

Science: talking and listening to diverse audiences

17 May 2023 - E4 DTP

Kris De Meyer - UCL Climate Action Unit

Session Outline

- Part 1: three dimensions of science communication
- Part 2: six insights from neuroscience and psychology
- Part 3: putting it all together: crafting your story
- We will have a break around 11.45am

Session Format

- Interactive workshop rather than a lecture
- Slides and reading/viewing list will be made available
- Have pen and paper to hand

Part 1: Three dimensions of science communication

**Science communication: *what* do we communicate?
Numbers, facts and knowledge or...?**



BLUE PLANET II

bbc one





6:48p PT

STOSSEL CLIMATE CONTROVERSY

ENERGY	EOG RESOURCES (EOG)	128.07	▼ 0.13	DOW	14578.54	
FOX BUSINESS	1.2820	▲ 0.0006	CHF/USD (CHFUSD=)	1.0527	S&P	1569.19
MOODY'S REVISES MICHIGAN'S RATING OUTLOOK TO POSITIVE				NAS	3267.52	

Activity - What characterises these examples?

At each table, discuss the three examples in turn:

- Blue Planet
- Pencil
- Green Tyranny

As a group, identify and write down up to 3 aspects for each example which characterise that particular kind of science communication

You will have about 6 minutes
Then we will have a whole group discussion

Numbers, facts and knowledge or...?

Science communicators do well with 'Curiosity' and 'Me', but struggle with 'Controversy'



Experiential
Engaging

Trust

Beauty
Passion
Drama



Controversy
When science clashes with values or ideals



Part 2: Six insights from neuroscience and psychology for effective science engagement

Activity - If climate change was...

Write down the answer to the following questions:

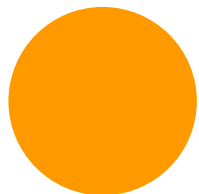
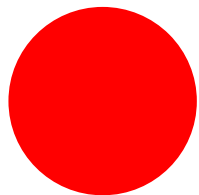
1. If climate change was a colour, what colour would it be?
2. If climate change was an animal, what animal would it be?

No need to overthink, write down the first answers that come to mind

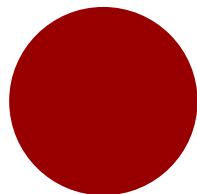
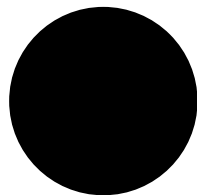
Please share with your table what you wrote and why (4 mins)

Common answers

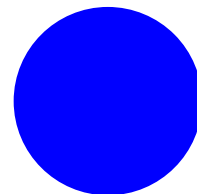
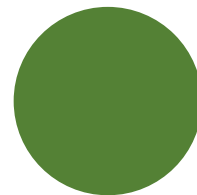
danger



death and decay



protecting nature



What did we just do?

Poke our Elephants



Insight 1

Not 1 type of thinking, but 2

Not one type of thinking, but two

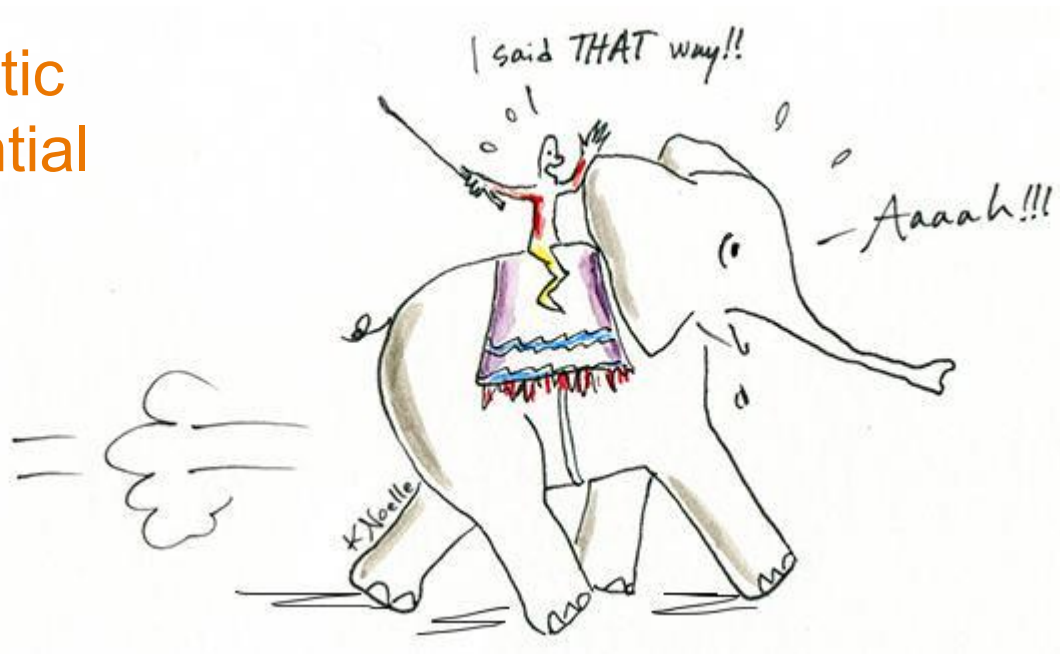
Intuitions

interact

Reasoning

Automatic
Experiential

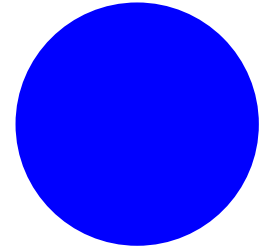
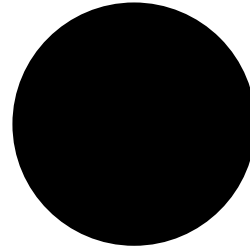
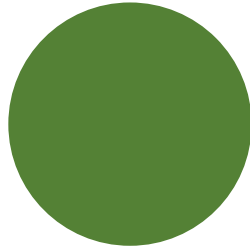
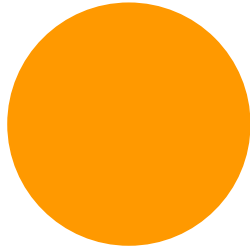
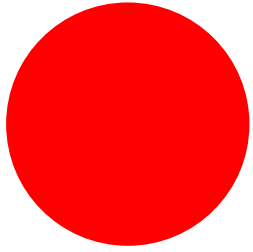
Controlled
Analytical



...LET'S BE HONEST AND ACKNOWLEDGE THERE'S AN
ELEPHANT IN THE ROOM...



