

Beauty
and
“Costly Signaling”

Puzzle 1:

“pinky nails”

In some cultures (e.g. villagers in N.E. India)



Image courtesy of [Thomas Stromberg](#) on Flickr CC BY-NC

Why?

“Because it’s beautiful”

We don't find it beautiful!

Why do they?

Puzzle 2:

White sneakers

Why do people like white sneakers?

They get dirty really easily ...



Image courtesy of [Allie Kenny](#) on Flickr. CC BY-NC.

Puzzle 3:

Mona Lisa

Why is the Mona Lisa beautiful?



It can't *just* be about its physical properties

If Mona Lisa were mass produced

E.g.,



Image courtesy of [Thomas Global](#) on Flickr. CC BY-NC-SA

We wouldn't be *this* enamored



Image courtesy of [sebr](#) on Flickr. CC BY-NC-SA.

Let's see *some* evidence...

Researchers showed subjects two paintings

Painting A



Painting B



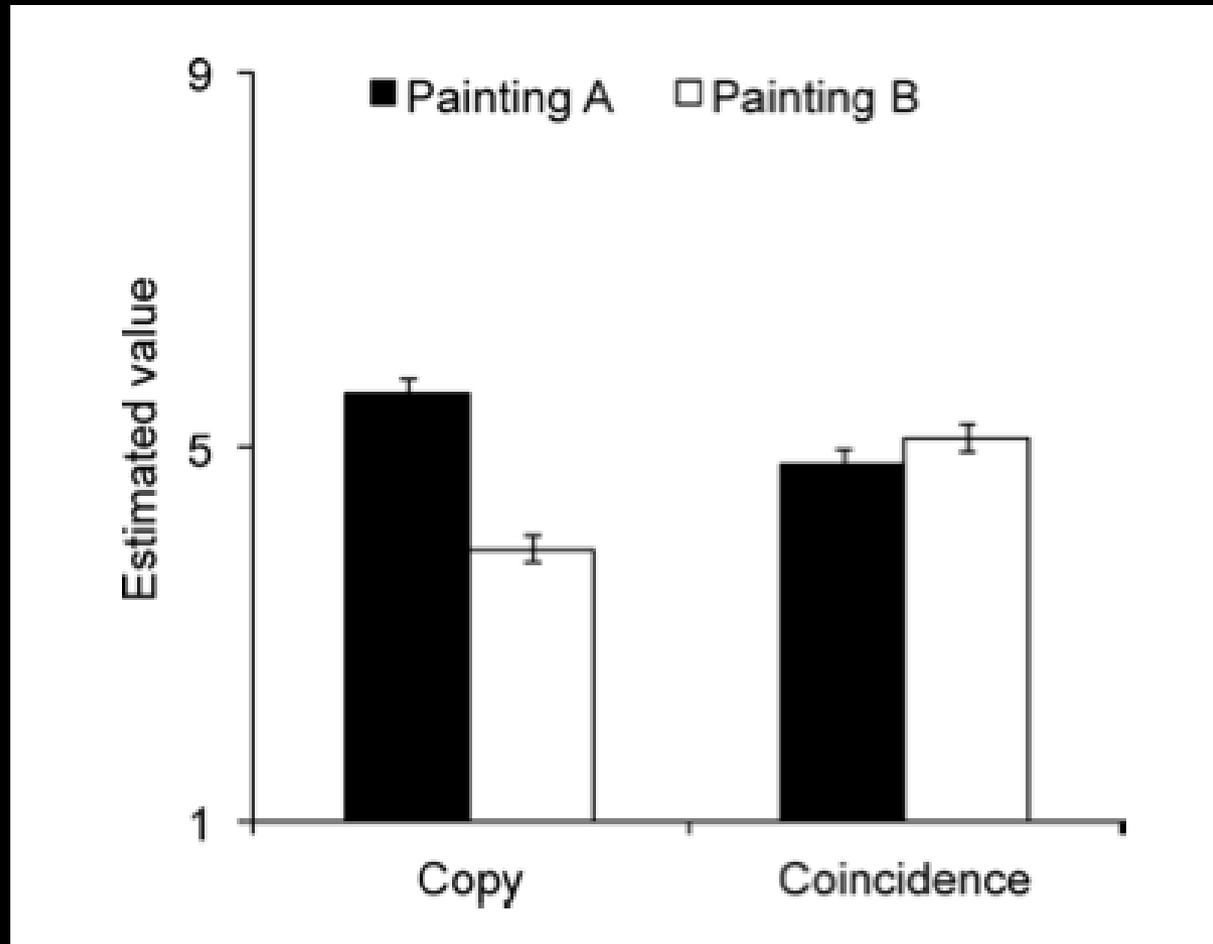
They sometimes told subjects Painting B was purposely designed to mimic painting A
(copy)

