

Psych 4320

Spring 2023

The Consciousness Revolutions*

Mondays 11:20am – 1:50pm

Professor Shimon Edelman
Department of Psychology
Cornell University
Ithaca, NY 14853

<https://shimon-edelman.github.io>

Mariposa clavada que medita su vuelo
(A pinned butterfly contemplating its flight)

Oda a Salvador Dalí
— FEDERICO GARCÍA LORCA

Soyez réalistes, demandez l'impossible
(Be realist, demand the impossible)

— a May '68 slogan

*Version 2, January 6, 2023.

1 Motivation and overview

Consciousness is all that you have in this world. Indeed, in a sense it *is* the world: when you descend into dreamless sleep, you vanish, and so does the world. This seminar focuses on a selection of topics arising from contemporary consciousness research. It starts by pointing to the key characteristic of consciousness, without realizing which it cannot be understood: like everything else about the mind, it is fundamentally a kind of computation. Among many other matters, this explains: how it is that we share some aspects of consciousness with bacteria; how it can arise in artificial machines and not just living ones; how the empty cocoon of the self that it spins ends up pretending to be the butterfly; and how consciousness dooms this virtual butterfly to the splendor and the suffering of being awake and aware. Unlike most other treatments of consciousness, this one concludes with a discussion of some possible ways whereby the pinned butterfly can, with a little help from its friends, do something about its condition.

2 Notes for participants

This section contains essential information for participants: format description, inclusion statement,¹ ground rules for discussion, and credit requirements.

2.1 Format

Note: in distinction from the typical Topics seminar, in this one will the students will not have to present papers. Instead, at each weekly meeting the instructor will give an overview of the material and lead the discussion.

2.1.1 The prerequisites

At least one course in a social science (psychology, sociology, anthropology), or permission of instructor.

2.2 Diversity, inclusion, and ground rules for discussion

Unlike in a large-enrollment lecture-based course, in which some students may choose, and succeed, to remain virtually anonymous, in a small-class seminar setting you are expected to contribute to the discussion at every weekly meeting. Because *your* informed opinion on every aspect of the material is unique and valuable, I shall strive to facilitate the conversation so as to make all voices heard. In this, I'll be counting on your help, and on the help of your classmates.

Even matters of “consensus” are not always easy to talk about, as the rare dissenters who dare voice their opposition know full well; how then should we approach potentially controversial topics? With care and compassion, diligence, openness, and daring: care for our shared humanity; diligence with regard to the relevant knowledge and findings; openness to informed dissent; and daring to venture into uncharted territory, as befits good education.

If at any point during the semester (no matter whether in class or after hours) you feel that you need to talk about any of these things, please let me know immediately — doing so will be my top priority.

¹The remarks in section 2.2, which are specific to this course, are intended to supplement the official Cornell statement on diversity and inclusion, which covers dimensions such as gender, race, socio-economic background, etc., and which can be found here: <http://diversity.cornell.edu/>.

2.3 Credit and grading

There are three components to getting credit for this course:

1. Attend the lecture and contribute to the discussion during the **weekly meetings**.
2. **No later than 9am on the Monday** for which readings have been assigned, post on the Canvas discussion board, under the relevant week's thread, **questions** on the material. Be prepared to raise these questions in class. At least 10 questions should have been submitted by the end of the semester.
3. One week after the last class, submit an **essay** (approximately 1000-1500 words) on a consciousness-related topic chosen in consultation with the instructor.

Final grade components:—

Weekly questions	40%
Participation in the discussions:	20%
Final essay:	40%

— — —

3 Weekly topics and readings

- **Week 1 (January 23) SELFLESS CONSCIOUSNESS.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, *Prelude* and ch. 1, *Selfless Consciousness*.
2. [OPTIONAL] Edelman, S. (2008). *Computing the mind: how the mind really works*. Oxford University Press, New York, NY, ch. 9, *Being No One*.
3. [OPTIONAL] Edelman, S. (2020). *Life, Death, and Other Inconvenient Truths*. MIT Press, Cambridge, MA, ch. 7, *Consciousness*.

- **Week 2 (January 30) MINIMAL SELVES.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 2, *Minimal Selves*.
2. [OPTIONAL] Moyal, R., Fekete, T., and Edelman, S. (2020). Dynamical Emergence Theory (DET): a computational account of phenomenal consciousness. *Minds and Machines*, 30, 1–21.

