The Psychology of Curiosity
PSYC GU4281
4 points

Fall 2019
Thursdays 2:10-4pm
Schermerhorn 352

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Office hours: TBA

Course Bulletin Description: What is curiosity and how do we study it? How does curiosity facilitate learning? This course will explore the various conceptual and methodological approaches to studying curiosity and curiosity-driven learning, including animal and human studies of brain and behavior.

Prerequisites: PSYC UN1001 The Science of Psychology or an equivalent introductory psychology course and instructor permission.

Full Description: As a scientific community, our understanding of what curiosity is and how it works is still just beginning, but researchers in fields including developmental psychology, cognitive neuroscience, behavioral economics, behavioral neuroscience, cognitive science, educational psychology, philosophy, social psychology, and artificial intelligence have been tackling this question in interesting and informative ways. This advanced seminar will provide a critical review of this nascent literature, examining points of congruence and controversy and, most importantly, identifying questions for future research.

Curiosity has puzzled philosophers and psychologists for centuries, but, over the past decade or so, researchers have begun to explore the concept of curiosity in new and exciting ways, paying particular attention to how and when curiosity enhances learning. We will begin this course by exploring the most prominent theories of curiosity, thinking about how curiosity is defined and operationalized and, therefore, how it might be measured. We will then explore what is currently known about the neural substrates of curiosity, paying particular attention to the potential involvement of reward processing networks in the brain. As curiosity spans several key psychological topics, including memory, attention, decision-making, development, social cognition, well-being, etc., we will devote the remainder of the course to examining curiosity through these many lenses.

By examining curiosity from these different standpoints, we’ll not only develop an understanding of what is known about curiosity, but we will also explore the variety of research methods and modes of analysis available to the psychological scientist, identifying the relative merits and limitations of each.
**Learning goals:** By the end of this course, we will demonstrate our ability to:

- Describe and contrast primary theories of curiosity and key research findings across a variety of subdisciplines within psychology and neuroscience.
- Apply critical thinking skills to evaluate research findings, paying particular attention to the merits and limitations of different research methodologies.
- Analyze and summarize empirical scientific articles and synthesize findings across multiple studies.
- Effectively communicate knowledge and ideas in written and oral form.
- Design a research study, articulating rationales and hypotheses and deciding on the most appropriate research methods.

**Role of PSYC GU4281 in the Psychology curriculum:**
GU4281 is a seminar open to graduate students and advanced undergraduate students. It fulfills the following degree requirements:

- For undergraduates pursuing the Psychology major or concentration or the Psychology postbaccalaureate certificate program, the course meets the Group I (Perception & Cognition) distribution requirement.
- For Psychology majors and Psychology Postbac students, it fulfills the seminar requirement.
- For Neuroscience & Behavior majors, it fulfills the advanced seminar requirement for the Psychology portion of the major.

**Topics and readings:** Readings include empirical articles, review articles, and book chapters, all of which will be made available as pdfs on Courseworks (Canvas). The schedule below details discussion questions and potential reading assignments for each week. This list remains subject to revision as new research continues to emerge.

**Week 1: Introduction -- What is curiosity?**

- How have philosophers, and psychologists and other scientists attempted to define and understand curiosity?
- What are some major theories of curiosity and how do they agree/differ?
- Readings
  - Supplemental:
Week 2: How do we measure it at the trait level?
● How do we measure trait levels of curiosity?
● How does trait curiosity map onto other personality traits and related constructs?
● Readings:
  ○ Supplemental:

Week 3: How do we assess curiosity as a state or behavior?
● What behavioral measures might tell us when people are curious?
● How does curiosity affect learning?
● What does curiosity look like in nonhuman animals?
● Readings:
  ○ Murayama, K., FitzGibbon, L., & Sakaki, M. Process account of curiosity and interest: A reward-learning framework of knowledge acquisition. [preprint]
  ○ Supplemental:
Week 4: What might curiosity look like in the brain?