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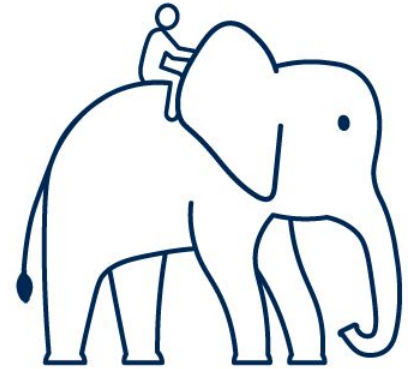


Elephant = associative brain



1. Intuitions come first, reasoning second
2. Intuitive thinking is rooted in lived experiences
3. Elephant = associative

Elephant and Rider



Take Home Messages



Insight 2

Ginger the Dog

What we say to dogs

Okay, Ginger! I've had it!
You stay out of the garbage!
Understand, Ginger? Stay out
of the garbage, or else!



What they hear

blah blah GINGER blah
blah blah blah blah
blah blah GINGER blah
blah blah blah blah...



**What we *think* we say
is often not what other people *hear***

Ginger Explained

Abstract words and phrases develop different associations and felt meanings (elephant understandings)

Reasons

- jargon
- practice differences
- value differences

The science behind Ginger

“Our results show that at least 10 to 30 variants of word meanings exist for even common nouns. Further, people are unaware of this variation, and exhibit a strong bias to erroneously believe that other people share their semantics.”

Marti et al. 2023 Open Mind https://doi.org/10.1162/opmi_a_00072

“The effect of emotion on semantic representation [in the brain] is especially salient when concepts are abstract and words do not have concrete or tangible meaning (e.g. freedom, American).”

de Bruin et al. 2023 Science Advances <https://doi.org/10.1126/sciadv.abq5920>

Climate change example (1)

'boundary
of doom'



'2C'

'Barcelona
in April'



Climate change example (2)

'avoiding
false alarms'

'avoiding something
slipping through the net'



'conservative risk estimate'



science

risk and policy

Activity - your 'Ginger' moment

Think of an example of when you have experienced a 'Ginger the dog' moment - either as listener, speaker or observer - from your professional or personal life

Make a few notes about your example. In particular:

- What happened in that moment
- What the effect was (if any) on the conversation
- How you dealt with the situation

Share your example at your table - 6 minutes in total

1. What we *think* we say is often not what other people *hear*
2. Ginger the Dog can often only be managed, not resolved

Meaning of Words



Take Home Message

Welcome to the Zoo: of Dogs and Elephants

Numbers, facts and knowledge or...?



Fiction
Drama

Controversy

When science clashes with values or ideals



Two ways communication can go wrong



Quiz

Quiz

Q1 How did deaths from natural disasters change in the 20th century?

- a) More than doubled
- b) Remained about the same
- c) Decreased to less than half

Q2 What percentage of the world's one year old children are vaccinated against measles?

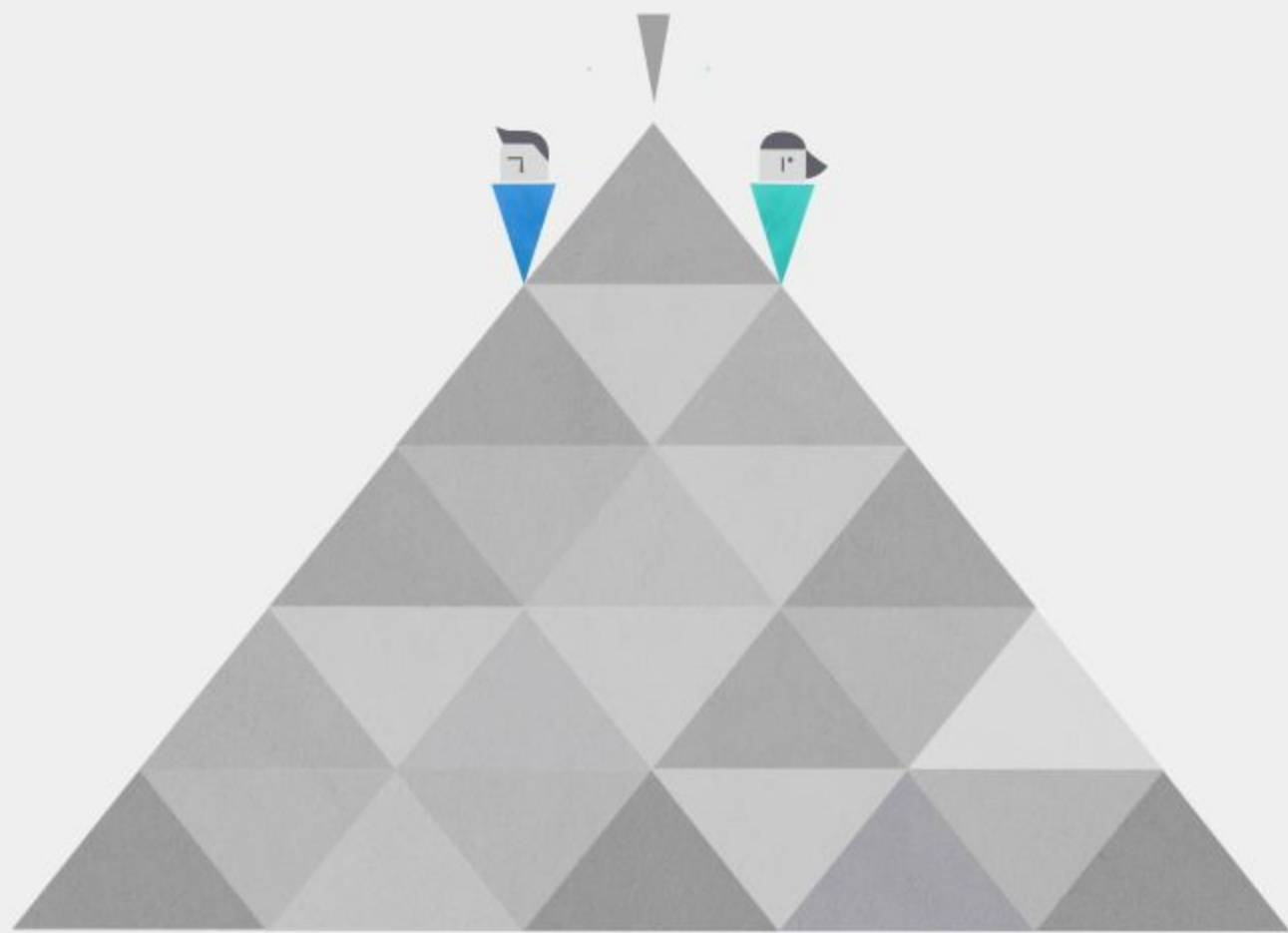
- a) 20% vaccinated
- b) 50% vaccinated
- c) 80% vaccinated

