For my idiographic proposal, I’d like to research caffeine’s effects on my inner circadian rhythm. Caffeine is said to produce noticeable effects on the body for 2-4 hours after onset, for a total span of 2.5-5 hours of effect after consumption (source: Erowid’s FAQ page on caffeine). My body mass is lower than average, so I would estimate a personal ceiling of 6 hours of elevated stimulation upon drinking a standard cup of coffee (averaging 100-150mg of caffeine, a medium dose). My research question asks what effect, if any, does having a cup of coffee in the morning have on my ability to sleep that evening? My hypothesis is that after the immediate physical effect of caffeine has passed, I will have no issue falling asleep—and so, if I drink coffee more than 6 hours before when I expect to go to sleep, I will not be affected by the caffeine when I attempt to sleep. My independent variable is the time at which I drink coffee: for control days, I will not drink coffee; for the first condition group, I will drink coffee before 3pm; and for the second condition, I will drink coffee after 3pm. My operationalization for the dependent variable is important: I am not measuring when I go to bed, as some days I will have more work to do than others, and will be able to retire early; this is beyond my control for the duration of this experiment. Unfortunately, I cannot stop taking other classes to measure this data. I will instead measure at what time each night I gauge myself tired enough to be able to sleep. This of course is a subjective measure, but so is all self-reported data. There is plenty of biographical research published to give me a background on the estimated effects (short-term duration, long-term effects, etc.) of caffeine on human cognition, sleep patterns, and physical arousal levels.

Data: self-reported, life data (time intervals)

I have two nomothetic proposals: first, I’d like to look at the Aircraft Wildlife Strike dataset released by the Department of Transportation. I’d find whether there are areas or times in which wildlife strikes are prevalent and compare these areas and times to see what they have in common. My hypothesis is that these strikes spike in migratory seasons and that they mostly occur along flight paths of migrating birds. My independent variable is the time at and area in which incidents are reported, and my dependent variable is the number of incidents reported in those areas. The independent variable changes with migratory seasons, and I’d expect to see the dependent variable change accordingly. There are many studies published by the Journal of Field Ornithology, Biological Conservation, the Journal of Wildlife Management, and the USDA Forest Service on bird-plane collisions.

Data: observational, self-reported (bird strikes)

Second, I would have liked to look at locations and timings of vehicle traffic and study what preventable factors introduced by city structure may lead to aggravated traffic in communities. But as I’m having a hard time locating public data regarding that subject, I propose to compare the number of electric-, diesel-, and gas-powered cars purchased per month in given areas in relation to the average gas price in those areas. The public dataset Highway Statistics, also released by the Department of Transportation, includes both these figures, along with many, many more. My hypothesis is that higher gas prices correlate with a higher prevalence of electric vehicles and a lower prevalence of diesel- or gasoline-powered cars purchased in an area. I realize gas prices are very volatile and that this study depends heavily on my ability to find monthly (or even more regular intervals) average gas prices, but my independent variable would be average gas prices in certain areas (I have not yet decided how I will select which areas to monitor), and my dependent variable would be the number of each type of car bought in those areas during the amount of time specified in the independent variable.

Data: observational, self-reported (cars sold)

<https://open.nasa.gov/>

<http://catalog.data.gov/dataset?groups=safety3175&page=1>

<http://www.nuforc.org/webreports/ndxevent.html>

<https://aws.amazon.com/public-data-sets/>