Hi everyone,

Thanks so much for being here. I’m really excited to get to share some of my dissertation work with you.

To briefly set up my analyses about the ecological effects of religion on health and mortality in China, I want to point to a bit of a gap that I think my project addresses.

There are models like the one of the left that show how characteristics of place impact health. Notably absent from these models is religion as a characteristic of place.

Then, there are conceptual models like the one on the right that depict how religion and spirituality impact health. But these models almost exclusively think of religion as an individual-level attribute and neglect its sociocultural characteriestics.

Interestingly, if you closely compare these models, you’ll see they both include social networks and relationships, psycho-social mechanisms, and health behavioral pathways for explaining health outcomes. My project links these two different theoretical conversations to ask: “how do the religious characteristics of a place impact the health of the people living there?”

And I specifically ask this question in the context of mainland China. Now, China China is an interesting place to study this topic because of its health disparities and because of its religious diversity. The map on the left shows the variation in China’s county-level mortality rate and the map on the right shows the predominant religion in each of China’s prefectures. There’s signficant variation across China in terms of health outcomes and religion.

What I am presenting here today are some preliminary analyses from one of the studies in my dissertation. The specific research question for this study is:

How is the religious environment of Chinese prefectures associated with individual-level self-rated health among middle-age and older adults?

To answer this question, I have constructed a dataset by merging geographic data of religious sites from the Online Spiritual Atlas of China with survey data from the China Health and Retirement Longitudinal Study or CHARLS (China’s version of the HRS).

To measure the religious environment, which is my focal independent variable, I use a standardized count of religious sites for each religion in each of the 91 prefectures represented in the CHARLS survey. For example, in each of China’s prefectures (which are administrative subdivisions of Chinese provinces), I calculate the number of Buddhist temples per 10k people. I do this for all of China’s 5 officially recognized religions: Buddhism, Catholicism, Daoism, Islam, and Protestantism.

The CHARLS survey has a variety of health measures, but here I use self-rated health as my primary dependent variable. This measure of self-rated health as 4 ordered categories (poor, fair, good, very good).

I have also selected a variety of control variables both at the individual and groups levels that I think are important factors to account for in the relationship between the religious environment and health.

As you can see here, these data are nested. There’s a multi-level structure to it. There are prefectures at the highest level. This is where I am measuring the religious environment. The CHARLS survey sampled individuals in specific communities for which they also collected community-level data. In addition, the CHARLs study also surveyed individual respondents AND their spouses, so there is a household level to this data as well. That’s 4 levels, about 6000 individuals from 3700 households in 175 communities in 87 prefectures.

So how is self-rated health related to the religious environment? In this graph, I show the breakdown of self-rated health categories by the dominant religion in Chinese prefectures. Let’s just look at the “Very good” category, the darkest blue here. So in prefectures where the predominant religion is Daoism, 20.5 percent report very good health, whereas in prefectures where the predominant religion is Buddhism or Catholicism, fewer than 10 percent report very good health. So there does appear to be some association worth exploring here.

In terms of the religious sites, here I show number of sites for each religion in Chinese prefectures. If you look at the box and whisker plots for each religion, you see that the median number of Buddhist and Protestant sites across Chinese prefectures is higher than the median number of Muslim, Daoist, and Catholic sites. So overall, the Chinese prefecures in this sample have on average more Buddhist and Protestant sites than they do sites from the other religions.

Moving on to the models.

I’m using mixed effects ordered logistic regression models. My DV is ordered and based on Brant tests, I don’t appear to be violating the parallel regression assumption that there’s an ordered relationship between the IVs and DVs in my models.

Also, my models are random intercept models which account for all 4-levels of data, and my likelihood ratio tests indicate that a 4-level model fits better than 2- or 3-level models.

A Variance Components model, examining how much variance is self-rated health is at the individual level and how much is at the prefecture level, produces a pretty low ICC here, which indicates that individual’s self-rated health within prefectures are not much more similar to each other than they are to observations in other prefectures. This concerns me a bit, because it suggests there may not be much variation at the prefecture level that can be explained by prefetcure-level characteristics.

I have 6 models here in this table of odds ratios. All of these models include all of the control variables suchs demographics and socioeconomic measures at the community, household, and individual-levels. In the first 5 models, I only include the number of sites for a single religion, but because I think that the presence of other religions might affect how the presence of any one religion is associated with health, I include all of them together in model 6, which is the model I’ll be interpreting.

As you can see from the table, only Islam and Daoism have a significant association with self-rated health. Islam has a negative association and Daoism has a positive association. The p-value on Islam is .06, so close enough to examine it in a bit more detail.

Here are the predicted probabilities of reporting each level of self-rated health across the range of concentration of Muslim sites. Again, these are from the model that includes the number of religious sites from each of the 5 major religions in China and are net of both individual and group-level control variables. So what we see here is that as the number of Muslim sites increases, respondents are increasingly likely to report poor health (the red line) and decreasingly likely to report good or very good health (gray and black lines). In places where there are no muslim sites, the probability of reporting poor health (the red line) is .18 and in places with the most number of muslim sites, the probablity jumps to .24, so a difference of .06. One reason that we could expect poorer health in areas with a greater presence of Islam is the Chinese government’s repressive policies towards Muslims, particularly in areas were Muslims are concentrated. Perhaps, the increased levels of stress in these ares is negatively impacting overall health.

Here are the predicted probabiblites of reporting each level of self-rated health across the range of Daoist sites. So as the number of Daoist sites increases, respondents are increasingly likely to report good or very good health (the grey and black lines) and decreasingly likely to report fair or poor health (the blue and red lines). For example, in places where there are no Daoist sites, the probability of reporting very good health (the black line) is .12 and in places with the most number of Daoist sites, the probability jumps to .28. A possible reason for this association is that Daoism has strong connections with traditional Chinese medicine and has a strong health componet to its philosophy. Also, several of the major health trends in the past few decades, most notably the qigong movement, also have strong connections to Daoism.

Another way to summarize this is by thinking about the “average” effect, here I show the average marginal effects of the number of Muslim and Daoist sites on each category of self-rated health. The values in the table show the average change in the probability of reporting each category for a SD increase in the number of Muslim or Daoist sites.

For each SD increase in the concentration of Muslims sites, there is a .015 increase in probability of having poor health and a .011 decrease in probability of having very good health (both p < .10).

For each SD increase in the concentration of Daoist sites, there is a .019 increase in probability of having very good health and a .022 decrease in probability of having poor health (both p < .05).

My preliminary conclusions here are that the number of Muslim sites in Chinese prefectures is negatively associated with self-rated health and the number of Daoist sites in Chinese prefectures is positively associated with self-rated health. And there’s no evidence that the concentration of other religions in prefectures are related to self-rated health.

Future analyses.

That’s all from me at the moment. I’d loved to hear any comments, suggestions, or questions you have.