- **Week 3 (February 6) THE BRAIN'S VR ENGINE: VISION.**

1. Marr, D. (1982). *Vision*. W. H. Freeman, San Francisco, CA, section 3.3.
2. Edelman, S. (2020). *Life, Death, and Other Inconvenient Truths*. MIT Press, Cambridge, MA, ch. 24, *Perception*.

• **Week 4 (February 13)** THE BRAIN'S VR ENGINE: LOCATION.

1. Edelman, S. (2008). *Computing the mind: how the mind really works*. Oxford University Press, New York, NY, ch. 6, *Memory*.
2. Wu, C.-T., Haggerty, D., Kemere, C., and Ji, D. (2017). Hippocampal awake replay in fear memory retrieval. *Nature Neuroscience*, 20(4), 571–583.
3. Bellmund, J. L. S., Gärdenfors, P., Moser, E. I., and Doeller, C. F. (2018). Navigating cognition: Spatial codes for human thinking. *Science*, 362, eaat6766.

• **Week 5 (February 20)** THE BRAIN'S VR ENGINE: MEMORY AND TIME TRAVEL.

1. Edelman, S. (2008). *Computing the mind: how the mind really works*. Oxford University Press, New York, NY, ch. 6, *Memory*.
2. Gilbert, D. T. and Wilson, T. D. (2007). Prospection: experiencing the future. *Science*, 317, 1351–1354.
3. Buckner, R. L. (2010). The role of the hippocampus in prediction and imagination. *Annual Review of Psychology*, 61, 27–48.
4. Hoerl, C. and McCormack, T. (2016). Making decisions about the future: regret and the cognitive function of episodic memory. In K. Michaelian, S. B. Klein, and K. Szpunar, editors, *Seeing the future: theoretical perspectives on future-oriented mental time travel*, chapter 12, pages 241–266. Oxford University Press, Oxford.
5. Christophel, T. B., Klink, P. C., Spitzer, B., Roelfsema, P. R., and Haynes, J.-D. (2017). The distributed nature of working memory. *Trends in Cognitive Sciences*, 21, 111–124.

• (February 28) [February break — no class]

• **Week 6 (March 6)** THE BRAIN'S VR ENGINE: EMBODIMENT.

1. Edelman, S. (2008). *Computing the mind: how the mind really works*. Oxford University Press, New York, NY, ch. 9, *Being No One*.
2. Ehrsson, H. H. (2007). The experimental induction of out-of-body experiences. *Science*, 317, 1048.
3. Blanke, O. (2012). Multisensory brain mechanisms of bodily self-consciousness. *Nature Reviews Neuroscience*, 13, 556–571.
4. Guterstam, A., Larsson, D. E. O., Szczotka, J., and Ehrsson, H. H. (2020). Duplication of the bodily self: a perceptual illusion of dual full-body ownership and dual self-location. *Royal Society Open Science*, 7, 201911.

• **Week 7 (March 13)** THE BRAIN'S VR ENGINE: SELF-MODEL.

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 3, *Self-consciousness*.
2. Metzinger, T. (2004). The subjectivity of subjective experience: A representationalist analysis of the first-person perspective. *Networks*, 3-4, 33–64.

3. [OPTIONAL] Hohwy, J. and Michael, J. (2017). Why should any body have a self? In F. De Vignemont and A. J. T. Alsmith, editors, *The Subject's Matter*, pages 363–391. The MIT Press, Cambridge, MA.

- **Week 8 (March 20) PAIN.**

1. Kolodny, O., Moyal, R., and Edelman, S. (2021). A possible evolutionary function of phenomenal conscious experience of pain. *Neuroscience of Consciousness*, 7(2), niab012.

- **Week 9 (March 27) LANGUAGE.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 4, *Speech and sign*.

- (April 4) [Spring break — no class]

- **Week 10 (April 10) SELF AND SOCIETY.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 5, *Self and society*.
2. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, *Interlude*.

