

Evolution Confers Morality

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[Paul Cézanne]



IANAL

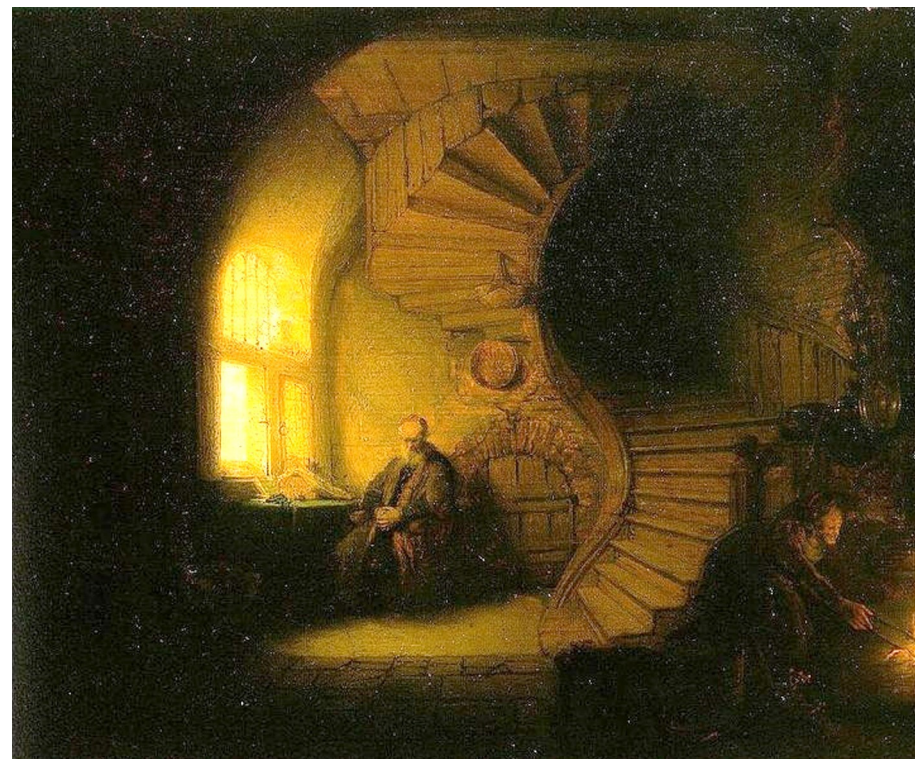


IANAB



IANAΦ

Descends with
modification
from



[Rembrandt van Rijn]

IANAB

But

Some of my best friends are biologists

I am coeditor of *Why Intelligent Design Fails*

I am coauthor of *Why Evolution Works (And
Creationism Fails)*

So

I am at least a fellow traveler

Definition

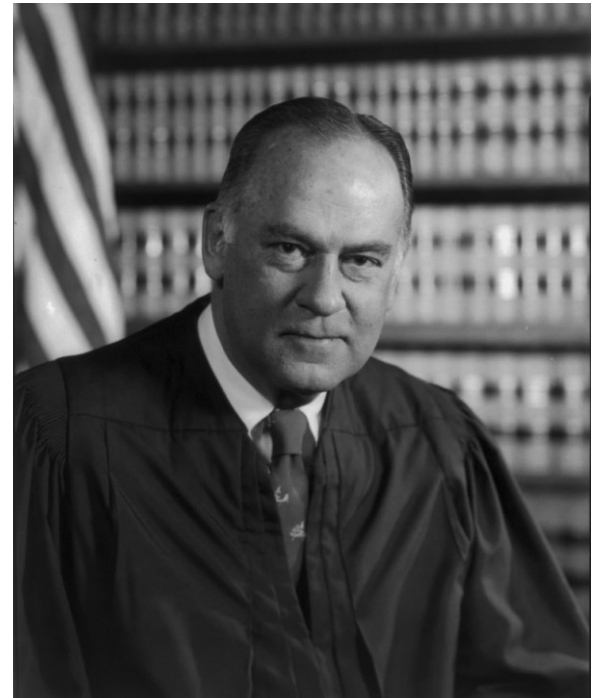
Define morality same way as

Mass

Length

Time

Pornography



[Official portrait]

Francis Collins – Human Genome Project

Morality is uniquely human
Altruism is uniquely human

} Debatable
propositions

↓ Inductive leap

Morality must have been
conferred by God

Rejects arguments based on
disparate ethical codes

Rejects sociobiological argument
that morality could be evolved
trait



IANAF

But

Serious philosophical problems with
idea that God conferred morality

Suppose that God said murder was moral

Would it be so?

No

Moral code would take
precedence over God

God would be a pipeline

We look elsewhere for the origin of morality



Collins refers to a Moral Law

So is there a moral law?

