## TEACHING STATEMENT

You can't learn something until you do it yourself. I gained an appreciation for this philosophy as an undergraduate Psychology major at Millersville University of Pennsylvania, which is a small, teaching-focused liberal arts college. At Millersville, I learned first-hand the value of good teaching – it was a professor's style of teaching a Sensation and Perception class that initially drew me to neuroscience. I sought out opportunities to work with this professor (Dr. Shawn Gallagher) outside of the classroom and ended up collaborating with him on a project that evaluated memory for tea flavors. This work resulted in a first-author publication in *The Journal of Undergraduate Neuroscience Education* (**Hallock et al., 2017**), in which we described and validated our unique method for teaching undergraduate Psychology students about human memory. Specifically, students in Millersville's Cognitive Psychology course were asked to consume different tea flavors, and later asked to retrieve those flavors from memory. The results of this active learning exercise were that memory for tea flavors were encoded differently than memory for words or pictures, indicating that sensation critically affects people's experience of events in their lives. This project was my first experience with pedagogical research, and it transformed my science into a learning experience for other students. Importantly, performing an experiment in the classroom reinforces Psychology as a scientific discipline in the minds of pupils, and *shows students that they themselves can be scientists*.

As a Ph.D. student in a research-intensive program at the University of Delaware, I sought out opportunities to teach in the classroom. As a teaching assistant for Brain and Behavior (equivalent to Introductory Neuroscience), I not only got firsthand experience with designing and grading exams and writing assignments, but also gave several lectures and held review sessions. My lectures in Brain and Behavior covered a wide range of material, including physiology of the cell, action potential generation, episodic and declarative memory, and Pavlovian conditioning. During these lectures, I took the initiative to develop active learning exercises to facilitate engagement from the students. For example, I asked students to stand in a circle, and gently squeeze the shoulder of the person in front of them when they themselves felt a squeeze from the person behind them. The amount of time it took for the last student to feel a squeeze divided by the number of students closely approximated the timing of a nerve impulse from the brain to the hand. A similar exercise with a tap of the foot instead of a hand squeeze neatly illustrated that the length of an axon (longer from brain to feet than from brain to hand) determines the timing of an action potential. Another lecture on learning and memory featured a video on Clive Wearing, a neuropsychological patient who had impaired episodic memory, but intact procedural memory (he could not remember his wife's name, but could still play the piano beautifully). How could this be the case? Students were then presented with data that I collected showing that lesions to the hippocampus in rats could impair episodic-like memory, while preserving procedural memory (**Hallock et al., 2013**). This allowed me to incorporate examples from my own learning and memory research into the lecture, with the goal of demonstrating that questions in science are dynamic and open-ended, and the boundaries of the knowledge in textbooks are constantly being stretched. I was additionally proactive about guest-lecturing in a number of other courses, such as Introduction to Psychology, Advanced Neurophysiology, and Spatial Cognition. These experiences helped me to become a versatile educator, and imbued me with the confidence that I could teach a wide range of courses to lower-classmen, upper-classmen, and graduate students alike.

The path to stretching the boundaries of knowledge leads through empirical tests. As an advanced graduate student, I developed a curriculum for Research Methods, and was instructor of record for Measurement and Statistics at the University of Delaware. For psychology students, it is often difficult to see the importance of experimentation. Human beings are all armchair psychologists, and it is dangerously easy to assume that we can classify others at a glance or explain their actions. My goal as an instructor of these courses was to unwind these misconceptions and show students how to use science to explain behavior, one hypothesis at a time. In Measurement and Statistics, I did this by using a flipped classroom approach in which particular statistical tests were briefly covered in lecture at the beginning of class. Following these lectures, students got into small groups and completed assignments that I created using the R programming language (**Verzani, 2014**). The goal of these assignments was to show students that the path to new understanding will lead them through math. In doing this, I showed them that math is not an abstract art, but is grounded in things

that they already understand. For example, students used math to explore the veracity of a claim that a certain brand of chocolate chip cookies were “extra chunky”. Through this project, students were able to critically evaluate something that they were told was *true*, and break this claim down to arrive at a finer understanding of what truth *means*. This simple exercise showed students that something they could intuit observationally could be verified or disproved through math. At the end of the course, my teaching philosophy had been put into action. Even if they didn’t plan to pursue a career as a psychologist or scientist, an understanding of *how* we “know what we know” will be critical for them as consumers of information from textbooks, media, and other sources. My Research Methods curriculum was constructed and validated during a two-semester graduate level “Teaching Practicum” course at the University of Delaware, led by Dr. Beth Morling, a worldwide leader in teaching of psychology. During this course, I developed all materials for Research Methods and presented them to Dr. Morling and my fellow graduate students for critical review. This invaluable experience gave me formal training in psychology instruction, and strengthened my skills in college-level course design.