- **Week 11 (April 17) SPECIES OF SUFFERING.**

1. Edelman, S. (2020). *Life, Death, and Other Inconvenient Truths*. MIT Press, Cambridge, MA, ch. 32, *Suffering*.
2. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 6, *Self-care*.
3. Metzinger, T. (2017). Suffering, the cognitive scotoma. In K. Almquist and A. Haag, editors, *The Return of Consciousness*, pages 237–262. Axel and Margaret Ax:son Johnson Foundation, Stockholm.
4. Edelman, S. (2022). On the ethics of constructing conscious AI. In A. Chella, editor, *Computational Approaches to Conscious AI*. World Scientific. To appear.
5. [OPTIONAL] Agarwal, A. and Edelman, S. (2020). Functionally effective conscious AI without suffering. *Journal of Artificial Intelligence and Consciousness*, 7, 39–50.
6. [OPTIONAL] Metzinger, T. (2021). Artificial suffering: An argument for a global moratorium on synthetic phenomenology. *Journal of Artificial Intelligence and Consciousness*, 8(1), 1–24.
7. [OPTIONAL] Edelman, S. (2021). Conscious AI is artificial slavery. In K. Wendland, N. Lahn, and P. Vetter, editors, *Künstliche Intelligenz mit Bewusstsein (Artificial Intelligence with Consciousness)*. To appear.

- **Week 12 (April 24) PERSONAL PALLIATIVES.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 6, *Self-care*.

2. Edelman, S. (2020). *Life, Death, and Other Inconvenient Truths*. MIT Press, Cambridge, MA, ch. 29, *Religion*.
3. Renna, M. E., Quintero, J. M., Soffer, A., Pino, M., Ader, L., Fresco, D. M., and Mennin, D. S. (2018). A pilot study of Emotion Regulation Therapy for generalized anxiety and depression: findings from a diverse sample of young adults. *Behavior Therapy*, 49, 403–418
4. Pickering, J. (2019). ‘I do not exist’: Pathologies of self among Western Buddhists. *Journal of Religion and Health*, 58, 748–769

● **Week 13 (May 1) A WORLD TO WIN.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, ch. 7, *A World to Win*.
2. Edelman, S. (2020). *Life, Death, and Other Inconvenient Truths*. MIT Press, Cambridge, MA, ch. 25, *Politics*; 26, *Power*.
3. Chatterton, P. and Pusey, A. (2020). Beyond capitalist enclosure, commodification and alienation: Postcapitalist praxis as commons, social production and useful doing. *Progress in Human Geography*, 44(1), 27–48.
4. Di Paolo, E. A. (2021). Enactive becoming. *Phenomenology and the Cognitive Sciences*, 20, 783–809.
5. Suissa, J. (2001). Anarchism, utopias and philosophy of education. *Journal of Philosophy of Education*, 35(4), 627–646.

● **Week 14 (May 8) CLOSING REMARKS AND GENERAL DISCUSSION.**

1. Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming, *Epilogue*.
2. [OPTIONAL] Le Guin, U. K. (1974). *The Dispossessed*. Harper & Row, New York, NY.
3. [OPTIONAL] Killjoy, M. (2014). *A Country of Ghosts*. AK Press, Chico, CA.
4. [OPTIONAL] Doctorow, C. (2017). *Walkaway*. Tor Books, New York, NY.
5. [OPTIONAL] Graeber, D. and Wengrow, D. (2021). *The Dawn of Everything: A New History of Humanity*. Macmillan, London, UK.

— — —

References

- Agarwal, A. and Edelman, S. (2020). Functionally effective conscious AI without suffering. *Journal of Artificial Intelligence and Consciousness*, 7, 39–50.
- Bellmund, J. L. S., Gärdenfors, P., Moser, E. I., and Doeller, C. F. (2018). Navigating cognition: Spatial codes for human thinking. *Science*, 362, eaat6766.
- Blanke, O. (2012). Multisensory brain mechanisms of bodily self-consciousness. *Nature Reviews Neuroscience*, 13, 556–571.

