TEACHING STATEMENT

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Teaching as Equalizer

I believe teaching can be used as a powerful equalizer; therefore, teaching with an inclusive audience in mind is vital for successful pedagogy. My primary teaching goal is to identify key barriers, especially among students who have traditionally been under-represented in the field and find solutions to build up interests. Below I share three concrete strategies that I found helpful in the past: (1) using an intuition-first, depth-next strategy in teaching quantitative methods, (2) incorporating an interdisciplinary lens in teaching stereotyping and diversity, and (3) fostering critical, but constructive thinking, by highlighting the development of ideas within a historical context.

Statistics is difficult. Nonetheless, statistics can be enlightening. The transition from feeling pain to feeling excitement first requires intuitive understanding. My goal in teaching advanced quantitative methods is to link dry mathematics with vivid examples. During my own learning process, I took advantage of great online resources, such as Khan Academy, 3Blue1Brown, Seeing Theory, and numerous others. All of them demonstrate how to break down complex concepts into simple examples. In my current research, I break down complex statistical concepts as much as possible. For example, when learning about Expectation-Maximization, an iterative algorithm used to find the most likely parameters of a statistical model, I tried to break it down into several steps of simple calculations that can be done by hand. The example I used was estimating the average heights of a group of students who were supposed to come from either the male or female subgroup. I explained my example to the teaching assistant and classmates and found they all enjoyed it. I also use the same strategy when mentoring thesis students. For example, when they do factor analysis, I often start by introducing blogs and Twitter threads to them for the first round of self-learning. I then explain why certain items "hang" together using examples and show some mock examples with simple simulations or sometimes by hand. Only after they understand intuitively, do I then introduce the formal definition of factor analysis. According to the students' comfort levels with mathematics, I will then add the formal definition, such as linear combinations, latent variables, and matrix transformation. Intuition is essential to attract interest, but it must be complemented with depth for precision and rigor. I have not done this yet, but I hope to organize boot camps on the basics of probability theory if possible. If the boot camp is not feasible, I would strongly encourage my students to take probability theory classes from other departments. Concrete strategies may change according to more teaching experiences; however, I am a firm believer in this statement: Statistics is just like a foreign language. The more exposure we have, the more training we have, and the better we will be at it. I want to contribute to equalizing statistical skills, a traditionally under-appreciated field in social psychology, with good teaching in quantitative methods.

Social psychology is a hub science in theory. However, social psychology has been isolated in practice. I think teaching with a deliberate interdisciplinary agenda can help rebuild the bridge. I have multi-disciplinary training, with backgrounds in social and cognitive psychology, public policy, and machine learning. All of them make it natural to find parallel patterns, especially concerning stereotyping. One example outcome is the interdisciplinary workshop I co-chaired on social biases in machine learning and in human nature. I am excited about recasting the study of stereotyping and diversity with stronger interdisciplinary communication. Another example comes from one small-group lecture in developmental psychology, where I led discussions on statistical learning in language development. After we discussed

the benefits of human ability in obtaining regularities from the linguistic environment, I asked: what are the drawbacks of statistical learning? What if patterns in the available environment are not representative of the larger world? Just with a simple nudge, my students started a heated debate on stereotyping as an example. Next, I connected statistical learning in cognitive science and machine learning in computer science. Then, I asked: what is the potential mechanism that makes machine bias. What would you do if you needed to design policies to de-bias machines? The goal of these discussions was not to reach actionable plans, but to encourage students to think across domains. Students also came from diverse majors, including psychology, computer science, chemistry, and literature, so the interdisciplinary topic made them feel more involved and relevant. Instilling perspectives from multiple disciplines to younger generations can curate innovative ideas that have not been envisioned. Hence, I would love to encourage inclusive conversations by including interdisciplinary materials as early as possible.

Science needs to be rigorous, but knowledge is also provisional. The theories we learn nowadays can be validated or invalidated in the future. It is the nature of science and learning with a critical mind is important; however, critical thinking needs to be constructive. For example, in my small-group lectures, I encouraged my students to ask questions of the presenter, but also say why the questions being asked were important to the presenter or to the topic in general. The reasons did not have to be perfect or logically sound. However, the intention to think for the presenter made the discussions constructive and efficient. Similarly, when reading papers, pointing out limitations is important, yet understanding why certain limitations emerged is also important. Students tend to quickly criticize the small sample size in prior literature, which is a valid concern, but a concern without depth. They often stumbled when I asked why they thought the researchers used a small sample size. I would then take the opportunity to introduce the history of psychology research, from qualitative work to quantitative analyses, from recruiting in-person subjects to online crowdsourcing, etc. The goal was to help students situate with prior work, imagine all the constraints back in the day, and understand the historical contexts. This is not to justify the limitations of prior work, but to highlight the provisional nature of research. We all need to be humble about our practices. This principle applies to the development of theories as well. I benefited tremendously from discussing classic theories in social cognition with my mentor, and I appreciated the chronological order, historical lens, and cooperative theory-building process. I hope to connect the past and the present by applying a historical lens to both my teaching and mentoring practices.

Taken together, I want to use the teaching opportunity to reach a broader student body. I plan to make quantitative methods accessible, encourage interdisciplinary insights, and improve psychological science with historical understanding. My practices mostly came from my role-model mentors and my teaching experiences with undergraduate students at Princeton. I want to keep learning from other faculty to improve my teaching skills, toward creating a better equalizer for higher education.