

# BC3380: Psychology of Imagination

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Office: Milbank 415-B  
Student hours: M: 9:00-10:00  
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OR send a calendar invite if this time does not work.

Logistics: One session per week M 1:10 - 3:00 pm in 214 Milbank Hall



## Course Description

We spend much of our time in our imaginations: we daydream or immerse ourselves in fiction, children engage in pretend play, and we mentally simulate how our room might look if we rearrange the furniture. Imagination

forms a critical link between perception, memory, creativity, and higher-order thinking. This seminar will examine imagination and mental simulation from the perspective of modern psychology. We will consider how imagination is formed in children, how it is used in adults, whether machines might imagine, and how we can study the contents of our imaginations.

## Learning Objectives

By the end of the course, you will be able to:

- Describe current research on the imagination.
- Articulate the positions of the major debates on imagination.
- Describe how imagination interfaces with perception, memory, creativity, and reasoning.
- Explain how and to what extent infants, non-human animals, and machines show imagination.

## Reading

This course does not have a specific textbook. Readings will be from peer-reviewed journal articles and book chapters and posted to Courseworks before each class session.

## Policies

### Students with Disabilities or Learning Differences

If you believe you may encounter barriers to the academic environment due to a documented disability or emerging health challenges, please feel free to contact me and/or the Center for Accessibility Resources & Disability Services (CARDS). Any student with approved academic accommodations is encouraged to contact me during office hours or via email. If you have questions regarding registering a disability or receiving accommodations for the semester, please contact CARDS at (212) 854-4634, [cards@barnard.edu](mailto:cards@barnard.edu), or learn more at the CARDS website ([barnard.edu/disabilityservices](http://barnard.edu/disabilityservices)). CARDS is located at 101 Altschul Hall.

### Academic Integrity

Approved by the student body in 1912 and updated in 2016, the Code states:

*We, the students of Barnard College, resolve to uphold the honor of the College by engaging with integrity in all of our academic pursuits. We affirm that academic integrity is the honorable creation and presentation of our own*

*work. We acknowledge that it is our responsibility to seek clarification of proper forms of collaboration and use of academic resources in all assignments or exams. We consider academic integrity to include the proper use and care for all print, electronic, or other academic resources. We will respect the rights of others to engage in pursuit of learning in order to uphold our commitment to honor. We pledge to do all that is in our power to create a spirit of honesty and honor for its own sake.*

Cheating is bad, I think we can all agree on that. The less-acknowledged truth is that it's not even worth it. Cheating cheapens the value of your work and everyone else's, and a single violation can literally ruin your entire academic and professional career. Students' work will be held to the standards of the Honor Code. If you are concerned that your collaboration might put you at risk of an academic integrity violation, please come see me during office hours as soon as possible. In my experience, violations of academic integrity are acts of desperation. If you are ever feeling desperate enough that a few extra points in this course seem worth risking, *please* consider talking to someone first — that could be me, a friend, or even someone at the Furman Counseling Center. I want you to succeed, and I am happy to talk to you if you feel undue pressure from this course or anything else.

## Class attendance

I expect you to attend class. The discussions we have in the seminar are critical to your understanding of the topic and cannot be replicated by watching a recording. If you need to miss a class for illness, religious holiday, sports event, or other reasons, I expect you to reach out to review the common notes that are generated from each class session.

## Emergencies

I will inform you via the class email list if I must cancel a class due to an emergency. Please consider your Barnard or Columbia email to be the default place to look for class-related information and get into the habit of checking it daily.

## Wellness Statement

It is important for undergraduates to recognize and identify the different pressures, burdens, and stressors you may be facing, whether personal, emotional, physical, financial, mental, or academic. We as a community urge you to make health, sanity, and wellness--your priority throughout this term and your career here. Sleep, exercise, and eating well can all be a part of a healthy regimen to cope with stress. Resources exist to support you in several areas of your life, and we encourage you to make use of them.

Should you have any questions about navigating these resources, please visit these sites:

Primary Care at Barnard: <http://barnard.edu/primarycare> Counseling:  
<https://barnard.edu/about-counseling> Wellness:  
<http://barnard.edu/wellwoman/about>

## Affordable Access to Course Materials

All students deserve to be able to study and make use of course texts and materials regardless of cost. Barnard librarians have partnered with students, faculty, and staff to find ways to increase student access to textbooks. By the first day of advance registration for each term, faculty will have provided information about required texts for each course on CourseWorks (including ISBN or author, title, publisher, copyright date, and price), which can be viewed by students. A number of cost-free or low-cost methods for accessing some types of courses texts are detailed on the [Barnard Library Textbook Affordability](#) guide. Undergraduate students who identify as first-generation and/or low-income students may check out items from the [FLLending libraries in the Barnard Library](#) and in [Butler Library](#) for an entire semester. Students may also consult with their professors, the Dean of Studies, and the Financial Aid Office about additional affordable alternatives for having access to course texts. Visit the guide and talk to your professors and your librarian for more details.