- Buckner, R. L. (2010). The role of the hippocampus in prediction and imagination. *Annual Review of Psychology*, 61, 27–48.
- Chatterton, P. and Pusey, A. (2020). Beyond capitalist enclosure, commodification and alienation: Post-capitalist praxis as commons, social production and useful doing. *Progress in Human Geography*, 44(1), 27–48.
- Christophel, T. B., Klink, P. C., Spitzer, B., Roelfsema, P. R., and Haynes, J.-D. (2017). The distributed nature of working memory. *Trends in Cognitive Sciences*, 21, 111–124.
- Di Paolo, E. A. (2021). Enactive becoming. *Phenomenology and the Cognitive Sciences*, 20, 783–809.
- Doctorow, C. (2017). *Walkaway*. Tor Books, New York, NY.
- Edelman, S. (2008). *Computing the mind: how the mind really works*. Oxford University Press, New York, NY.
- Edelman, S. (2020). *Life, Death, and Other Inconvenient Truths*. MIT Press, Cambridge, MA.
- Edelman, S. (2021). Conscious AI is artificial slavery. In K. Wendland, N. Lahn, and P. Vetter, editors, *Künstliche Intelligenz mit Bewusstsein (Artificial Intelligence with Consciousness)*. To appear.
- Edelman, S. (2022). On the ethics of constructing conscious AI. In A. Chella, editor, *Computational Approaches to Conscious AI*. World Scientific. To appear.
- Edelman, S. (2023). *The Consciousness Revolutions*. Springer, Cham, Switzerland. Forthcoming.
- Ehrsson, H. H. (2007). The experimental induction of out-of-body experiences. *Science*, 317, 1048.
- Gilbert, D. T. and Wilson, T. D. (2007). Prospection: experiencing the future. *Science*, 317, 1351–1354.
- Graeber, D. and Wengrow, D. (2021). *The Dawn of Everything: A New History of Humanity*. Macmillan, London, UK.
- Guterstam, A., Larsson, D. E. O., Szczotka, J., and Ehrsson, H. H. (2020). Duplication of the bodily self: a perceptual illusion of dual full-body ownership and dual self-location. *Royal Society Open Science*, 7, 201911.
- Hoerl, C. and McCormack, T. (2016). Making decisions about the future: regret and the cognitive function of episodic memory. In K. Michaelian, S. B. Klein, and K. Szpunar, editors, *Seeing the future: theoretical perspectives on future-oriented mental time travel*, chapter 12, pages 241–266. Oxford University Press, Oxford.
- Hohwy, J. and Michael, J. (2017). Why should any body have a self? In F. De Vignemont and A. J. T. Alsmith, editors, *The Subject's Matter*, pages 363–391. The MIT Press, Cambridge, MA.
- Killjoy, M. (2014). *A Country of Ghosts*. AK Press, Chico, CA.
- Kolodny, O., Moyal, R., and Edelman, S. (2021). A possible evolutionary function of phenomenal conscious experience of pain. *Neuroscience of Consciousness*, 7(2), niab012.
- Le Guin, U. K. (1974). *The Dispossessed*. Harper & Row, New York, NY.

- Marr, D. (1982). *Vision*. W. H. Freeman, San Francisco, CA.
- Metzinger, T. (2004). The subjectivity of subjective experience: A representationalist analysis of the first-person perspective. *Networks*, 3-4, 33–64.
- Metzinger, T. (2017). Suffering, the cognitive scotoma. In K. Almquist and A. Haag, editors, *The Return of Consciousness*, pages 237–262. Axel and Margaret Ax:son Johnson Foundation, Stockholm.
- Metzinger, T. (2021). Artificial suffering: An argument for a global moratorium on synthetic phenomenology. *Journal of Artificial Intelligence and Consciousness*, 8(1), 1–24.
- Moyal, R., Fekete, T., and Edelman, S. (2020). Dynamical Emergence Theory (DET): a computational account of phenomenal consciousness. *Minds and Machines*, 30, 1–21.
- Pickering, J. (2019). ‘I do not exist’: Pathologies of self among Western Buddhists. *Journal of Religion and Health*, 58, 748–769.
- Renna, M. E., Quintero, J. M., Soffer, A., Pino, M., Ader, L., Fresco, D. M., and Mennin, D. S. (2018). A pilot study of Emotion Regulation Therapy for generalized anxiety and depression: findings from a diverse sample of young adults. *Behavior Therapy*, 49, 403–418.
- Suissa, J. (2001). Anarchism, utopias and philosophy of education. *Journal of Philosophy of Education*, 35(4), 627–646.
- Wu, C.-T., Haggerty, D., Kemere, C., and Ji, D. (2017). Hippocampal awake replay in fear memory retrieval. *Nature Neuroscience*, 20(4), 571–583.