Amy Attaway

A generic unobserved bias is an unmeasured covariate that affect many behaviors at the same time in parallel. This is a common problem in studies that I perform when I analyze patients with COPD, as they are almost always smokers and, as Rosenbaum discusses in his chapter, smokers tend to be associated with other addictions. Therefore, are patients with COPD more likely to have severe lung disease due to their comorbid addictive behaviors? To complicate matters, inhalational drugs cause emphysema, IV drug abuse cause emphysema, and HIV itself can cause emphysema. It becomes difficult comparing a COPD population to a general control when you consider the added risk of addictions which is why it's important to account for addictions other than smoking in comparing these two different cohorts of patients. In my UK biobank analysis for my final project, I made sure that my controls were all former smokers as well, and matched based on pack years of smoking, current smoking status, substance abuse history, alcohol addiction and number of drinks per week in order to account for these observed behaviors occurring in parallel. Without doing so, my analysis could have exaggerated the severity of COPD and my ongoing studies analyzing the associated skeletal muscle loss that occurs in this population.

Wyatt Bensken

As defined in chapter 12, an unobserved generic bias is a covariate that promotes several treatments at the same time in a parallel way. As in the example given this could be something that promotes several layers of personal safety at the same time (seat-belt wearing, not texting and driving, etc.). I think one example of this that I have noticed to be true is around the general disposition of various health-seeking behaviors. People who have great education and health knowledge are likely to have (or at least have access to) improved diet, opportunities for leisure time physical activity, perhaps better employment (from education) leading to better health insurance to cover regular visits. All of these treatments are a result of the general disposition of being more aware of health mechanisms while concurrently having the means to take advantage or act on this knowledge relating to the outcome of interest (overall improved health). We know in reality the situation is not this straightforward, and we have made many attempts to try to collect information on this general health-seeking behavior disposition disentangling the 'treatment' is near impossible. I think this is a big issue in all of our health research as we seek to understand disparities and outcomes, we cannot downplay the role of health-seeking and other enabling factors which may contribute to these outcomes. While this may be a simplistic example, I believe it is one that I can relate to as I recognize my point of privilege in having the knowledge and opportunity, and therefore the disposition, to make certain decisions which certainly influence my health outcomes.

Sofija Conic

I have a personal interest in the US medical residency match, specifically from the point of view of international medical graduates. One of the strongest predictive factors in match success is the US medical licensing exam (USMLE) scores. This is a standardized test required for medical licensing, so it is taken by both US and international medical graduates. Additionally, program directors' surveys and feedback from ranking committees often stress this as a vital part of the selection process. However, these exams have a few unique properties. The USMLE cannot be retaken if you achieve a passing score, it costs nearly $1,000 for international medical graduates (slightly less for US med students), it covers all preclinical subjects, and scheduling requires you to register for a 3 month testing window up to 1 year in advance.

Since this is many students' one shot to distinguish themselves, it is reasonable that individuals whose disposition tends towards long term planning and research would score better. However, this same disposition would also help someone be successful in the residency match. For example, extensive reading about the process could lead an international medical student to realize that some programs review applications on a first come-first serve basis and that letters of recommendation require up to an additional 2 weeks to process when compared to US medical students. So, the kind of person who would carefully plan for an exam 1 year in advance might also know to ask for a letter to be submitted in a timely way.

While I certainly believe that USMLE scores are strong predictors of matching, it has been my experience when speaking with high scoring applicants that had success in the match that they also had a shared set of behaviors. It is possible that there is some generic unobserved covariate that promotes several unrelated behaviors in parallel.

Weichuan Dong

An unmeasured bias from the source of a disposition of oneself is a difficult one, because one has to admit the existence of such disposition having an effect on life or work. Often times, a person is unclear about his or her own disposition, but I think the disposition I am going to describe here is a real one after many years of self-observation.

One of my disposition that might have been changing my life is my frequently changing minds on things I wanted to do. Simply put, it is a disposition about always making plans but changing those plans completely afterwards. Before I got the current job at CWRU, I had hundreds of ideas about my careers, including being a film maker, an economist, a computer scientist, a naturalist, a farmer, a travel agent, a consultant, an English teacher, and a professor, and I spend a lot of time and money on each of them. But I did not make enough efforts on each of them and always gave up. I believe this disposition prevented me from being an expert in a specific field. But things changed after I was hired by CWRU as a health services research and spatial analyst. I admit that it was mostly luck that I got

the current job because I did not have any previous experience on health services research and had never considered to go this direction. It was my data analytic experience and geographer major that got me contacted by my current employer who got to know me by a common acquaintance. I felt settled, became interested in my current job, and thought this was going to be my career even though it was not on my career list. So, I would say this disposition of making and changing plans damaged and delayed my career development, but it might be the same disposition of having an open mind and trying new things that helped me get on to the current job quickly and be interested in it. I believe this disposition is hard to measure and is definitive affecting many aspects (outcomes) of my life and work, in both bad and good ways.

Joshua Froess

In this chapter the author talks about the generic bias of personal safety involving cycling. This is used to compare individuals that got into an accident either wearing a helmet or not. The generic bias of personal safety is also something I can relate to my life. I've been in multiple car accidents, but wouldn't consider myself an unsafe driver. When thinking back on these accidents all of them except one occurred in the snow during winter. This could show that my personal safety while driving is worse in the snow.

If I were used in a car accident study on the effectiveness of seatbelts, I believe because of this I would fall more in the middle for personal safety while driving. I would have been in car accidents even though I always wear a seatbelt. This would show a mixture of personal safety since I wear a seatbelt, but am not so cautious that I never get into a car accident. I think this chapter shows an interesting way to think about covariates, and how variables can bias the exposure to outcome relationship.