- What does neuron activity in nonhuman primates tell us about curiosity?
- What does neuroimaging in humans tell us about curiosity?
- Readings:
- Supplemental:

Week 5: What might curiosity look in the brain? (continued)

- What does neuroimaging in humans tell us about curiosity?
- How does curiosity enhance learning – and what are the underlying neural mechanisms of this process?
- Readings:
curiosity activates reward circuitry and enhances memory. *Psychological Science, 20*(8), 963-973.


- Supplemental:

**Week 6: How does curiosity change across development?**

- How do we measure curiosity in infants and children?
- In what ways is curiosity adaptive?
- Readings:

- Supplemental:
Week 7: How does curiosity relate to boredom, mind-wandering, and attention?

- What do we know about boredom? How does that map onto (or not) our understanding of curiosity?
- How are curiosity and attention related?

  - Readings:
  - Supplemental:

Week 8: How will we study curiosity? Experiment proposal workshop

- What questions are left unanswered or only partially answered?
- What do we still want to know about curiosity?
- How will we design studies to explore these unanswered questions?
- Assignment:
  - Draft experimental proposal due via Canvas (more details provided under *Course Requirements*)
  - In-class presentation of proposed experiment

Week 9: How does curiosity affect information search?
• When and why do we choose to seek information?
• How can the larger literature on exploration & exploitation help us understand curiosity?
• Readings:
  ○ Supplemental:

**Week 10: How does curiosity affect information search? (continued)**

• What stifles curiosity?
• When do we avoid information and why?
• Readings:
  ○ Supplemental:


Week 11: Can we make ourselves and others curious?

- What does curiosity look like in the classroom?
- How can we leverage prior knowledge to increase curiosity?
- Is curiosity contagious?

Readings:


Supplemental:

Week 12: How does curiosity improve our lives?

- Does curiosity enhance well-being?
- Can curiosity improve our academic, social, and professional lives?

Readings:


Supplemental:


Week 13: Where do we go from here? [Wrap-up, open questions, and presentation of research]

- What might our experiments tell us about curiosity?
- What else will we want to know?

Course requirements
Class preparation and participation: The assigned readings are designed to expand your knowledge of the field and to hone your critical thinking skills. The papers we’ll tackle this semester are complex, so we’ll have a lot to discuss. Strong preparation and participation will enable us to have high-level, thought-provoking discussion. We rely on each other to actively and thoughtfully contribute to class discussions. Given that thorough reading enables thoughtful discussion, you will be asked to submit a short (one-paragraph) reading response to CourseWorks by 6:00 pm the night before each class period. The goal of these reading responses is to help you keep current on course readings. The reading responses also help me to understand where you may have had difficulty with the readings and what you were most intrigued by, and, therefore, which areas may warrant more focus during class time. Each reading response need only be a short paragraph, either discussing something interesting you found in the readings or asking substantive questions about concepts in the reading you found challenging. As the goal of these assignments is to keep you up to speed and to help guide my teaching and our class discussions, the assignments will just be graded on a pass/fail basis. (I can only accept responses submitted before the deadline.)

This is an upper-level, discussion-based seminar. To ensure that everyone is accountable for thoroughly engaging with the material during class discussions, your active participation in these discussions will contribute to your final grade. I do understand that for some people participating regularly in class discussions can be difficult. Those students who might be concerned about their ability to contribute to class discussions should see me. In such cases, we might be able to work out other ways for you to contribute thoughtfully. Generally speaking, effective class preparation and participation could include:

- Asking insightful or clarifying questions.
- Connecting the reading to other reading we’ve done in the course or reading you’ve done on your own or in other classes, drawing parallels and/or contrasts among findings.
- Actively listening to fellow classmates and responding to their ideas.
- Offering thoughtful critiques of the research methodology and providing suggestions for how it might be improved.
- Bringing in outside sources—potentially from the news media, your own experience, or other sources—that shed light on these research questions.