Analogous to

Law of gravity

Laws of logic or mathematics

I will
assume
not

If I am wrong, title of talk is

How *our sense of* morality evolved

Evidence that morality is somehow built in

Incest taboo

Brother and sister

Over 21, consenting adults, and all that

Agree to sleep together

Just once

To see what it is like

Take special

precautions to avoid

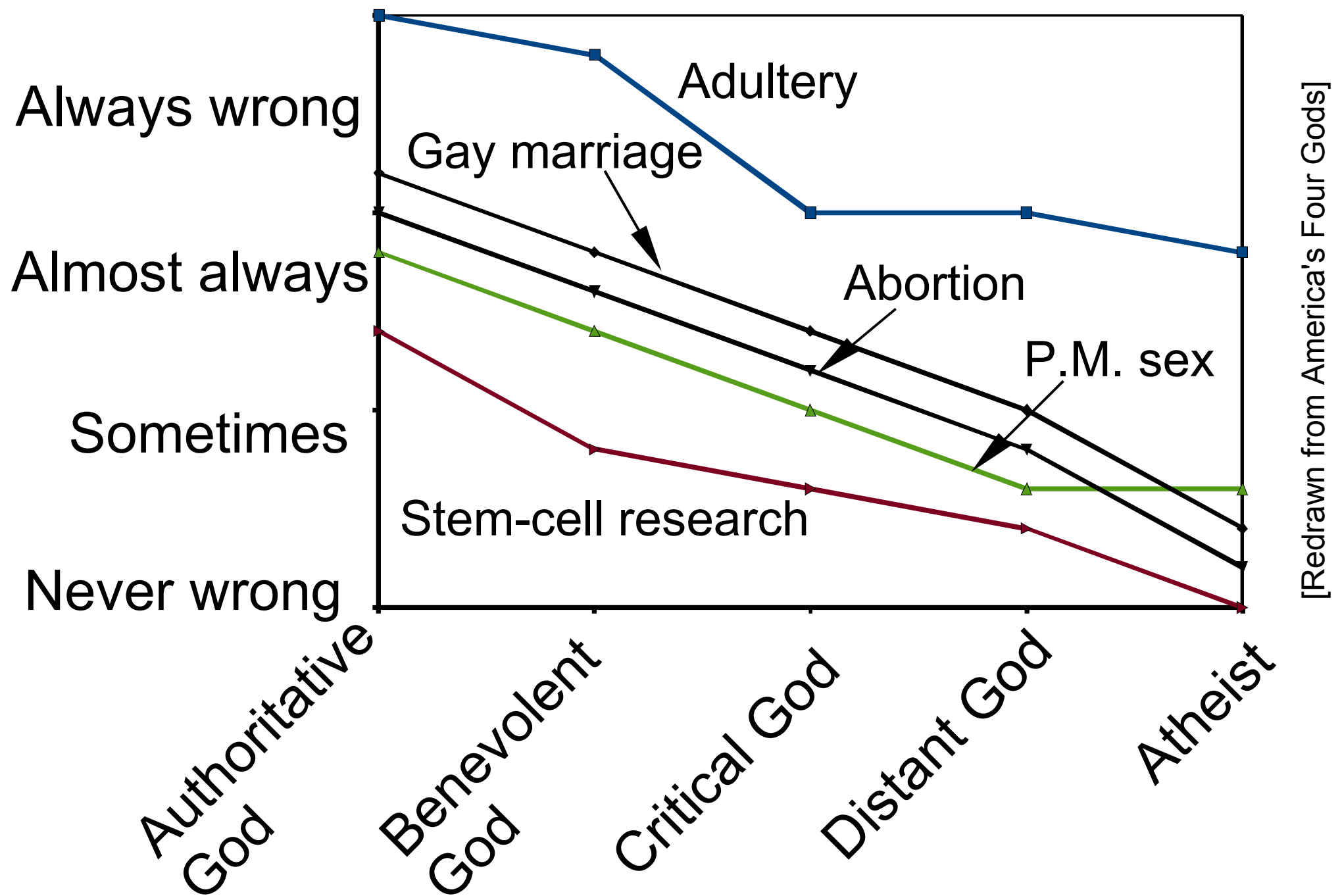
pregnancy

Will never tell anyone

Is that wrong?

Why?

