CARDIFF UNIVERSITY

Cardiff School of Social Sciences

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In the beginning

Berger and Luckman helped to create the environment for sociology of scientific knowledge by helping to create the ‘sixties’.

The Bath School’s starting point was a Winchian interpretation of Wittgenstein; the first publications were in 1974 and 1975 The second of these was radically constructivist

What was distinctive about the Bath School was that it grew out of empirical studies of science rather than out of theoretical considerations and it concentrated on contemporaneous science rather than historical sciences. (It also initiated controversy studies.)

The Bath school was, I think, influential, but always pretty small

The academic environment

Though we started independently without knowing much, the Bath School could only have become influential because of what else was around

The sixties!

The rationality debate

Kuhn

The strong program with the ending of Mannheim's exceptionalism in respect of science

In philosophy, the context is sometimes seen as the 'scientific realism' debate

Alternation

Berger's *Invitation to Sociology* was methodologically important for introducing the idea of 'alternation'

It is still a vital idea, not least for helping me understand what I am doing today in my analysis of the detection of gravitational waves

Methodological relativism

Though the Bath School started out as philosophically radical, my position since 1981 has been ‘methodological relativism’

It means *treating* the world as socially constructed without necessarily making a philosophical claim other than such a position is not self-contradictory.

Methodological relativism is vital because otherwise social analysts can cut social inquiry short anytime they like by playing the ‘reality’ or ‘rationality’ card. It has been worked hard in the matter of the detection of gravitational waves

Sociological and philosophical relativism

But a principled rather than a methodological social constructivism is needed for my work on artificial intelligence (AI) and on tacit knowledge.

Empirical studies of science *do* show that *in the short term* scientific findings are subject to interpretive flexibility and therefore they are properly described as 'socially constructed'; *scientific findings are agreements to agree*.

We can call this short term claim, 'sociological relativism'.

(Philosophical relativism must be right in perpetuity)

We want to use empirical studies of science to show that computers will not be able to mimic human performance until they can be embedded in social life.

Deep dreaming

Incidentally, a rule of thumb for the assiduous practice of sociology relativism is to treat the objects of science as though they were ‘pictures in the fire’ or ‘pictures in the clouds’. Google’s ‘Deep Dreaming’ has done us the favour of showing us what science might look like under this rule

Critiques of Artificial Intelligence

The most famous critic of AI is the Heideggerian, Hubert Dreyfus who wrote a striking article in 1967 called : 'Why computers must have bodies in order to be intelligent' and later (1972) published the heroic, *What Computers Can't Do*

His work rests heavily on Samuel Todes's 1963 thesis (published as *Body and World* in 2001)

The counter-critique is that computers do not need bodies to be intelligent but they do need to be embedded in society. Bodily features are needed only to make it possible to be so embedded and these are minimal

Todes and society

But Todes, and thus Dreyfus, ignore social life

The reader is forewarned that the analyses presented in this study are not of our normal experience in its full complexity. ... Thus, for example, for the purposes of this study of the human body as the *material* subject of the world, our experience is simplified by disregarding our experience of other human beings.' (Todes, 2001: 1, italics in original)

A reviewer writes: 'the book bypasses entirely the fundamental human experiences of sociality and language – instead one could read Todes thinking that humans are hermits working out the meaning and efficacy of their participation in the world. The kinds of insights later hermeneuts and constructionists offer – that the categories we use to make our experience know-able and habit-able are accessible human and cultural constructions – were not available to Todes'. (Strong, 2004: 521)

Individual and Society

No-one seems to ‘get’ the crucial distinction between the kind of body needed to construct a human-like society and that needed by an individual human or computer which is parasitical on a human society

Human-like bodies are needed to *form* human-like societies but a human-like body is not needed to *engage* with human-like societies; if it were, the congenitally disabled would be isolates!

