

# Evidence for Costly Signaling

Aside:

- last problem set was hard
- especially for those without programming background
- goal is to teach you valuable tools and insights NOT penalize you for not knowing a tool!
- please chat with us if worried. Please! We want you to enjoy class and get grade deserve not be miserable!

-Don't worry

- goal is for you to learn
- won't get bad grade in class just bc that assignment (drop lowest pset!)
- next simulation will give you related code to tweak
- will NOT be penalized for having no programming background (albeit might work a bit more!)

-Was important lesson

- we don't believe in busy work!
- Simulating replicator really powerful tool
- results insightful on h-d-b game
- Zoe will do review session where go over solutions

-were resources available

- Zoe went through VERY similar code
- Zoe is ALWAYS available by email
- Erez and I are (usually) available by email
- should be working in pairs, and asking other classmates for help

Today:

- animal analog

- firm analog

- human aesthetics

  - white clothes

  - art

  - optimal weight

- what makes good evidence?

- why useful?

Will now show clear evidence in animals costly signaling shapes analog of “aesthetics”



- This tail is **cumbersome!**
  - Attracts predators
  - And makes it harder to escape them!
- But more cumbersome for poor flyers!

Recall, costly signaling Requires:

- Costly for all
- More costly for bad type
- Females prefer longer tails
- Better mates grow longer tails

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(Note: this is the part of the theory that is paradoxical, and hence strongest evidence for costly signaling)

Researchers caught 20 Malachite Sunbirds and split them into 3 treatment groups:

1: shortened their tails

2: tails cut, but repaired to same length

3: tails lengthened

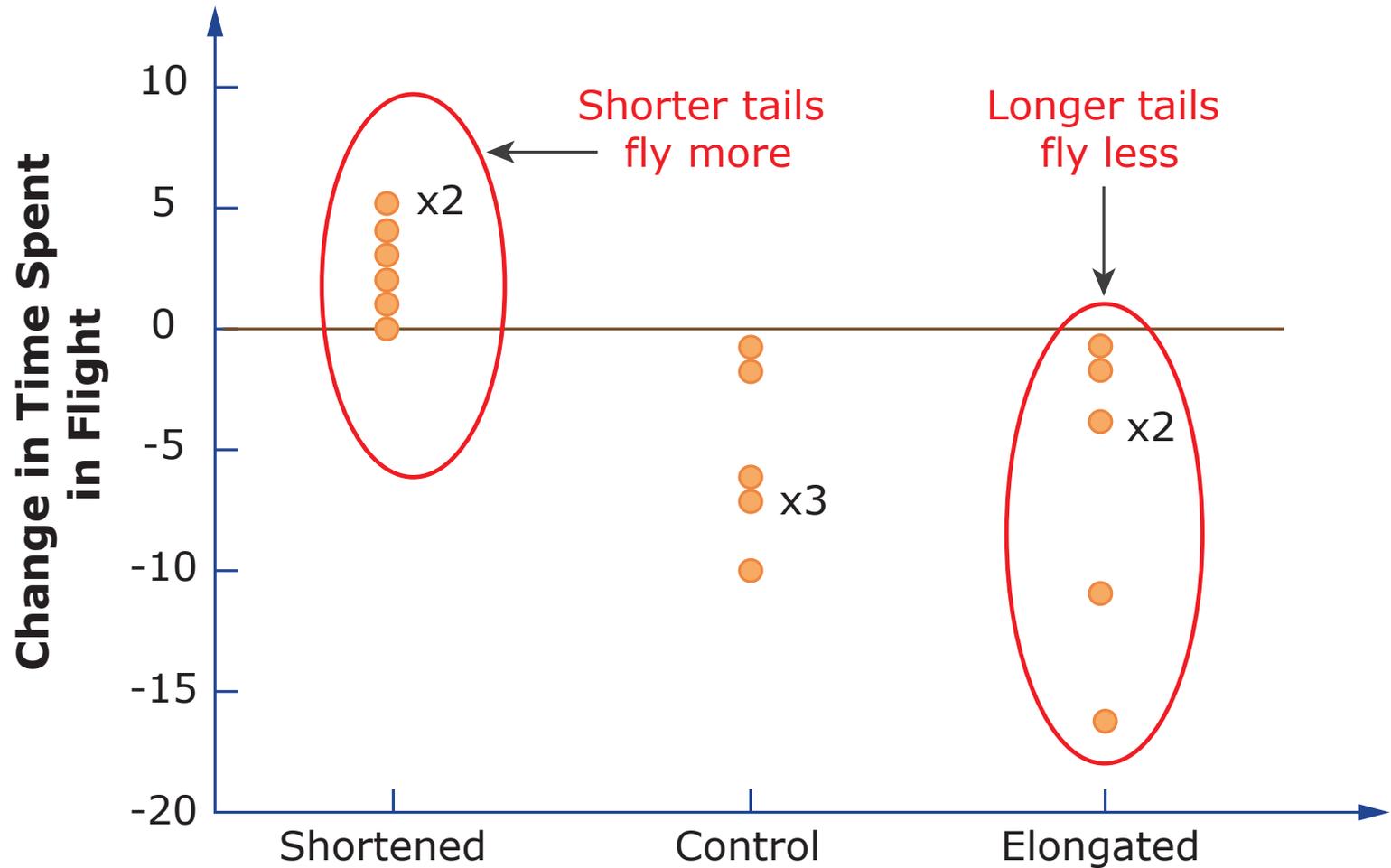


Image by MIT OpenCourseWare.

