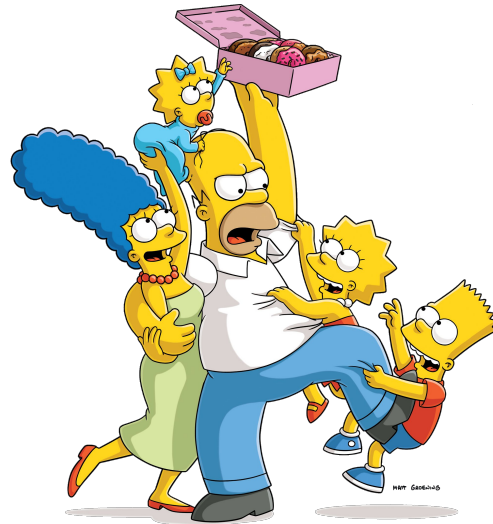


kinship



Introduction

We talked last time about the importance of alloparents. But why should anyone take care of someone else's kids?

Some of the answers we gave hinged on degree of relatedness (e.g., different kinds of grandparents)

In this lecture, we focused on that question explicitly, with a return to kin selection (discussed in the first part of the course).

Outline

- Kin selection
- Love and altruism toward kin
- Homicide within the family
- Parent-offspring conflict

Why we say “blood is thicker than water”

We love our relatives, and help them (although we sometimes squabble with them)

Why? Why did those emotions evolve?

Kin selection is the evolutionary theory behind those feelings

Hamilton's Rule explains altruism to kin

Natural selection can favor genes for behavior that helps a relative, even at a cost to you, because you may share that gene by descent

the fitness benefit depends on how close the relative is (the probability that a gene will be shared by descent). A mutation will spread if this inequality holds:

Hamilton's Rule: $c < rb$

c: cost to actor

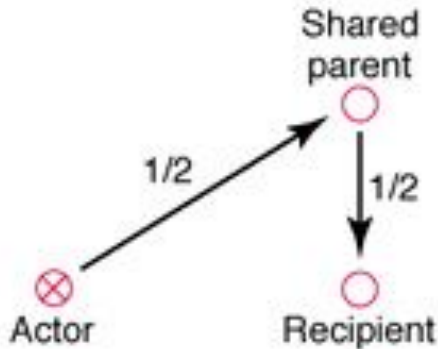
b: benefit to recipient

r: genetic relatedness between actor and recipient

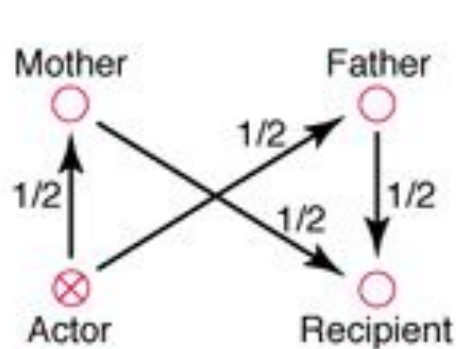
Calculating the coefficient of relatedness (r)

r between actor and recipient: the expected (average) fraction of genes that are identical by virtue of their family relationship