Language (interactional expertise) can link those without human-like bodies to society just as it links the rest of us to those with different practices

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Madeleine

`she had never fed herself, used the toilet by herself, or reached out to help herself, always leaving it to others to help her' (p 58)

`spoke freely indeed eloquently ... revealing herself to be a high-spirited woman of exceptional intelligence and literacy' (p56)

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The sociological critique

We do not know how to build a socialisable machine so the machines we build will not be able to act like humans – not even severely disabled stationary humans; that is why no computer can pass a demanding Turing Test nor will in the foreseeable future

All computers' failings can be understood this way

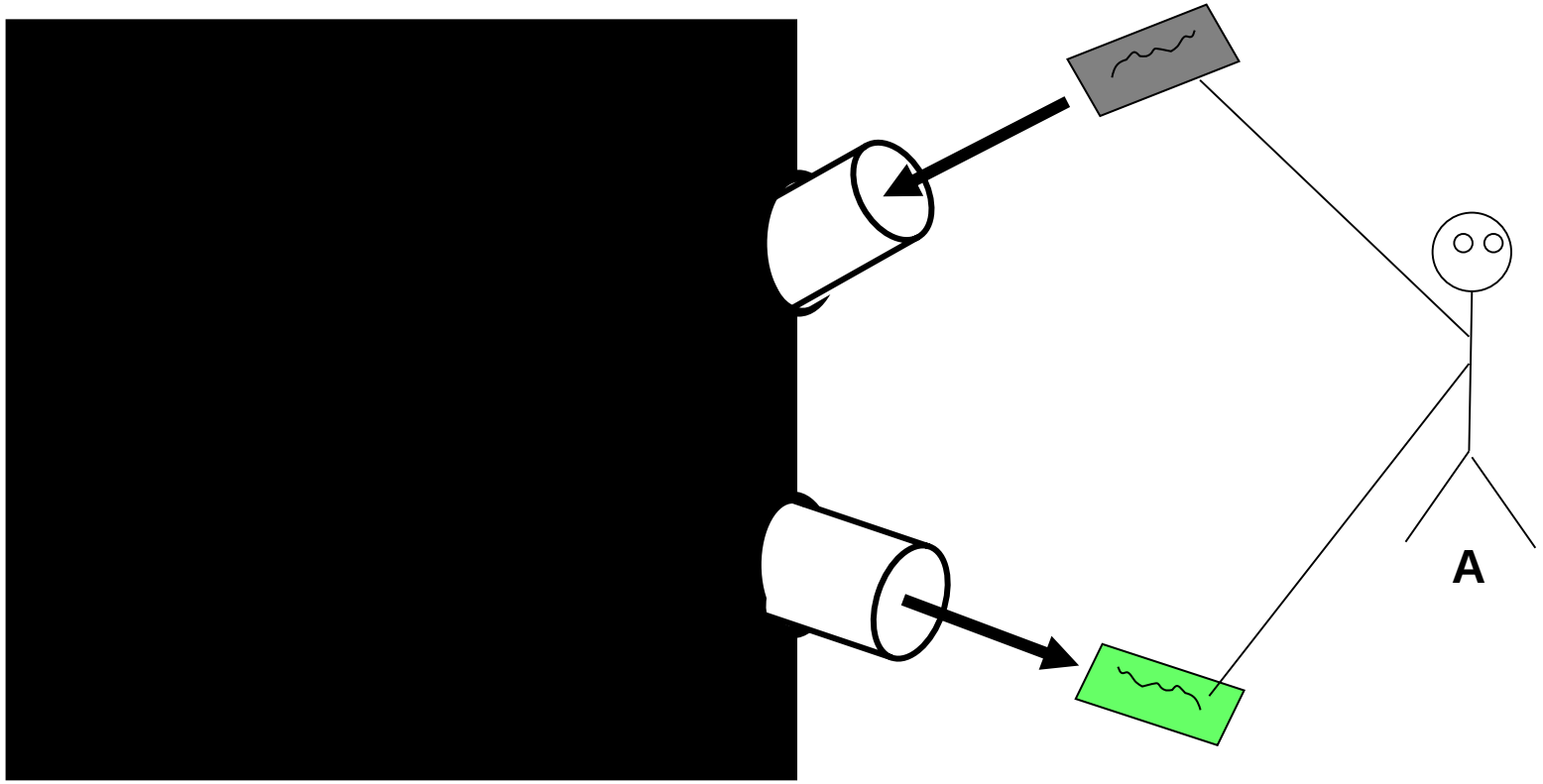
But it may be that *the sociological critique*, which worked well for a couple of decades, is becoming less secure