Source: Evans and Hatchwell 1992

# Shorter tails better at “hawking”

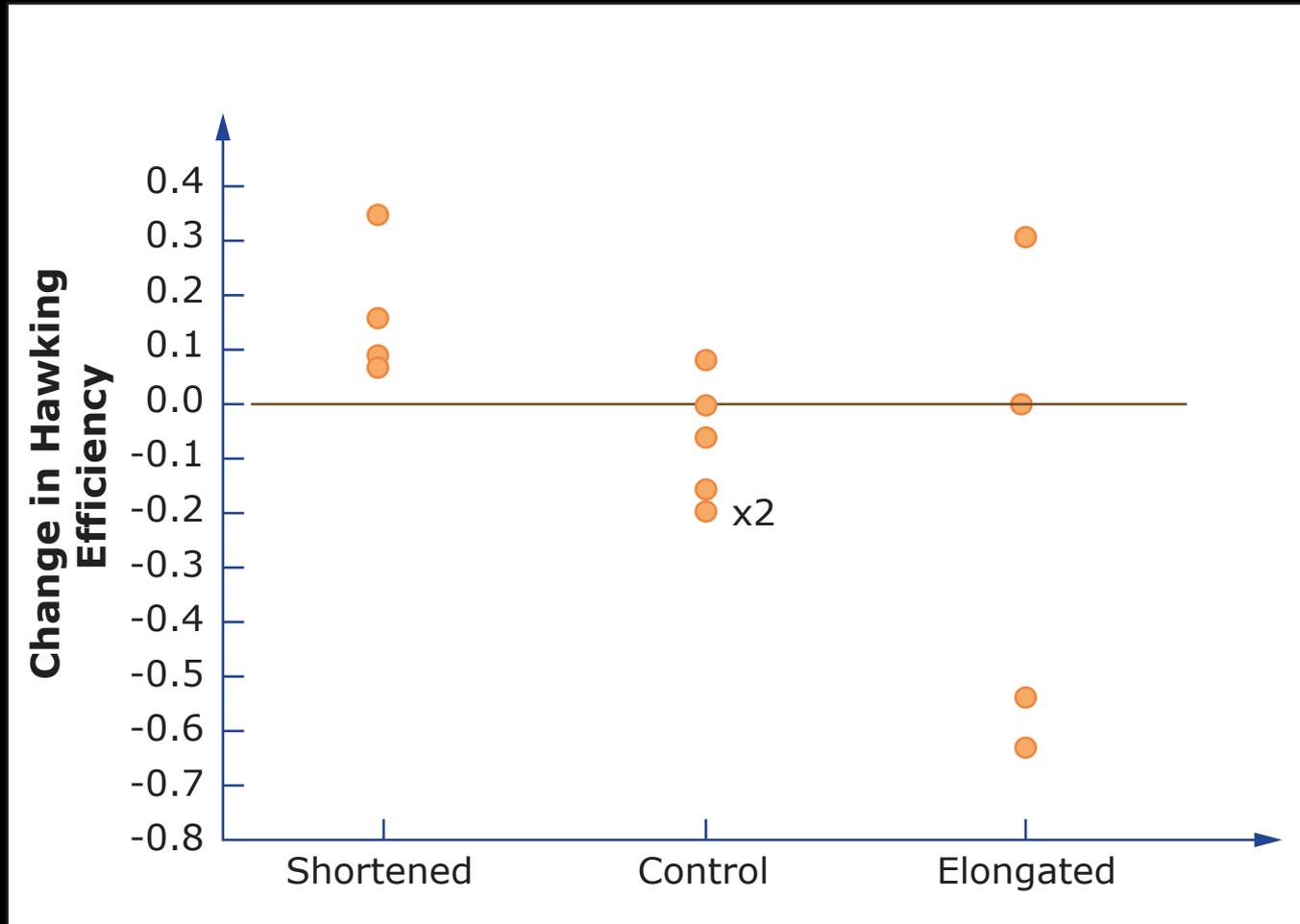


Image by MIT OpenCourseWare.

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(notice that this rules out one key alternative:  
“fisher’s runaway hypothesis”

=females like males with trait x bc then will have  
sons with trait x.

x might be costly for all, but shouldn’t be more  
costly for bad. )

Long tails more costly for unfit

This is somewhat self evident. But here's some indirect evidence:

