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Behavioural Economics

Warwick Pre-University Summer School 2023

21 July 2023

Welcome and Introduction - Dr Taha Movahedi

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Research Interests

- Behavioural Economics
- Experimental Economics
- Applied Microeconomics
- Behavioural Game Theory and Decision Making
- Political Economics

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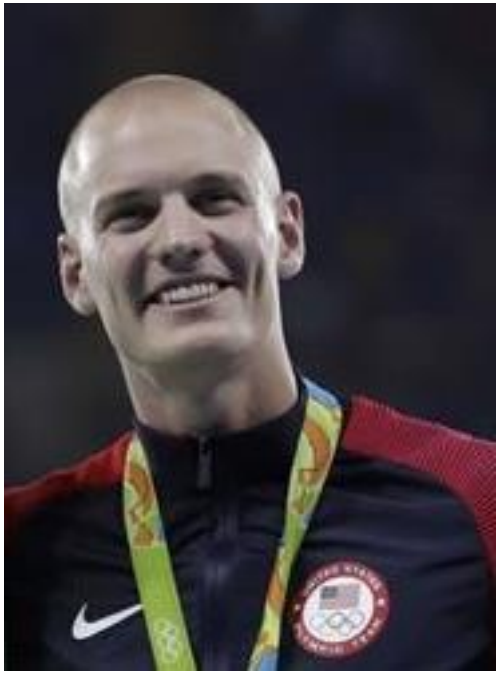

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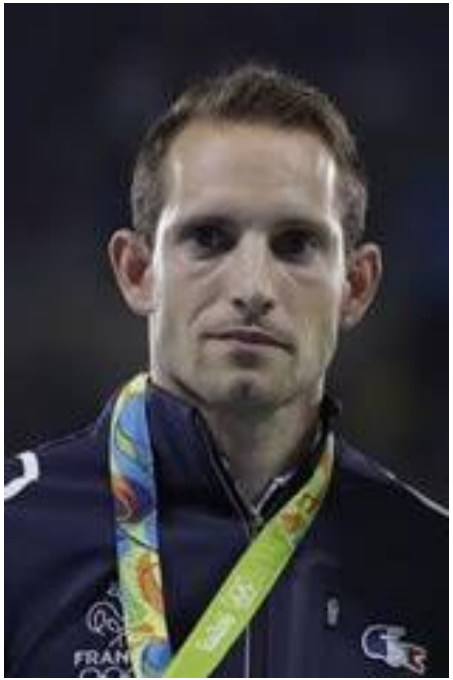

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Which Medal did Person A win?

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slido

Which medal did Person B win?

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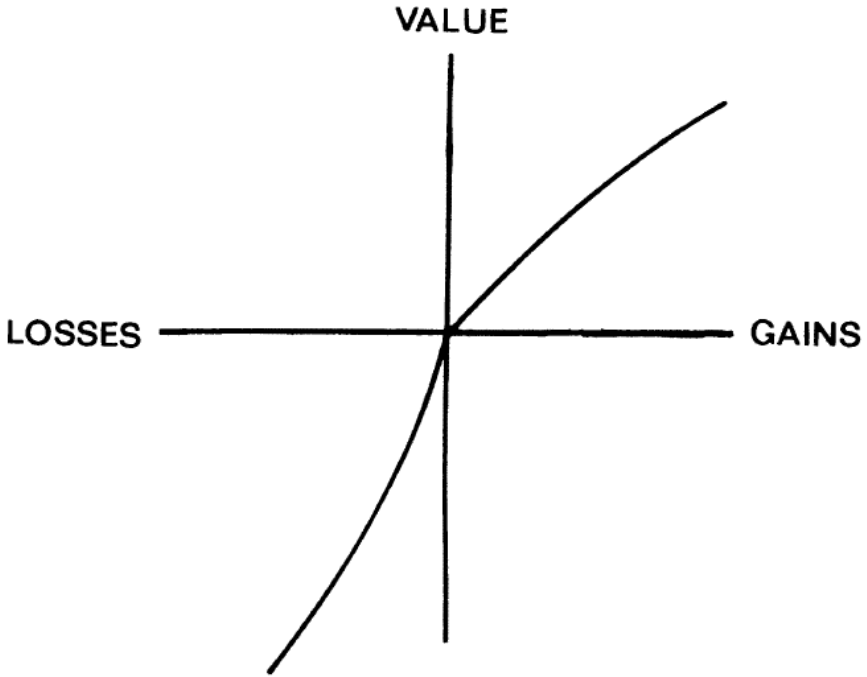
Loss Aversion
Winning 10$
Losing 10$
Heh, Cool I Guess...
Oh Cruel World!
-versusthemachines