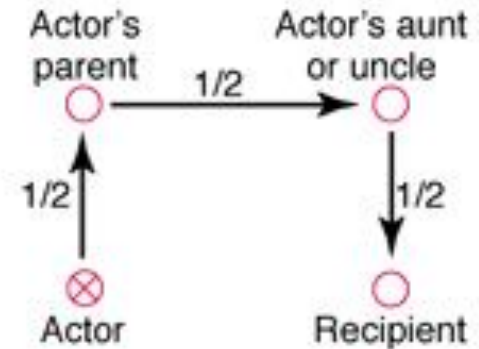
Half-siblings



Full-siblings



Cousins



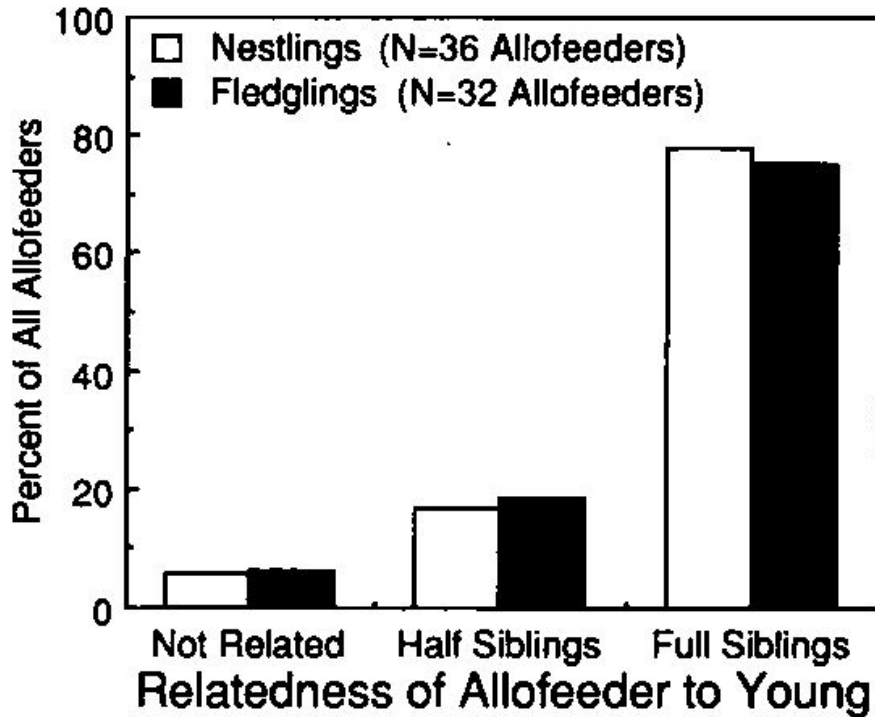
Kin selection explains altruism in non-humans

- sterile workers in bees
- alarm calls in Belding's ground squirrels (see Buss, p. 223)
- “helpers at the nest” in scrub jays:

yearling male jays may stay at home to help parents raise the new season's young, if new territories are hard to find.

Can kin selection explain it?

Alloparenting in Florida Scrub Jays



Non-breeding jays were more likely to provision closely-related young

Experimentally removing helpers lowered fledgling survival; helpers reduced predation and fed young

Birds with helpers raised 5 times as many birds.

But do animals do algebra?

No need to calculate Hamilton's Rule. Biased behavior to relatives can involve:

- kin recognition (e.g., via MHC or physical appearance).
- living near kin (if altruistic to nearby individuals)

Kin-directed altruism depends on more than “r”

Little data showing precise match between altruism and “r”

- “b” and “c” matter, are hard to measure (for yearling jays, cost depends on whether it can get a good territory)
- real “r” reflects paternity uncertainty
- friends ($r = 0$) confer other benefits
- reproductive value of the recipient matters

Outline

- Kin selection
- Love and altruism toward kin
- Homicide within the family
- Parent-offspring conflict

Biological and classificatory kinship

Our classificatory kinship system: many relatives called “cousin”. In some kinship systems, same term for father and father’s brother.

Is the psychological distance the same to each of them?



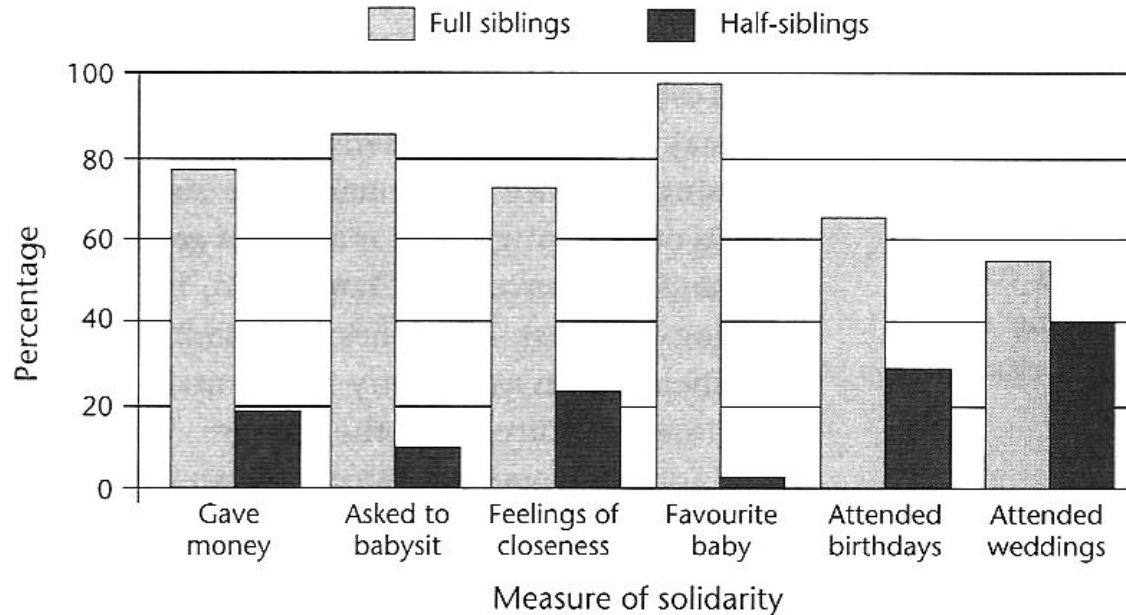
Yanomamo Axe Fight:

In a fight between two genealogically overlapping villages, men were more likely to fight to support their genetic kin.

Chagnon and Bugos 1979

Biological and classificatory kinship: full and half sibs

“Unlike most polygamous families living in Montana, the Salt Lake Valley, and northern Mexico, the preferred ideal in Angel Park is to live together in one ‘united and harmonious’ household.”

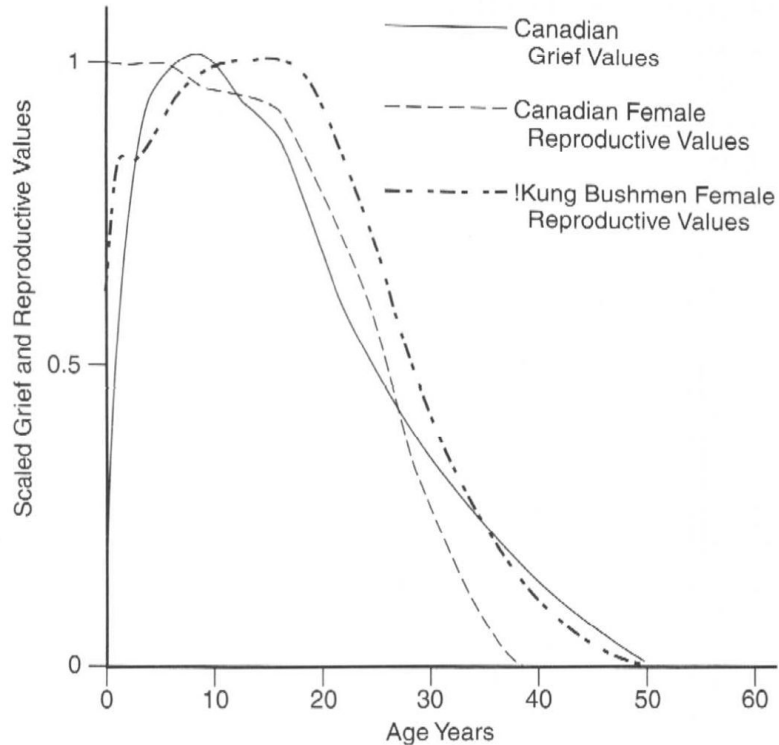


Relationships among co-wives cross-culturally

Polygynously-married wives usually live in separate dwellings. . . . unless the wives are sisters (sororal polygyny).

	Shared Dwelling	Separate Dwelling
Sororal Polygyny	60 (81%)	14 (19%)
Non-sororal Polygyny	96 (32%)	207 (68%)

Kin altruism and reproductive value



Kin altruism is based on more than just relatedness:

Intensity of grief at a lost child matches reproductive value of a child in the EEA, not in modern societies:

Crawford et al. 1989

Conflicts within families

flip side of kin selection is that, even within families, there are conflicts of interest where r is less than 1.

is the family a “unit”? conflicts of interest between mom and dad, and parents and kids ($r = 1/2$ in the latter case). And sibs (sibling rivalry).

Conflicts of interest are to be expected. We can still try to ameliorate them, but understanding evolutionary sources may help.

Outline

- Kin selection
- Love and altruism toward kin
- Homicide within the family
- Parent-offspring conflict

Homicide as a conflict assay

Daly and Wilson study homicide because it has an objectively observable outcome.