Further evidence



Order constant across all beliefs

Adultery

<

Gay marriage

<

Abortion

<

P.M. sex

<

Stem-cell research

Evidence that morality is related to selection

The trolley problem

Trolley problem

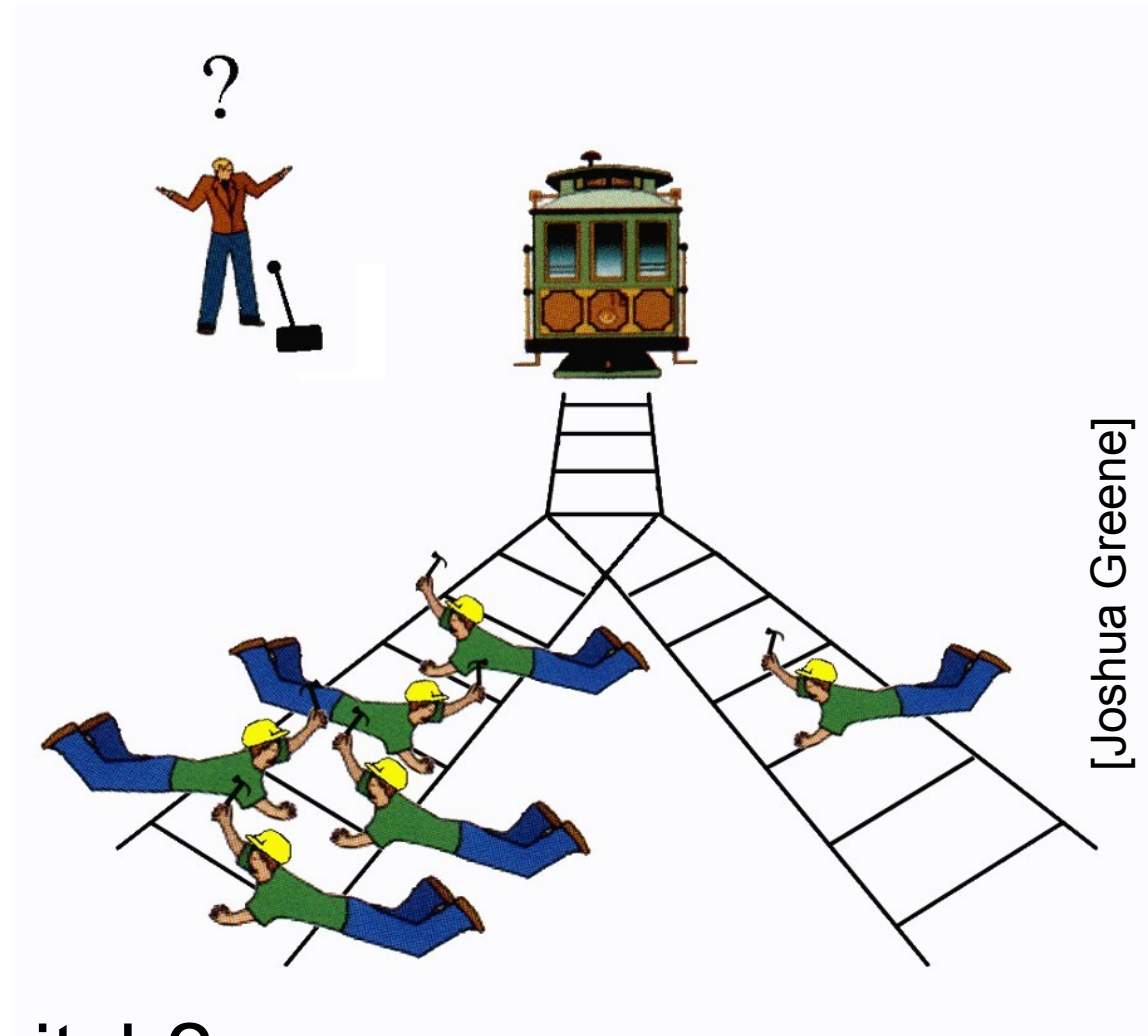
Five workmen on a
trolley track

Out-of-control trolley

You can pull switch

Save five, but

Kill one



[Joshua Greene]

Should you pull the switch?

Must you pull the switch?

Revised trolley problem

There is no switch

There is a ~~fat man~~ portly gentleman

May you push him over to stop the trolley?

What if *you* were the portly gentleman?



[Joshua Greene]

There is no objective difference between the two cases

Typically 70-80 %

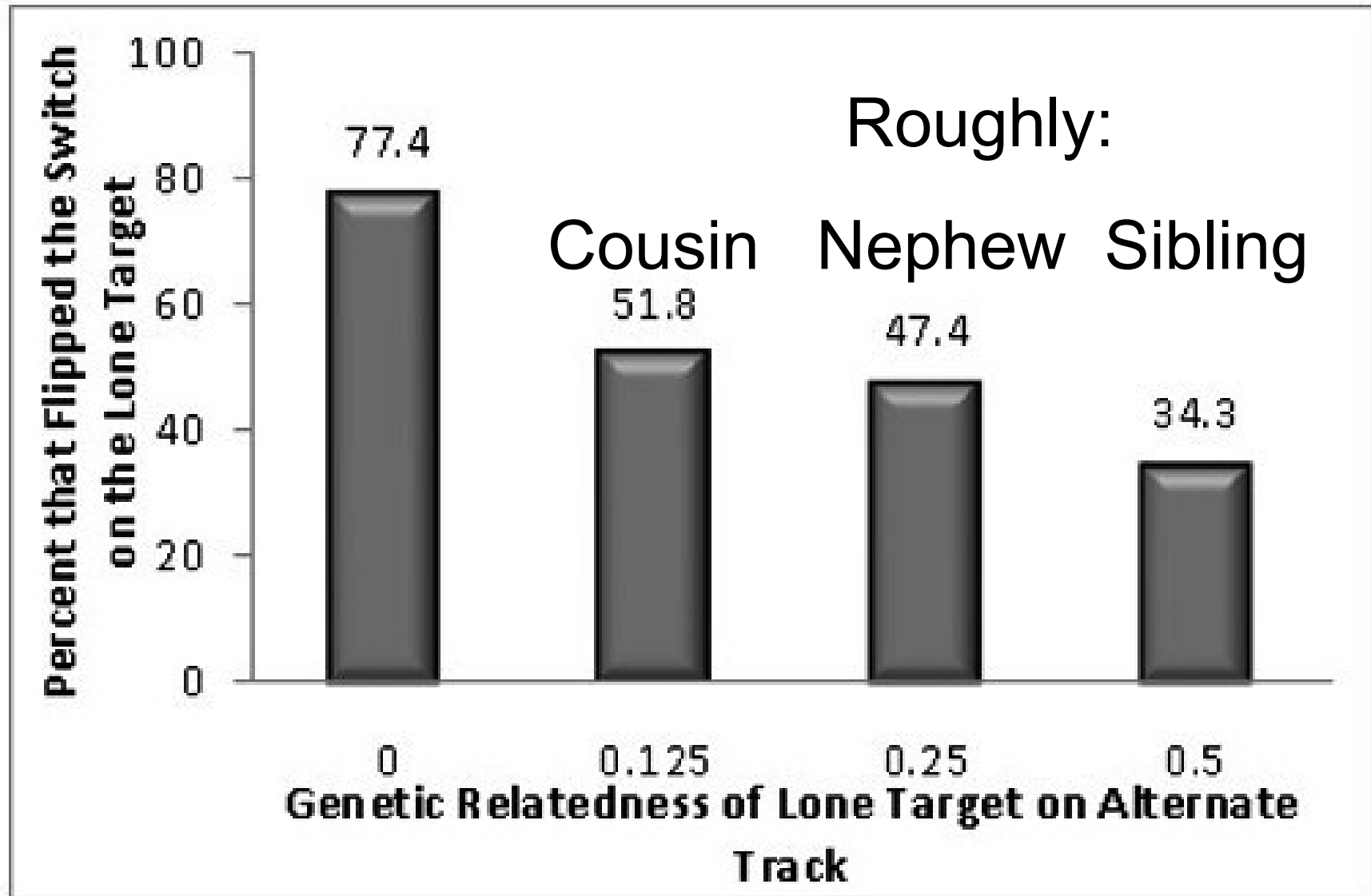
Yet more people throw the switch than
deliberately throw the man off the bridge

Typically <30 % Why?