How minds and behaviours change in real life



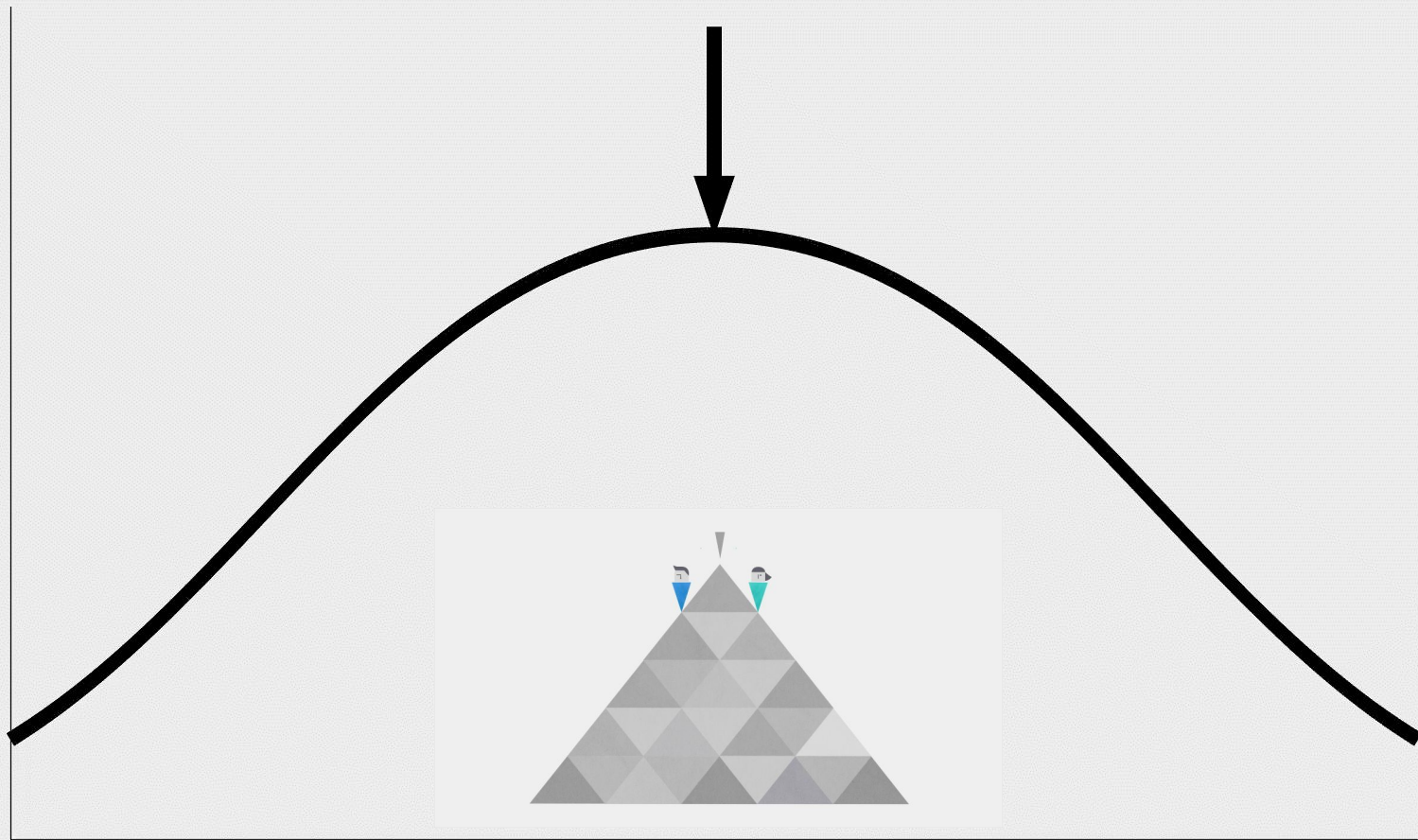
Insight 3

The pyramid of
self-persuasion and polarisation





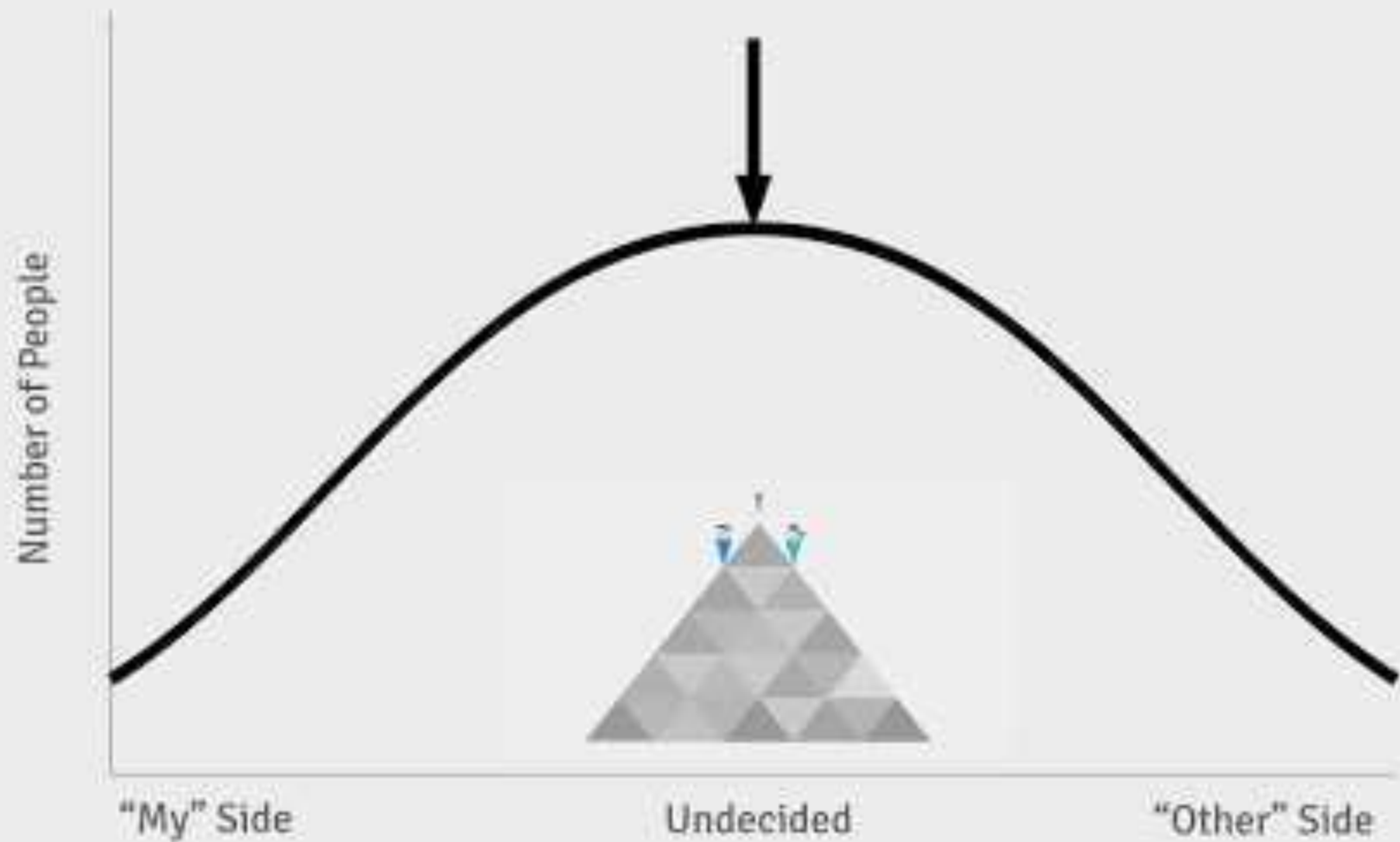
Number of People

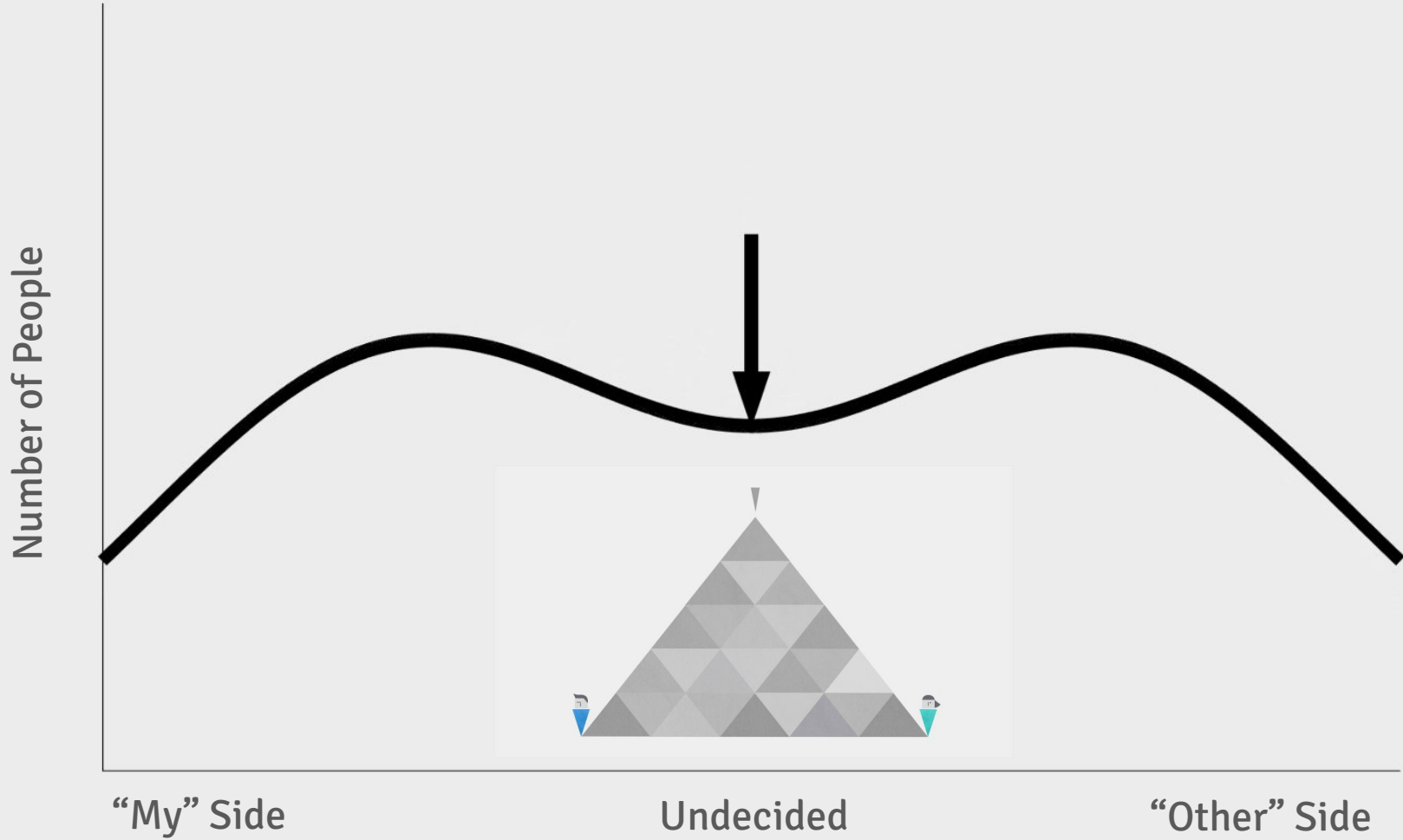


"My" Side

Undecided

"Other" Side



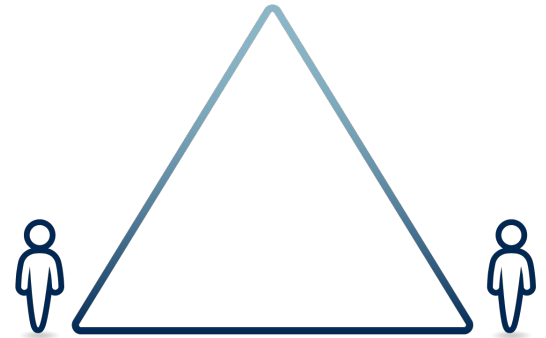


Fragmentation of 'meaningful' climate action



1. The pyramid = moving from weak to strong opinions about an issue
2. As concern increases, opinions about climate action will fragment
3. Opinion fragmentation can lead to action paralysis

The Pyramid of Polarisation



Take Home Message



Insight 4

The brain as a sponge

Quiz - Answers

Q1 How did deaths from natural disasters change in the 20th century?