pain from losses has stronger effect than pleasure from gains



Outline

- Behavioural Economics
  - **How it works**
- Basic Concepts and findings
  - **Time Preference, Framing Effect, Endowment Effect**
- Applications
  - **Nudge**

What is Behavioural Economics

- a method of economic analysis that applies **psychological insights** into **human behaviour** to explain **economic decision-making**
  - **Psychological underpinnings of economic analysis**
- The objective is to **modify**, **supplement**, and **enrich** economic theory by adding insights from psychology
- The starting point is still standard economic theory

Behavioural Economics-Methods

- Experiments played a large role in the initial phase of behavioural economics
  - **experimental control is exceptionally helpful for distinguishing behavioural explanations from standard ones**
- Experimental economics and behavioural economics are clearly linked – experiments have produced many empirical regularities that support behavioural economics
  - **However, it is a methodological field (like mathematical economics or econometrics) that can be widely applied and not a part of behavioural economics**

Behavioural Economics-Methods

- Field data (survey based data)
- Field experiments (*artefactual, framed, natural*)
- Computer simulation (e.g. a*gent based modelling*)
- Brain scans (more on this later in *Neuroeconomics)*

Asking people to fill surveys

Answer questions or take some actions

Go to the field and observe directly

The Marshmallow Test for Self-control

Time Preference

- We fly in time and the value of objects changes over time.

- We value the money differently in different time. How does the value vary over time and w hat effect does it have on the choices we make?

- Present Bias: Tendency of individuals to prioritize immediate rewards over larger but dela yed rewards. In other words, people have a preference for instant gratification and may und ervalue or overlook the benefits of waiting for a greater reward in the future. For example, s omeone might choose to spend money on a luxury item now instead of saving it for a more significant purchase later.

- Future Bias: Individuals overvalue future rewards and may delay gratification excessively. For instance, someone might save every penny and avoid spending on enjoyable experien ces because they are overly focused on a distant future goal.

Imagine you have been given the following options of receiving some money. Which option would you choose?

Time Preference: Example of Violation

Would you prefer to get:

A. £100 in 30 days or

B. £110 in 31 days?

Would you prefer to get:

C. £100 today or

D. £110 tomorrow?

- Often people choose **(B)** and **(C)**
- Shows that we are **impatient** and exhibit **present bias**

Moe:

"This thing can **flash fry** a **Water Buffalo** in **40 seconds.**"

Homer:

"Ohhhhh, **40 seconds**!
But I want mine Now."

Inconsistent Time Preference

- Plenty of empirical observations in the consumption-saving literature
  - **Over Consumption (or under-saving)**
- Individuals choose not only when to carry out the onerous task, but also which task to carry out
  - **Example: I plan to clean my entire house tomorrow, so I do not clean the toilet today**
- Issues with self control and Procrastination –Prof. Dan Ariely

Concept: Framing Effect

The following experiment is an all-time-classic brought forward by Amos Tversky and Daniel Kahneman.

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is ***expected to kill 600 people****. Two alternative programs to combat the disease have been proposed and you have to choose one of them. Assume that the exact scientific estimates of the consequences of the programs are as follows:*

- 600 lives are threatened.
  - **Action (A) saves 200 lives**
  - **Action (B) saves all 600 lives with probability 1/3 and saves nobody with probability 2/3**

Which action would you choose? (A) or (B)?

- 600 lives are threatened
  - **Action (C) causes 400 to die**
  - **Action (D) causes 600 to die with probability 2/3 and causes nobody to die with probability 1/3**

Which action would you choose? (C) or (D)?