Or that it merely looked like painting A
(coincidence)

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

(Ideally they would have asked them to rate “beauty.” Final project?)

B was rated lower than A when it was a copy
But rated same or higher when coincidence



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Source: Newman and bloom (2011)

Ok, maybe we care about “resell value”?

But that begs the question:

Why is resale value different?

Jewelry works pretty similarly...



Image courtesy of [1791 Diamonds](#). CC-BY



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We don't like "fakes"

Even though...

We often can't tell the difference

“Although often referred to as synthetic, this term has been considered somewhat problematic. In the U.S., the Federal Trade Commission has indicated that the alternative terms laboratory-grown, laboratory-created, and [manufacturer-name]-created "would more clearly communicate the nature of the stone", as consumers associate the term synthetic with imitation products – whereas man-made diamonds are actual diamond material (i.e. pure carbon, crystallized in isotropic 3D form)”

- http://en.wikipedia.org/wiki/Synthetic_diamond

And they are built just as well

Some fake Rolexes are made with genuine Swiss parts designed to last hundreds of years

And a \$20 Timex tells better time anyway

(ok, maybe we care about “resell value,” but that begs the question why is resale value different?)

Why?

So what makes watches, and paintings, and shoes, and fingernails beautiful?

Is beauty arbitrary?

“beauty is in the eye of the beholder”

Completely determined by “socialization”?

(we find fingernails ugly, perhaps had we seen long fingernails on Bond?)

Completely “innate”?

(on the savannah, we needed...)

Resemblance to reality?

(Mona Lisa looks so REAL)

“In the eye of the beholder”

“Beauty is no quality in things themselves: It exists merely in the mind which contemplates them; and each mind perceives a different beauty. One person may even perceive deformity, where another is sensible of beauty; and every individual ought to acquiesce in his own sentiment, without pretending to regulate those of others.”

(Hume 1757, 136)

Useful?

- *Socrates*: In short everything which we use is considered both good and beautiful from the same point of view, namely its use.
- *Aristippus*: Why then, is a dung-basket a beautiful thing?

(Xenophon, Book III, viii)

Maybe

Sometimes

I don't know

But we do KNOW **something** that matters (**for some aspects** of beauty)!

“Costly Signaling”



The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred
Nobel 2001

George A. Akerlof, A Michael Spence, Joseph E. Stiglitz

Costly signaling...

Used to shed light on:

In economics:

why we take useless classes (no comment)

Why ads often say nothing

Why we conspicuously consume

...

And in biology:

Why peacocks have long tails

Why baby birds chirp

Why gazelles stot

...

In psychology:

Religious rituals

Mountaineering

etiquette

And beauty

(will discuss these more, after theory)

This argument is **NOT** trivial

Requires game theory

Without game theory...

