

Highly-creative baby-breeding idea propagators



what human (re)productive choices
mean for the future of our species

A scientist among creatives



I have taught courses in:

- ★ Ecology
- ★ Evolution
- ★ The Evolution of Cooperation
- ★ The Evolution of Sex
- ★ The Evolution of Play
- ★ The Evolution of Music
- ★ Behavioral Ecology
- ★ Human Evolution

Pratt

*School of Liberal Arts & Sciences
Department of Mathematics & Science*

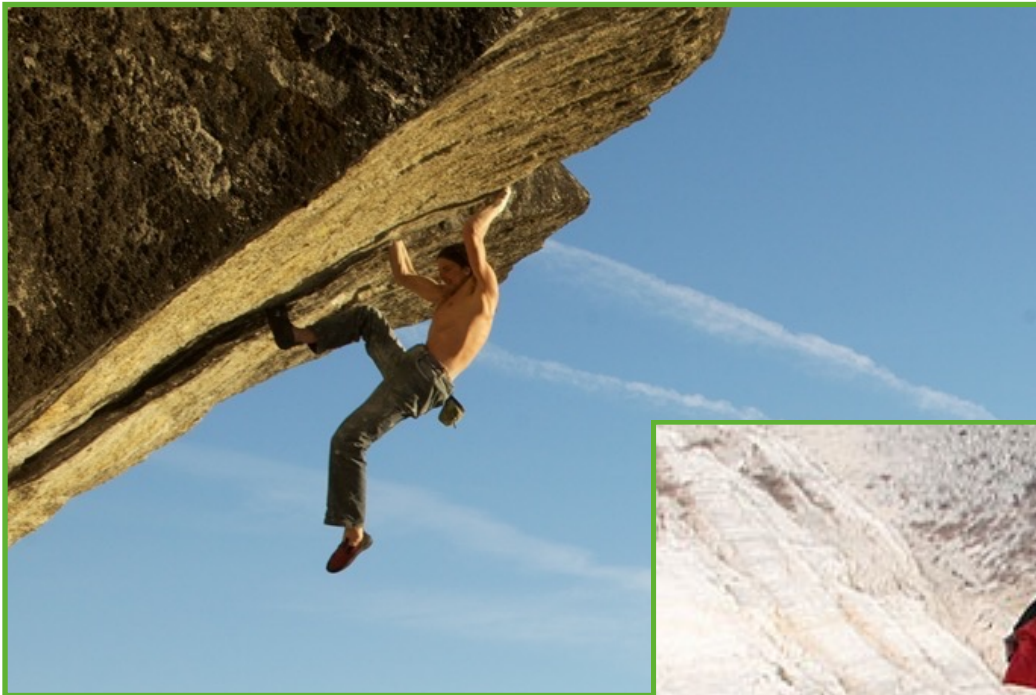
WARNING:

Portions of this presentation have the potential to offend, as I will be talking about...

- ★ The choice of whether or not to have children (and how many)
- ★ The genetic evolution of humans
- ★ The cultural evolution of humans

Inexplicable behaviors

Source: fiveten.com



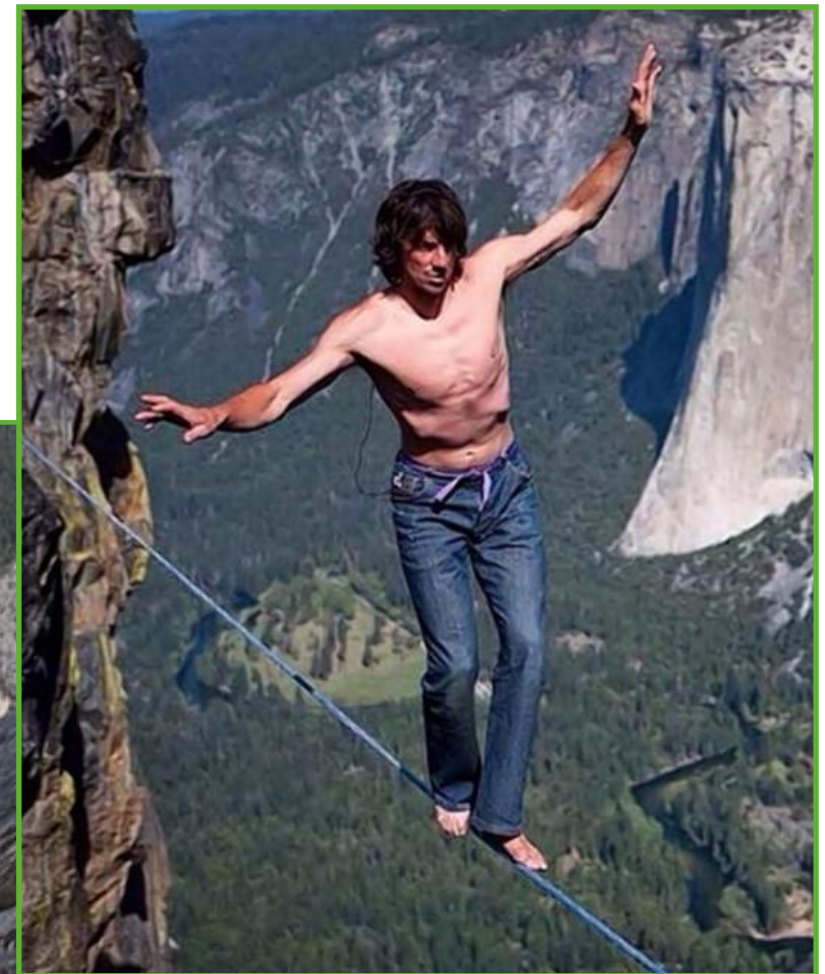
Free soloing

Dean Potter
self-described
“aerialist”

Wingsuit
BASE
jumping



Source: buildering.net



Source: nydailynews.com

Highlining

Extreme behaviors are risky...

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Dean Potter Killed in BASE-Jumping Accident

The climbing great died Saturday while attempting a wingsuit flight from Yosemite's Taft Point

By: Grayson Schaffer May 17, 2015



On the trail,
you're an animal.

Most Popular

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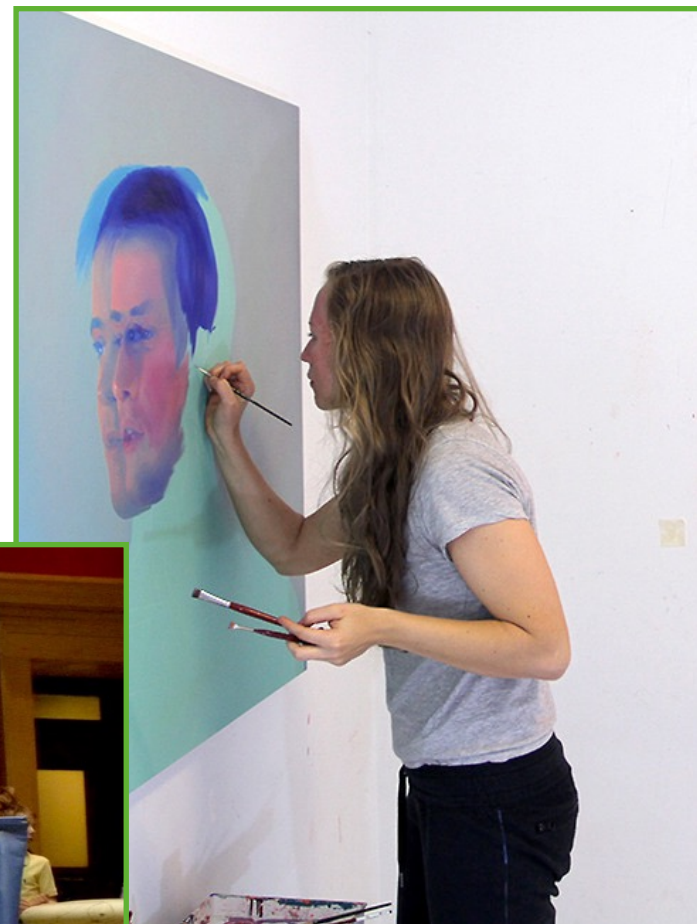
What seems surprising about Dean Potter's activities?



Why are Dean Potter's activities surprising to evolutionary biologists?

★ He failed to leave any offspring!

Plenty of us pursue our passions in lieu of pursuing parenthood



Plenty of us pursue our passions in lieu of pursuing parenthood

“Eighty-three countries had below-replacement fertility during 2010-2015, and in 25 of those countries, fertility was below 1.5 children per woman.”

