How do you know you don't know?

What uncertainty monitoring can teach epistemology

Whats my problem?

I’m a philosopher

So I have a philosophical problem – One that I think is illuminated by work in animal cognition – in particular the work on uncertainty monitoring that I presented to the class earlier this semester.

- I’m going to start with some philosophy
- Then give you a taste of the Comparative Psychology
- Go back to the philosophy
- Finally wrap up with some questions that I’d like your thoughts on

Philosophy – part 1

• One crucial issue in the philosophic investigation of knowledge involves identifying those features of an accurate representation of the world that improve the epistemic qualities of that representation.

- The central idea here is that there is something importantly different between getting things right by chance and getting them right for a reason. E.g. If Abel believes there are five coins on the plate because he/she counted them and Baker has the same belief but because he/she guessed then Abel's belief is epistemically superior to Baker's.

• Question: What is it that makes the difference?

• There's more than one way to go on this and whilst I've got a view (Alston's epistemic desiderata) I'm going to finesse this for now and worry about a related question – ACCESS

Philosophy – part 1

- Assume some inquirer has a cognitive mechanism that produces true beliefs (so we can stop worrying about what exactly it is that does this).
- Does the inquirer need ACCESS to the operation of this mechanism for it to improve the inquirers epistemic situation?
- E.g. Tortoise versus Hare – Colin says Hare and Katy gives reasons
- In philosophy there are 2 views –
  - Externalism says no access needed
  - Internalism says access of some sort is relevant
- What counts as ACCESS? – for philosophers it typically involves being able to give reasons. EG you can put something after the because in “I believe that X because …”.

Philosophy – part 1

Problems

- Externalism doesn't account for sense that access makes a difference

- Internalism demands a kind of access that is both hard to get and often seems irrelevant

- This is where I think Animal Cognition can make a difference by
  - a) highlighting and
  - b) demonstrating the existence
- of a kind of ACCESS that is relevant and achieveable.

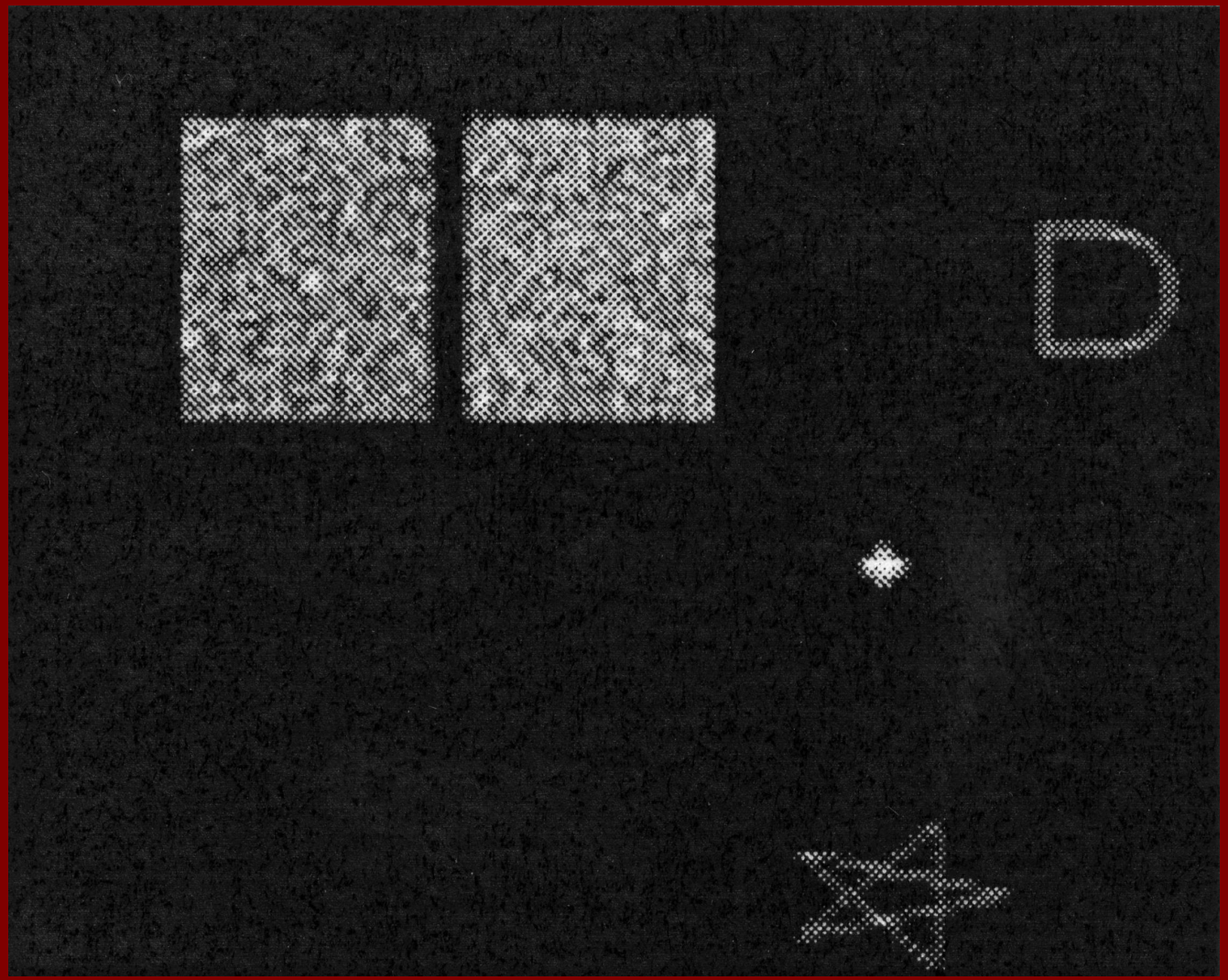
- So let's look at the Animal Cognition work.