They want to identify psychological factors that underpin such conflicts

They don't assume homicide is an adaption.

Homicide risk at home

Denver (UPI) – A just-completed national survey indicates the American home is the most violent place in the country, three sociologists reported Friday. The pioneering study led researchers to conclude that physical violence occurs between family members more often than it occurs between any other individuals. . .

Children Are Often The Victims

Home Is Most Violent Place In The Country

DENVER (UPI) -- A just-completed national survey indicates the American home is the most violent place in the country, three sociologists reported Friday.

The pioneering study led researchers to conclude that physical violence occurs between family members more often than it occurs between any other individuals or in any other setting except for riot and war.

Dr. Richard J. Gelles of the University of Rhode Island said one of the most shocking findings suggests that "a million kids are growing up facing parents who are using guns and knives on them—not

just threatening but they have actually used a gun or knife on them."

"I think this is an astoundingly high level of violence used on kids and I'm not sure society is capable of dealing with it," he said in an interview.

The survey, based on interviews in 1976 with a nationally representative sample of 2,143 families, was directed by Gelles, and Drs. Murray A. Straus of the University of New Hampshire and Suzanne K. Steinmetz of the University of Delaware. The first results were reported at the annual meeting of the American Association for the Advance-

ment of Science.

Straus reported that extrapolation of the interview results to the whole population shows that one of every six American couples had a violent episode during the survey year.

"About one out of every 100 husbands and wives had gone beyond slapping, kicking or throwing things at a spouse and said that they had been beaten up or had beaten up their spouse in the previous year," Straus said in a summary he and Gelles prepared.

"Even more startling is the fact that almost 4 per cent had gone so far as to have actually used a knife or gun

in attacking their husband and wife."

The researchers said this means that of the 47 million couples living together in the United States, an estimated 17 million had at some time faced a spouse wielding a weapon. Well over 2 million had been beaten up by their spouse.

Dr. Steinmetz, who analyzed violence between brothers and sisters in 1,224 families, found that three of four youngsters between ages of 3 and 17 had engaged in some kind of physical violence against each other during the past year. By violence, she included everything from

pushing to actually using a knife or gun.

The interviews, financed by the government's National Institute of Mental Health, were conducted by the Response Analysis Corp., of Princeton, N.J. If anything, Straus said the study probably underestimates the amount of violence in American families.

Gelles said the study of violence against children indicates over 80 per cent of parents of children aged 3 to 9 used physical punishment including spankings during the past year.

Among his findings:

—20 per cent of the parents

interviewed said they had at some time hit a child with some object;

—4.2 per cent said they had "beaten up" the child;

—2.8 per cent of the parents said they had threatened a child with a knife or gun and 2.9 per cent said they had actually used a gun or knife on a child.

And he said the fact parents admitted using weapons on children "means they think it's reasonably acceptable."

Seminars:

THE 197

★ ★ ★

Homicide risk at home

? Doesn't kin selection predict less violence among family members ???

Killing requires access. People have a lot of access to family members.

Kin selection predicts that, *given the same opportunity and access*:

there will be fewer homicides between blood relatives than others

Daly and Wilson looked at homicides in Detroit households (1970).

Households included:

- blood relatives (parents, children, sibs)
- non-blood relatives (e.g., spouses, in-laws)
- non-relatives

Average resident lived with 3 other people, 60% lived with a spouse, 98 total domestic homicides.

Q: If homicide was randomly distributed within households, what would you expect? How does that compare to the actual distribution?

	A	$B=(A/3)$	$C=(B*98)$	D	$E=(D/C)$
<i>Non-Kin</i>					
Spouses	0.6	0.20	19.60	65	3.32
Other non-kin	0.1	0.03	3.27	11	3.37
Total non-kin	0.7	0.23	22.87	76	3.32
<i>Kin</i>					
Offspring	0.9	0.30	29.40	8	0.27
Parents	0.4	0.13	13.07	9	0.69
Other kin	1.0	0.33	32.67	5	0.15
Total kin	2.3	0.77	75.13	22	0.29
Grand Total	3.0	1.00	98.00	98	

(from Daly and Wilson 1988)

A = number of other individuals in this category in the household, on average

B = divide by 3 to get %, since the average person lived with 3 other people

C = 98 total homicides, so multiply B by 98 to find expected number of homicides if they were random

NOTE: I mis-spoke in the audio lecture, C is the expected number, not percent

D = actual number of homicides in each category

E = relative risk (actual / expected)

Outline

- Kin selection
- Love and altruism toward kin
- Homicide within the family
- Parent-offspring conflict

Parent-offspring conflict

You are related to yourself by 1, your mom is related to you by $1/2$. This sets the stage for conflicts of interest.