- U.N. World Population Prospects Report

2014
birth rates

South Korea = 1.25

Singapore = 0.80

Cuba = 1.46

Ukraine = 1.30

Denmark = 1.73

Costa Rica = 1.91

Japan = 1.40

Azerbaijan = 1.91

U.K. = 1.90

Iran = 1.85

Paraguay = 1.96

China = 1.55

Three evolutionarily significant human (re)productive behaviors

- B** Breeding
- P** Propagating
- C** Creating

Breeding



“breeding” is about passing on genes

Breeding

Genes evolve

“success”



genes

Possible reasons for differential reproductive success:

- ★ survival?
- ★ ability to find a mate?
- ★ parental ability?



“failure”



genes

0

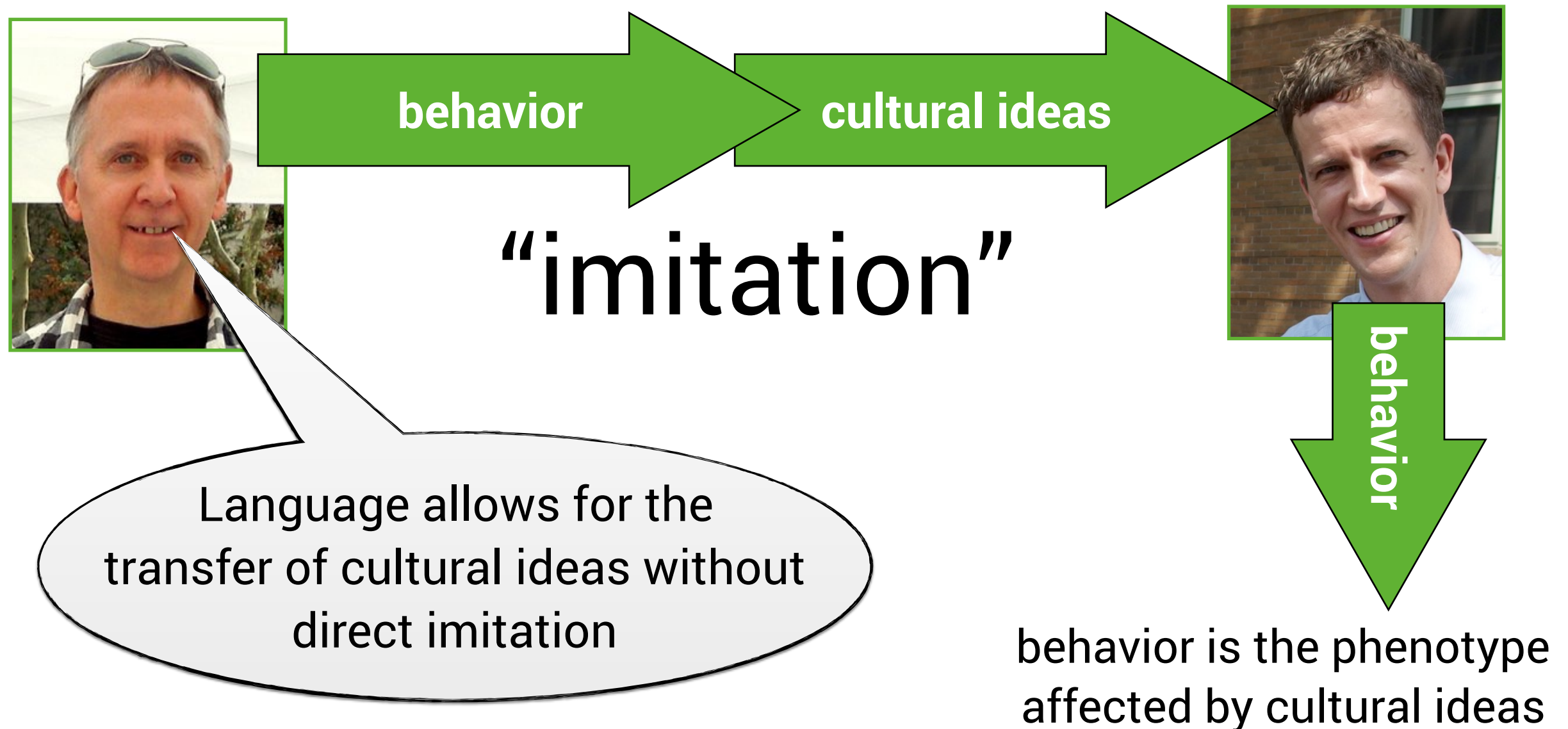
“breeding” is not “parenting”

How do we conceptualize parenting?

- ★ Parenting is about assuring the health and welfare of dependent children (*biological survival*)
- ★ Parenting is about teaching dependent children skills and values (*passing on culture*)

Propagating

What is culture? Where is culture?



Propagating

Animals that learn from their environment



Animals that imitate
innovations of others



“cumulative culture”

Humans who can build
on the innovations of others



Propagating

*The power of
cumulative culture*

Imitation without
novel innovation

Accumulation of
cultural innovations



*Lower paleolithic
3.3Ma to 300 ka*



*Upper paleolithic
40ka to 10 ka*

Propagating

Culture evolves

“success”



cultural ideas

Possible reasons for differential cultural success:

- ★ social connections?
- ★ prestige?
- ★ popularity?
- ★ perceived value?



“failure”

cultural ideas



behavior



behavior



behavior

Propagating

What about material culture?

a tool

(product of culture)



Propagating

Culture can be “mutualistic” or “parasitic” to biology



use antibiotics for infection

cultural ideas



genes



go wingsuit BASE jumping

cultural ideas



genes

0

"failure"

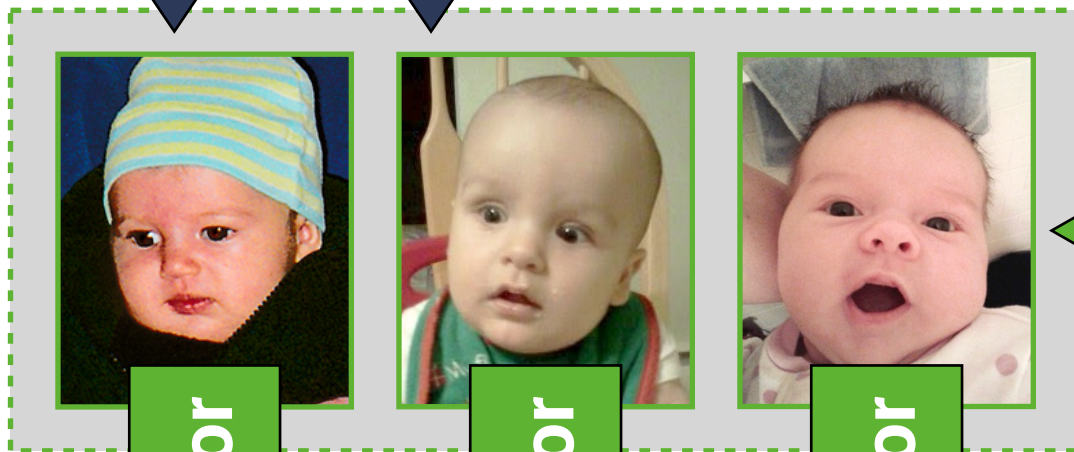
genes

culture

Propagating

*Culture is propagated
both vertically and
horizontally*

peers,
celebrities,
media
"success"