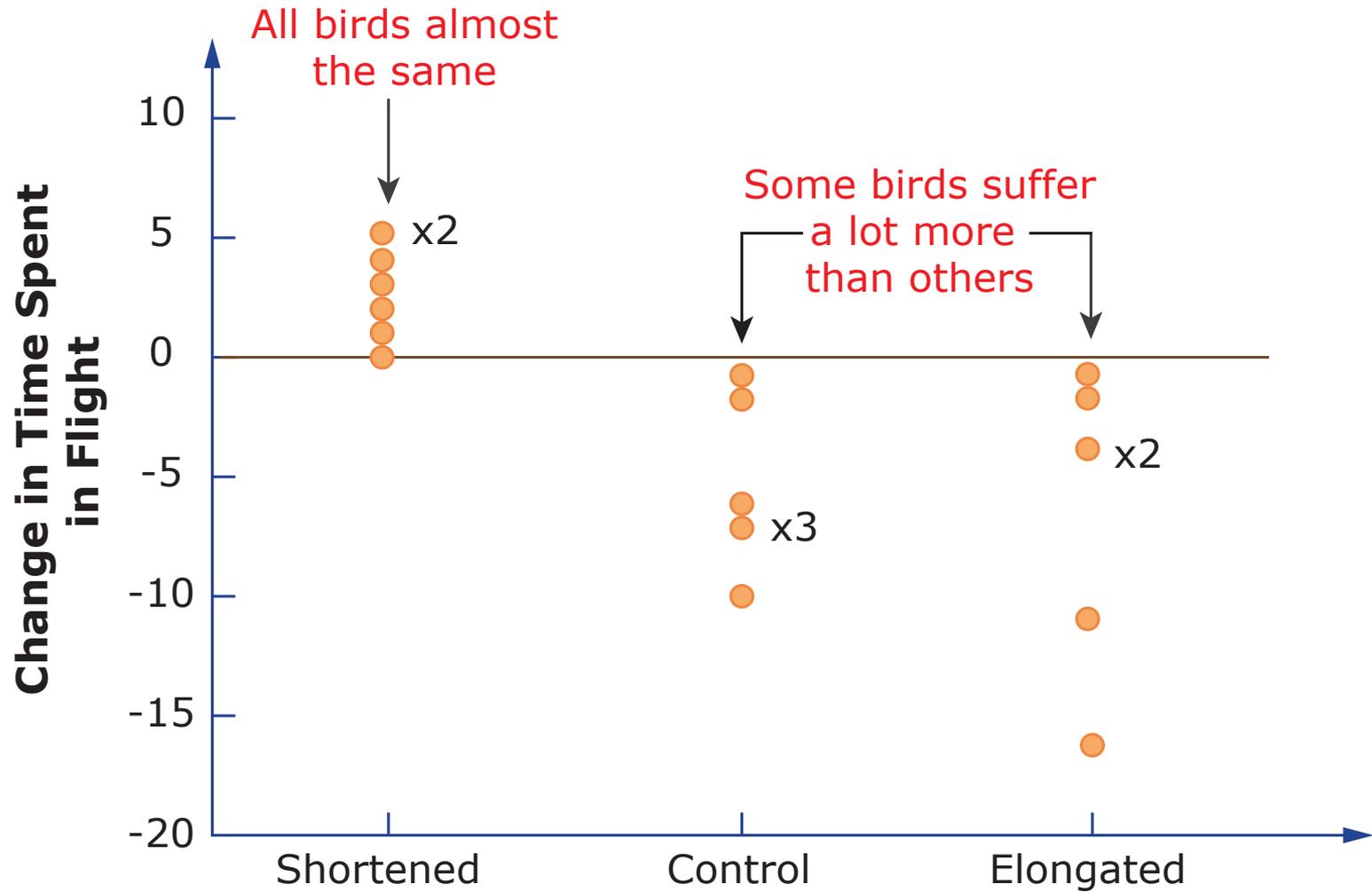


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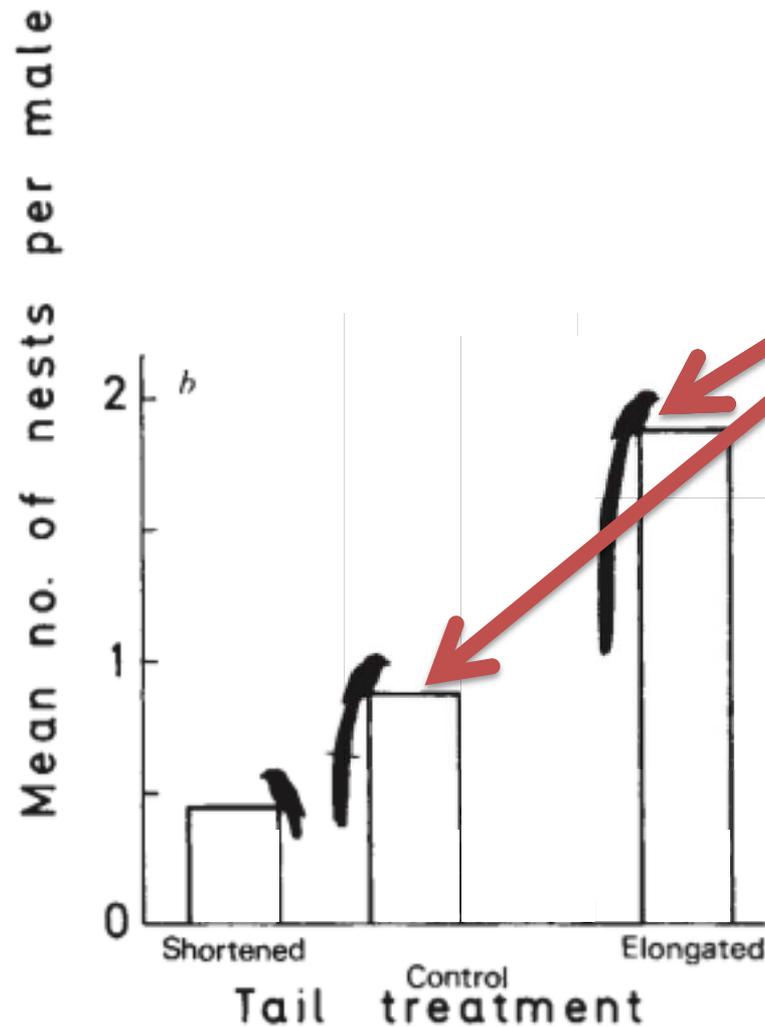
(Not strong evidence in favor of costly signaling,  
but still need to show theory consistent with  
facts)