As a post-doctoral fellow, I have extended my pedagogical skillset by attaining a competitive Collaborative Teaching Fellowship from the Johns Hopkins Teaching Academy. Through this fellowship, I am currently a co-instructor for an Introductory Biology course at Goucher College, which is a small, private liberal-arts college in Baltimore. I am also instructor of record for an Introductory Neuroscience course at Johns Hopkins that will be offered this summer. As both of these courses are being offered virtually, I have been developing both synchronous and asynchronous content for each. I have reinforced my teaching philosophy by creating active learning opportunities that translate well to an online format. For example, I will challenge my students in both classes to go beyond their textbooks by diving into scientific articles and creating video presentations in which they outline the core methods, results, and interpretations from these articles. For Introductory Biology, which is a course with a laboratory component, I have mailed supplies to students for lab exercises that have been formatted for at-home completion. In one of these exercises, students will simulate gel electrophoresis with a pipetman, some food dye, gelatin packets, and a microwave. In Introductory Neuroscience, which is traditionally a lecture-based course, students will have an opportunity to apply their knowledge of neuroscience to broader society through writing prompts centered on connecting ideas about neuroscience and racism, health, and diversity. Through these assessments, students will develop the ability to clearly communicate their thoughts about how scientific discovery fits into the broader context of our world. I believe that being challenged to form and communicate ideas about how science relates to history and culture is foundational to a successful liberal arts education. In an era of virtual learning, I also enjoy the opportunity to create asynchronous content in a wide variety of modalities (visual, audio, hands-on), which fosters inclusivity by giving students a variety of avenues in which to learn.

My philosophy demands action from both my pupils and myself - my job is to help my students learn by doing. They learn past knowledge, how to create future knowledge, and how to develop the skills that they will need to make their own knowledge paths. My responsibility is to assist them on that journey, and I believe that mentoring my students as whole people, both inside and outside of the classroom, is the core of that responsibility. I also believe it to be *critical* that opportunities for *doing* should be accessible to everybody. I have put this belief into practice by designing lectures and activities about neuroscience for underrepresented minority (URM) middle school students, reaching out as a scientific pen-pal to URM elementary school students, and mentoring post-baccalaureate research education program (PREP) scholars as a postdoc. My commitment to diversity and equity in science will always inform my values as an educator and mentor, and I will continue to actively seek avenues for teaching, recruiting, retaining, and guiding minority future scholars and scientists.

My experience makes me ideally suited to teach Neuroscience (Introduction and Advanced), Design and Analysis, and Quantitative Methods in Psychology at Lafayette. I would also be enthusiastic about developing courses such as Current Techniques in Neuroscience, and Computational Approaches to Analyzing Neural Data. I believe that my versatility as an instructor would make me a valuable contributor to the Neuroscience program at Lafayette. I am also enthusiastic about growing my pedagogy skills by learning from other talented Lafayette faculty members. Most of all, I look forward to guiding Lafayette’s students toward attainment of their professional goals; their success is the ultimate outcome assessment measure.

## References


Hallock, H.L., Arreola, A.C., Shaw, C.L., & Griffin, A.L. (2013). Dissociable roles of the dorsal striatum and dorsal hippocampus in conditional discrimination and spatial alternation T-maze tasks. *Neurobiology of Learning and Memory, 100*, 108-116.

Hallock, H.L., Garman, H.D., Cook, S.P., & Gallagher, S.P. (2017). Recognition without words: Using taste to explore survival processing. *Journal of Undergraduate Neuroscience Education, 15*(2), A122.

Verzani, J. (2018). *Using R for introductory statistics*. CRC Press.