behavior

behavior

behavior

culture



*it is possible to be
culturally successful
without having offspring*

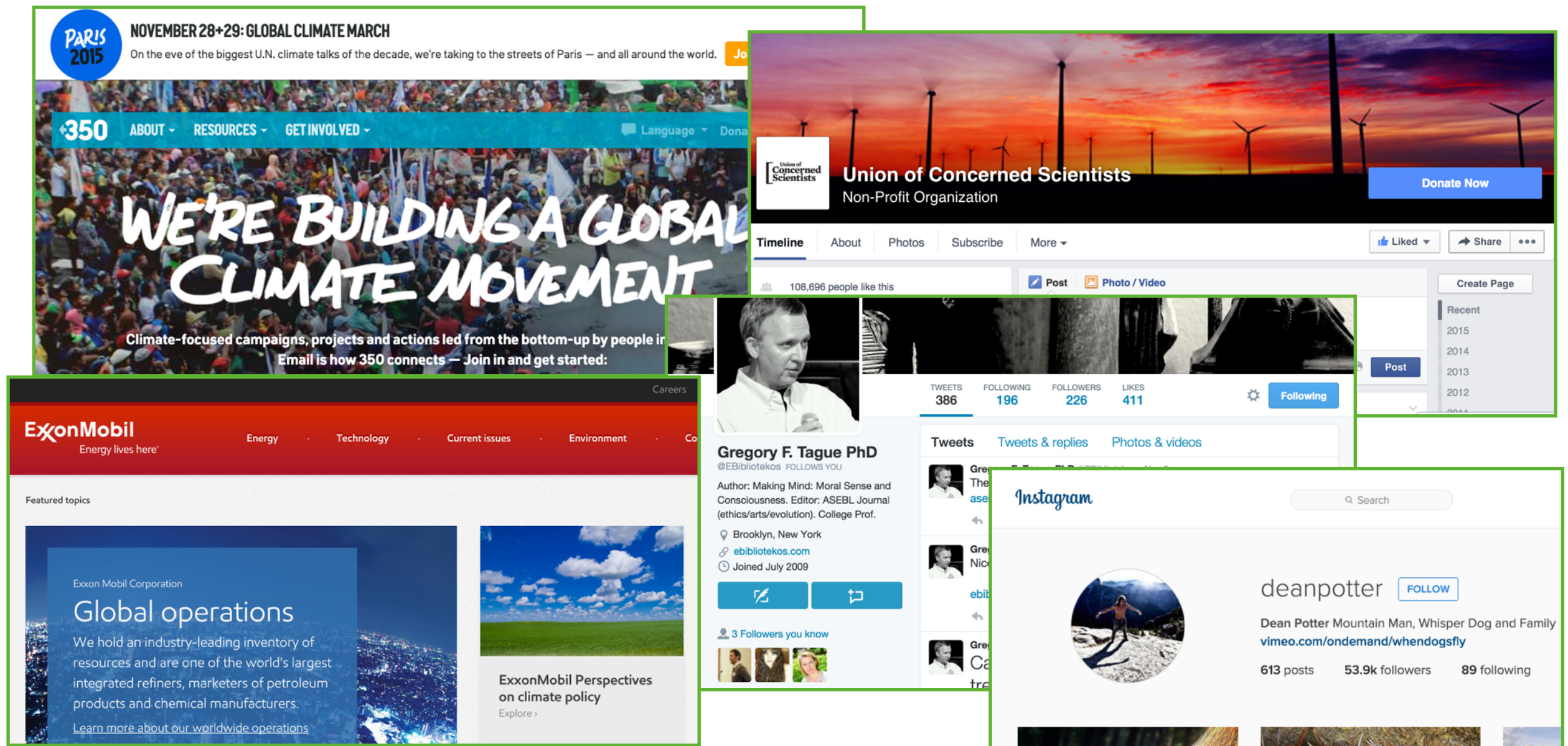


CHRISTOPHER X J. JENSEN

Associate Professor, Pratt Institute

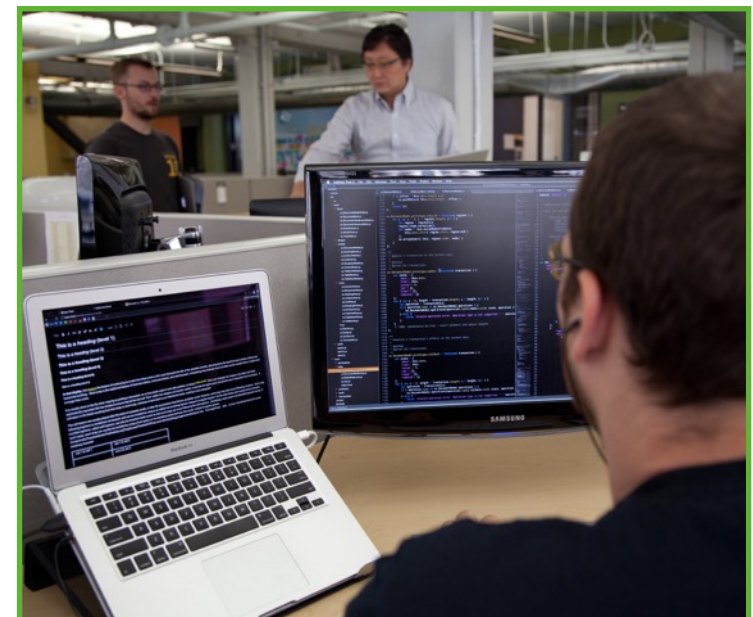
Propagating

The internet is a horizontal propagation engine



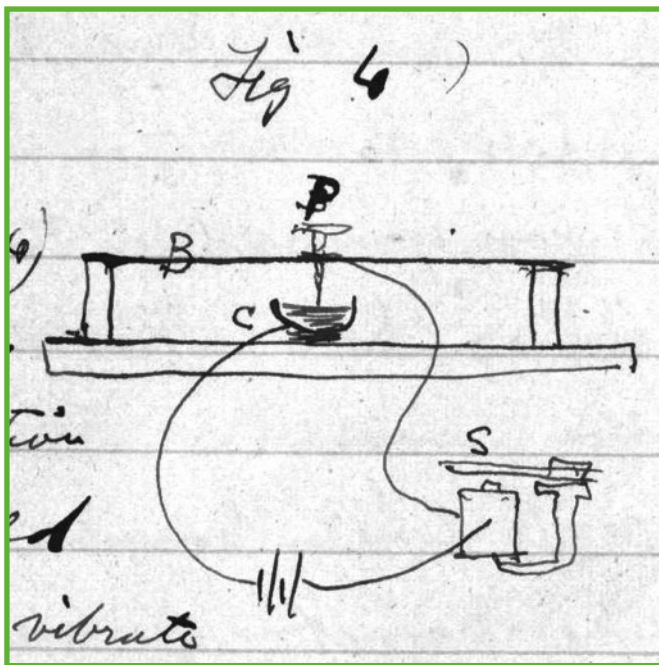
Creating

What makes these
“creative” endeavors?



Creating

adding novel ideas to existing culture



unlike mutations,
novel cultural
variants can be the
product of intent



cultural variation
is what makes
cultural
evolution
possible



our propensity for creating new cultural variants
drives the rapid pace of cultural evolution

A behavioral trade-off

Limited
resources

How to spend limited resources?
(time, materials, social connections)

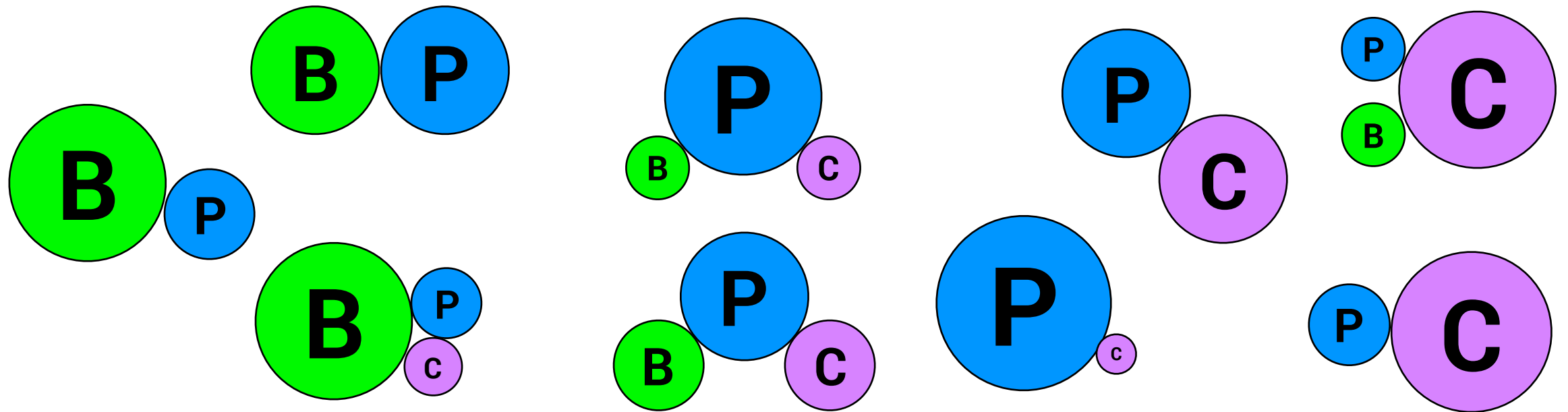
*“pure”
strategies*

**UNLIKELY/
IMPOSSIBLE**
B

MAYBE?
P

UNLIKELY
C

“mixed” strategies

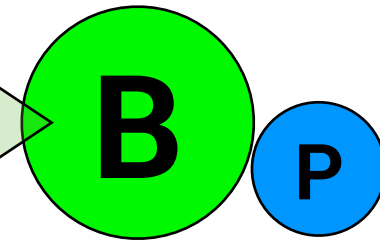


An unstable configuration?

Our current civilization would be unstable if...

People with
Genotype B

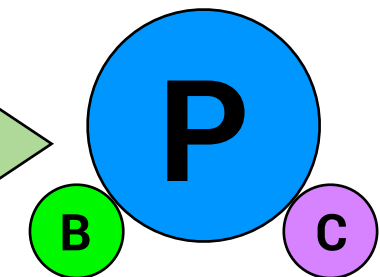
are most likely to pursue this strategy



GENETICS COULD NOT BE THIS SIMPLE BUT...