Possibly because killing is incidental in first
case, deliberate in second

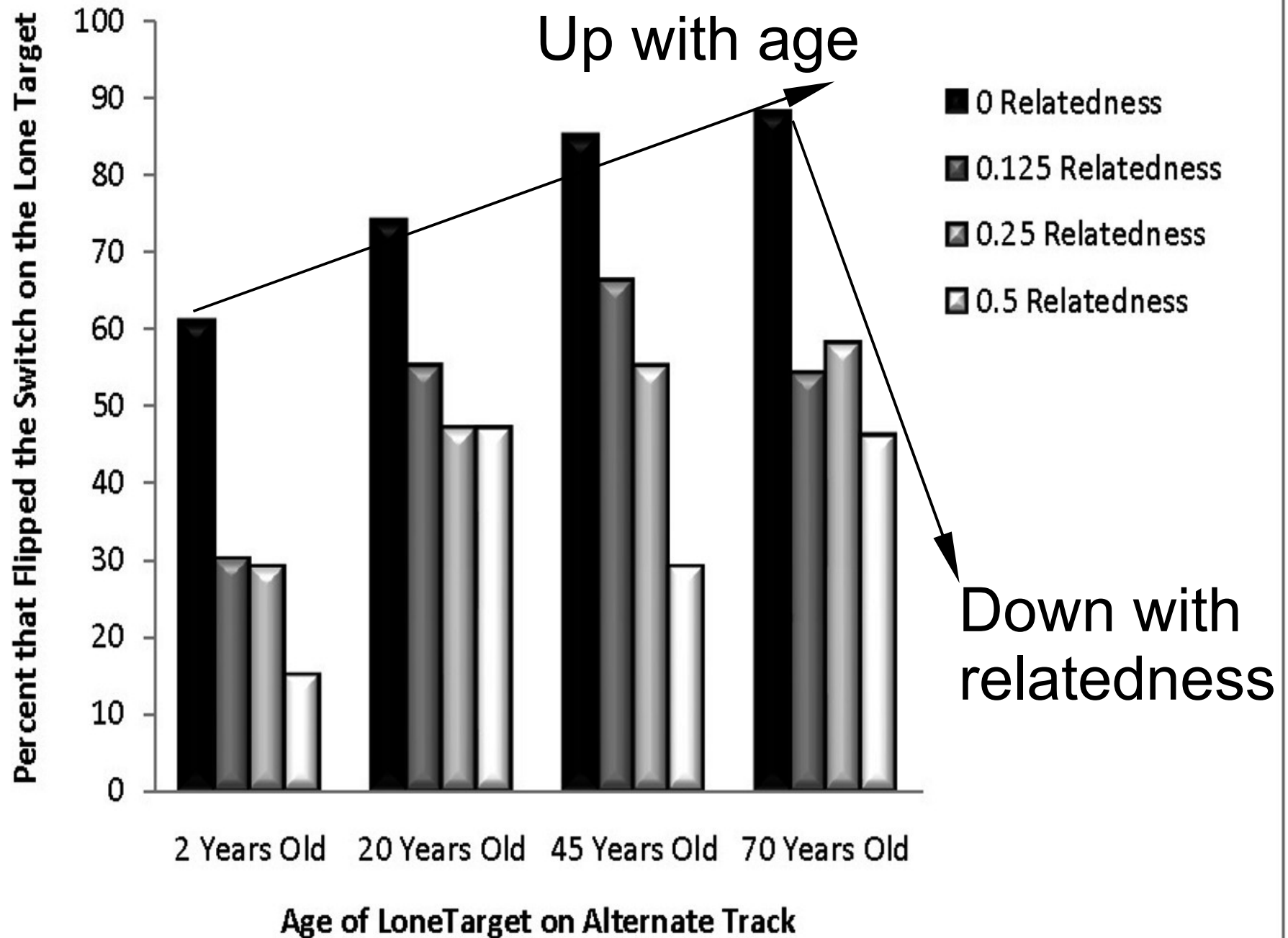
Objective research on the trolley problem