Trapped birds and *randomly* divided them into 3 groups

Then applied the following:

- Treatment 1: shortened their tails
- Control: shortened the tails, then lengthened back to original length
- Treatment 2: lengthened their tails

The longer the tail, the more mates, even though no more fit



Reprinted by permission from Macmillan Publishers Ltd: Nature.  
Source: Andersson, Malte. "Female Choice Selects for Extreme Tail Length in a Widowbird." *Nature* 299 (1982): 818. © 1982.

What other kind of evidence could they have collected?

(also A TON of evidence for costly signaling and other animal behaviors, like bird chirping!)

What does this suggest about human aesthetics?

There is also evidence that firms are effected by costly signals

- e.g. expensive uninformative ads more likely for products where quality hard to verify, but once try, if good, continue (e.g. gum)

- huge literature in I.O.!

Why is this consistent with costly signaling? How can this be explained without? What does this teach us about aesthetics?

And some evidence in humans that could be conscious/strategic or could be learned preferences:

-e.g. spending on conspicuous (clothes), but not inconspicuous goods (chocolate) INCREASES with wealth of peer group.

-how is this consistent with costly signaling?  
What else could explain this?

What's the evidence human aesthetics driven by costly signaling?

Let's start with fingernails...

If Costly Signaling underlies Indians' preferences for long pinky nails, then:

- They should be costly for everyone
- More costly for farmers
- Beautiful to everyone
- Only grown by white-collar workers

The first two assumptions are almost certainly true. I've provided anecdotal support for the third and fourth

Providing survey or experimental evidence for these would make for a great final project!

Next, let's go back to white clothes

In men, perhaps the most conspicuous example is the white dress shirt

This certainly doesn't SEEM like a costly signal.  
We just find white beautiful!

The white shirt originated as an undergarment,  
hidden under layers of other clothes

And folks didn't wash them all that often

Until...

remarkable extent. Glimpses of it have been revealed ever since the days of the Tudors, either by slashings of the jerkin or by unbuttoning the top of the eighteenth-century waistcoat and subsequently by means of the V opening. In these ways the quality of the material, starched or frilled, was exposed to distinguish the 'gentleman' from the manual worker. The clean white shirt-cuffs were a visible proof that the wearer had no occasion to soil his hands.

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Hence, we TRY to make conspicuous. This is indirect evidence that it is about costly signaling.

And hard for everyone to keep white

And harder for poor

(And poor less likely to wear (hence: “blue collar”))

(But also consistent with other explanations like just inherently find white beautiful)

More evidence: suppose that becomes cheap for all to wear white...

Costly signaling: white becomes LESS attractive

This is counterintuitive (and hence solid evidence!)

White clothes are beautiful...especially when  
linen...not so much when polyester

“Among other properties **polyester** (PET–polyethylene terephthalate) is particularly known for its significant inherent stain resistance (excluding oily based substances). This fiber has **excellent resistance to harsh acid base dyed and natural dyed substances, and has better than average resistance to strong oxidizers (such as chlorine bleach).**”

- Source:

<http://www.blissflooring.com/bliss/about/warranties/information/~media/Files/Technical%20Support%20Information/performance/Polyester%20stain%20resist%20features%20PDF.aspx>

In fact (as further evidence fashion partly costly signaling):

“In some circles, to wear polyester is to invite unto oneself characteristics of that fabric-- cheapness, lack of status, artificiality. “

- Chicago Tribune, January 30, 1985

It's not because of how it feels. For many fabrics, polyester feels the same or better:

“Its developers can make it look like any number of expensive, natural fabrics now.”