Leading discussions: As a primary learning objective in this course is to help you hone your oral and written communication skills, you will be asked to present an article and co-lead the class discussion for at least two class meetings. I’ll provide more information and give a demonstration of the sort of presentation I’m looking for in the first week of class. But, briefly, you’ll walk us through your assigned article, describing the methods and results, highlighting any strengths or weaknesses of the study design, and giving your thoughts on the meaning and importance of the findings. Please be sure to meet with me at least two days prior to your presentation, so that I can provide feedback and help answer any questions you might have. As the goal is for you to become more skilled in presenting research findings and leading discussions, in calculating grades, the second presentation will be weighted more heavily than the first.
**Experiment proposal paper:** Early in the course, you will be asked to start thinking about an open question in the field of curiosity research and how you might address it with an empirical study. We'll discuss this project in greater depth during class, but, briefly, you'll be asked to submit a topic proposal, an experimental design, and a final draft of 10-15 pages that includes a review of relevant literature, a thorough description of your experimental design, and a discussion of anticipated results and how they would be interpreted. You'll first be asked to submit a topic proposal, which will include a short paragraph about your intended topic and a list of at least five (and no more than 10) references you intend to use. I will make suggestions regarding focus, potential sources, etc. Once your topic is approved, you will begin work on designing the experiment. You will present your proposed design in class during Week 8 and receive feedback from your colleagues and me. Your final research proposal paper will be due the last day of classes.

**Grading:** Grades will be calculated based on the percentages outlined below.

A. Class preparation and participation...................................................25%
   - Reading responses 10%
   - Contribution to class discussion 15%
B. Discussion leading.................................................................................35%
   - First presentation 15%
   - Second presentation 20%
C. Experiment proposal paper......................................................................40%
   - Topic proposal: 5%
   - Proposed experimental design: 10%
   - Final draft: 25%

**Class policies:**

**Diversity & Inclusion:** My aim is to foster a learning environment that supports a diversity of perspectives and experiences and honors your identities. Please reach out to me with any concerns or suggestions you may have to better address your learning needs and to improve the effectiveness of this course. I look forward to working together to create a classroom community built on mutual respect and inclusivity.

**Students with Disabilities:** Students with special needs who may require classroom/assignment accommodations should make an appointment with me before or during the first week of class. You should also contact the Office of Disability Services (ODS) in Lerner Hall before the start of the course to register for these accommodations. The procedures for registering with ODS can be found at http://health.columbia.edu/services/odsor by calling (212) 854-2388.

**Academic integrity:** As members of this academic community, we are responsible for maintaining the highest level of personal and academic integrity: "[E]ach one of us bears the responsibility to participate in scholarly discourse and research in a manner characterized by intellectual honesty and scholarly integrity.... The exchange of ideas relies upon a mutual trust
that sources, opinions, facts, and insights will be properly noted and carefully credited. In practical terms, this means that, as students, you must be responsible for the full citations of others’ ideas in all of your research papers and projects... [and] you must always submit your own work and not that of another student, scholar, or internet agent” (from the Columbia University Faculty Statement on Academic Integrity: https://www.college.columbia.edu/faculty/resourcesforinstructors/academicintegrity/statement).

Plagiarism—whether intentional or inadvertent—is a serious violation of academic integrity. If you have any questions about what constitutes plagiarism and/or how to properly cite sources, please come to me. I am more than happy to help. Similarly, if you put yourself in a situation, e.g., starting an assignment very late, in which you think your best option might be to cut some corners, see me. It is far better to have a few points deducted from a paper than to compromise your academic integrity and potentially put your academic standing in jeopardy.

Attendance: Class participation is the foundation of this course. Of course, there are times when life gets in the way of things, but more than one absence will be detrimental to your learning – and to your grade. One absence will not negatively impact your grade, but please inform me of the absence as soon as possible. You will still be responsible for the work due in that class, e.g., reading responses and interim deadlines for the final paper.

Late assignments: It is not fair for you to get more time on your assignments than your peers. If there’s an appropriate reason for turning an assignment in late, please discuss it with me well in advance so that we can work out an arrangement. I will have to penalize late assignments, unless there is an appropriate reason and the revised due date has been agreed upon ahead of time.

Class Etiquette: Research shows that many of us think we’re good multi-taskers. Research also shows that most of us are not. If you typically take notes or read papers on a laptop, you can use the laptop in class. But, out of respect for your classmates and in the interest of your own learning and ability to actively participate in class discussions, please refrain from using your laptop inappropriately.

Syllabus is subject to revision. Updates will be posted on Courseworks.