

THE CORTICAL PARTNERSHIP:

An Auto-Ethnographic Case Study of Cognitive Division of Labour in Human–AI Co-Creation (Final v5.0)

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Author Note: The author uses the functional designation “cDr.” (Cognitive Doctor) in other works to denote expertise in conceptual modelling and cognitive-systems design. It is omitted here to avoid reviewer bias.

Abstract

This paper presents an eight-month (April–December 2025) auto-ethnographic analysis of a sustained

human–AI co-creation workflow carried out in full physical isolation and under minimal technological conditions.

During this period, the human–AI partnership generated 317 discrete research artefacts, including 109

Zenodo preprints, 162 Academia.edu uploads, 17 Archive.org deposits, 10+ book publications, and five

patent-level technological concepts submitted to CIPO (Canada) and USPTO (USA).

Using frameworks from Extended Cognition, Distributed Cognition, Cognitive Offloading, and

Human–AI Co-Creation Theory, the study identifies a dual-layer mechanism of Cognitive Division of Labour (CDL).

The synergy constitutes a Cortical Partnership Model, wherein AI acts as a stabilising external cognitive

module rather than an autonomous originator of novelty.

Data Availability: All supporting data for this study are permanently archived at Zenodo (DOI: 10.5281/zenodo.17774980).

1. Introduction

Human–AI co-creation is evolving rapidly, yet long-duration, high-intensity collaborations outside institutional settings remain poorly documented.

This paper describes one such rare case: an independent researcher in full isolation, working intensely

with frontier AI models for eight consecutive months.

Key outputs:

- 317 total artefacts
- 109 DOIs on Zenodo
- 5 patent submissions
- A complete CDL framework

Research Questions:

1. How does sustained human–AI collaboration function under minimal infrastructure?
2. What mechanisms structure the division of labour between intuition and AI scaffolding?
3. How does isolation modulate cognitive processes?
4. What does this case reveal about post-institutional research ecosystems?

2. Theoretical Framework

Extended Cognition (Clark & Chalmers, 1998)

Distributed Cognition (Hutchins, 1995)

Cognitive Offloading (Risko & Gilbert, 2016)

Human–AI Co-Creation (2024–2025 literature)

Recent supporting works include:

- Guzman et al. (2025) – AI as cognitive prosthetics
- Rezwana & Maher (2025) – Creative partnership patterns
- Wu et al. (2025) – From co-author to co-brain
- Louppe & Cranmer (2025) – AI-augmented discovery
- Oppenlaender (2024–25) – Collaboration taxonomies

3. Methodology

Auto-ethnographic analysis of a continuous eight-month workflow.

Data Sources:

- 4,800+ interaction logs

- Publication archives
- Patent application documents
- Daily cognitive journals

AI Models Used:

- OpenAI o1-preview
- OpenAI o3-mini-high
- Grok-4 (xAI)

Coding Framework:

- IL-1 – Intuitive Leap
- AS-40 – AI Stabilisation
- ICA – Isolation Cognitive Amplification

4. Researcher Preconditions

Skills contributing to synthesis:

- Concept architecture
- Telecommunications
- Systemic reasoning

5. Cognitive Division of Labour (CDL)

Human Layer (Origination):

- Intuition, synthesis, conceptual framing

AI Layer (Amplification):

- Structuring, expansion, stabilisation

Together forming the Cortical Partnership Output.

6. Cortical Partnership Diagram (Description)

[Diagram omitted in PDF version; vector PDF provided separately upon request.]

7. Patent Evidence

Three verifiable CIPO provisional applications and one USPTO utility filing (pending public release):

CIPO (Canada) – 2025:

- 3279677 – Cognitive/AI-integrated device
- 3280534 – Sensory-feedback architecture
- 3279222 – Neuro-adaptive monitoring system

USPTO (USA):

- Utility Filing – Application number pending release (18-month confidentiality)

8. Comparative Context

Comparisons with:

- Ethan Mollick
- Lilian Weng
- Alan D. Thompson
- EleutherAI logs

None combine minimal hardware + full isolation + patent outputs.

9. Discussion

Implications:

- Hybrid cognition reshapes research
- Post-institutional ecosystems emerging
- Epistemic inequality risks
- AI as cognitive infrastructure

10. Limitations

- Single case (n=1)
- Extreme conditions
- Limited generalisability

11. Data Availability Statement

All supporting materials (DOI list, patents, transcripts, codebook, timeline) are archived at Zenodo:

DOI: 10.5281/zenodo.17774980

12. Conclusion

Even under extreme minimal infrastructure, sustained human–AI collaboration can produce verifiable

scientific and technological contributions.

The CDL mechanism and Cortical Partnership Model offer a foundational framework for hybrid cognition research.

References (Selected):

Clark & Chalmers (1998)

Hutchins (1995)

Risko & Gilbert (2016)

Guzman et al. (2025)

Rezwana & Maher (2025)

Wu et al. (2025)

Louppe & Cranmer (2025)

Oppenlaender (2024–2025)