- a) More than doubled
- b) Remained about the same
- c) Decreased to less than half

Q2 What percentage of the world's one year old children are vaccinated against measles?

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- b) 50% vaccinated
- c) 80% vaccinated



So how did we do?



The brain as a sponge

- Our brains absorb the statistics of physical and social reality
- 'Background beliefs' are shaped by our cultural environment
- Examples:
 - levels of social development
 - levels of crime and immigration



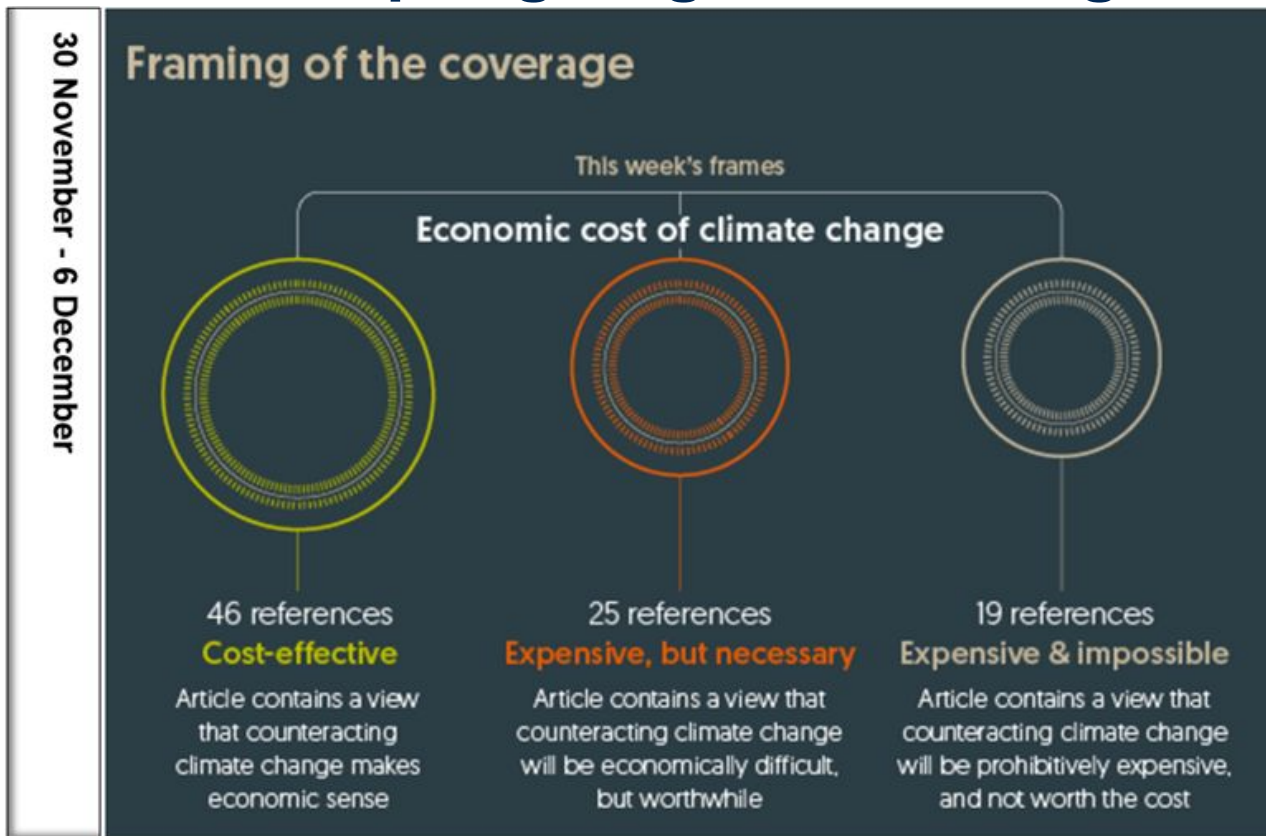
Media & brain as a sponge

- Agenda setting theory in media studies (B. Cohen, 1963)

“The press may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think *about*.”

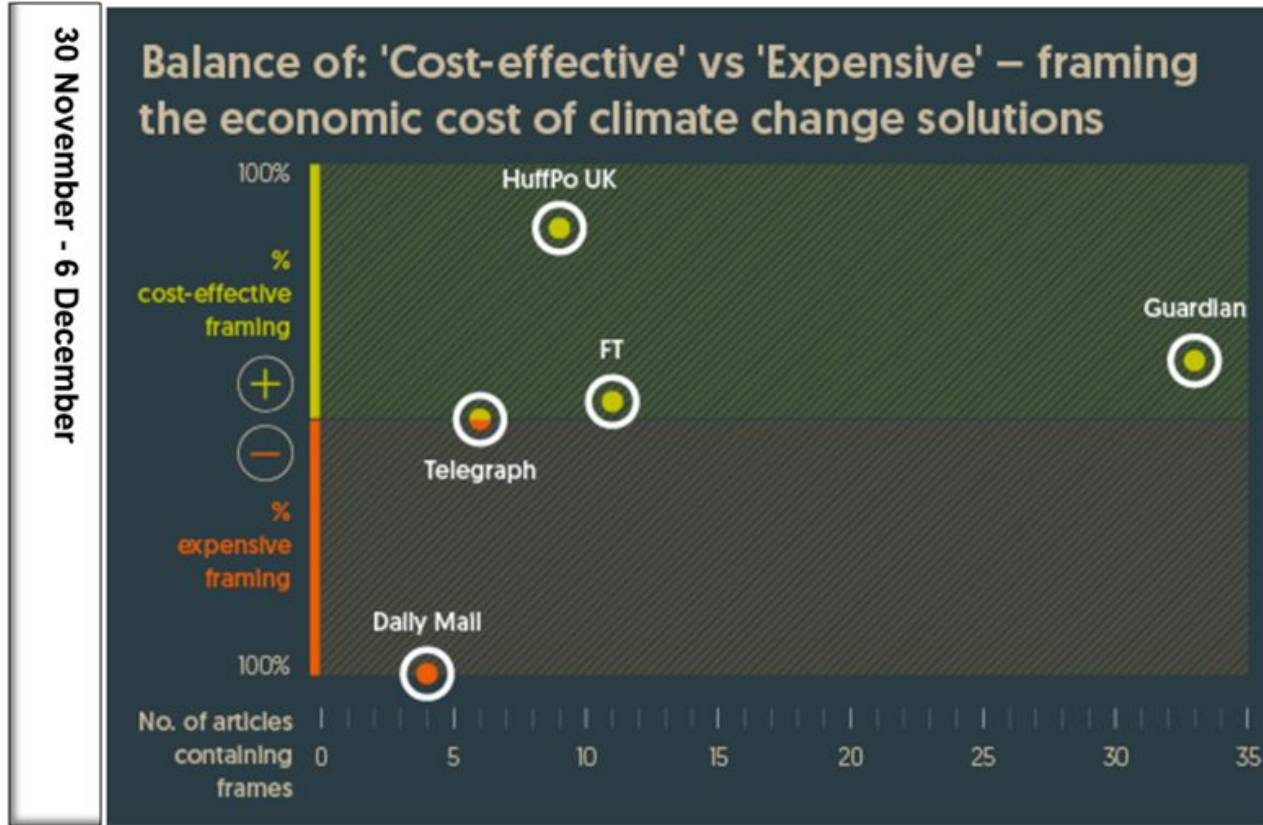
- Scientists & media professionals are people too