Framing effect

Action (A) saves 200 lives *(72%)*

Action (B) saves all 600 lives with probability 1/3 and saves nobody with probability 2/3 *(28%)*

Action (C) causes 400 to die *(22%)*

Action (D) causes 600 to die with probability 2/3 and causes nobody to die with probability 1/3 *(78%)*

- These problems are identical, apart from how they are framed.
  - Yet the *most common* choices are different.

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Student Task

Targeting your Cognitive System

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#1203489

1. A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

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slido

2. If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

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3. In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

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Correct answers:

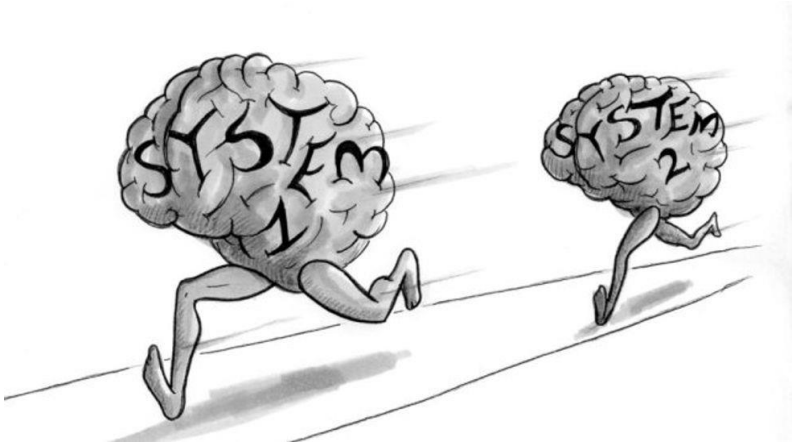
1. A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?
5 cents

2. If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?
5 minutes

3. In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?
47 days

Cognitive Reflection Test: System 1 v System 2

System 1	System 2
Fast	Slow
Unconscious	Conscious
Automatic	Effortful
Everyday Decisions	Complex Decisions
Error prone	Reliable



Daniel Kahneman, Nobel Laureate, *Thinking Fast and Slow*, 2011.

Multiple System Hypothesis: similar concepts

Interests vs passions (Smith)	Superego vs Ego vs Id (Freud)	Controlled vs Automatic (Benhabib & Bisin, 2004)	Cold vs Hot (Metcalfe and Mischel, 1979)
System 2 vs System 1 (Frederick and Kahneman, 2002)	Deliberative vs Impulsive (Frederick, 2002)	Conscious vs Unconscious (Damasio, Bem)	Effortful vs Effortless (Baumeister)
Planner vs Doer (Shefrin and Thaler, 1981)	Patient vs Myopic (Fudenburg and Levine, 2006)	Abstract vs Visceral (Loewenstein & O'Donoghue 2006)	

Nudge Theory

Why do we need a Nudge?

“Gut”

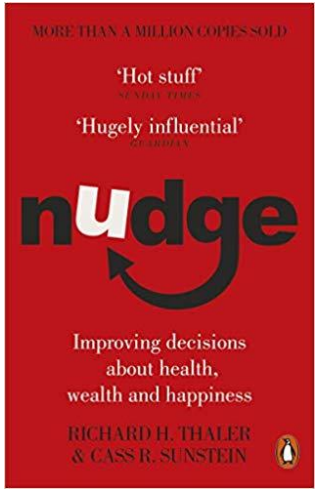
Automatic Cognitive System

vs

“Mind”