## Grading and Requirements

**Class Preparation (15% of total):** I expect you to read the assigned readings before each class session. To help you, we will use Hypothesis to socially annotate each reading. These will be graded in a binary manner, with full credit going to students who engage with the reading at a deep level. I do not provide a goal for the number of annotations you should make for two reasons: first, each reading is unique, and a set number may not be appropriate for all; second, any annotation may be shallow or deep. I will grade leniently for the first week so you can understand my expectations. These will be due at 8p the Sunday before each class session.

**Class Participation (15% of total):** Come prepared with your questions and be prepared to debate. The following will be taken as evidence of your preparation: asking insightful questions, making connections to other readings in this class or others, making connections between the points raised by your classmates, and providing suggestions and ideas for future study.

**Leading Discussion (10% of total):** You will lead the discussion on one paper during the course of the semester. You can sign up for a topic during the first week of the semester. During your session, you will present the paper or chapter and guide the class through a series of questions about it. I expect each student to check in with the week before their session to coordinate content.

**Syntheses (20% of final grade):** You will submit a short (150-400 words) synthesis of the readings and class discussion. These will be submitted to CourseWorks by 8p the Tuesday following each class. The response aims

to help you organize your thoughts, assess whether and how your views have changed, and indicate what concepts still need clarification. You may comment or question on conceptual aspects of the reading or discussion, provide open-ended questions that you would have liked to discuss during class or comment on the strengths and weaknesses of the particular findings in the reading. These will be graded in a binary manner and collated for the Common Notes.

### **Final Project: 40% of final grade**

The final project will be a written product that is either an empirical review of one of the course topics or a research proposal for an experiment (or series of experiments) that would address one of our topics. The final project should be in the range of 3500-4500 words. The project will break down in the following manner:

- Topic selection: Due February 5 (5%).
- Outline and annotated bibliography: Due February 26 (10%)
- Draft: Due March 18 (10%)
- Peer review: Due March 25 (5%)
- Final written product: Due April 29 (10%)

Your final grade will be determined on the following scale:

<b>Grade</b>	<b>Percentage</b>	<b>Grade</b>	<b>Percentage</b>
A+	>95%	B-	77-79%
A	90-94%	C+	74-76%
A-	87-89%	C	70-73%
B+	84-86%	D	50-69%
B	80-83%	F	<50

## **Course Calendar**

Note: Readings may change during the semester.

### **January 22: What is the imagination? What is it good for? (Note: readings optional)**

- Plato, *Phaedrus* (excerpts)
- Aristotle, *The Poetics* (excerpts)
- Aikin, On the Pleasure Derived from Objects of Terror
- Pinker, *How the Mind Works* (p538-545)

### **January 29: What does it mean to see with the mind's eye?**

- Shepard & Cooper (1982) *Mental Images and Their Transformations*, chapter 1
- Kosslyn, S. M., Pinker, S., Smith, G. E., & Shwartz, S. P. (1979). On the demystification of mental imagery. *Behavioral and Brain Sciences*, 2(4), 535–548.  
<https://doi.org/10.1017/S0140525X00064268>

### **February 5: The Great Mental Imagery Debate: Is mental imagery visual?**

- Pylyshyn, Z. W. (2002). Mental imagery: In search of a theory. *The Behavioral and Brain Sciences*, 25(2), 157–182; discussion 182-237. <https://doi.org/10.1017/s0140525x02000043>
- Kosslyn, S. M., Thompson, W. L., & Ganis, G. (2009). *The Case for Mental Imagery* (Illustrated edition). Oxford University Press. (Chapter 1)

### **February 12: Do we all see with our mind's eye? Exploring aphantasia**

- Zeman, A., Dewar, M., & Della Sala, S. (2015). Lives without imagery—Congenital aphantasia. *Cortex*, 73, 378–380. <https://doi.org/10.1016/j.cortex.2015.05.019>
- Keogh, R., & Pearson, J. (2018). The blind mind: No sensory visual imagery in aphantasia. *Cortex*, 105, 53–60. <https://doi.org/10.1016/j.cortex.2017.10.012>

### **February 19: The neuroscience of mental imagery**

- Pearson, J. (2019). The human imagination: The cognitive neuroscience of visual mental imagery. *Nature Reviews Neuroscience*, 20(10), Article 10.  
<https://doi.org/10.1038/s41583-019-0202-9>
- Zeidman, P., & Maguire, E. A. (2016). Anterior hippocampus: The anatomy of perception, imagination and episodic memory. *Nature Reviews Neuroscience*, 17(3), Article 3.  
<https://doi.org/10.1038/nrn.2015.24>

### **February 26: Simulating the physical world: A physics engine in our heads?**

- Battaglia, P. W., Hamrick, J. B., & Tenenbaum, J. B. (2013). Simulation as an engine of physical scene understanding. *Proceedings of the National Academy of Sciences*, 110(45), 18327–18332. <https://doi.org/10.1073/pnas.1306572110>
- Freyd, J. J. (1987). Dynamic mental representations. *Psychological Review*, 94(4), 427–438.
- Hafri, A., Boger, T., & Firestone, C. (2022). Melting Ice With Your Mind: Representational Momentum for Physical States. *Psychological Science*, 33(5), 725–735.  
<https://doi.org/10.1177/09567976211051744>