Significance of Sponge/Agenda Setting



Source: James Painter - Reuters Institute for the Study of Journalism - Oxford University
Martin Moore - Center for the Study of Media, Communication and Power - King's College London

Significance of Sponge/Agenda Setting

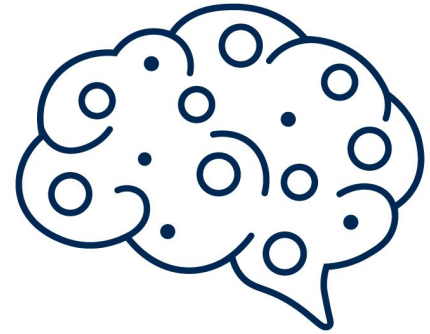


Source: James Painter - Reuters Institute for the Study of Journalism - Oxford University
Martin Moore - Center for the Study of Media, Communication and Power - King's College London



1. Concern leads to more stories of concern leads to a poverty of stories
2. We may under- as well as overestimate the scale of problems

The Brain as a Sponge



Take Home Message

Break

Pens/paper for drawing during next part



Insight 5

All 'factual' debates
are profoundly social





Who would you like to be your friend?



Social Thinking

We automatically assign

- intentions
- emotions
- character traits

It allows us to

- cooperate
- judge who we trust/distrust

Significance

- social thinking = automatic (elephant)
- + minds are tailored to respond to stories about people (but not issues)
- + we easily learn from the actions of others
- we denigrate those who disagree with us on matters close to our heart

IGNORANT

STUPID

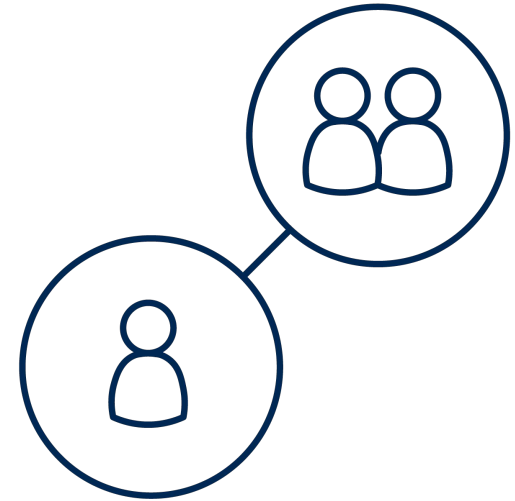
CRAZY

EVIL



1. Minds respond to stories about people/characters
2. We easily learn from people's 'stories of doing'
3. Deep disagreements lead to stupid-crazy-evil reasoning

Social Thinking



Take Home Message



Insight 6

Values

Values = answers to the question:
What do you care about in life?