Your response may be influenced by selection

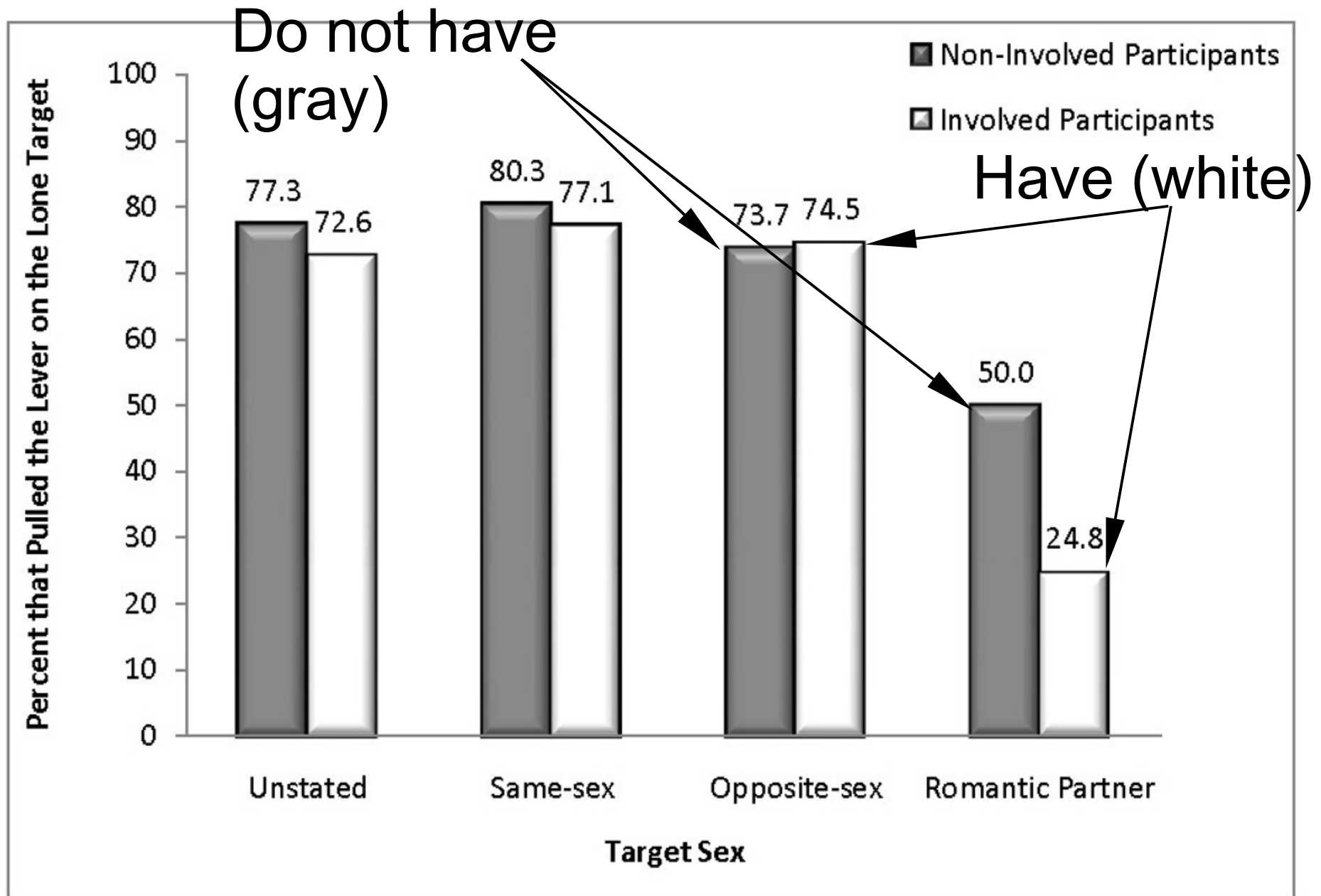


[Bleske-Rechek, et al.]

Age and relatedness of target



“Romantic partners”



So:

People's willingness to throw the switch
decreases with

Relatedness of lone
individual (target)

Involvement with target

Age of target

} “Ought” to be
irrelevant

Note added in proof

(so to speak)

Criticism:

Trolley problem is not real

Just thought experiment

Decisions never so stark

Response by audience member:

Generals make precisely such decisions in war

Sacrifice soldiers for civilians

For other soldiers

~~Politics~~ Democracy stops at the water's edge

Moral precepts often apply primarily to the
in-group

Biblical Hebrews ordered to wipe out or enslave
other peoples

Columbus kidnaps Indians, brings to Spain as
slaves

Modern societies dismiss casualties of war as
“collateral damage”

*Lends force to argument that morality somehow
relates to selection*

How can altruism have evolved? [Strassman and Queller]

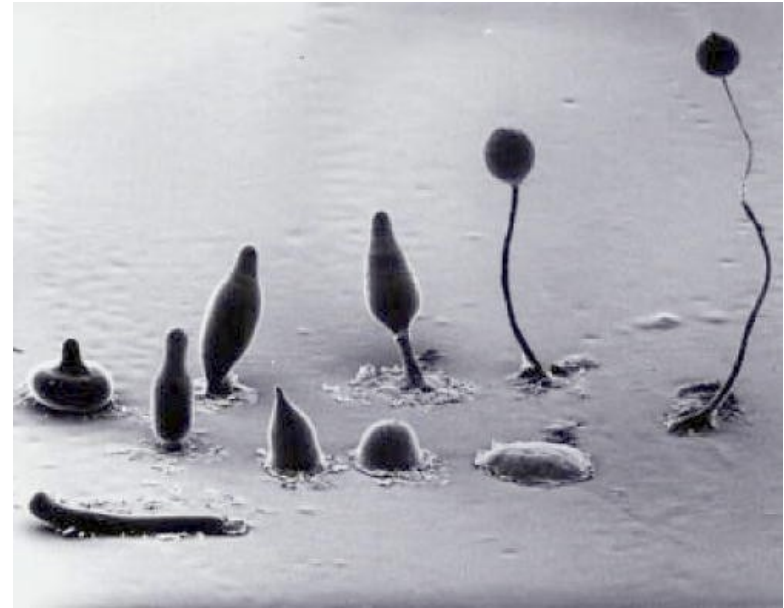
Slime mold (*Dictyostelium discoideum*)

Solitary amoebas

In times of stress, secrete chemical

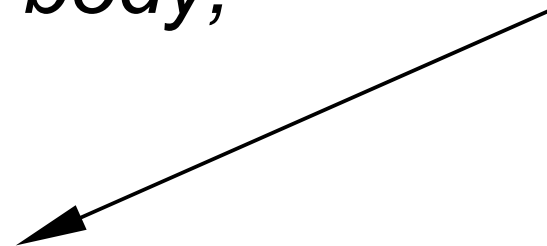
Clump together in *fruiting body*,
form spores

Most amoebas die in the process



[Texas Tech University]