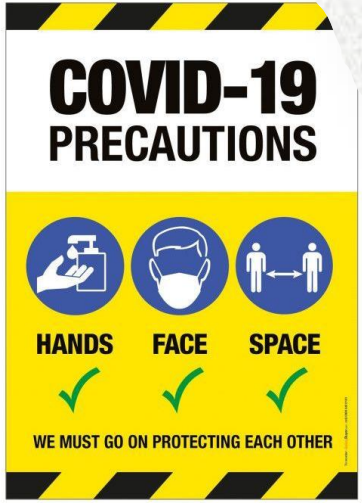
Reflective Cognitive System

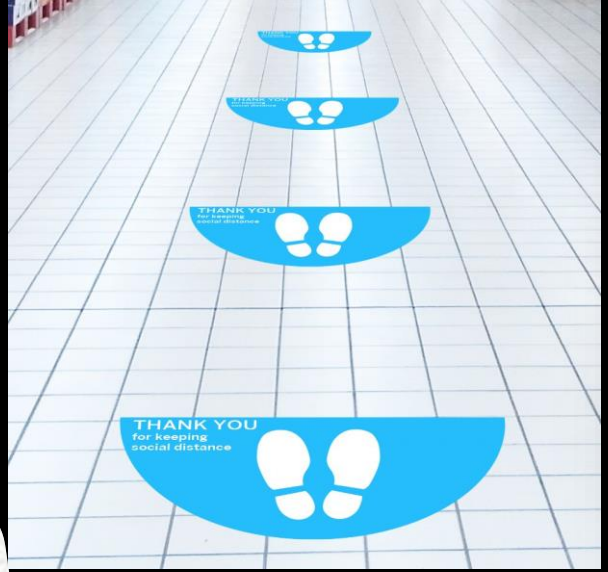
"A Nudge is any feature in the environment (i.e., the **choice architecture**) that attracts out attention and influence our behaviour."



Video : Richard Thaler

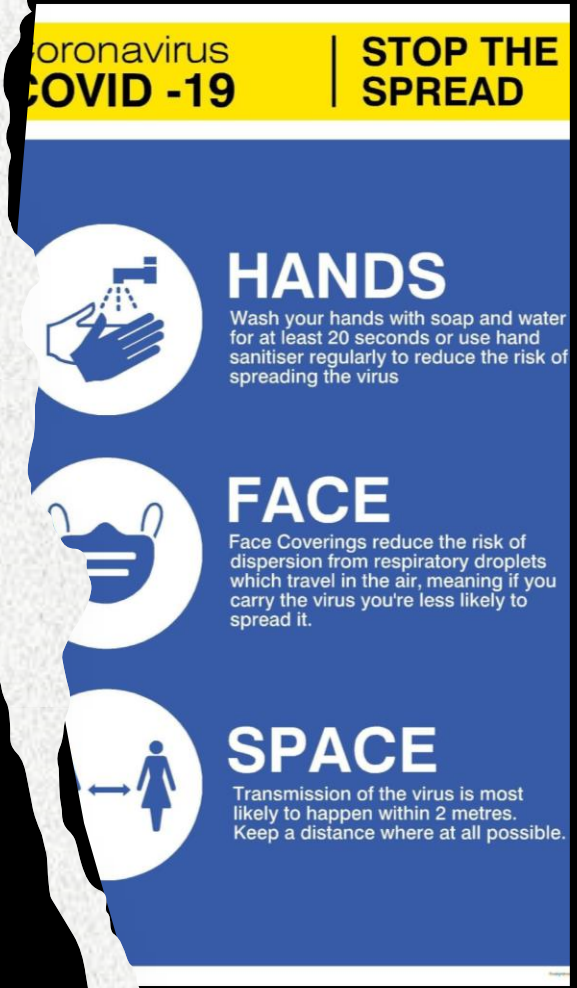
Nudge Examples


COVID-19
PRECAUTIONS
HANDS
FACE
SPACE
WE MUST GO ON PROTECTING EACH OTHER


THANK YOU
for keeping
social distance


HM Government
We must
keep on protecting
each other.
HANDS
FACE
SPACE
STAY ALERT CONTROL THE VIRUS SAVE LIVES

COVID 19


oronavirus
OVID -19
STOP THE
SPREAD
HANDS
Wash your hands with soap and water for at least 20 seconds or use hand sanitiser regularly to reduce the risk of spreading the virus
FACE
Face Coverings reduce the risk of dispersion from respiratory droplets which travel in the air, meaning if you carry the virus you're less likely to spread it.
SPACE
Transmission of the virus is most likely to happen within 2 metres.
Keep a distance where at all possible.