The Chinese Room

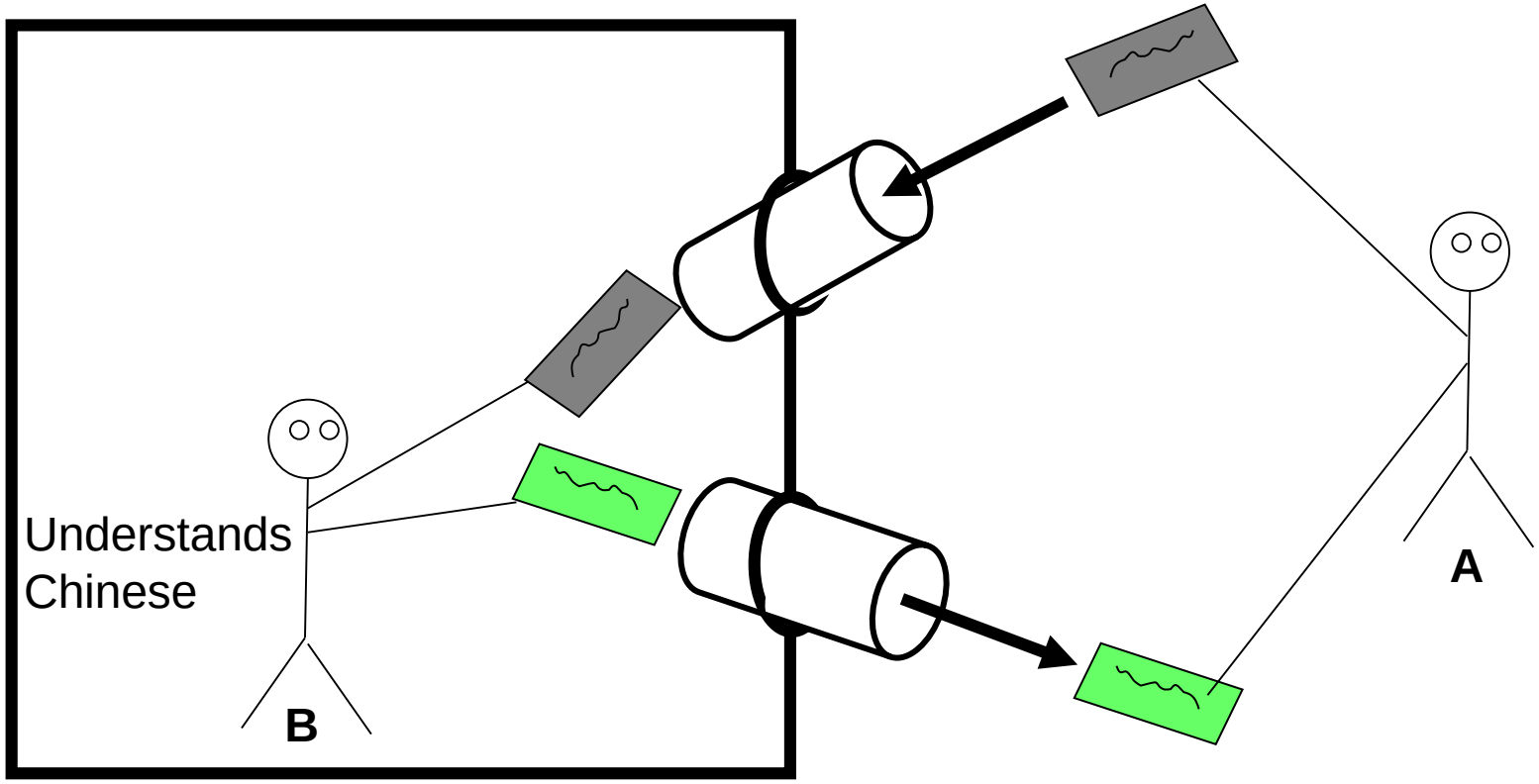
One way to deliver the sociological critique to an audience of AI-enthusiasts is to start with the Chinese Room argument of Searle