Examples of value categories

independent
curious

unity with nature
a world of beauty

enjoying life

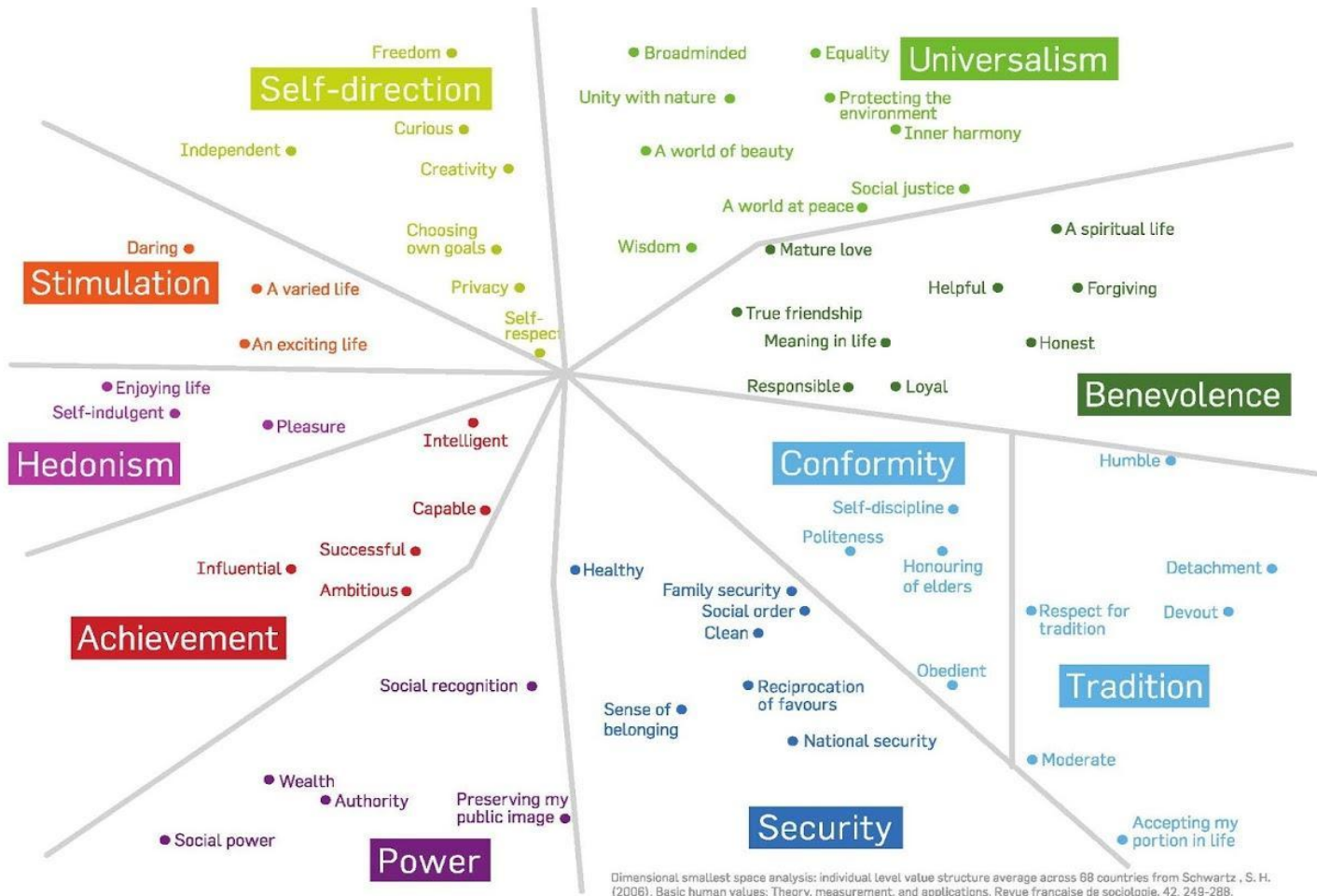
forgiving
honest

influential
ambitious

family security
belonging
clean

respect for tradition
obedient

wealth
social power



Dimensional smallest space analysis: individual level value structure average across 69 countries from Schwartz, S. H. (2006). Basic human values: Theory, measurement, and applications. *Revue française de sociologie*, 42, 249-288.

Achievement

Influential ●

Successful ●

Ambitious ●

● Health

Social recognition ●

● Wealth

● Authority

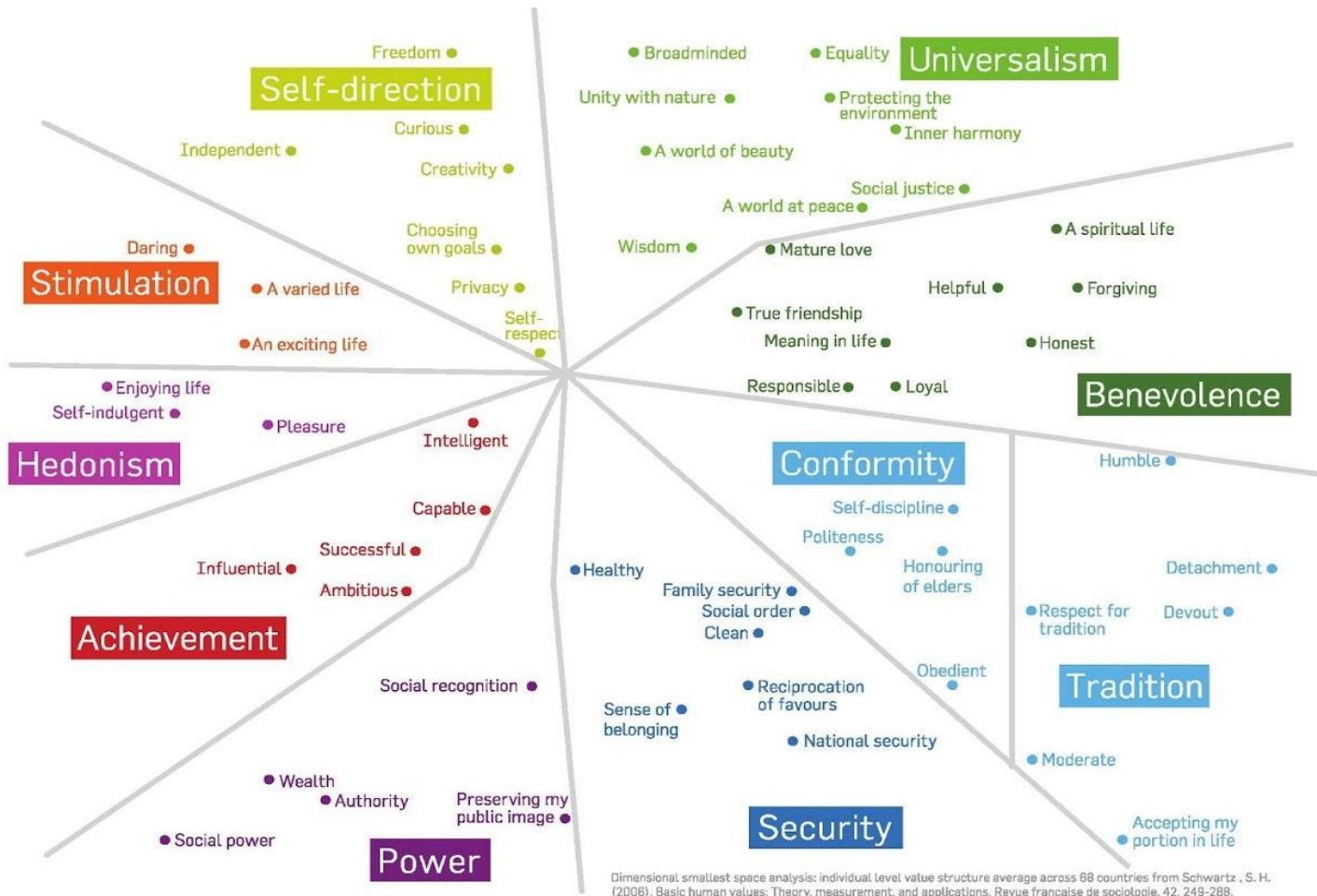
Preserving my
public image ●

● Social power

Power

Sen
belo

Dim
(20



Dimensional smallest space analysis: individual level value structure average across 69 countries from Schwartz, S. H. (2006). Basic human values: Theory, measurement, and applications. *Revue française de sociologie*, 42, 249-288.