People with
Genotype P

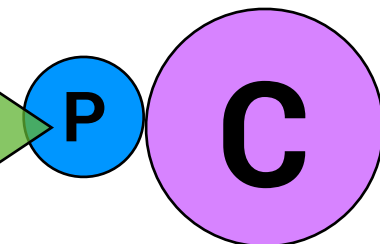
are most likely to pursue this strategy



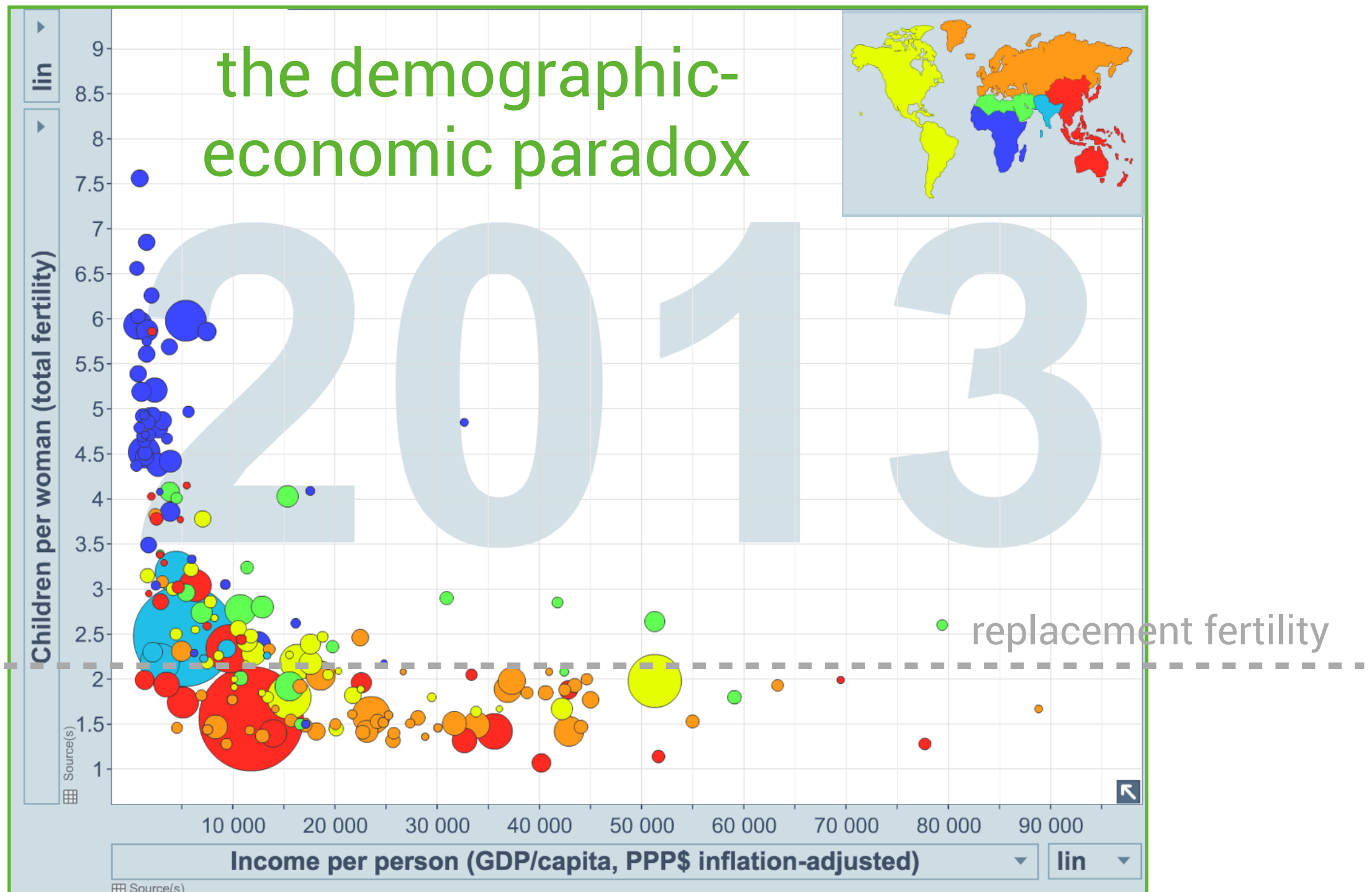
...THAT DOESN'T PRECLUDE GENETIC INFLUENCE

People with
Genotype C

are most likely to pursue this strategy



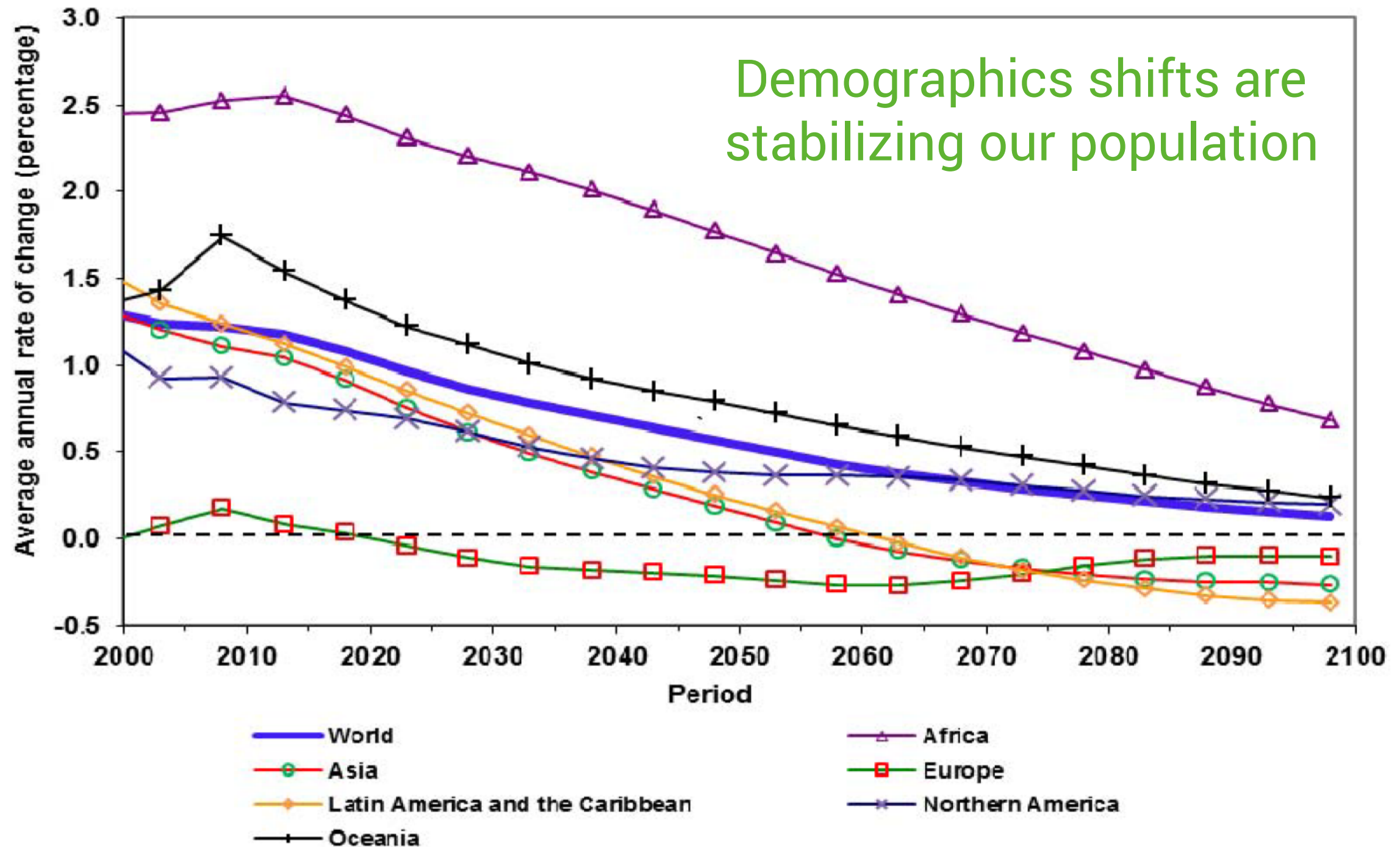
Who's breeding?



Who's breeding?

Region	Children per Woman 2005-2010	Children per Woman 2010-2015
Africa	4.90	4.70
Asia/Oceania	2.30	2.20
Latin America & the Caribbean	2.30	2.15
North America	2.00	1.86
Europe	1.55	1.60

Who's breeding?