### **March 4: How counterfactuals reveal the structure of the imagination**

- Kahneman, D., & Tversky, A. (1981). *The Simulation Heuristic*. Retrieved August 22, 2023, from <https://apps.dtic.mil/sti/citations/ADA099504>



- Byrne, R. M. J. (2005). *The Rational Imagination: How People Create Alternatives to Reality*. The MIT Press. <https://doi.org/10.7551/mitpress/5756.001.0001> (Introduction, Chapter 3)

### **March 11: NO CLASS (Spring Break)**

### **March 18: Essentialism and make-believe worlds**

- Gelman, S. A. (2003). *The Essential Child: Origins of Essentialism in Everyday Thought*. Oxford University Press. (Introduction)
- McCoy, J., & Ullman, T. (2019). Judgments of effort for magical violations of intuitive physics. *PLOS ONE*, 14(5), e0217513. <https://doi.org/10.1371/journal.pone.0217513>
- Schulz, K. (2017, October 30). Fantastic Beasts and How to Rank Them. *The New Yorker*. <https://www.newyorker.com/magazine/2017/11/06/is-bigfoot-likelier-than-the-loch-ness-monster>

### **March 25: Imagination in children**

- Carey, S. (1987). *Conceptual Change In Childhood*. MIT Press. (Chapter 1)
- Singer & Singer (2013) “Historical overview of research on imagination in children” from *The Oxford Handbook of the Development of Imagination*. Oxford University Press.
- Shtulman, A., & Carey, S. (2007). Improbable or Impossible? How Children Reason About the Possibility of Extraordinary Events. *Child Development*, 78(3), 1015–1032. <https://doi.org/10.1111/j.1467-8624.2007.01047.x>

### **April 1: Uniquely human? Imagination in non-human animals**

- Raby, C. R., Alexis, D. M., Dickinson, A., & Clayton, N. S. (2007). Planning for the future by western scrub-jays. *Nature*, 445(7130), Article 7130. <https://doi.org/10.1038/nature05575>
- Gruber, R., Schiestl, M., Boeckle, M., Frohnwieser, A., Miller, R., Gray, R. D., Clayton, N. S., & Taylor, A. H. (2019). New Caledonian Crows Use Mental Representations to Solve Metatool Problems. *Current Biology*, 29(4), 686-692.e3. <https://doi.org/10.1016/j.cub.2019.01.008>
- Pailian, H., Carey, S. E., Halberda, J., & Pepperberg, I. M. (2020). Age and Species Comparisons of Visual Mental Manipulation Ability as Evidence for its Development and Evolution. *Scientific Reports*, 10(1), Article 1. <https://doi.org/10.1038/s41598-020-64666-1>

### **April 8: Dreaming, daydreaming, and hallucinations**

- Königsmark, V. T., Bergmann, J., & Reeder, R. R. (2021). The Ganzflicker experience: High probability of seeing vivid and complex pseudo-hallucinations with imagery but not aphantasia. *Cortex*, 141, 522–534. <https://doi.org/10.1016/j.cortex.2021.05.007>
- Fox, K. C., Girn, M., Parro, C. C., & Christoff, K. (2018). Functional neuroimaging of psychedelic experience: an overview of psychological and neural effects and their relevance to

research on creativity, daydreaming, and dreaming. *The Cambridge Handbook of the Neuroscience of Creativity*, 92-113.

#### **April 15: “Photographing” your mental images**

- Gosselin, F., & Schyns, P. G. (2003). Superstitious Perceptions Reveal Properties of Internal Representations. *Psychological Science*, 14(5), 505–509. <https://doi.org/10.1111/1467-9280.03452>
- Mangini, M. C., & Biederman, I. (2004). Making the ineffable explicit: Estimating the information employed for face classifications. *Cognitive Science*, 28(2), 209–226. [https://doi.org/10.1207/s15516709cog2802\\_4](https://doi.org/10.1207/s15516709cog2802_4)

#### **April 22: Visualization and perspective-taking**

- Libby, L. K., Shaeffer, E. M., Eibach, R. P., & Slemmer, J. A. (2007). Picture Yourself at the Polls: Visual Perspective in Mental Imagery Affects Self-Perception and Behavior. *Psychological Science*, 18(3), 199–203. <https://doi.org/10.1111/j.1467-9280.2007.01872.x>
- Nilsen, D. M., Gillen, G., & Gordon, A. M. (2010). Use of mental practice to improve upper-limb recovery after stroke: a systematic review. *The American Journal of Occupational Therapy*, 64(5), 695-708.

#### **April 29: Imagination and creative discovery**

- Knoblich, G., Ohlsson, S., & Raney, G. E. (2001). An eye movement study of insight problem solving. *Memory & Cognition*, 29(7), 1000–1009. <https://doi.org/10.3758/BF03195762>
- Miller, A. I. (2000). *Insights of Genius: Imagery and Creativity in Science and Art*. The MIT Press. <https://doi.org/10.7551/mitpress/3806.001.0001> (Chapter 8)