Section 2: Week 3: Designing an Experiment

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# Designing an Experiment

NCU-Cares (NCU-C) is a politically neutral nonprofit organization, seeking to make the world a better place through targeted lobbying efforts. The death of George Floyd has risen the debate of police violence and reform to the national stage (Crary & Morrison, 2020). While the topic rests on American’s hearts and minds, it has also become highly partisan with many efforts to undermind the conversation (McCaskill, 2020). Separating the seed from the chaff requires a well-structured experiment that identifies independent and dependent variables (IV versus DV). Next, precise controls must exist to reduce interference from either internal or external threats to conclusive validity. These controls will guide data collection requirements and dictate analysis procedures that follow.

# Section I: Identify the Problem

The first step to designing an experiment is to define clearly the specific problem of research. Harris (2008) uses an example of investigating the “influence of music on driving ability.” In this situation, music is the independent variable versus driving ability the dependent result. However, music could refer to either the categorical genre or perhaps the volume level. Meanwhile, the driver’s ability could be a measurement of maintaining lane alignment or parallel parking. These nuances to the question have a substantial impact on all aspects of the design and must be declared upfront.

Similarly, an exploration of police violence needs explicit constraints to avoid boiling the ocean through open-ended discovery. The collective perspective of the Black Lives Matter movement is that police exert disproportionate force against people of color (BLM, 2020). This statement infers that *race* is the independent variable that shapes the *response*. Meanwhile, others believe that *sanity*, such as caused by mental illness or narcotics, applies more pressure to the situation (Lamb, Weinberger, & DeCuir, 2014). NCU-C would like to understand which of these independent variables is the most dominant factor. After assessing this information, the organization could then more effectively fight police violence through either (a) civil rights policies or (b) mental health programs. However, a null hypothesis could exist that concludes that there is no statistically significant difference between these variables. That result might infer that law enforcement indiscriminately applies force to all parties.

# Section II: Methodology

There are multiple strategies for determining which variable has more effect on a situational outcome. News articles typically approach the problem by looking at the raw descriptive statistics, such as the ratio of victims that were experiencing a mental crisis. A challenge with this solution is that the telemetry only communicates what happened, not why. Consider the extreme example that one hundred percent of all police violence within a given community is against a specific race. While this scenario immediately raises questions around racial profiling, it should also invite a discussion around the diversity of the inflicted population. An alternative solution could look at changes after significant interventions (DeCarlo, 2018). Starting in the late 1960s, health institutions began releasing and turning away thousands of patients due to insufficient funding (Lyons, 1984). The impact of these decisions has likely left an imprint in arrest policies and statistics. If such an imprint does exist, then examining funding records on mental health and drug addiction facilities might surface a correlation.

DeCarlo (2018) states that quasi-experiments are particularly useful in social welfare policy research (see chapter 12.2). Under a quasi-experiment, the researcher team does not use random assignment and instead looks at different populations. This method could be highly effective for examining the impact of both *race* and *sanity* variables. For example, how does *race* impact police violence when comparing diverse metropolitan areas (e.g., Chicago and Detroit) to homogenous cities (e.g., Brandsen or Sioux Falls)? Likewise, for every dollar that Nevada spends on public health, Alaska invests six (United Health Foundation, 2017). From examining these groups that are both similar and complete opposites, it should lead to a quantitative sense of the underlying effect of these variables.

# Section III: Threats to Validity

There are four major categories of threats to the accuracy of statistical conclusions that led to erroneous results that are not generalizable.

## Internal Threats

## External Threats

## Statistical Conclusion Threats

## Construction Threats

# Section IV: Data Requirements

## Collection Process

## Data Analysis Procedures