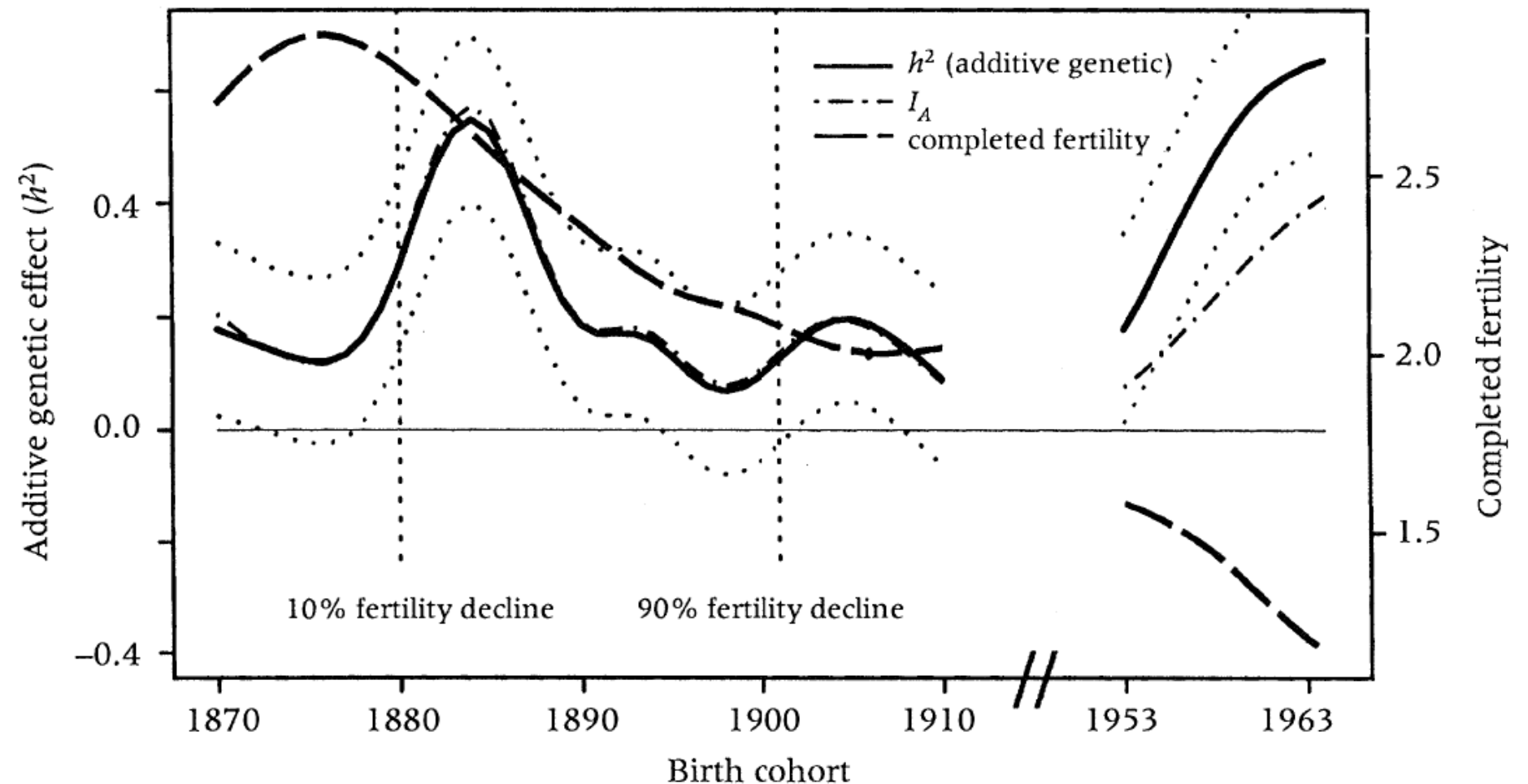


Who's breeding?

Within-population variation may have a more significant effect on biological evolution

Is Fertility Behavior in Our Genes? Findings from a Danish Twin Study

HANS-PETER KOHLER
JOSEPH L. RODGERS
KAARE CHRISTENSEN



Heritability of fertility increases as overall fertility declines

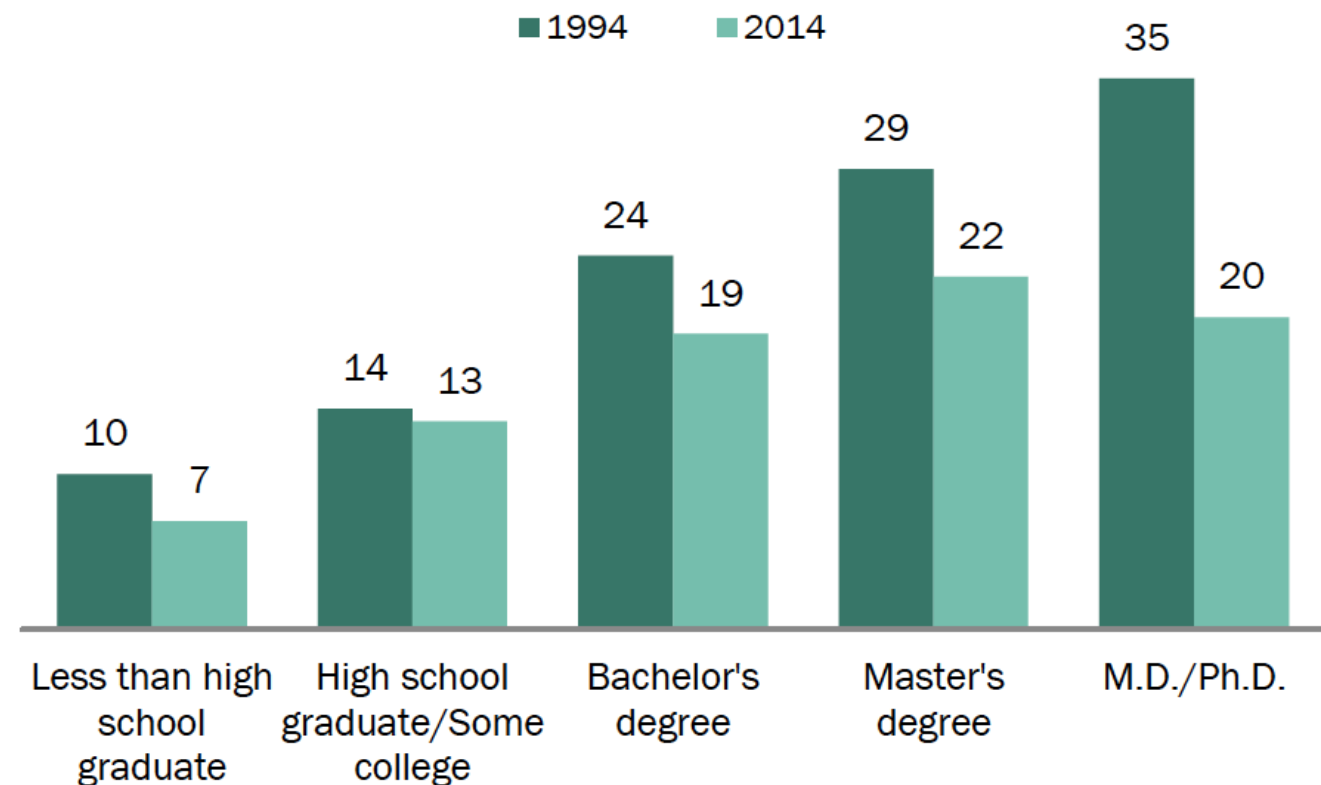
Who's breeding?

Within-population variation may have a more significant effect on biological evolution

Pew Research Center

For the Highly Educated, Dramatic Declines in Childlessness

% of women ages 40 to 44 who are childless



Educational attainment is becoming less predictive of fertility

Who's breeding?