Jesus Gutierrez

This was a very interesting chapter that brought to my attention the issue of biases from general dispositions for the first time. In general, I believe that I am very concerned with my health. I don't smoke, I don't engage in substance abuse and I brush my teeth every day. If I were to join a study that examines whether smoking causes lung cancer, I would be place in the group of nonsmokers. The investigators would compare my group to those of smokers adjusting for whether or not I brush my teeth. This would under-adjust for the unmeasured disposition. In fact, it only adjusts for one of the manifestations of my general disposition to be healthy and ignores the other 'treatments' that I undertake to maintain my health. Instead, the investigators should take a small risk and bet that brushing my teeth neither prevents or causes lung cancer. Then, they would compare smokers who brush to nonsmokers who don't brush and look at the differential effect of one treatment in lieu of the other. They would then be over-adjusting for brushing to adequately adjust for my general concern for my health. Under a simple model, that

comparison removes the bias from the general disposition. If that model is wrong, a sensitivity analysis can examine differential biases.

Joseph Hnath

A generic bias that I experienced while in undergrad was the conflation of grades / performance in school with frequency of involvement with weekend social gatherings (i.e. partying). From a very general perspective, I would agree that the overall average GPA of students partying on any given weekend are likely to have a lower GPA than those that are not, but there is some nuance needed for actual analysis of treatment effects depending on your subpopulation and alternative definition of performance in school / achievement.

The potential for bias emerges among high achieving students that perhaps had a different social upbringing and perspective towards partying. Some of the smartest kids I knew in undergrad were gifted in that they did not need to study on the weekends, and some actually used the motivation of partying to do better in classes. When focusing on a different metric of achievement, such as getting into medical school or a good job. There is no doubt that there are many elements beyond general academic performance that contribute to getting into med school or a job, but let's focus on the interview component. This is one of, if not, the most important element(s) of an application, and I think that confounding could exist between social preferences and performance on interviews. You could see a bias towards the null of the treatment effect of partying on getting into medical school, where some of the best applicants are students that have excellent grades and are also social, but some of the worst applicants are students that party and do not have good grades.

Jason Huang

My mom attributes my GERD syndrome with how I sometimes indulge myself with large amounts of food and iced drinks. So her comparison is between me, someone who often binge-eats and drinks iced beverages, and someone who doesn't do either and doesn't have GERD. This may very well be true, but there might be an underlying tendency for me for risky health behaviors, so her observed association might be biased because I am doing a lot of other risky things than my control person.

I don't (and can't) drink a lot, which pulls me back a little bit on the risky health behaviors spectrum. If we can eliminate this unobserved generic bias of tendency for risky health behaviors, it would be by comparing me to someone who doesn't binge-eat or drink iced beverages but drinks a lot more than I do.

Morgan McGrath

Let's say I was interested in the effect of daily physical activity on the risk of developing dementia. I would be concerned about an underlying disposition of "healthfulness" – i.e. a person who is consistently physically active may generally care more about their health, meaning they also eat well, get plenty of vitamins/minerals, hydrate, and floss their teeth. Presumably dental hygiene has no direct effect on dementia, but it is an indicator of a general bias toward healthfulness. In order to adequately adjust for this important underlying disposition, I could over-adjust for flossing. Thus, I would want to compare physically active people who do not floss their teeth with people who are not physically active but do floss. This allows me to look at the differential effect of one treatment in lieu of the other.

Laurie Ann Moennich

In a recent study that I designed and ran at work, I experienced the consequence of my own assumptions and generic bias of the population of patients I attempted to enroll. This study examined patient's ability to perform a series of functionality assessments, commonly used as endpoints in many clinical trials (six-minute walk test, timed up and go test, five-meter gait speed test), in the patient's home during a virtual visit through the Express Care Online platform. I provided patients with the necessary instructions and materials, trained them in how to use the virtual visit software, and performed a "test" virtual visit in the clinic setting simulating how the patient would be able to set up the course and run through the visit at home.

For some patients, the technology aspect came easy to them. They were able to quickly understand my instructions, set themselves up for account on the Express Care Online platform (or, better yet, already had an account from previous virtual visits they had done with their doctor) and seemed poised to succeed in the study versus patients with whom I had to coach carefully through every step. I perhaps fell victim to the generic bias in this situation by believing these patients who breezed through the set up and were very comfortable using the technology would be very adherence study participants to the follow up requirements. As we finally finished enrollment, I can say that these tech-savvy participants did not have a perfect attendance rate. Missed visits and rescheduled visits seemed to be pretty even between those who were comfortable with the technology and those who struggled. As I am doing my analysis now, I want to make sure I do not make any assumptions about segments of my study population and their likelihood to adhere to follow up requirements just because of their ability to use technology.

Amin Saad

Each patient in a study has a unique disposition to produce an outcome of interest. In colorectal surgery, patients with inflammatory bowel disease (IBD), such as Crohn's and ulcerative colitis), are more prone to developing complications. Thus, if we were attempting to assess post-operative complications after a surgical intervention or a drug therapy, then having participants with IBD being overrepresented in one arm of the study may dramatically bias the results. Even if we match these patients based on their medical and treatment histories, generic unobserved bias in an unobserved covariate relating to IBD; for instance compliance, may push our estimates in a specific direction. Thus, it is important to be mindful of these pitfalls early on in designing a study by setting clear and well-thought-of criteria for inclusion and exclusion.