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W241 Section 3
May 16, 2018

# Essay 1: Correlation Versus Causation

I would combine the first two paragraphs into a single paragraph. Additionally emphasize that the paper made a causal claim not just a link.

The study I have chosen to critique is *Maternal caffeine intake during pregnancy and childhood growth and overweight: results from a large Norwegian prospective observational cohort study*, by Papadopoulou et al.[1]

The interesting conclusion from this study is that excessive caffeine intake during pregnancy is linked to excessive growth during the child's first year, and an increase in risk of obesity at eight years of age.

The data came from a nationwide cohort study of nearly 51,000 mothers in Norway (The Norwegian Mother and Child Cohort Study, or 'MoBa'). At week 22 of the pregnancy, the mothers were given a food frequency questioner (FFQ) to estimate the maternal intake of caffeine. Then after birth, the child's weight and length measurements were made 11 times up to 8 years of age.

Great - A very thorough description of the data source.

Maybe try reworking the first sentence to remove "I believe"

I believe that the bias in the observational study is to overestimate the effects of caffeine on childhood obesity. The main causes of childhood obesity is due to behavior and genetics according to the CDC[2]. The behavioral traits associated with obesity include having a diet of high calorie food and a lack of physical exercise.

One particular group that may bias the study is lower income families. Lower income families are more likely to have unhealthy diets that include junk food (high in calories) and soda (high in caffeine). It seems reasonable that a mother from a low income family may tend to consume more caffeine (from soda and coffee) during pregnancy than the average mother. After pregnancy, the family's unhealthy diet would then contribute to the child's obesity.

Great

This idea could be generalized from single mothers to people with high-stress lifestyles. That group might also include people with multiple jobs or high-pressure jobs who would drink caffine while pregnant

A second group that may also bias the study are single mothers. During pregnancy, they may consume more caffeine through coffee due to their work schedule. After pregnancy, their dependence on child care and lack of availability in the child's life may prevent their children from getting as much exercise as they should, contributing to their child's obesity.

Consider adding a transition sentence between the assumption and ideal experiment

The main assumption that must be believed in order to accept the conclusions of the study is that caffeine affects the center of the brain of the unborn child that controls growth and development, which results in the increased growth after birth.

Ideal?

A population or a random sample of a population?

The idea way to test the results of this study would be to run an experiment. A population of women that just started their pregnancy would be needed. This population should large enough to have women from different ages, economic backgrounds, employment status, health, and obesity levels.

Half of the group should be randomly assigned to the treatment group, and the remaining half should be assigned to the control group. Both groups should be placed on a caffeine restricted diet during pregnancy so that the women do not consume more than 49 mg of caffeine a day (this is considered a low caffeine intake by the MoBa study). During pregnancy, the treatment group will take a 200mg caffeine pill, and the control group will take a placebo. Similar to the MoBa study, the child's weight will be measured 11 times between birth and 8 years of age. A statistical analysis will then be performed to determine if there is any statistically significant difference between the weight of the children from the control and treatment groups at the different measurement ages.

Great - A well designed experiment.

A challenge with this study is that participants may not want to volunteer if they are informed that that taking caffeine has the potential to make their child obese. Similarly, this study has ethical implications if caffeine in fact does contribute to childhood obesity, as the consequences of obesity include, among other things, high blood pressure, risk for type 2 diabetes, and social/ psychological issues related to being obese.

Consider adding a concluding sentence. Something like "Due to the ethical limitations of conducting this experiement, we will most likley continue to see observational studies on caffine's affects on human development without establishing a causal relationship.

References


1. Papadopoulou E, Botton J, Brantsæter A, et al Maternal caffeine intake during pregnancy and childhood growth and overweight: results from a large Norwegian prospective observational cohort study BMJ Open 2018;8:e018895. doi: 10.1136/bmjopen-2017-018895
2. Centers for Disease Control and Prevention. (2016). Childhood Obesity Causes & Consequences. Retrieved May 14, 2018 from https://www.cdc.gov/obesity/childhood/causes.html