Within-population variation may have a more significant effect on biological evolution

National Health
Statistics Reports

Like continental
data, these
trends don't
confirm any sort
of genetic
selection

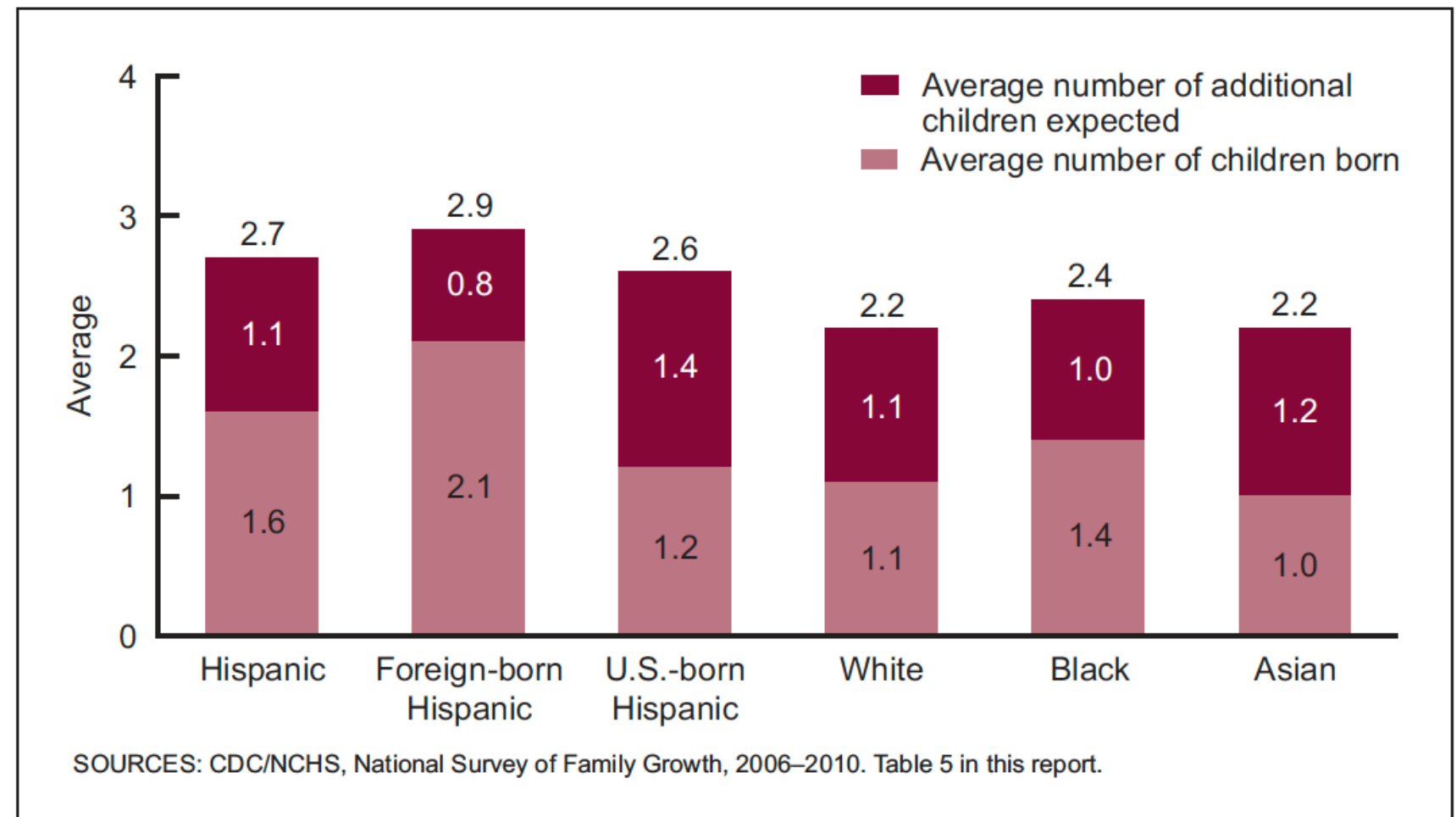
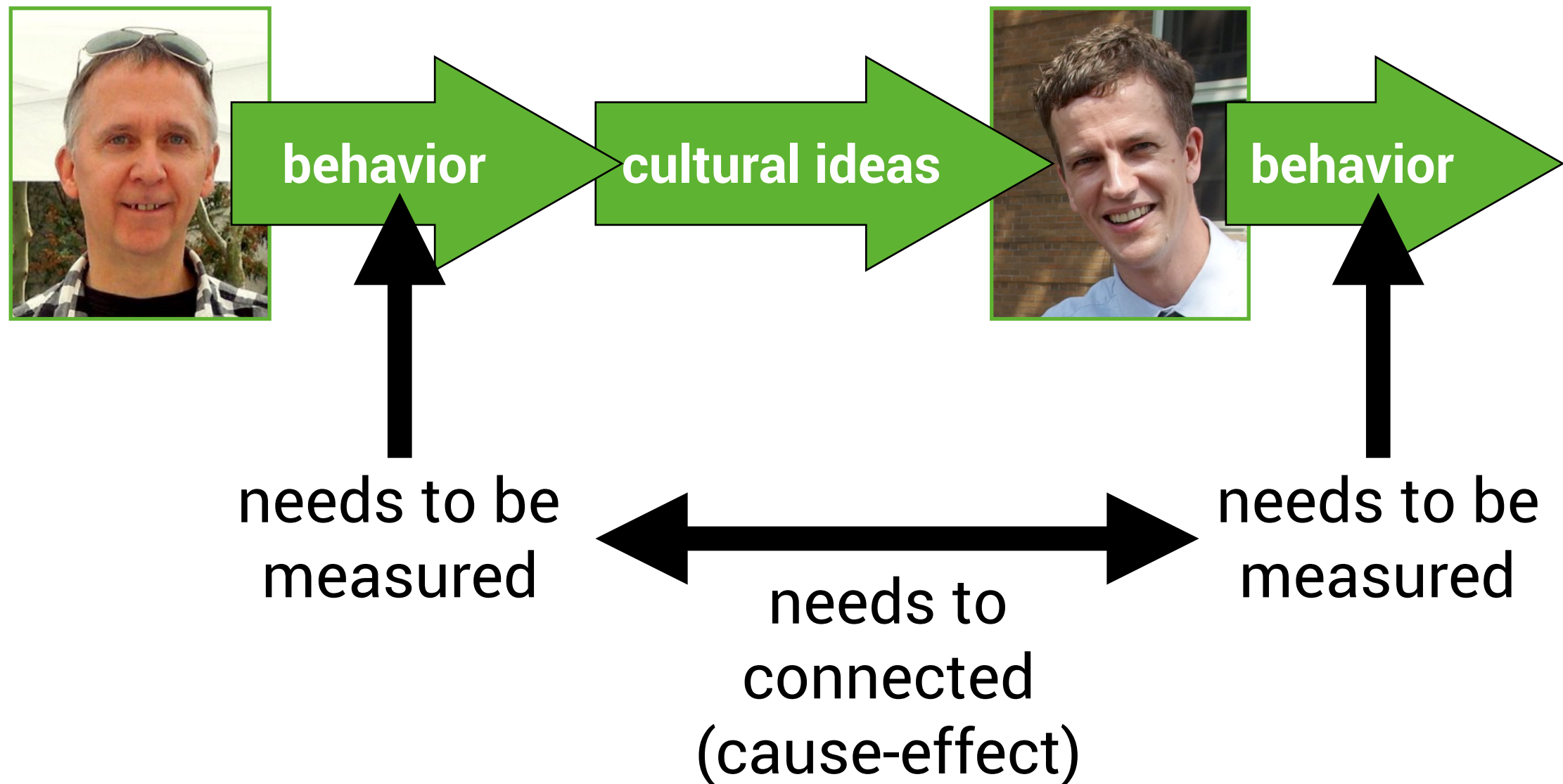


Figure 2. Average number of children born, additional children expected, and total births expected for women aged 15–44 years, by Hispanic origin and race: United States, 2006–2010

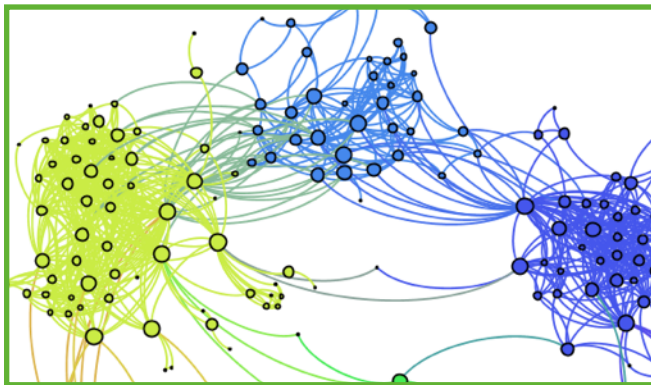
Who's propagating?

"Cultural fitness" is not easy to measure



Who's propagating?

What are some reasonable proxies for "cultural fitness"?



Social connection defines the potential for propagation, so looking at social networks is a good start



Change in population prevalence of a behavior whose origin is known



Patterns of change in behavior - evidence of "net export" of culture

Who's propagating?

Religious beliefs in the United States

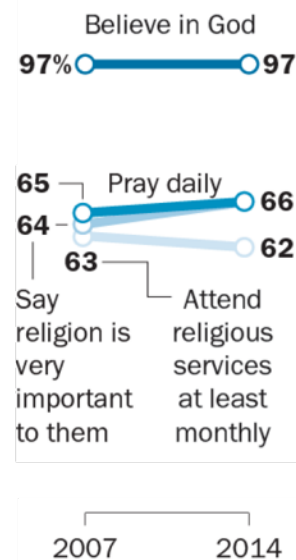
How does religiosity affect fertility?

