives

Human Kinship

Importance of kinship & kin selection in human species?

- ▶ *Cinderella* phenomenon
 - ▶ Martin Daly & Margo Wilson in *Homicide*
 - ▶ “bad step-mother” real phenomenon (bad step-father, too)
 - ▶ find that children living with adult not biologically related to them at greater risk of abuse or infanticide
 - ▶ because non-related parent “less interested” in welfare of child
 - ▶ but not the case for adoption

Incest Taboo

Woody & Soon-Yi Affair



- ▶ Woody Allen born 1935, Soon-Yi Previn born 1970
- ▶ Soon-Yi adopted at age 7 in Korea by Mia Farrow & husband André Previn
- ▶ Mia & Woody have relationship 1979–1989
- ▶ never lived together
- ▶ 1992 Mia discovers nude pictures of Soon-Yi in Woody's apartment
- ▶ 1997 Woody & Soon-Yi married in Venice
- ▶ Incestuous?

Incest Taboo

Woody & Soon-Yi Affair

What Is Incest?

WOODEN ALLEN IS NOT SOON-YI'S BIOLOGICAL FATHER, HE IS NOT MARRIED TO HER ADOPTIVE MOTHER MIA FARROW, AND HE DID NOT LIVE IN THEIR HOME. MOREOVER, SOON-YI IS A CONSENTING ADULT. BUT IF THE WOODY-SOON-YI AFFAIR IS NOT LEGALLY OUT OF BOUNDS, IT IS HEAVILY MISSED. AT THE VERY LEAST, A MAN WHO SLEEPS WITH HIS EX-LOVER'S DAUGHTER APPEARS PREDATORY AND MANIPULATIVE. BUT THE RELATIONSHIP SHEDS INTO INDECENCY WITH THE CLAIM BY SOON-YI'S SIBLINGS THAT ALLEN HAS BEEN A FATHER FIGURE TO THE ENTIRE FARROW TRIAD, EVEN ALONG WITH YI WHO WAS A PROTECTOR, NOT A CHILD BRINGING HER A LITTLE TOO CLOSE TO HOME, CLOSE ENOUGH TO RAISE THE ISSUE OF INCEST?

Defining the ancient taboo becomes hard in an era of recombinant families created by divorce, remarriage and adoption. The traditional structure—the original relations between parent and child or brother and sister—still holds, but how does it apply to today's blended and extended families, where blood ties are often thin or absent?

Historically the taboo has had a scientific rationale: that inbreeding drains the gene pool, greatly increasing the chances of mental and physical defects in offspring. But modern geneticists have found that such dangers are overstated; it would take generations of inbreeding for such problems to surface regularly. A more important reason for the taboo is cultural: incest has been banned to preserve family harmony by keeping disruptive rivalries and jealousies at bay. It has also helped to strengthen kinship clans, by forcing members to marry outside the group, the clan expands its wealth and allies.

Today the most significant damage from incest is psychological. The heart of a family, say experts, is not the bloodstream but the emotional connection. "Proper human growth involves gradually separating emotionally from your family so that you can go off and start one of your own," stresses child therapist Carole West of Beverly Hills, California. "Incest disrupts that process."

The surge in nontraditional families increases the risk of disruption. "There are more incidents of incest reported in stepfamilies than in biological families," observes Lynn Reynolds of the Institute Against Social Violence, in Briarcliff Manor, New York. Adopted children may be particularly vulnerable; as matter how well they are treated by their adoptive families, they frequently struggle with feelings of abandonment by their biological parents.

Anyone who comes into a marriage with a teenage child needs to exercise extra caution about incest," warns psychiatrist Dorena Rendone of Loyola School of Medicine, in Chicago. "That [child is] beginning to blossom, and will sometimes compete with the natural parent." Freudian theory holds that the earliest erotic impulses are incestuous; young boys unconsciously rival their father for their mother's affection, while daughters covet their father, a normal process in development known, in boys and girls respectively, as the Oedipus and Electra complexes. One therapist wonders whether Soon-Yi may never have resolved such early longings and might now be replacing her mother as the father's lover.

The courts may not call it incest or child abuse, but the relationship is surely an abuse of power. "Does anyone really see Soon-Yi as a consenting equal?" asks West. "Would she feel free to say no to the great Woody Allen?" Is she intellectually mature enough? One reason the taboo of incest has endured so strongly is the understanding most people have that the complex emotional bonds and power relationships that exist within a family—even an extended one—should never be abused.

By Anastasia Tsioulik, Reported by Andrea Sachs/
New York and James Willwerth/Los Angeles



- ▶ *Time* article “What Is Incest?” (31 Aug 1992)
- ▶ illustrates two traditional *cultural* theories of incest avoidance
 - ▶ preserves family harmony by preventing confusion of roles & disruptive jealousies
 - ▶ forces individuals to find spouses outside immediate kin group ⇒ creates network of reciprocal ties among families

Incest Taboo

Westermarck Effect

- ▶ *sociobiological* theory of incest avoidance
 - ▶ prohibition of sexual relations between close relatives is universal feature of human societies
 - ▶ based on spontaneous aversion to sexual activity among adults raised together in early childhood
 - ▶ called *Westermarck effect* after Westermarck (1891)
 - ▶ evolved because helps preventing *inbreeding depression* (= accumulation of recessive genes in inbred individuals)

- ▶ three “natural experiments” suggesting biological (non-cultural) foundation of brother-sister incest avoidance
 - ▶ Israeli *kibbutzim*
 - ▶ absence of sexual activity among adults raised together at early age
 - ▶ despite absence of cultural opposition to these unions
 - ▶ *minor marriages* in Taiwan
 - ▶ “adoption” of girl as future wife of boy
 - ▶ boy & girl raised together from early age
 - ▶ high failure rate of marriages (infertility, high divorce rate, ...)
 - ▶ preferential marriages of cousins in Lebanon
 - ▶ close residential proximity in childhood
 - ▶ high divorce rate

Incest Taboo

Westermarck Effect

- ▶ Sociologist Pierre van den berghe concludes study of incest taboo (*Human Family Systems*, p. 117):
 - ▶ “Incest taboos are the cultural expression of a biological predisposition not to breed with close relatives [...] The cultural significance of incest taboos has been much exaggerated in the anthropological literature.”
- ▶ Review questions
 - ▶ Q – What is a *kibbutz*?
 - ▶ Q – The tendency of children raised together at an early age to avoid sexual relations in adulthood is called the ___ effect.