Values = shortcut to 'what resonates'

Values help to understand how messages resonate:

- positive engagement
- indifference
- angry rejection

Example: 'save the planet' vs 'litter on the street'

The Sea

Dark and terrifying

Tropical beach
holiday

Pride and nostalgia:
Britain as a
seafaring nation

British seas -
grey and dull

Captivating! I want
to discover more



Climate change value frames

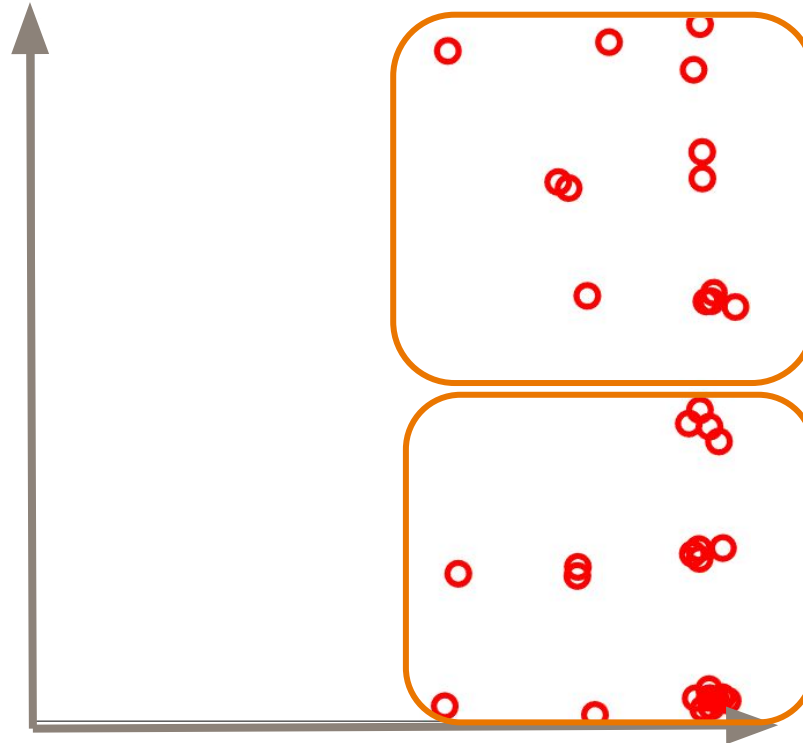
“We have to change our behaviour to save the planet”

“Where can I buy the solution to climate change?”

Climate change: data

“Where can I buy the solution to climate change?” The higher up, the more this framing resonates.

Every red marker is 1 person’s response



For responses in this corner, both framings are important

For responses in this corner, the need to change behaviour is most important

“We have to change our behaviour to save the planet”.
The further to the right, the more this framing resonates.

Values = same behaviour, different reasons

What psychological reasons / motivations can you identify for:

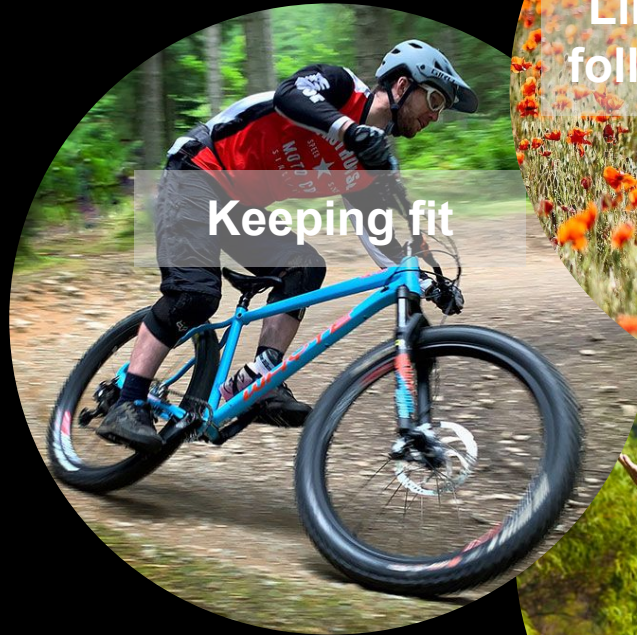
1. being outdoors in nature
2. putting solar panels on your roof
3. using reusable shopping bags

You have 5 minutes on your table

Brainstorm as many reasons for each as you can find

Table discussions

Being outdoors in nature



Keeping fit



Likes & followers



Nature connection



Walking the dog



Other people



Saving money



Being green

Putting solar panels on the roof

Using
reusable
shopping bags



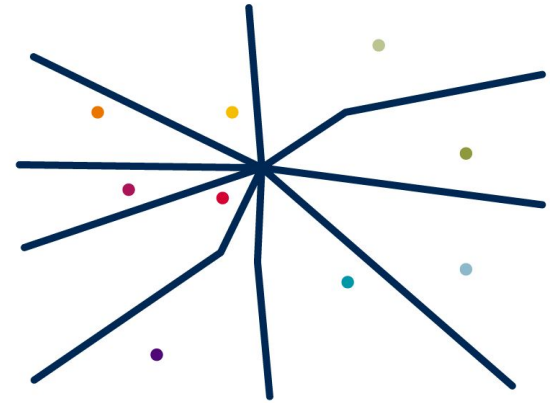
30p



£850

1. Values are a shortcut to understand what resonates
2. Different people may take the same actions for different underlying reasons

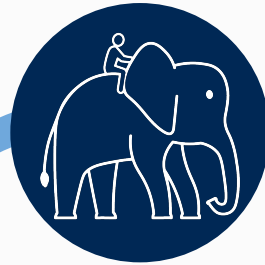
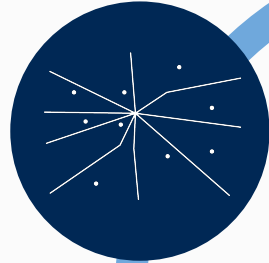
Values



Take Home Message

Putting it all together

Values =
what resonates



Speak to
the Elephant!



Manage
Ginger-the-Dog

Facts work in
stories about people



Tell more
varied stories



Actions and
choices drive
polarisation

Part 3: Crafting your story

Activity: What do you want to get across?

Think of a specific audience. What do you want them to get away from an interaction with you?

On a sheet of paper, make a drawing that signifies something that you are passionate to get across to this audience.

You have 4 minutes for the drawing.

Activity: What do you do?

On a sheet of paper, make a drawing of something you *do* as a researcher. Make it as specific an event or action as possible.

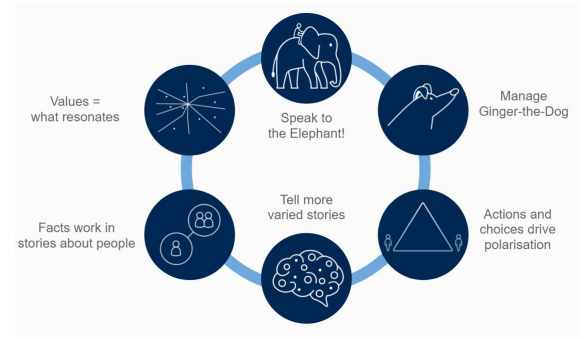
You have 4 minutes for the drawing.



Your Story



enables



The end

I will send out a further reading/viewing list