J. theor. Biol. (1975) 53, 205–214

Mate Selection—A Selection for a Handicap

AMOTZ ZAHAVI

*Institute for Nature Conservation Research, Faculty of Life Sciences,
The George S. Wise Centre for Life Sciences, Tel-Aviv University, Israel*

(Received 23 July 1974, and in revised form 2 December 1974)

It is suggested that characters which develop through mate preference confer handicaps on the selected individuals in their survival. These handicaps are of use to the selecting sex since they test the quality of the mate. The size of characters selected in this way serve as marks of quality. The understanding that a handicap, which tests for quality, can evolve as a consequence of its advantage to the individual, may provide an explanation for many puzzling evolutionary problems. Such an interpretation may provide an alternative to other hypotheses which assumed complicated selective mechanisms, such as group selection or kin selection, which do not act directly on the individual.

Writing about Costly Signaling:

*“I have changed my mind, as it happens, about a highly **paradoxical** theory... That theory is the **Handicap Principle** suggested **by the Israeli zoologist Amotz Zahavi**. I used to think it was **nonsense**, and I said so in my first book, *The Selfish Gene*. In the Second Edition **I changed my mind...**”*

- Richard Dawkins

(Source: <http://amaurosis-fugax.blogspot.com/2010/11/richard-dawkins-changes-his-mind-on.html?m=1>)

So what is Spence's model of costly signaling?

Let's describe using our first puzzle: pinky nails...

Recall that some villagers in N.E. India had long fingernails.

Because “they are beautiful”

Did everyone have long fingernails?

No!

Then who?

(Anecdotaly)

-**teachers**, mayors, priests: pinky nail

-**farmers** (most men): no pinky nail

(anecdote → data, would make good final project)

Pinky nails are kinda a pain for teachers

Pinky nails are is A huge pain for farmers

(Anecdotally...)

Female villagers preferred mating with teachers!

Farmers *could* pretend to be a teacher

(sometimes at least, e.g. when meet stranger in market)

But his nails don't lie!

That is:

Suppose...

-all females find pinky nails “beautiful”

→ farmers want such nails, but they aren’t worth the hassle

→ teachers want such nails, it is a hassle, but not that much, so perhaps worth it?

→ Females who are attracted to such nails “accept” teachers.

→ Noone has “incentive” to change (i.e. above is “Nash”)
(Will formalize shortly)

→ if preferences are “learned”, above will “emerge”
(will formalize shortly)

We will...

First...

- 1) Formulate **the game**
- 2) Take an aside to discuss other applications
(shows model **powerful**)
- 3) Show above is **Nash**
- 4) Show Nash is **robust** (homework)
- 5) Consider what happens **if preferences learned...**
- 6) Show learning analysis is **robust** (homework)

We will

Later...

- 1) Return to our **puzzles**
- 2) Discuss the **evidence**
- 3) Discuss **implications**

Let's formulate "the game" ...

-first in terms of pinky nails

-later more generally

- Male either
 - farmer (probability p)
 - or teacher (probability $1-p$)
- Male chooses length of nail
- Female observes nail, not occupation
- Female chooses whether to “accept” or “reject” male
(perhaps based, at least partly, on how beautiful she finds his nails.)

IF...

- 1) Longer nails cumbersome for all males, more cumbersome for farmers
(-1/cm, -2/cm)
- 2) Females benefit from accepting teachers, but not farmers
(+10, -10)
- 3) All males benefit from being accepted
(+5,+5)

THEN

Exists a Nash equilibrium s.t.:

-farmers don't grow nails

-teachers grow nails to length l

(where l is some number between 2.5 and 5 cm)

-females accept those with nails at least length l

Works even if...

- females cannot easily observe nails
 - females can usually know male's occupation
 - not all females care about occupation
 - not all farmers find nails cumbersome
- (You will play with these in homework)

This model is beautiful!

“costly signaling”

This model is paradoxical!

- Nails **costly** for EVERYONE, even teachers!
- Females more attracted to males who waste more?!?
- Shouldn't this reduce whatever it was that made them attractive?
- Should evolution/learning/market EVER lead to waste?!?

Zahavi!

Darwin!

Smith!

MIT OpenCourseWare
<http://ocw.mit.edu>

14.11 Insights from Game Theory into Social Behavior
Fall 2013

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