Hubbub – reducing cigarette litter in the streets of London

The Famous piano stairs -
Mozart + Movement = Fun in Stockholm

There is a Fly in my Urinal - Schiphol Airport in Amsterdam

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ECONOMICS

Concept: Endowment Effect

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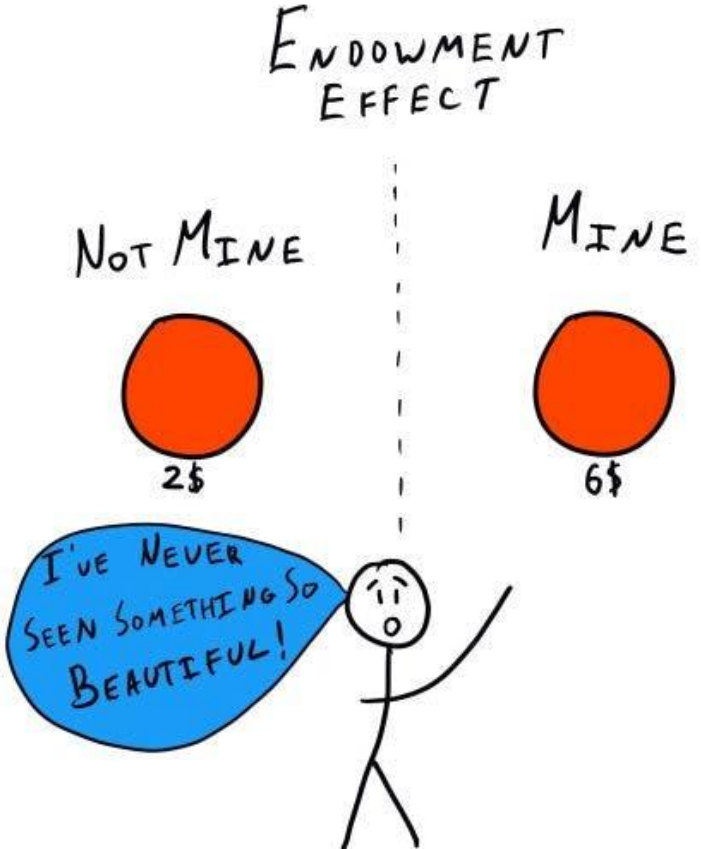
ENDOWMENT EFFECT
NOT MINE
MINE
2$
6$
I'VE NEVER SEEN SOMETHING SO BEAUTIFUL!

Endowment Effect- Experiment

- Individuals were endowed either with a mug, or with the money to buy this mug
- Their WTP and WTA are elicited
  - **WTP-Willingness to Pay is the maximum price an individual is willing to pay to get a good**
  - **WTA-Willingness to Accept is the minimum compensation demanded by the owner to sell a good**
- Standard Assumptions imply that WTA = WTP

Endowment Effect

- Markets for induced-value tokens and consumption goods yielded sharply different results.
- For the token: WTP = WTA
- For the *Mug*, WTP=2.75 (median) and WTA=5.25 (median)
- Similar Experiments were conducted with pens, folding binoculars, lottery tickets etc.

RESULTS OF EXPERIMENT 1

INDUCED-VALUE MARKETS

Trial	Actual Trades	Expected Trades	Price	Expected Price
1	12	11	3.75	3.75
2	11	11	4.75	4.75
3	10	11	4.25	4.25

CONSUMPTION GOODS MARKETS

Trial	Trades	Price	Median Buyer Reservation Price	Median Seller Reservation Price
		Mugs (Expected Trades = 11)		
4	4	4.25	2.75	5.25
5	1	4.75	2.25	5.25
6	2	4.50	2.25	5.25
7	2	4.25	2.25	5.25
		Pens (Expected Trades = 11)		
8	4	1.25	.75	2.50
9	5	1.25	.75	1.75
10	4	1.25	.75	2.25
11	5	1.25	.75	1.75

