Course Syllabus and Schedule

Instructor: Professor Gideon Nave

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Course Website: Canvas

Lectures: Lecture recordings and slides will be made available on Tuesday / Thursday, 1PM

Required Bulkpack: Please obtain - there are required readings.

Overview

How can studying the brain improve our understanding of consumer behavior?

While neuroscience made tremendous strides throughout the 20th century, rarely were meaningful applications developed outside of medicine. Recently, however, breakthroughs in measurement and computation have accelerated brain science and created an array of opportunities in business and technology. Currently, applications to marketing research and product development are experiencing explosive growth that has been met with both excitement and skepticism. This mini-course provides an overview of the neuroscience behind and the potential for these developments. Topics will range from well-known and widely used applications, such as eye-tracking measures in the lab and the field, to emerging methods and

measures, such as mobile technologies, face-reading, and neural predictors of market response.

This course is self-contained and has no prerequisites. However, students with some background in business, economics, psychology, and/or neuroscience are likely to find some of the material covered in this course complementary to their existing knowledge. Much of the foundational work in consumer neuroscience and neuroeconomics involves laboratory experiments. Accordingly, we will read and discuss several experimental papers. So, the craft of designing an experiment will occasionally be discussed. However, we will not dedicate significant time to the methodology of experimental design and analysis. As will become clear as the course progresses, "consumer neuroscience" can be used to study almost any aspect of consumer behavior.

Objectives

By the end of this course, students should be familiar with:
1. Fundamental facts and misconceptions about the brain and the tools for studying it.
2. Key scientific discoveries that can guide future work in research and industry.
3. Applications of neuroscience to consumer research.

Students will also be asked to apply their knowledge in several ways:
1. Think critically about existing uses of neuroscience in industry.
2. Identify insights and applications from the existing scientific literature.
3. Construct an original research question.

Materials

The required textbook for this course is Consumer Neuroscience (hereafter referred to as CN): Moran Cerf and Manuel Garcia-Garcia, editors. Consumer Neuroscience. MIT Press, 2017. Additional required and recommended readings are listed below and will be made available via study.net.

Timeline

The below may be adjusted as time and interest permit. Visit Canvas for the most up-to-date syllabus.

March 24	**Class Introduction**
	The 5 P's of Consumer Neuroscience
	Optional readings:
	Ariely, D., & Berns, G. S. (2010). Neuromarketing: the hope and hype of neuroimaging in business. *Nature reviews neuroscience*, *11*(4), 284-292

	Plassmann, H., Venkatraman, V., Huettel, S., & Yoon, C. (2015). Consumer neuroscience: applications, challenges, and possible solutions. *Journal of Marketing Research*, *52*(4), 427-435.
March 26	**Brain Structure and Function** **The Neuromarketing Toolkit Part I** CN Chapters 2, 4 **Watch:** Moran Cerf – What if we could look inside human brains? https://www.youtube.com/watch?v=sewhbmh0ECg&t=7s
March 31	**The Neuromarketing Toolkit Part II** **Neuroscience Gone Wrong** **Watch:** Molly Crockett - Beware of Neuro-Bunk https://www.youtube.com/watch?v=b64qvG2Jgro Optional readings: Bennet, C., Baird, A., Miller, M., & Wolford, G. (2010). Neural correlates of interspecies perspective taking in the post-mortem Atlantic salmon: An argument for proper multiple comparisons correction. Journal of Serendipitous and Unexpected Results, 1(1), 1-5. Poldrack, Russell A. "Inferring mental states from neuroimaging data: from reverse inference to large-scale decoding." Neuron 72.5 (2011): 692-697.
April 2	**Attention** **Eye Tracking** CN Chapter 5 Optional readings: Milosavljevic, Milica, et al. "Relative visual saliency differences induce sizable bias in consumer choice." *Journal of Consumer Psychology* 22.1 (2012): 67-74. A. Selin Atalay, H. Onur Bodur, and Dina Rasolofoarison. Shining in the Center: Central Gaze Cascade Effect on Product Choice. Journal of Consumer Research, 39(4):848-866, 2012 **Watch:** Ray Burke - How stores track your shopping behavior https://www.youtube.com/watch?v=jeQ7C4JLpug
April 7	**Emotion** **Skin Conductance** **Face Reading** CN Chapter 7 Watch: Roz Picard – Technology and Emotions

	https://www.youtube.com/watch?v=ujxriwApPP4

Optional readings:

Brian Knutson, Scott Rick, Elliott Wimmer, Drazen Prelec, George Loewenstein. Neural Predictors of Purchases. Neuron, 53(1): 147-156, 2007

Teixeira, Thales, Rosalind Picard, and Rana El Kaliouby. "Why, when, and how much to entertain consumers in advertisements? A web-based facial tracking field study." Marketing Science 33.6 (2014): 809-827. |
| April 9 | **Reward**

CN Chapter 9

Optional readings:

Bushong, Benjamin, et al. "Pavlovian processes in consumer choice: The physical presence of a good increases willingness-to-pay." *American Economic Review* 100.4 (2010): 1556-71.

Genevsky, Alexander, and Brian Knutson. "Neural affective mechanisms predict market-level microlending." Psychological science 26.9 (2015): 1411-1422.
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Watch: Brian Knutson – Neuro-forecasting internet market success
https://www.youtube.com/watch?v=IfGLZeEWYR0 |
| April 14 | **Expectations, Valuation, Decisions**

Optional readings:

Plassmann, Hilke, et al. "Marketing actions can modulate neural representations of experienced pleasantness." Proceedings of the National Academy of Sciences 105.3 (2008): 1050-1054.