Comparative Psychology

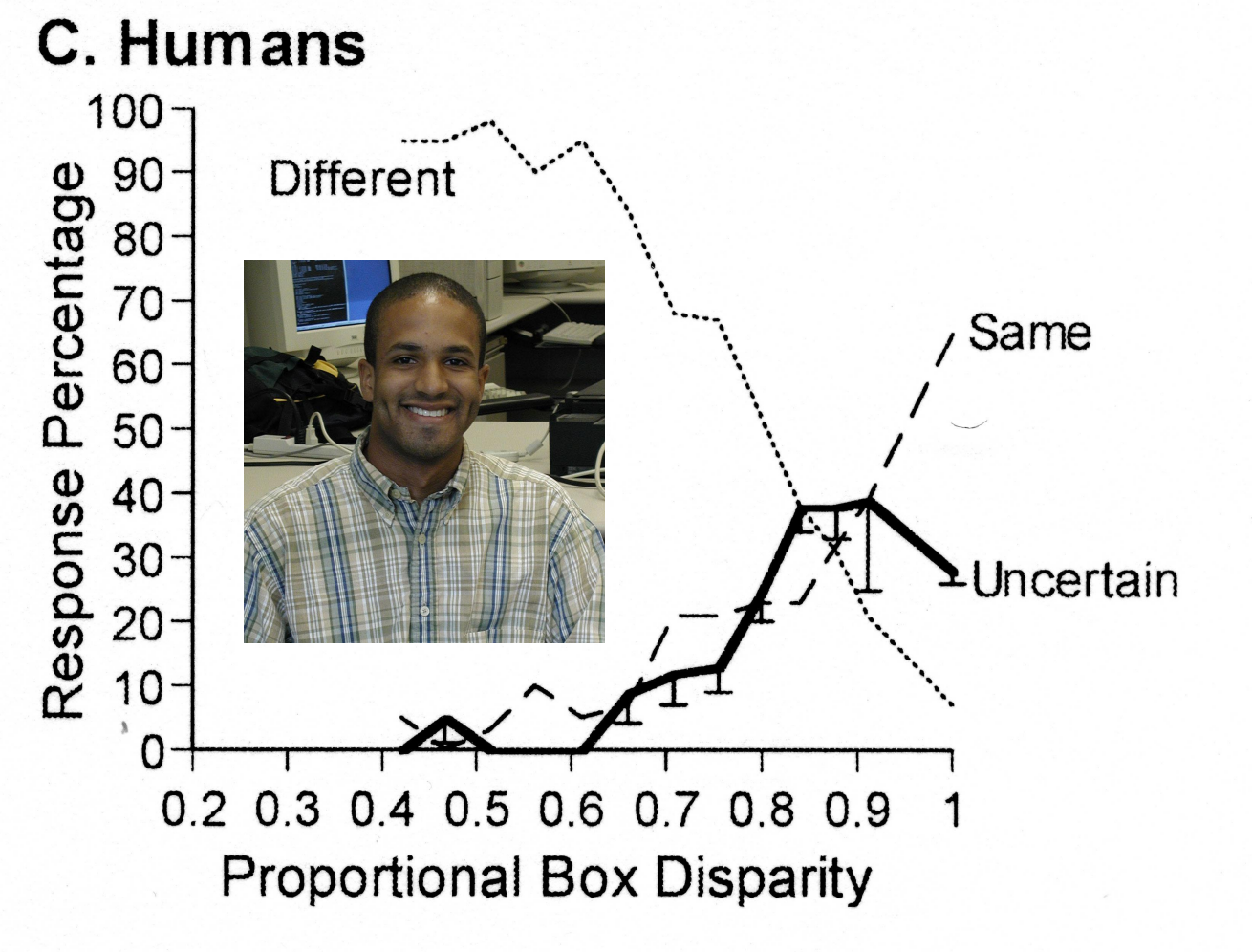
- Shields et al (1997) report the achievements of both humans and macaques on a same-different perceptual discrimination task.
- This paper should be consulted for exact details of the experimental results described below.
- Subjects: 2 Macaques and 6 Humans