This is probably the most famous criticism of AI but seems to be universally misunderstood, not least by Searle himself

The original Chinese Room

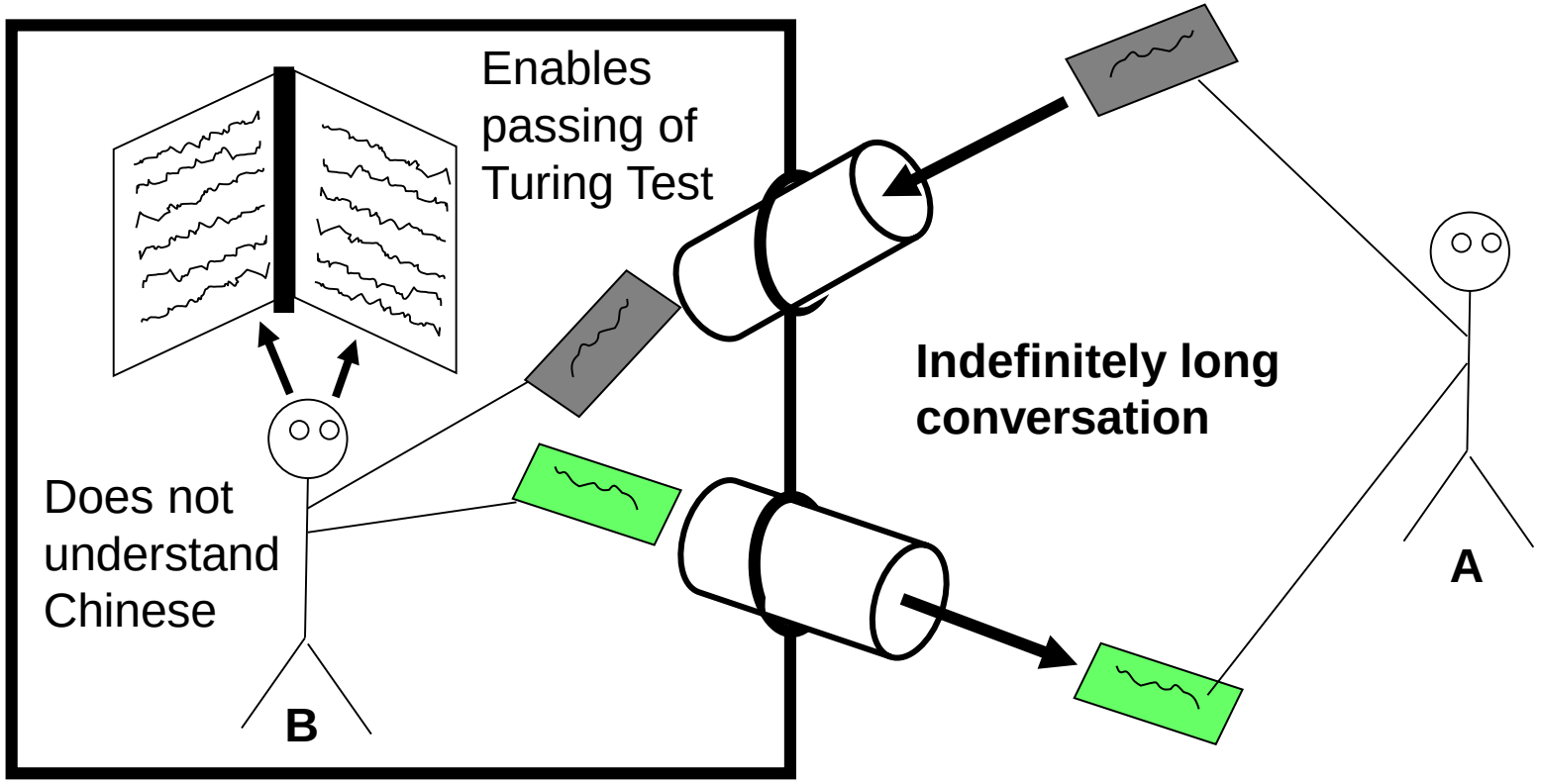


The original Chinese Room



The original Chinese Room