If we go back to the study on paintings, we see that this “cheapening” effect is specific to paintings but not cars.

(again, this is EXACTLY what costly signaling would predict, and hard to reconcile with alternatives, so GOOD evidence!)

Recall...

# Researchers showed subjects two paintings

Painting A



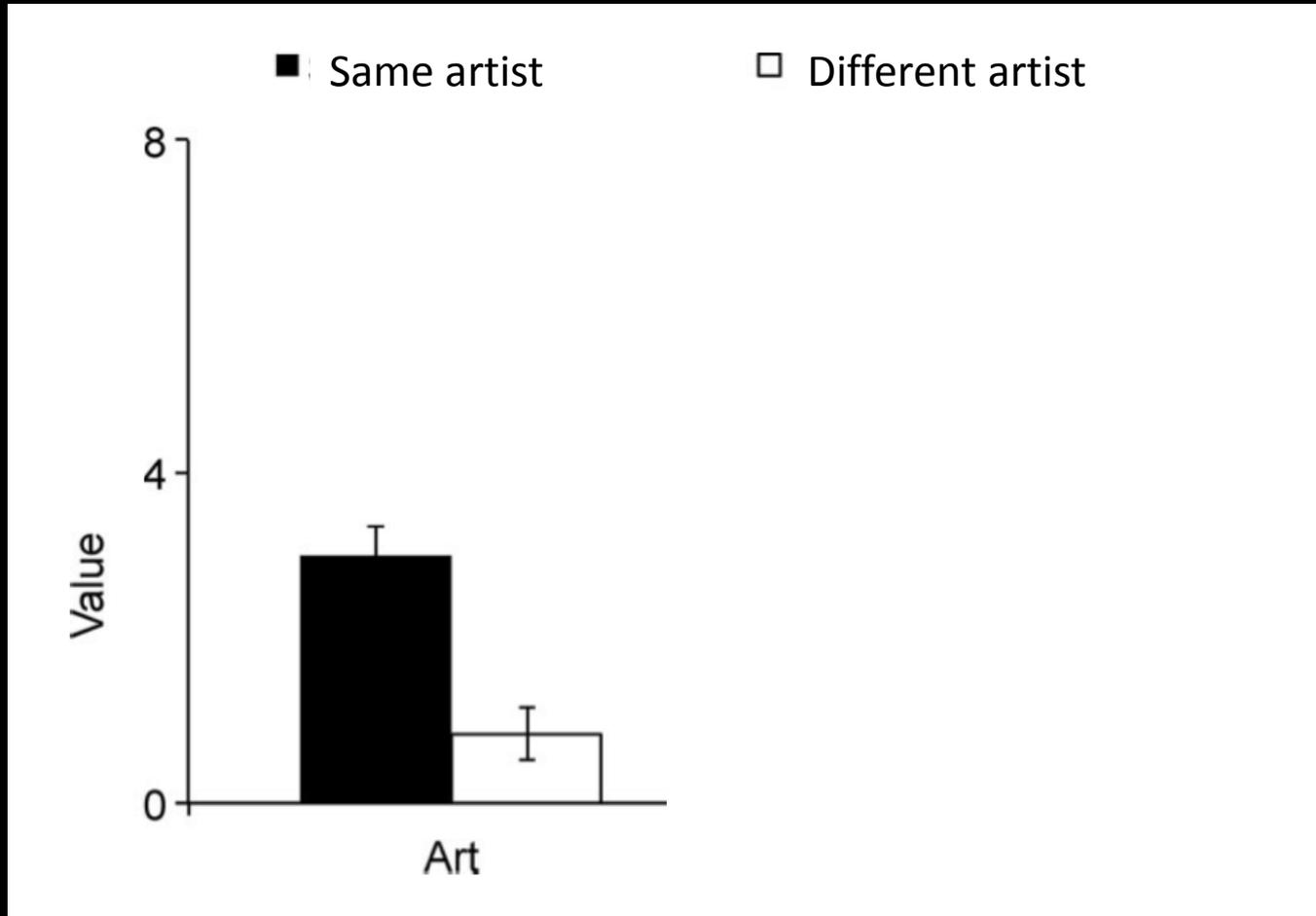
Painting B



Researchers sometimes told subjects Painting B was purposely designed to mimic painting A by a different painter

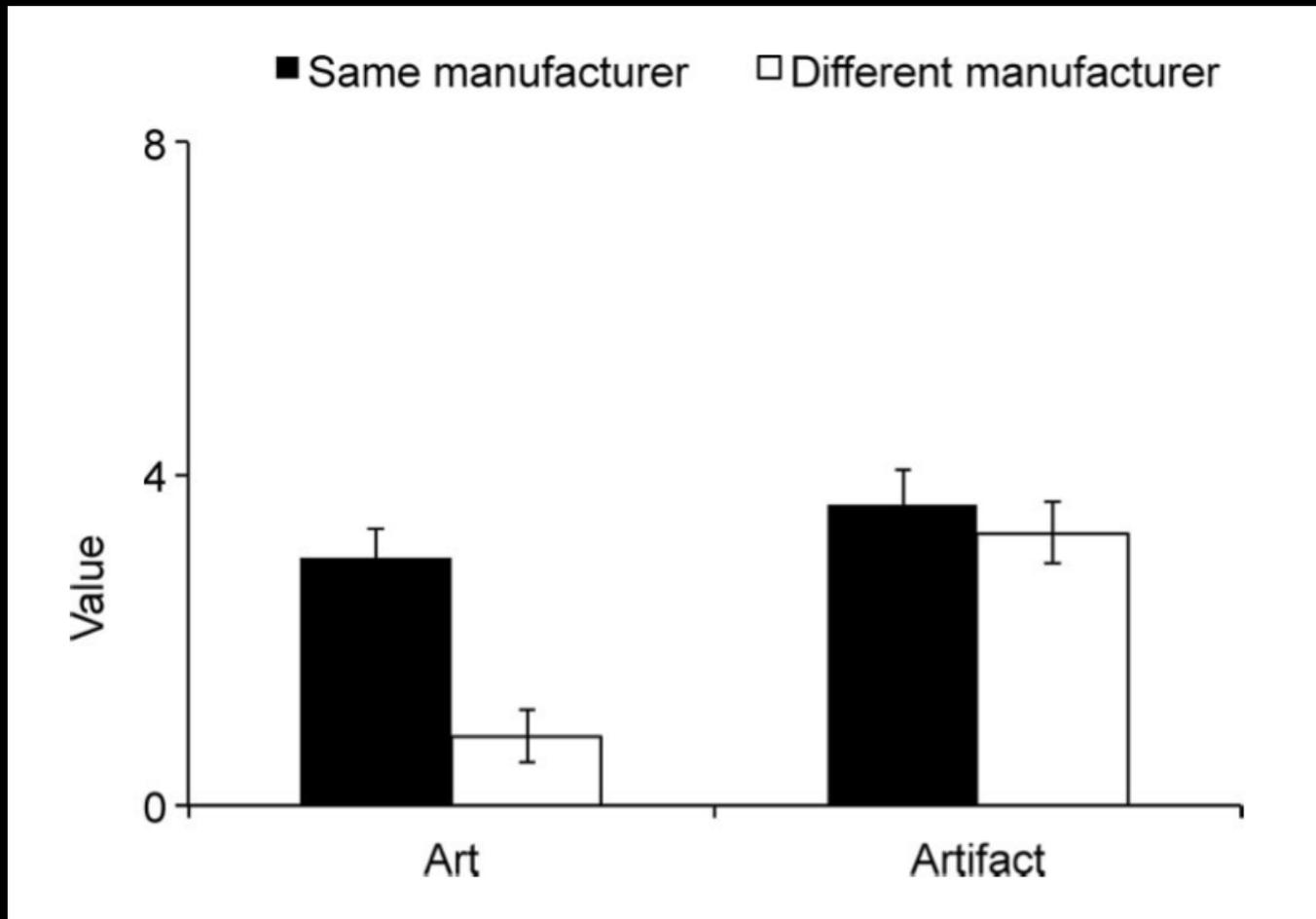
Subjects were asked to rate the “value” of the painting