Neuroeconomics

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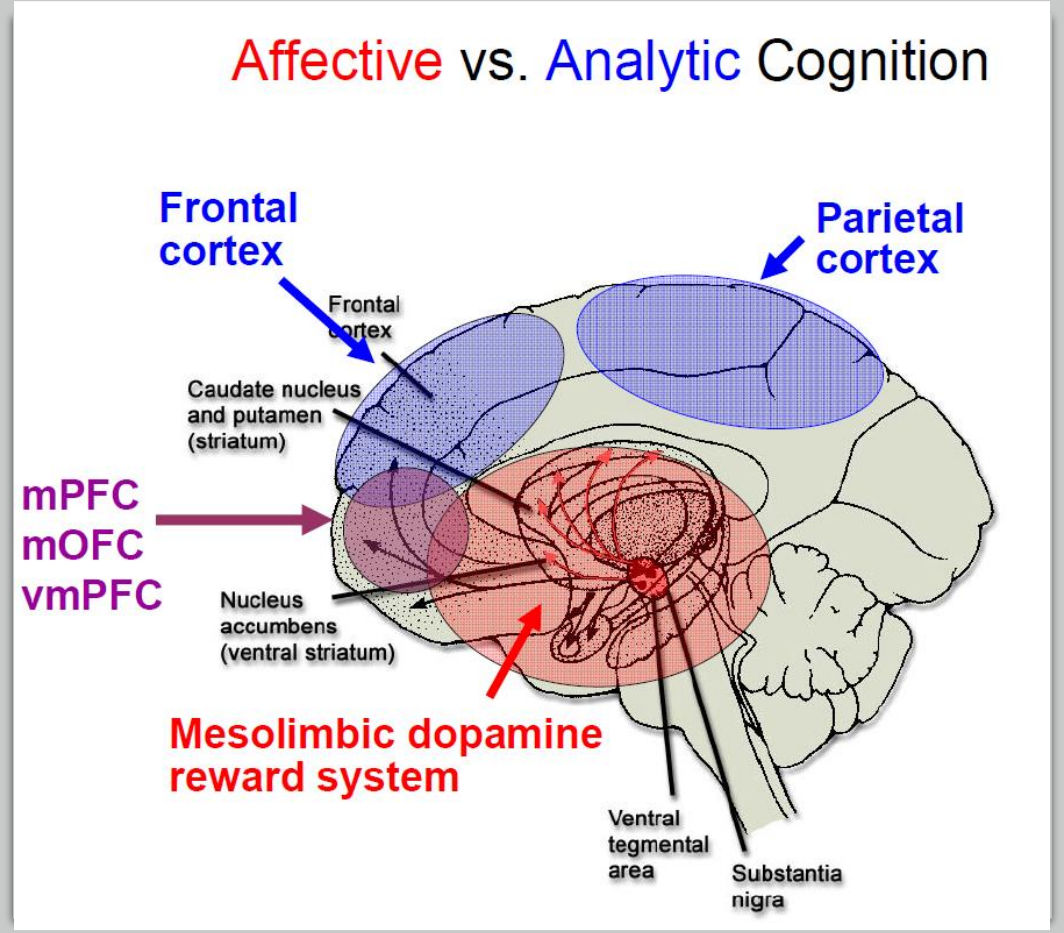
Brain System

- **Affective system**
  - fast
  - unconscious
  - myopic
  - effortless
- **Analytic system**
  - slow
  - conscious
  - forward-looking
  - self-regulatory
  - effortful and exhaustible



Neuroeconomics-Empirical Example

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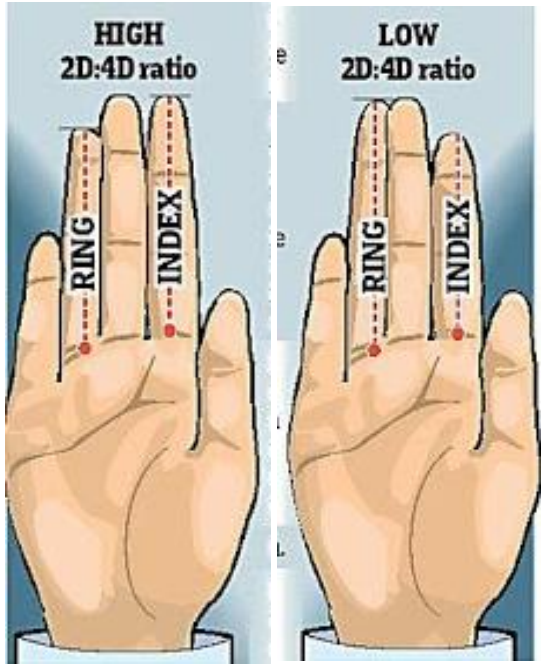
Coates et. al. (2009)