Krajbich, Ian, Carrie Armel, and Antonio Rangel. "Visual fixations and the computation and comparison of value in simple choice." *Nature neuroscience* 13.10 (2010): 1292.

Watch: Antonio Rangel - The Neuroeconomics of simple choice
https://www.youtube.com/watch?v=D6CQjaP98Ew&t=563s |
| April 16 | **Memory and Brands**

CN Chapter 6,10

Optional readings:

McClure, Samuel M., et al. "Neural correlates of behavioral preference for culturally familiar drinks." Neuron 44.2 (2004): 379-387.

Chen, Yu-Ping, Leif D. Nelson, and Ming Hsu. "From "where" to "what": distributed representations of brand associations in the human brain." *Journal of Marketing Research* 52.4 (2015): 453-466.

Watch: Daniel Kahneman - The Riddle of Experience vs. Memory |

April 21	**Individual Differences: Personality** <u>Optional readings:</u> Matz, S. C., Kosinski, M., Nave, G., & Stillwell, D. J. (2017). Psychological targeting as an effective approach to digital mass persuasion. Proceedings of the national academy of sciences, 114(48), 12714-12719.
April 23	**Individual Differences: PGenetics** **Ethics** CN Chapter 15 <u>Optional readings:</u> Turkheimer, Eric. "Three laws of behavior genetics and what they mean." Current directions in psychological science 9.5 (2000): 160-164. Farah, Martha J. "Neuroethics: the practical and the philosophical." Trends in cognitive sciences 9.1 (2005): 34-40. **Watch:** John Dylan Haynes – Mind Reading with Brain Scanners https://www.youtube.com/watch?v=XgRlrBl-7Yg
April 28	**Projects Video Presentations**

Grades and Assignments

Quizzes: 10%

Assay: 10%

Eye Tracking Tutorial: 10%

Group Project: 30%

Final Exam: 40%

NOTE: Late assignments will not be accepted.

There will be no make-up or extra credit assignments given.

Additional details for each item will be discussed in class and posted on Canvas.

Quizzes. There are ten scheduled quizzes. The quizzes are brief exercises based on the assigned readings and class lectures (each lecture has a quiz associated with it). They will be posted on Canvas and are to be completed outside of class. Quizzes are graded for completion (make sure to "check the box" to confirm that you have completed the quiz). All quizzes are due

on April 28th, but I recommend completing them shortly after watching the relevant lecture. You can miss up to two quizzes without penalty.

Assay. Each student will write a short assay (up to 800 words) on 'reverse inference', to be submitted via Canvas.

Eye tracking tutorial. Each student will complete a short online tutorial, designated for understanding basic concepts in the analysis of Eye tracking data.

Project. Groups of students will complete a project addressing a question(s) in consumer behavior that can be addressed using neuroscience data.

Final Exam. The online final exam will cover concepts presented in lectures and the assigned readings. This is an open-book, open notes exam, but it must be done individually.

Miscellanea

Discussion boards. Every lecture and assignment will have an associated discussion board on Canvas, where you can post questions and initiate discussions of specific topics. I will monitor these discussion boards and respond to your questions.

Staying up to date. To optimize the learning experience, I reserve the right to adjust or change syllabus dates and policies. Students are responsible to learn about these changes if they miss class time.

Communicating with me. I will always do my best to respond quickly to emails. Please give me 24 hours, but feel free to send again after that. My preference and priority for meetings and communication will be Monday through Thursday. When sending emails to me, please follow email etiquette such as using a relevant subject line.

Accommodations. The University of Pennsylvania provides reasonable accommodations to students with disabilities who have self-identified and been approved by the office of Student Disabilities Services (SDS). If you have not yet contacted SDS, and would like to request accommodations or have questions, you can make an appointment by calling SDS 215-573-9235. The office is in the Weingarten Learning Resources Center at Stouffer Commons 3702 Spruce Street, Suite 300. All services are confidential.

A note about the readings. Many of the assigned readings are from scholarly journals, and can have intimidating statistics, complex brain images or mathematical proofs. Do not worry, a comprehensive understanding of those parts is not the purpose of this course. The goal is to understand the motivation for the paper, the key hypotheses, the data that were used, the conclusions, any shortcomings, and potential applications. I strongly encourage students to push through the entire paper each time; it will get easier and more rewarding as the course progresses.

Academic Integrity

Please re-familiarize yourself with Penn's Code of Academic Integrity:

https://catalog.upenn.edu/pennbook/code-of-academic-integrity/

You are encouraged to discuss class topics with other students in the class. However, your individual and group assignments, responses, and contributions to class are to be your own original work and must truthfully represent the time and effort you apply. If you are unsure whether your work constitutes a violation of the Code of Academic Integrity, it is your responsibility to clarify any ambiguities. Consult with the instructor if you have any questions about academic integrity expectations.

To ensure fairness, students suspected of cheating will be referred to the Office of Student Conduct. The Office of Student Conduct will determine if there was cheating and if so, what punishment will be administered. There are no exceptions.

Important Dates

April 6	**Project Group formation**
April 8	**Essay Due**
April 13	**Eye Tracking Tutorial Due**
April 27	**Project Due**
April 28	**All Quizzes are Due**
April 29 – May 3	**Final Exam (online)**