# The real (“same artist”) one was rated higher



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Then, they said the same thing, but about an  
“artifact” (car)



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Source: Newman and bloom (2011)

How else can we provide evidence that aesthetics are (partly) driven by costly signaling?

Suppose signal  $X$  used to be more costly for bad type, but now signal  $-X$  is more costly for bad type...

Costly signaling predicts  $X$  fashionable, then  $-X$ .  
What other theory would?

X=body fat

(used to be hard for poor to have have body fat,  
now hard for them to be slim)

As predicted by costly signaling...



Vecchio, Portrait of a Woman 1518-1520

## Isabelle Caro (1982-2010)

- Image removed due to copyright restrictions.
- See pictures of [Isabelle Caro](#).

In some places still hard for poor to have body fat. What do we find there?

e.g. tribal Nigeria

- Consistent with costly signaling
  - Costly for everyone (>6 months doing nothing but eating!)
  - Costlier for the poor
  - Everyone finds it beautiful
  - Heavier wives find better mate
- How else explain?

A related example (albeit anecdotal):

When I offered my research assistant in N.E. India ice cream, she said “please.”

Then I asked if she liked ice cream.

She said “no, but my boyfriend wants me to become fatter.”

For more evidence that preference for body shape affected by costly signaling:

Measured playmate of the year 1960-2000

When economic conditions hard, playmates were heavier

(see Pettijohn II and Jungeberg, Personality and Social Psychology Bulletin 2004)

Perhaps the same for tanned skin?

- used to be attractive for Caucasians to have fair skin in U.S.
- now attractive for Caucasians to be tan
- in North East India the fairest were considered attractive.

Bc costly signaling?

(in past and in India fair meant indoor job. But in US now, even poor have indoor job? )

Notice: NOT conscious!  
(like our taste for spices!)

(Isabelle Caro wasn't trying to signal wealth, she was trying to look beautiful)

(The Nigerians aren't trying to signal wealth, they are just trying to look beautiful)

# What kind of evidence have we presented?

- Solid theory
- Analog in animals
- Analog in firms
- costly for all, and more costly for good type (e.g. white, fingernails)
- Becomes unattractive if no longer costly (e.g. polyester, replica)
- ONLY true for aesthetics (e.g. art) but not for useful (e.g. car)
- Reverses if costs reverse (e.g. body fat, skin tan)

What else can explain this evidence?

(Of course, costly signaling isn't the ONLY thing that influences beauty!)

Who cares?

For starters, it can help us avoid non-sequitur

Such as:

“Beauty is affected by culture → Aesthetics arbitrary”

When driven by costly signaling, it can be affected by culture without being arbitrary

Recall, body fat, fingernails, skin tans.

All of which are “affected by culture”

But not arbitrarily.

Any other non-sequiturs?

(e.g. from philosophers who didn't have this model? Extra credit?)

Perhaps also gives insights for fashion industry?  
(extra credit?)

Or policy?

(tricky!)

(Extra credit?)

Current events?  
(extra credit?)

History?

(extra credit?)

And there are other possible applications  
outside aesthetics:

-grammar

-etiquette

-religious rituals

(evidence? final project!)

And there are other important models of “signaling” that may have similar evidence and insight

- countersignaling

- cheap talk

- verifiable signals

(but won't discuss due to time constraints. Final project?)

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14.11 Insights from Game Theory into Social Behavior  
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