PHILOSOPHY OF SCIENCE: PRE-LINGUISTIC COGNITION

Course overview: Far from a blank slate, recent work in cognitive science has been widely interpreted as showing that young human infants innately represent numbers, causality, beliefs, agency, and more. But what should we make of these claims? For a start, how could we possibly know the contents of a non-linguistic creature’s mind? And why should we suppose that babies literally represent numbers of a sort that we might discuss in the math class, or appreciate that others have beliefs of a sort that can misrepresent reality? Aren’t there simpler interpretations of the available results? Even if there are not, it seems we must still account for the manifest differences between young children’s grasp of number or causation or agency or belief and that of mature, enculturated, thinkers, when they conceive of such abstract notions. How might we do this? In this class, we will take a deep dive into these issues at the intersection between philosophy and cognitive science, considering how the tools of analytic philosophy can be used to illuminate the relevant scientific results.

Assessment:
- Participation (15%)
  - Be prepared to engage in discussion during class.
  - Students will be asked to present on the assigned readings on weeks arranged in class.
- Writing (85%) - Complete one of two paths:
  - Option A You will write two short papers of around 3,500 words each. The first (40% of course grade) is due March 15th, the second (45%) is due May 5th.
  - Option B You will write one research paper, around 7,500 words total, in two steps. A detailed proposal/extended abstract of around 1000 words (30% of course grade) is due April 11th, and the seminar paper (55%) is due May 5th.

Weekly readings:
Week 1: Introduction
Required reading:
If you haven’t come across ‘core cognition’ before, I’d recommend trying to get through the following:
- Chapters 1-3 of Carey’s The Origin of Concepts. OUP.
If you’re keen, try this too:
- Chapters 1-3 of Spelke’s What Babies Know. OUP.
Both books are amazing – a useful exercise would be to read [and re-read] them, soak up the science, and take a note of each of the philosophical claims being advanced/raised – later chapters may also introduce helpful case studies for your own research.

Week 2: How does core cognition differ from mature knowledge?, Part 1: Representational Content

Required reading:
  - This was published with 26 commentaries and our response to these – you don’t need to read all of these, but some of the more philosophically interesting responses were those by Opfer, Samuels, Shapiro & Snyder, and by Gross, Kowalsky, and Burge.

For further reading on this topic, follow up on references in the above papers. For background, see Chapter 4 of Susan Carey’s The Origin of Concepts.

Week 3: How does core cognition differ from mature knowledge?, Part 2: Perceptual Content

Required reading:
- Yousif, S., Clarke, S., & Brannon, E. (pre-print) ‘Number Adaptation: A Critical Look’ (try the demos)

Further reading:
- Sami Yousif and I have compiled a list of all published reports of number adaptation, here: https://www.samiyousif.org/number-adaptation-bibliography
- For another intriguing case of high-level adaptation, relevant to our discussions in class, see causality adaptation:

Week 4: Interlude: Is perceptual adaptation the best way to characterize a perception-cognition border?

Required reading:

Further reading:
- For an extended defense of the idea that adaptation is a mark of the perceptual, see: Block, N. (2022) The border between seeing and thinking, OUP.
For other ways of thinking about the perception-cognition border, see: Clarke, S. & Beck, J. (2023) ‘Border disputes: Recent debates along the perception-cognition border’, *Philosophy Compass*. 18(8): e12936.

For ways in which this might all be relevant to our treatment of core number cognition, see:


**Week 5:** *How does core cognition differ from mature knowledge?, Part 3: Conceptual Content*

**Required reading:**


**Further reading:**

- You could check out sections 2-3.2 of Clarke, S. (2023) ‘Compositionality and Constituent Structure in the Analogue Mind’, *Philosophical Perspectives*, for a summary of what (I think) has gone wrong in Beck’s argument. (This may not be necessary – Halberda’s paper is probably harder going, but more authoritative on these points).
- For a fantastic intro to concepts, see the intro to Margolis, E. & Laurence, S. (1999) *Concepts: Core Readings*. MIT Press

**Week 6:** *How does core cognition differ from mature knowledge?, Part 4: Format*

**Required reading:**


**Further reading:**


**Week 7:** *A puzzling dissociation*

**Required reading:**

- Spelke, E. (2023). ‘Number’, Chapter 4 of *What babies know: Core knowledge and composition, Volume 1*. OUP.
Further reading:

- There is lots of work on subitizing, or small number representation, out there. Follow the references in Spelke’s book for more. For a philosophical treatment of these abilities, see Eric Margolis (2020) ‘The Small Number System’ in *Philosophy of Science*.
- For a related puzzle (in the case of infant object cognition) see also Chapter 6 of Stephen Butterfill’s (2020) *The developing mind: A philosophical introduction*, Routledge.

Week 8: *From number to social cognition: The case of false belief*

Required reading:


Further reading:

- Follow up the references in the above, especially:

Week 9: *Action perception: Intention or goals?*

Required reading:


Further reading:

As will be clear from the main readings (especially Helton’s article) there is a question of whether the relevant discriminations are perceptual in nature. See:


To better understand how these perceptual discriminations operate, see:


For recent philosophical work on these issues, see:


Week 10: *Is action perception a problem for minimal mindreading?*

Required reading:


Further reading:
• All the readings from Week 9 will be relevant here.

Week 11: Replication crises in developmental psychology
Required reading:

Further reading:

Week 12: Beyond genetics 1: Cognitive gadgets
Required reading:
• Look through at least some of the commentaries (and Heyes’ response to these)

Further reading:
• Heyes’ theory of cognitive development is laid out more comprehensively in her (very readable) Cognitive Gadgets: The Cultural Evolution of Thinking.

Week 13: Beyond genetics 2: Cumulative culture
Required reading:
  • See also the responses to the above target article.

Week 14: Beyond genetics 3: Concept learning
Required reading:
• Spelke, E. (2017) ‘Core knowledge, language, and number’, *Language Learning and Development*, 
  13(2): 147-70.
• Clarke, S. (MS.) ‘Number Nativism’.

Further reading:
• Carey’s *The Origin of Concepts* is the crucial reference point in this literature. For (sympathetic) 
  philosophical discussion, see:
    Origin of Concepts* (OUP, 2009), *Biology & Philosophy* 26, 129-139
• Also interesting is Richard Samuels and Eric Snyder’s new book ‘Number Concepts’ CUP.