Does not matter if B understands or doesn't understand Chinese



Therefore shows that seemingly intelligent action does not necessarily indicate understanding

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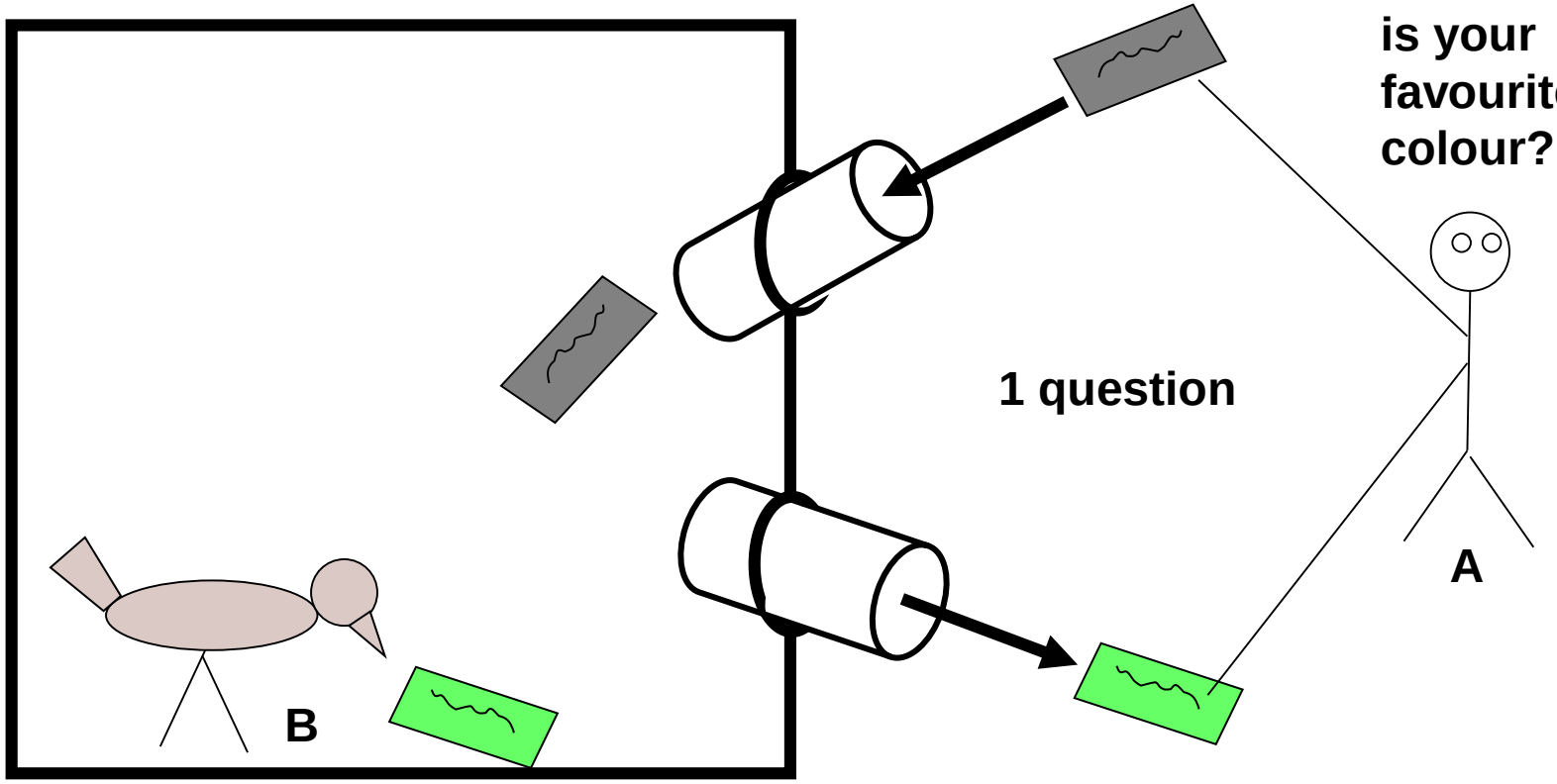
The Essential Chinese Room