Altruism,
of a sort



But: Unrelated amoebas in same clump
fight to get into fruiting body

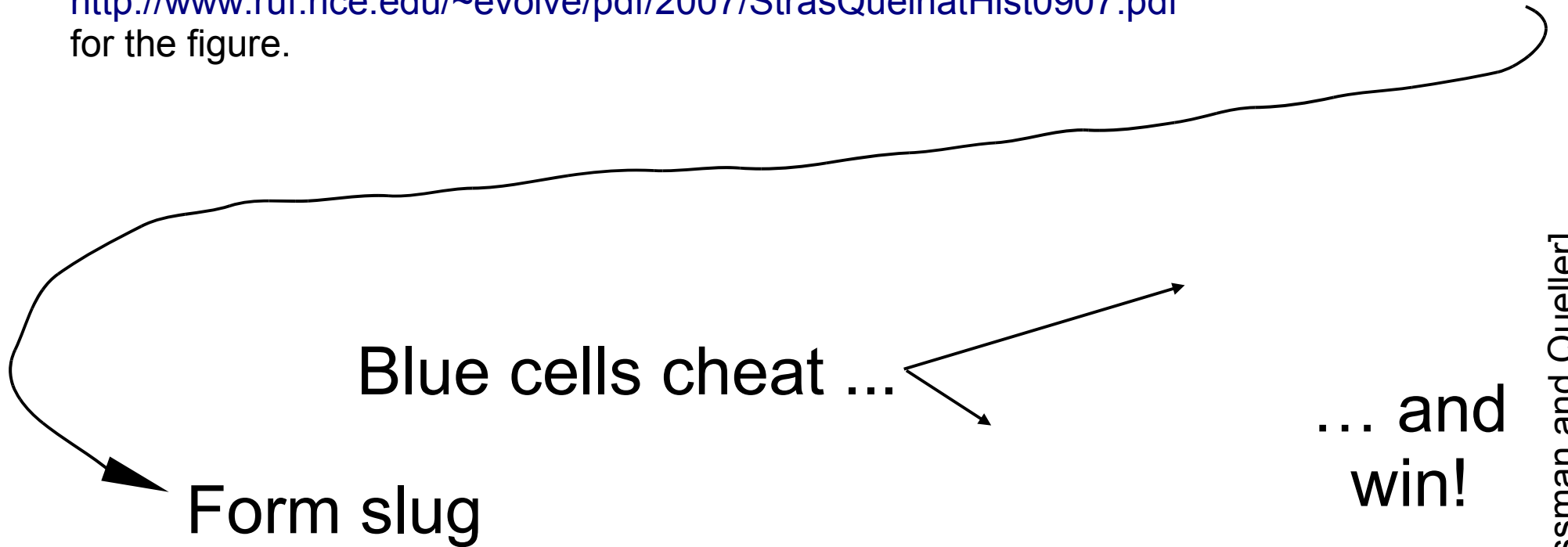
Solitary amoebas

Clump together

See here

<http://www.ruf.rice.edu/~evolve/pdf/2007/StrasQuelNatHist0907.pdf>

for the figure.



Conclusion: Amoebas (at least) are *altruistic only*
toward those who share their genes

They *cheat* on those who do not share their genes

Aside: Researchers also found gene “for” altruism

Kin selection

You are a gene's way of making another gene

More beneficial *to your genes* if you sacrifice on behalf of close relative than on behalf of stranger

Mother bird risks self for chicks

Haldane would sacrifice self for 2 brothers, 8 cousins

I say 3 brothers, 9 cousins

Altruism toward relatives thus at least partly genetic



Group selection (controversial)

Humans more likely to sacrifice for children than nephews

For nephews than close associates (*in-group*)

For close associates than outsiders (*out-group*)

For outsiders than foreigners

Suggests role for genetics in altruism (if not morality in general)

How can altruism be selected for?

One group may outcompete another if altruists sacrifice selves

But don't altruists then die out?

Maybe not ...

Computer simulation [Choi and Bowles]

Computer “organisms” with 2 genes with 2 alleles each

Cooperated with each other

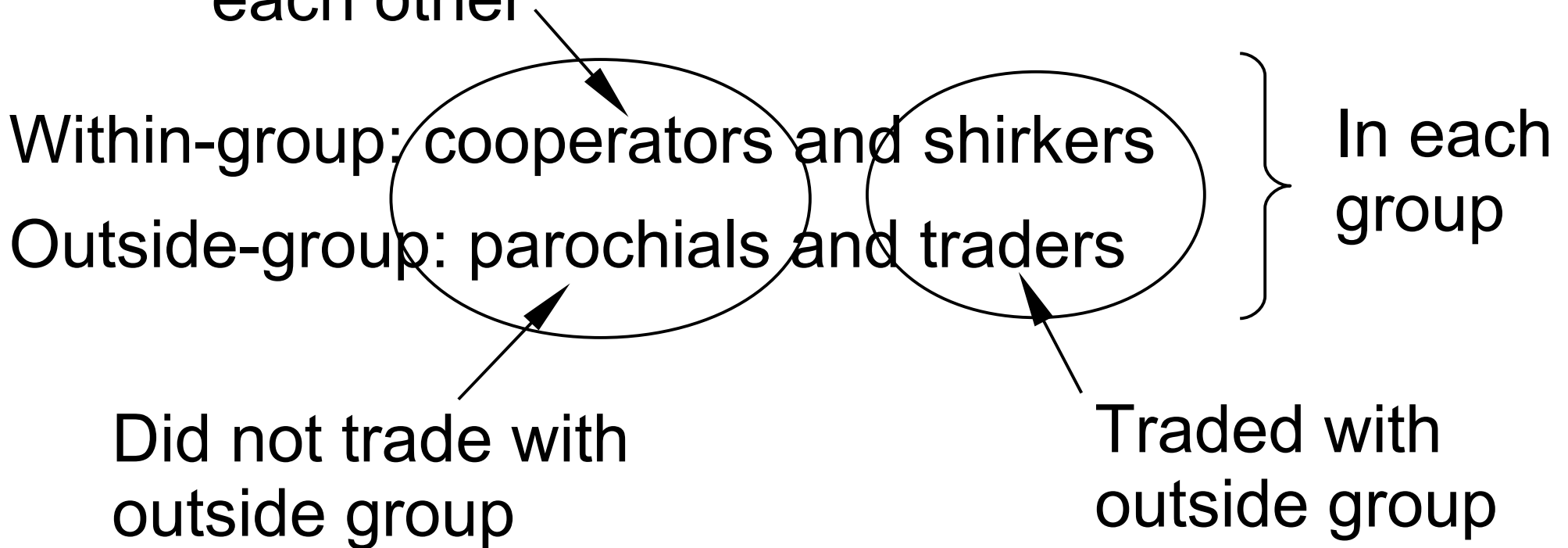
Within-group: cooperators and shirkers

Outside-group: parochials and traders

In each group

Did not trade with outside group

Traded with outside group



Altruism survives!

Most-successful groups: parochial cooperators
or trading shirkers

Least-successful groups: included cooperating
traders (altruists):

Cooperated with both in-group and out-group

Suggests that altruism can survive if not prosper

Computer and other games

Prisoner's dilemma:

2 prisoners:

Cooperate with police or
with confederate?

Mistrust forces
prisoners to betray
each other

Repeated prisoner's dilemma (simulation):

Program that gives *Tit for Tat* succeeds best

Ultimatum game

(Laboratory experiments on humans)

I have 10, \$1 bills
Must share with you any way I like } And you know it

But

If you reject my offer, we get nothing

I offer you \$1 – how many will accept?

The most rational thing is to accept:

Why did you not accept?