Importance of Religion	Fertility
Very	2.3
Somewhat	2.1
Not	1.8

How the U.S. Public Became Less Religious

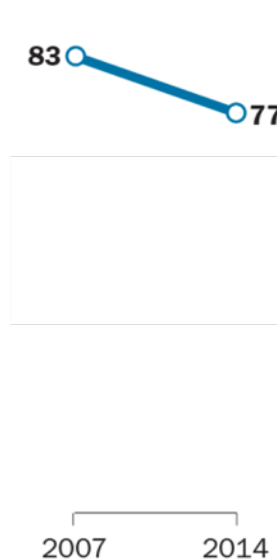
As of 2014, the religiously affiliated are, by and large, about as religious as they were in 2007 ...

Among the religiously affiliated



... but the percentage of adults who describe themselves as religiously affiliated has shrunk.

% of adults who are religiously affiliated



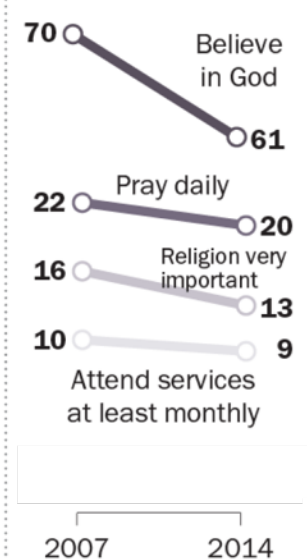
At the same time, the percentage of adults who are religiously unaffiliated has jumped about 7 points ...

% of adults who are religiously unaffiliated



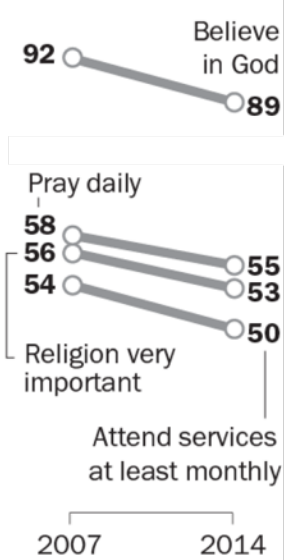
... and the "nones" have become even more secular in their beliefs and practices.

Among religiously unaffiliated



The **net result** is an overall U.S. adult population that has become slightly less religious.

Among all U.S. adults

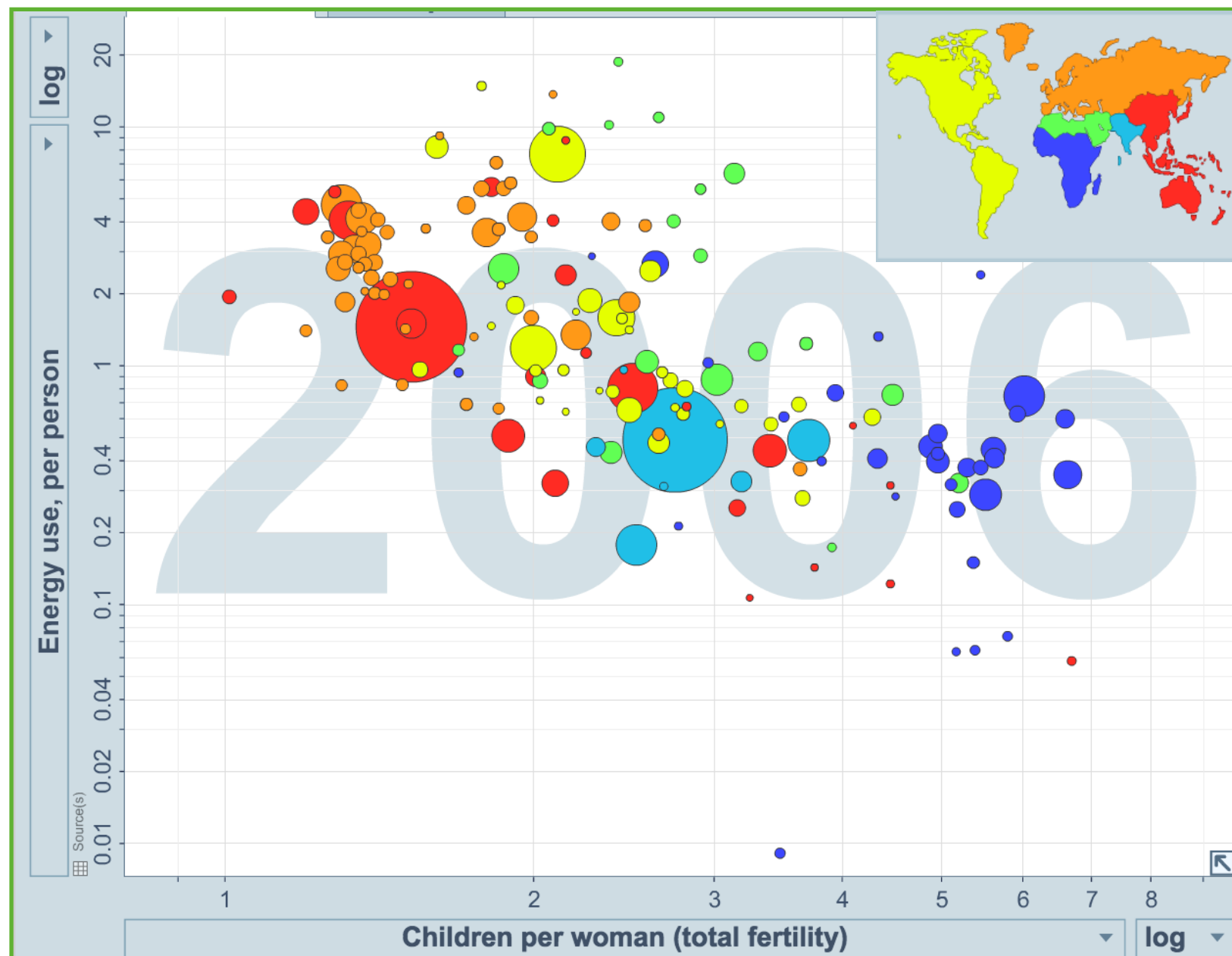


Source: 2014 Religious Landscape Study, conducted June 4-Sept. 30, 2014.

PEW RESEARCH CENTER

Who's propagating?

Much of our propagation is tied to material consumption



Who's creating?

What are some reasonable proxies for “creative fitness”?