- **Set Up: I'm glad you asked!**

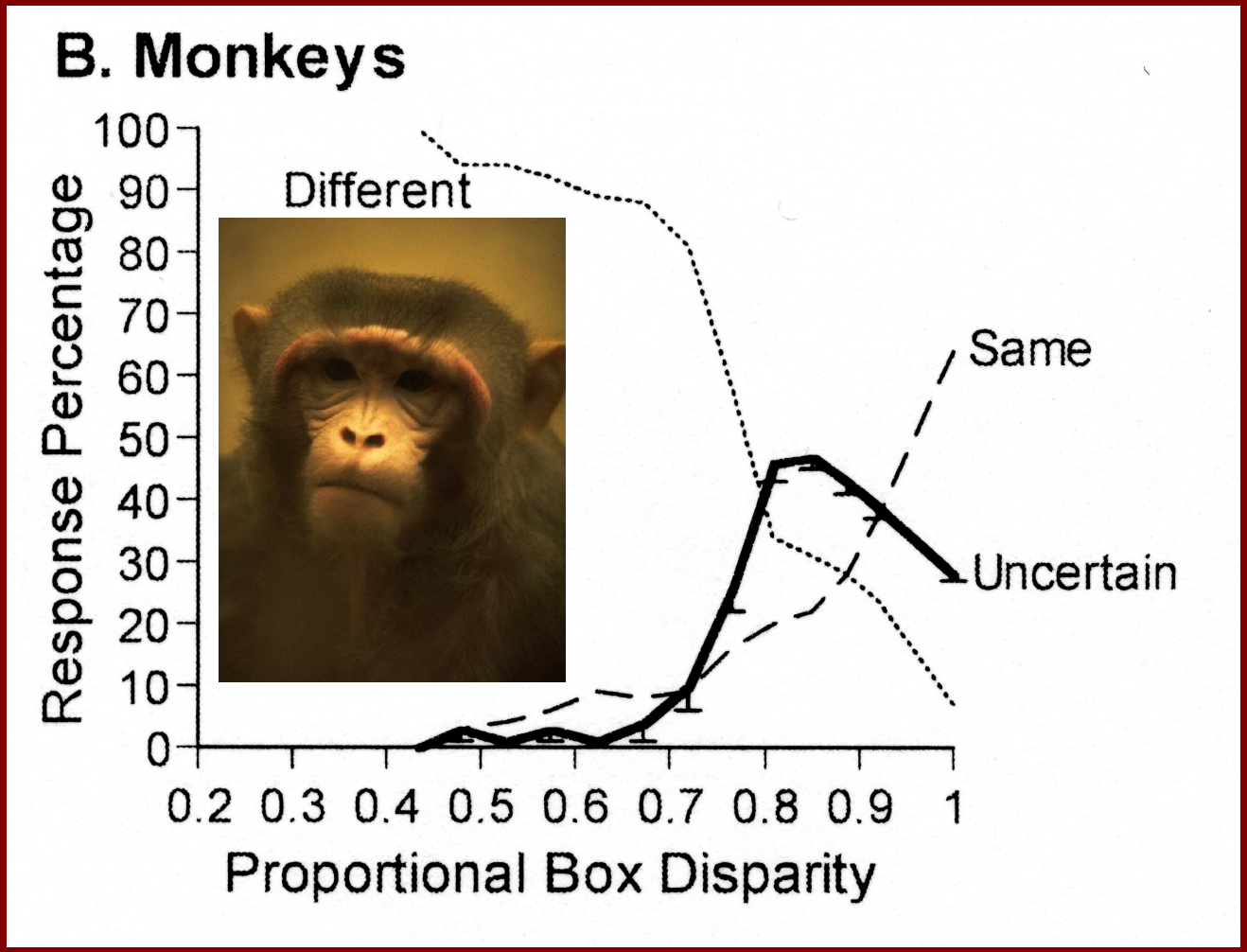
Comparative Psychology



Comparative Psychology



Comparative Psychology



Comparative Psychology

- Human subjects debriefed after the experiment described their experience of the trials as follows. When they could see that the boxes were different they selected the ‘D’, when they were the same they selected the boxes. In situations where they could not ‘see’ either ‘same’ or ‘different’, that is, when they were *uncertain* they selected the ‘★’.

- Given the substantial similarity of the performance curves of macaques and humans it was judged that macaques possess a cognitive capacity functionally equivalent to the human capacity to monitor uncertainty.

Philosophy – part 2

- Macaque uncertainty monitoring improves their ability to 'GET THE WORLD RIGHT' in the sense that they do not use perception to guide action in circumstances where that modality is untrustworthy. This means they are more sensitive to the state of the world than an organism that acted on its sensory data regardless of its trustworthiness.

- Uncertainty monitoring is an improvement on *internalism* because cognitive monitoring is more widely available than reason giving and it is more appropriately connected to the processes on which it operates than *post hoc* reason giving is.