Monkeys and apes sometimes refuse fair division

Repeated games

Suggest that *cooperation mixed with punishment*
is best strategy

Cooperators can survive

Therefore they can evolve

Frans de Waal

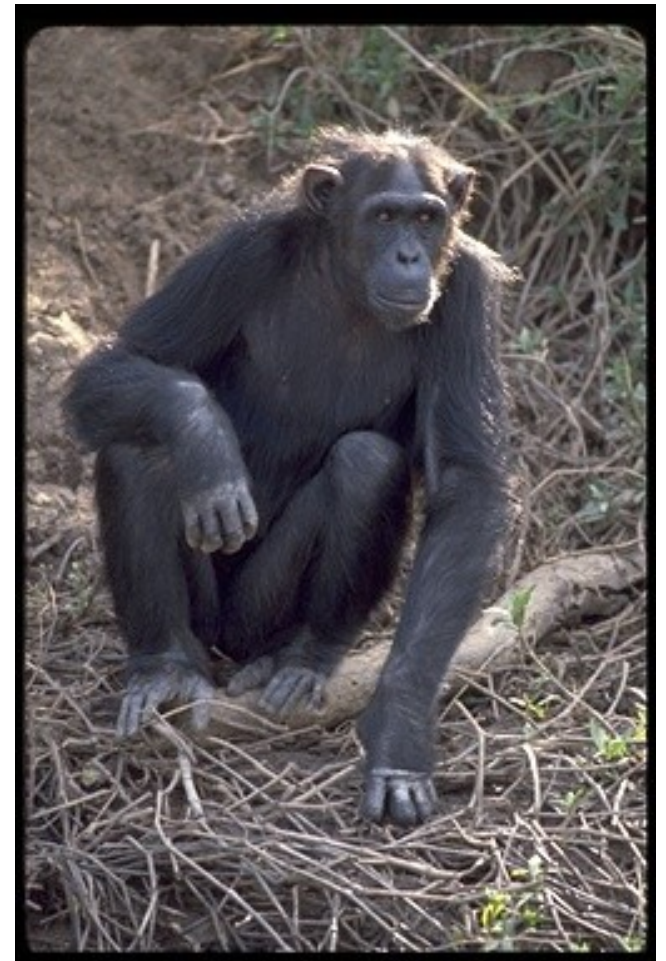
Observed thousands of examples of *reciprocal altruism* among captive chimpanzees

You feed me; I'll feed you

You groom me; I'll groom you



What de Waal calls
reciprocal altruism



[NCBI]

De Waal's argument

Cooperation + memory → *reciprocal* altruism

Reciprocal altruism + sympathy → *true* altruism

De Waal thinks primates, possibly elephants & whales understand needs of conspecifics

Thinks human morality may have evolved from similar origins

Michael Shermer

Calls cooperative behavior in (nonhuman) animals
premoral behavior

Thinks morality requires understanding of right
and wrong

But

De Waal gives anecdotes where apes seem
to punish one another for “wrong” actions

Marc Bekoff and Jessica Pierce

(biologist and philosopher)

Some animals have moral understanding

Primates

Social carnivores

(wolves, coyotes, hyenas)