**Martin
Prosperity
Institute**

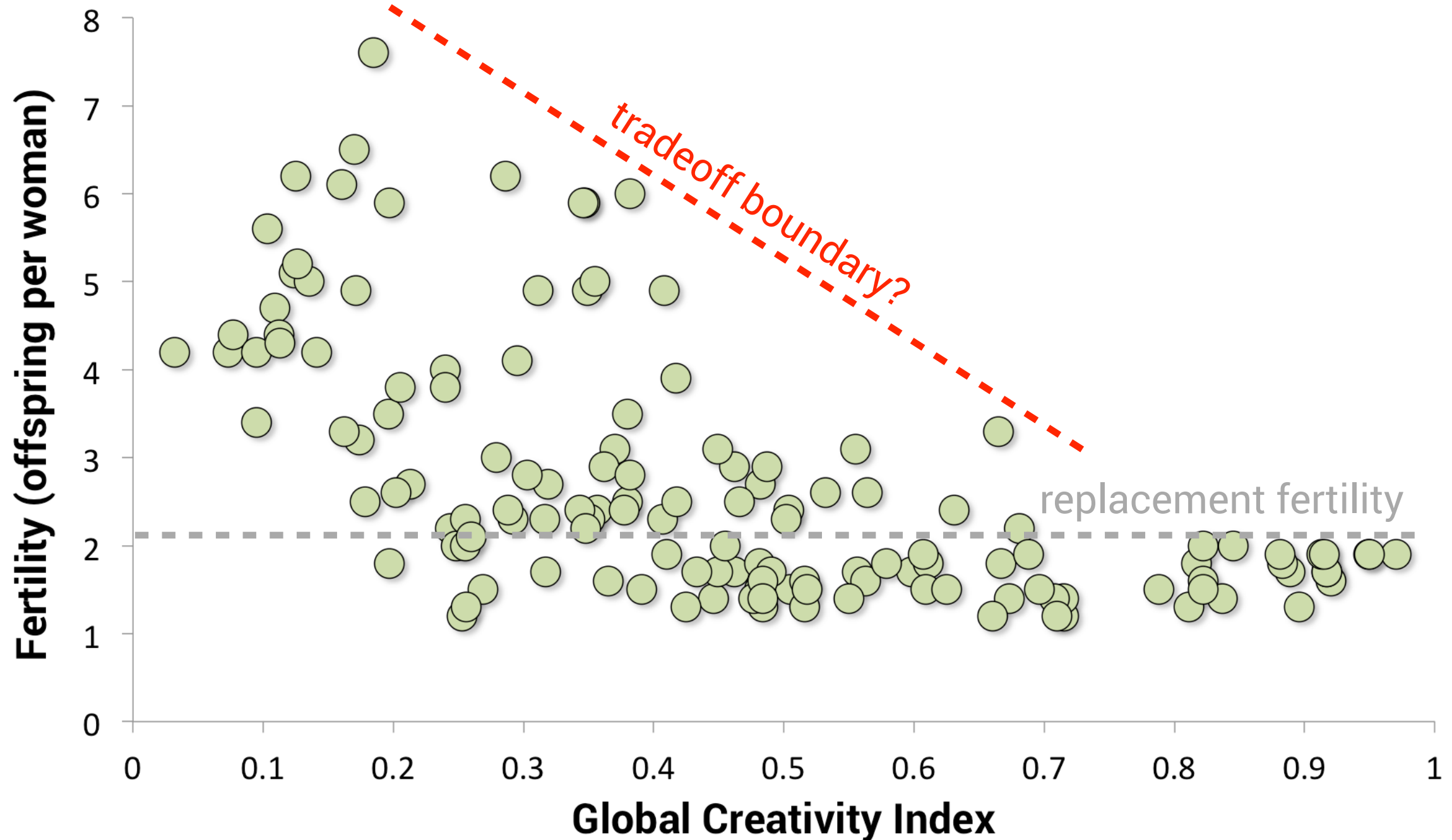


Global Creativity Index:

- ★ talent
- ★ technology
- ★ tolerance

Measured for 139 countries spanning the globe, correlates strongly with other economic measures (per capita GDP, global competitiveness, entrepreneurship)

Who's creating?



Breeding & parenting to propagate

How effectively do parents propagate culture?

RESEARCH REPORT

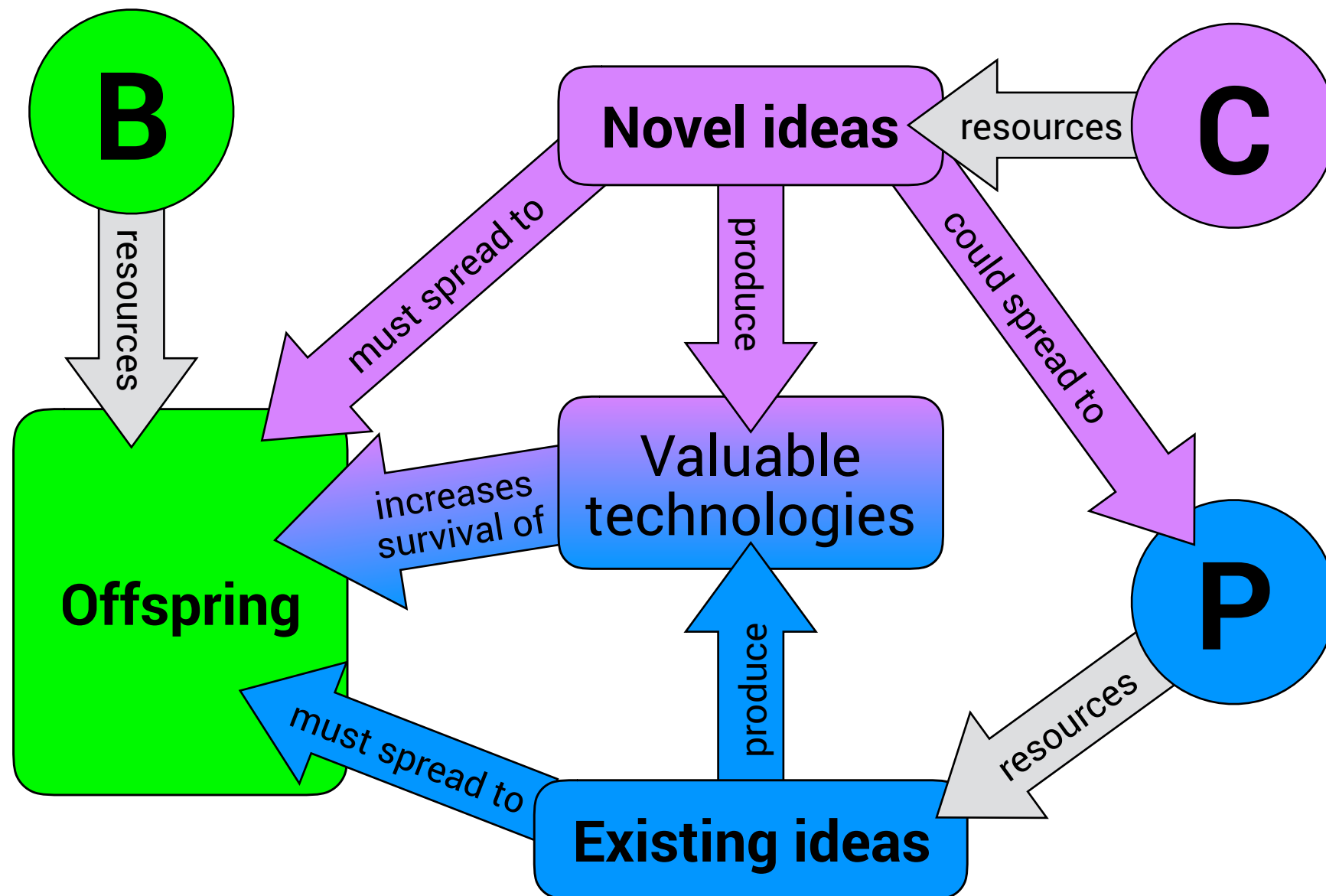
The role of genes in tobacco smoking during adolescence and young adulthood: a multivariate behaviour genetic investigation

Victoria M. White¹, John L. Hopper², Alexander J. Wearing³ & David J. Hill¹

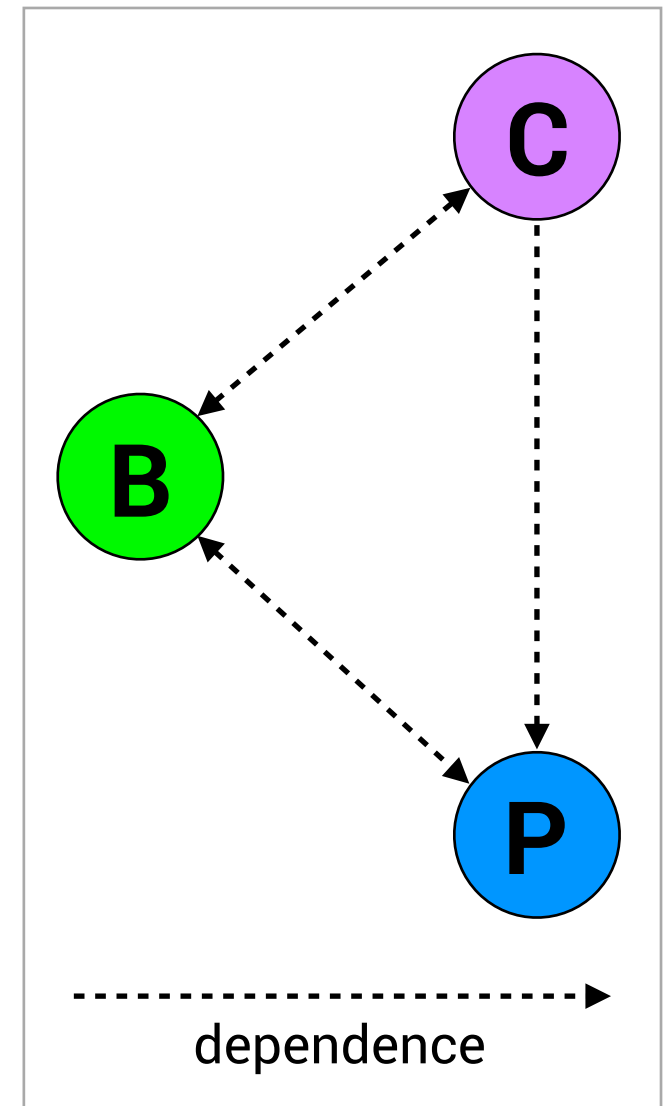
Centre for Behavioural Research in Cancer, The Cancer Council Victoria, Victoria, Australia¹, Department of Genetic Epidemiology, University of Melbourne, Parkville, Victoria, Australia² and Department of Psychology, University of Melbourne, Parkville, Victoria, Australia³

“peers, and not parents, have the major role in influencing the smoking behaviours of adolescents”

Breeders vs. propagators vs. creators



*incomplete
interdependence*



The *Biocultural Paradox*: Who's exploiting whom?

Thoughts or questions?

www.cxjj.us