Does not matter if B understands or doesn't understand Chinese



Therefore shows that seemingly Intelligent action does not necessarily indicate understanding

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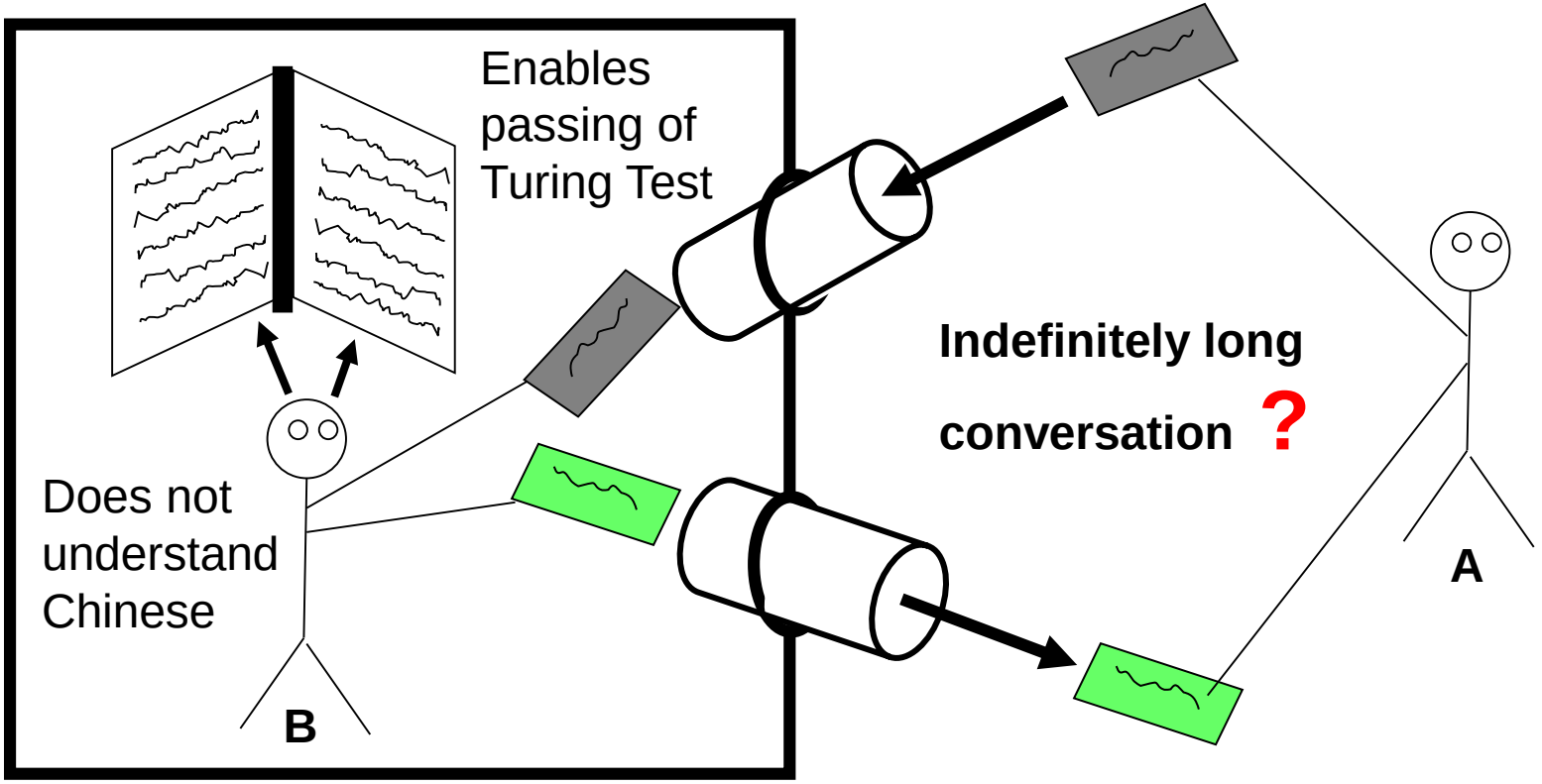
The Essential Thesis