- Uncertainty monitoring is an improvement on *externalism* because it rules out guessing. It does this by not using the primary cognitive mechanism when that mechanism is not trustworthy.

Puzzles

- Can macaques make use of their ability to monitor their own uncertainty as part of a more active approach to inquiry? In short, does being uncertain lead macaques to seek more information about a situation if that is a possibility? Imagine that the screen in the Shields et al. experiments contained a fourth option ‘C’. Selecting the ‘C’ condenses the lit pixels in each box so that they form a solid block of light at the bottom of each box. Selecting ‘C’ costs time and does not guarantee a solvable problem but will in general reduce the difficulty of the same-different judgment.

- What is the relation between the reliability of a cognitive mechanism and its epistemic status? Improved epistemic abilities are not merely more reliable mechanisms but enhanced reliability seems requisite for the natural selection of those mechanisms. Is there anything more to be said about the relation of these two notions?

References

- Shields, W.E., Smith, J.D. & Washburn, D.A.(1997) Uncertain responses by humans and rhesus monkeys (*Macaca mulatta*) in a psychophysical same-different task. *Journal of Experimental Psychology: General* 126: 147-64.

- Smith, J.D., Shields, W.E. & Washburn, D.A. (2003) The comparative psychology of uncertainty monitoring and metacognition. *Behavioral and Brain Sciences* 26: 317-73.