The child is likely to want more from Mom than it may benefit her to give (in terms of reproductive success).

The inevitability of P/O conflict plays out in weaning conflicts and sibling rivalry.

Optimal time for weaning is different for mother and child

“Some mornings I just stayed around and my tears fell and I cried and refused food. That was because I saw him [the brother] nursing, I saw with my eyes the milk spilling out. I thought it was mine” (Shostak 1976; San foragers)

Weaning among the Ache is “an extremely unpleasant experience for mothers (and apparently for children), with children screaming, hitting, and throwing tantrums for several weeks.” (Hill and Hurtado 1996).

“Farmer parents explained that the timing of weaning was important because it enabled mothers to leave their youngest children at home and thus farm more productively.” (Fouts et al. 2005).

Parent-offspring conflict: Implications

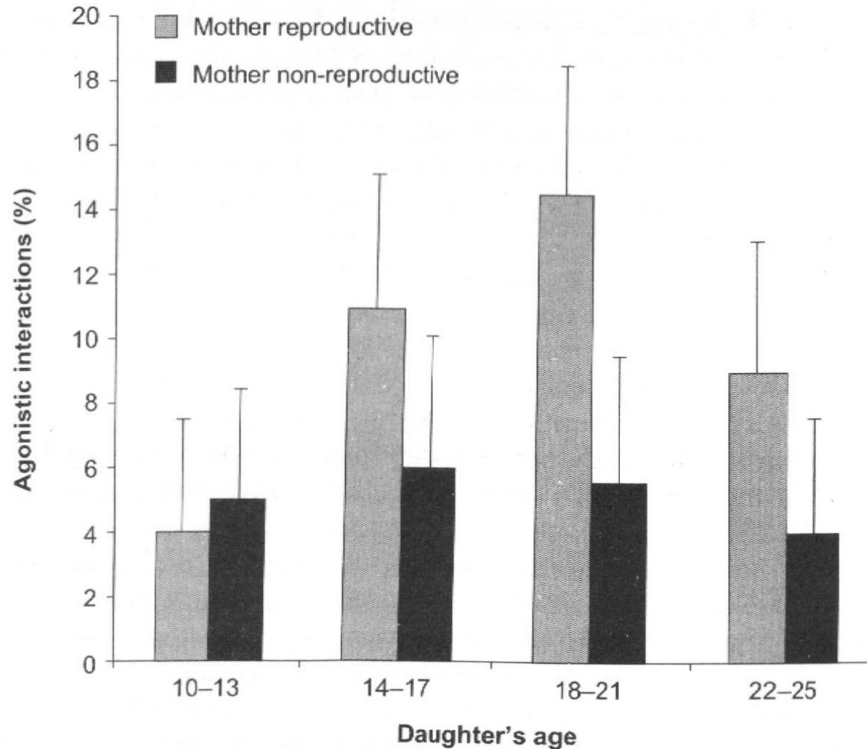


picture caption: “Are you worried about the change in your 3-year-old’s behavior after your second child?”

Some Psychological Implications:

- Weaning conflicts
- Children “regressing” (acting more needy) when new baby arrives
- Mom wants children to “share” with each other more than they do

Mother-daughter conflict in Trinidad



In this study: When mother and daughter live in same household, typically only one reproduces. If they are both reproductive, there is more conflict between them (from Flinn 1989, describing a rural village in Trinidad)

Concluding thoughts

We love our family (genes shared by descent) and are more altruistic to them than to non-kin, other things equal. But. . .

Family conflicts (parent-child, sibling rivalry, husband-wife) are inevitable because we are not genetically identical.

Even in that most close and intimate of relationships, a mother and her child, $r=.5$, not 1, and some conflict is normal.

Evolutionary theory predicts familial interactions shaped by:

- degree of relatedness
- costs to actor, benefit to recipient
- age (reproductive value) of the recipient