That what might appear to be intelligent action does not demonstrate understanding is shown by either the original Chinese Room or the `Essential Chinese Room'

It does not matter if it involves a 5 minute Turing Test of a single question with a single answer

But we are never shown that the Chinese Room would pass the Turing Test – this is assumed



But look-up table is frozen so the room's language does not evolve with society's language; the room is not embedded in society

1) How does Google change this?

But, if the Chinese Room was plugged into the internet in the way Google is plugged in, continually scanning all written communication by humans and, in the future, listening in on all human conversations conducted by phone, could it automatically update the data base?

Would it then be equivalent to a socialised human being?

Why Google updating is not socialisation

Google updating is not socialisation because it there is no ‘domain discrimination’ (a concept drawn from a modified version of the Periodic Table of Expertises)

Domain discrimination enables us to discriminate between knowledge sources whereas Google’s pagerank is based on popularity

Facts as a proxy for value

Under pagerank, anti-vaccine websites will feature large so if knowledge is equated with popularity then don't vaccinate your children

Google is attempting to supplement pagerank with an algorithm which measures the number of true statements on a posting. One can see the problems!

In social life as represented by studies of science, value is measured by trustworthiness based on personal acquaintance with member of the specialist domain. This is domain discrimination.

2) How does massive computing power and 'deep learning' change this?

It is claimed that *unsupervised* computers can recognise even unnatural objects such as digits

It is claimed that modern computers 'trained' on huge databases of images – 'deep learning' – can match humans in pattern recognition when confronted with new sets of images

Do these challenge a radical version of social constructivism – one that would hold that all recognition of classes of objects is a matter of socialisation?

Does it set a limit on social construction?

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‘Deep quote’ is a prestigious founder of the field

He tells me an algorithm, *t-distributed stochastic neighbor embedding (t-SNE)*, will sort hand-written digits into distinct and correct clusters without doing more than unsupervised similarity recognition

This seems possible

He says this means:

‘CATEGORIES ARE REALLY THERE’

Should we care if basic categories are really there?

Evolutionary biology: animals developed, hard-wired, universal, basic, object recognition (UBOR) to survive. Not culturally specific because animals have no culture

Why not humans? Digits probably draw on UBOR to make them as distinct as edible or dangerous things.

But neither machines nor us can distinguish digits from other symbols : Ω ¥ © ◙ ≤ with UBOR; this is socially constructed

It is said that machines trained on *labelled* data sets (a billion or more examples) can recognise objects, eg motorbikes, in new data sets with more than 95% accuracy but, that's training, and does not distinguish types of motorbike

Universal basic object recognition (UBOR) is not a threat

Universal basic object recognition is a useful idea

UBOR AFFORDANCE => house

High Medium Low Zero

HOUSE

AFFORDANCE => LETTERS IS HIGH

High High ~zero High

SOCIALLY CONSTRUCTED AFFORDANCE => house

But computers can recognise ‘HOUSE’!

But only in the way they recognise all language – not, as we once would have said as a frozen cross-section, but now as a cross-section without social judgement

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THE END