- *Background*:
- The second-to-fourth digit length ratio (2D:4D) has been proposed as a marker of prenatal androgen effects
- a relatively longer fourth finger indicates higher prenatal androgen exposure
  - **Studies report possible relations between prenatal androgen and *aggression* and *activity level* in children**
  - **have important organizing effects on brain development and future behaviour**

Coates et. al. (2009)



2D:4D has been shown to predict success in highly competitive sports

Coates et. al. (2009)

Apply that to highly competitive and risky economic activity:
trading in the financial world

Coates et. al. (2009)

- recruited 49 male traders from a trading floor in the City of London
- used individual traders' profit and loss (P&L) statements as the primary measure of their relative performance

	Age (years)	Trading experience (years)	Approximate Annual Income (£1~$2)
Mean	26.9	2.77	£285,000
Std	4.14	1.9	£59,000
Range	19 to 38	1 to 12	-£2,000 to £4,200,000

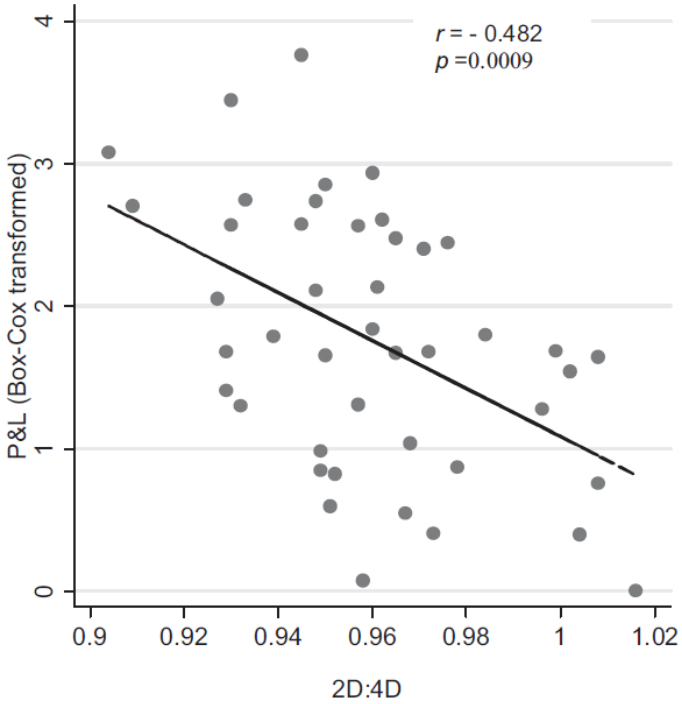
Coates et. al. (2009)

Table 1. Average annual income by class of 2D:4D and experience (£ ≈ $2)

	Experience		
2D:4D	Inexperienced (≤2 yr)	Experienced (>2 yr)	Average
Low (0.932)	£145,080	£828,480	£679,680
Medium (0.956)	£62,400	£299,880	£173,160
High (0.988)	£27,360	£154,440	£61,320
Average (0.959)	£56,160	£537,720	£296,880

2D:4D is grouped by tertile, with the average digit ratio in parentheses. Experience is grouped by number of years trading, with inexperienced traders defined as anyone trading for 2 years or less.

Coates et. al. (2009)



Results:

the lower a trader's 2D:4D Ratio (longer 4th digit), the greater his net profit (profit and loss)

Coates et. al. (2009)

- **prenatal androgens** increase risk preferences and promote more rapid visuomotor scanning and physical reflexes
- Remark: *the traits signalled by 2D:4D are likely to confer the greatest advantage in noise or high-frequency trading an occupation that requires, in addition to the ability to take risks,* ***heightened vigilance*** *and* ***quick reactions***
- *"Our findings may therefore be replicated among amateur day traders, high frequency traders at other banks, and local traders on the floors of stock and futures exchanges. But the correlation may weaken among traders who require additional skills"*

Thank You!

Any Questions/Comments

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