

Marina Wang
Exploring Racial Disparities in Physicians' Treatment of Patient Pain
QSS Honors Thesis: 2024-25

What I Did

My QSS thesis was initially inspired by my coursework on the social determinants of health and how it impacts health outcomes. Additionally, I conducted research under Professor Zaneta Thayer where I explored maternal health, touching on the high Black maternal mortality rate in the U.S. Therefore, in my thesis, I knew I wanted to explore something related to health disparities. My QSS thesis built upon the [groundbreaking paper](#) published by Hoffman et al. (2016) which found that medical students and residents who had a higher rate of false beliefs in biological differences between Black and white patients were more likely to prescribe less pain medication. I found the paper's results jarring and wanted to expand on the study to understand if these results could be replicated in a U.S. physician sample.

For my thesis, I conducted a survey experiment to examine potential racial disparities in physicians' treatment of acute pain. Ultimately, I did not explore if there was a relationship between false beliefs in biological differences between racial groups and amount of pain treatment administered due to survey length constraints. A novel aspect of my study was that patient race was implicitly signaled through patient names to decrease social desirability bias, and to activate social stereotypes linked to racial identity that might generate implicit biases. In the survey, physician-participants were given two patient vignettes depicting kidney stones and an ankle fracture, and asked to rate their likelihood of prescribing different forms of non-opioid and opioid medications.

What I Learned

I used a two-step analytical approach, combining Latent Class Analysis and binary logistic regression, to understand how prescription patterns may differ based on a patient's race and other factors. Results indicated no significant difference in physicians' prescription patterns of pain medication to patients based on their race. I proposed a few reasons for my null results such as my results could indicate that the use of implicit rather than explicit race signaling may reduce the potential for racial bias, lending support to the movement in medicine to not include patient race when reporting patient histories.

Beyond my results, I learned a lot about the research process: from drafting a research question that is feasible to study for an undergraduate in a year to launching a large-scale survey, and from applying the skills I learned in QSS 17 to producing a research paper over the course of a year. I also learned new statistical methods and was able to deeply dive into the field of racial disparities and pain management.

Why I Did It

I originally was not planning on writing a QSS thesis and did not enroll in QSS 81 (QSS's mandatory course for all thesis writers in the fall) until the second week of fall term. What pushed me to write a thesis was realizing that it would be a great opportunity to apply the skills I'd learned in my classes throughout Dartmouth and being able to use them towards a long-term project that was largely driven by me. Additionally, I had enjoyed my research experiences prior to senior year, and I felt like writing a thesis would be one of my last chances to conduct research (for a while), as I knew my postgrad job would likely be very different from research and academia, so I wanted to jump on this opportunity while I could. Lastly, Dartmouth is amazing for having financial support that provides students with the funds to launch large-scale surveys, travel for their research, and more. Therefore, this felt like a special and unique opportunity that was hard to pass up on.

Advice for Future QSS Thesis Students

- 1. Start looking for an advisor early.** Even if you are unsure if you want to write a senior thesis, it is better to assume that you will and start building relationships with professors in subject areas that you are interested in (it's never too early!). Dartmouth professors are very busy and many only have the capacity to take on 1-3 thesis advisees a year. Therefore, I recommend that around junior winter (and at the latest, the middle of junior spring) to start reaching out to professors and seeing if they would be interested and have the capacity to advise you. It's a good idea to also have a general idea of what you want to study and write about (even broad topic areas are fine) as you want to make sure your advisor feels comfortable advising you in your area of interest. Do not fret if you are a late thesis joiner (like me), Professor Herron does a great job of making sure that all students who want to write a thesis can find an advisor.
- 2. Think about being co-advised.** QSS is an interdisciplinary department; therefore, you may need to find multiple advisors (I had two and would probably recommend no more than three) who can help you with various aspects of your project (whether it be subject area knowledge, quantitative skills, etc). In my case, one of my professors was an expert on survey experiments, while my other professor was an expert on racial disparities and health outcomes. Hence, I was able to leverage both of their expertises to conduct my survey experiment on racial disparities in the medical field. Lastly, I was very fortunate that both of them were very knowledgeable about quantitative methods which was useful when I was analyzing my data.
- 3. Everything takes longer than you think.** While you may think it will only take you a week to produce a first draft of your Literature Review section, it will likely take you twice, if not three times as long. Give yourself more time than you think you need for analyzing data and writing up the sections of your thesis. Write a detailed weekly plan for

winter and spring term, and hold yourself accountable to reaching your weekly milestones. The QSS thesis becomes largely self-directed in the winter, so it is important to keep yourself on track. As you probably know now, Dartmouth terms also go by fast and are busy, so if you can afford to, consider taking a lighter course load during either your winter or spring term to dedicate more time to your thesis while being able to still enjoy your senior year.

4. **Start drafting your survey early.** If you are planning on running a survey-based thesis, start drafting your survey early, as in the middle of fall term, as soon as you have a basic lit review going. It will take longer than you think to finalize your survey and you will go through more iterations than you think. Additionally, data analysis will take longer than you think, so try to have your survey launched by the middle of winter term. Your spring self will be very grateful.
5. **Do not be afraid to ask for help.** Sometimes you might want to get something as close to perfect before sending it to your advisor and waste unnecessary time going in circles trying to figure something out. Do not be afraid to reach out and get help on something you have given a solid attempt at and are still stuck on. Furthermore, send multiple iterations of your thesis drafts to your advisor for feedback. They are there to help and it will make your life (and their lives) easier in the final push.
6. **You will hit roadblocks. Things will likely not go as planned.** And that is okay! At the end of the day, this is an *undergraduate* thesis and it is likely the first-time you are conducting a long-term research project that is mostly self-directed. This is a chance to expose yourself to the field of research and the research process, and less about the groundbreaking results and findings. There will be moments of doubt, frustration, and uncertainty, but know that when you submit your final draft in the spring, you will have accomplished a huge feat and hopefully feel like the experience was a net positive. Do your best to stay on track, work closely with your advisors, and most of all, enjoy your senior year!

Writing a QSS thesis is a long but rewarding process. If you would like to discuss more about the QSS thesis experience, have any questions, especially about conducting survey experiments or researching in areas related to my thesis, please feel free to reach out via email:

mhxwang@gmail.com. Happy to answer any questions and offer advice. Good luck!