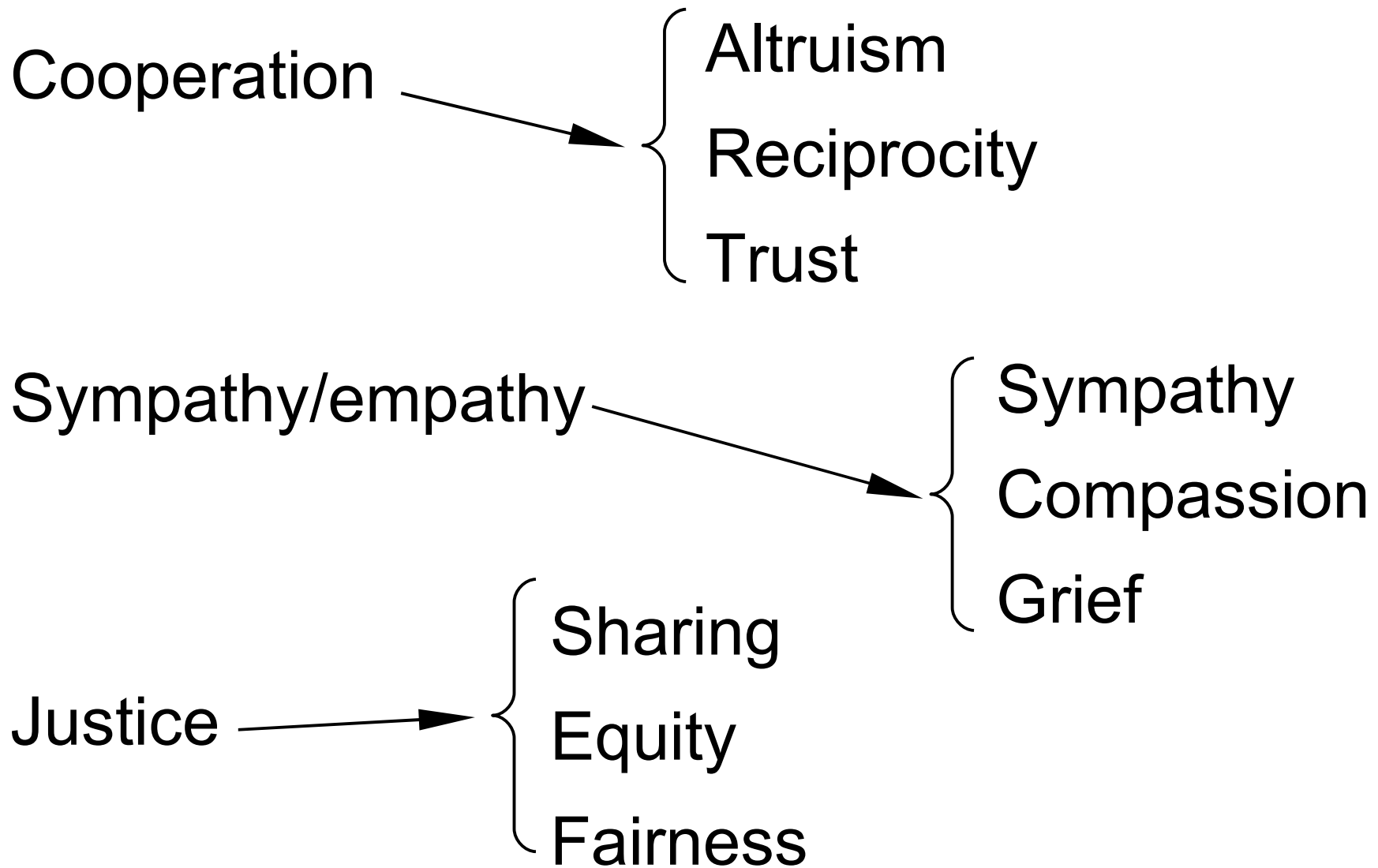
Cetaceans

Certain rodents

} All herd animals



Clusters of behaviors



At least rudiments of morality in nonhuman animals

Back to Francis Collins

Morality could not have evolved unaided

Compare with

Eye is so complex it could not
have evolved unaided

[See the Sidney Harris cartoon,
“Then a Miracle Occurs,” here
<http://www.sciencecartoonsplus.com/pages/gallery.php>]

Collins’s argument is

God-of-the-gaps argument

Argument from incredulity

Form of intelligent-design creationism

Conclusion: Did human morality evolve?

Yep!

Imperfectly as always, but it evolved

Shameless self-promotion by author

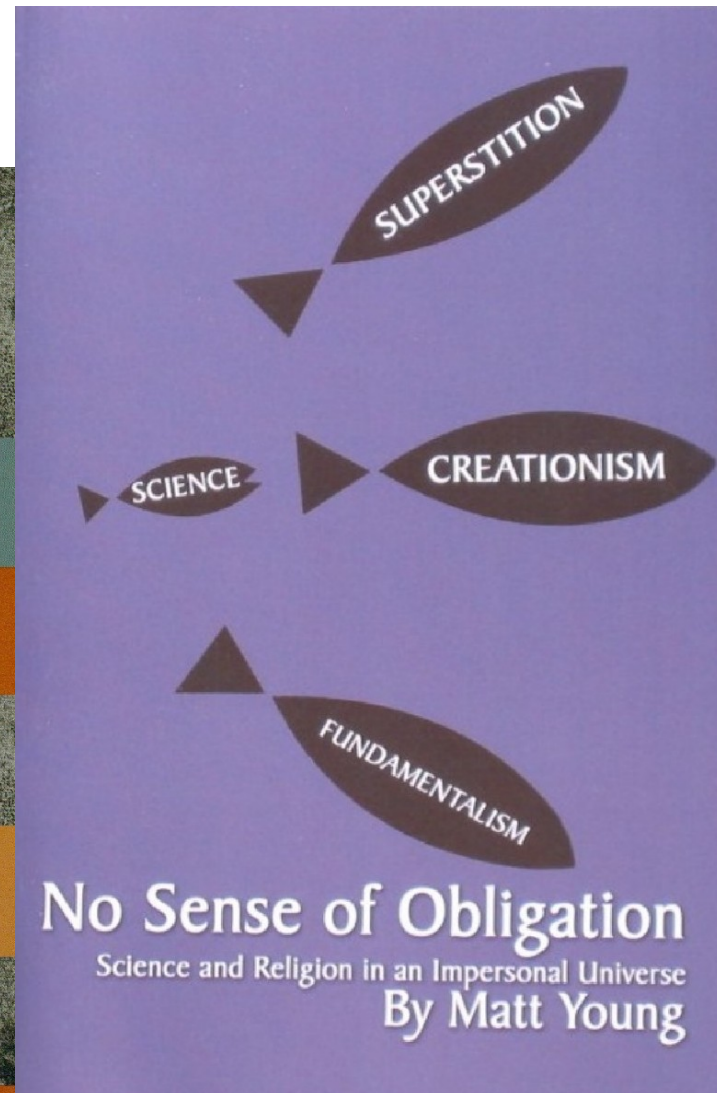
WHY EVOLUTION WORKS
(AND CREATIONISM FAILS)

Matt Young and Paul K. Strode

Why Intelligent Design Fails

A Scientific Critique
of the
New Creationism

Edited by Matt Young and Taner Edis



References.

Bekoff, Marc, and Jessica Pierce. 2009. *Wild Justice: The Moral Lives of Animals*. Chicago: University of Chicago Press.

Bleske-Rechek, April, Lyndsay A. Nelson, Jonathan P. Baker, Mark W. Remiker, Sarah J. Brandt. 2010. "Evolution and the Trolley Problem," *Journal of Social, Evolutionary, and Cultural Psychology* 4 (3), 115-127. Figures used with permission.

Berkman, Michael, and Eric Plutzer. 2010. *Evolution, Creationism, and the Battle to Control America's Schools*. New York: Cambridge University Press.

Choi, Jung-Kyoo, and Samuel Bowles. 2007. "The Coevolution of Parochial Altruism and War." *Science* 318, 636-640.

Collins, Francis. 2006. *The Language of God: A Scientist Presents Evidence for Belief*. New York: Simon & Schuster.

De Waal, Frans. 1996. *Good-Natured: The Origins of Right and Wrong In Humans and Other Animals*. Cambridge, Massachusetts: Harvard University Press.

Shermer, Michael. 2004. *The Science of Good and Evil: Why People Cheat, Gossip, Care, Share, and Follow the Golden Rule*. New York: Henry Holt.

Strassmann, Joan E., and David C. Queller. 2007. "Altruism among Amoebas." *Natural History*. Vol. 116, No. 7, pp. 24-29. <http://www.ruf.rice.edu/~evolve/pdf/2007/StrasQuelNatHist0907.pdf>. Accessed 12 February 2011.

Young, Matt. 2001. *No Sense of Obligation: Science and Religion in an Impersonal Universe*. Bloomington, Indiana: 1stBooks Library.

Young, Matt, and Paul K. Strode. 2009. *Why Evolution Works (and Creationism Fails)*. New Brunswick, New Jersey: Rutgers University Press.

Photograph of amoebas copyright M.J. Grimson & R.L. Blanton, Biological Sciences Electron Microscopy Laboratory, Texas Tech University. <http://dictybase.org/Multimedia/LarryBlanton/index.html>. Accessed 12 February 2011.