EVIDENCE-BASED PRACTICE FOR MANAGING THE MENTALLY ILL INMATE POPULATION

THE ETHICS OF SECONDARY DATA ANALYSIS AND ITS EFFECTS ON SOCIETY

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By
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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Year after year, the United States is the world's leader in incarceration (Kann, 2019). While the United States makes up about 5% of the world's population, our jails currently hold about a quarter of the world's prisoners (NAACP, 2015). A large portion of this population consists of individuals who are detained and jailed due to an action caused by serious mental illness such as major depression, schizophrenia, and bipolar disorder. A study published by the U.S. Bureau of Justice Statistics reports that forty-five percent of federal prisoners have symptoms of serious mental health illnesses (U.S. Department of Justice, 2006). This problem began in the 1960s when the government began to push mentally ill individuals out of hospitals and into communities in hopes of deinstitutionalization (Sheehy, 2016). Currently, mentally ill individuals are not receiving the support they need, often resulting in events that place them in jail.

The technical project seeks to identify areas of injustice or a lack of resources for the mentally ill inmate population through an analysis of data from Region 10 mental health community service providers, Albermarle-Charlottesville Regional Jail (ACRJ), Charlottesville Offender Aid and Restoration (OAR), Jefferson Area Community Corrections (JACC), Thomas Jefferson Area Coalition for the Homeless (TJACH) and Virginia Department of Corrections (DOC). The technical project will take place over a two-semester period led by Professor K. Preston White, Professor Michael Smith, Charlottesville Community Criminal Justice Planner Neal Goodloe and Data Scientist Loreto Peter Alonzi. The team consists of seven University of Virginia (U.Va.) undergraduate Systems Engineering students: Henry Bramham, Claire Deaver, Sean Domnick, Emma Hand, Melanie Gonzalez, Emily Ledwith, Noah O'Neill, and Callie Weiler.

The Science, Technology and Society (STS) project will focus on examining the ethics of secondary data analysis and its effect and relationship with society. This topic will call into question how to handle data ethically when there is a gap between the human subject of data collection and the secondary analyzer, an individual given data from an initial data collector. The STS topic will investigate how to best ensure data subjects are represented and respected throughout an analysis. The project will also look at how data analysis, a fairly new research tool, can cause both positive and negative changes in society.

These two topics are closely related, with the STS topic taking a more holistic and societal view of a specific part of the technical project. While the technical topic involves a more data-driven approach, the STS topic will focus more on reading literature and studies already completed by others. By the end of the analysis, these two topics coupled together will complement each other and provide a more comprehensive view of the mentally ill inmate population. For the STS project, the first semester will be spent performing initial research and writing the Prospectus. The second semester will be spent researching further and writing the Undergraduate Thesis. As can be seen in the figure below, the technical project will have more specific tasks and deadlines to ensure project progress.

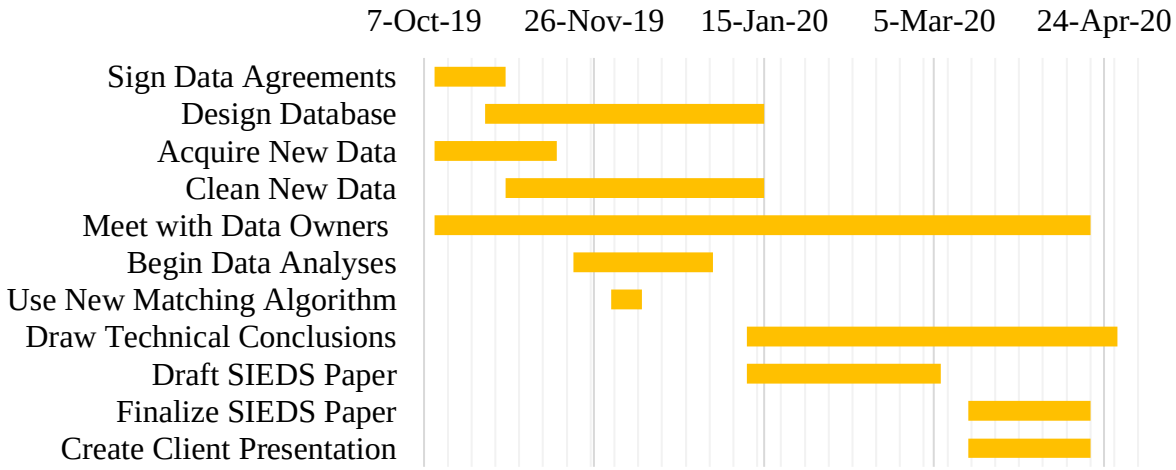

Figure 1. Project Gantt Chart: The chart shows a breakdown of tasks and their respective deadlines (Domnick, 2019).

EVIDENCE-BASED PRACTICE FOR MANAGING THE MENTALLY ILL INMATE POPULATION

Mass incarceration is an issue that has only sparked a conversation in the past few decades, as the rate of incarceration in the U.S. remained relatively stable up until the mid-1970s (National Research Council of the National Academies, 2014). Since then, the rate of incarceration has nearly quadrupled. With this increase, the amount of mentally ill inmates has also grown. Locally, this population makes up nearly 30% of the Albemarle-Charlottesville Regional Jail cohort (Dalton, 2018). However, rehabilitation programs designed for individuals with mental illness are not built to help such a large population of mentally-ill inmates. This has opened up discussions about whether or not current practices are suitable to serve those individuals and what needs to change to better serve the community of inmates with serious mental illness.

Inmates often enter the prison system with undiagnosed or misdiagnosed mental illnesses. Additionally, inmates who are flagged for needing mental health resources often do not receive them from their respective jail. This results in only a fraction of those who likely require treatment for mental health disorders ultimately receiving it. The rest are regarded as “healthy” inmates. Once released, the inmates with mental health diagnoses are given referral information about options for treatment in the community. Many of these individuals do not seek out these resources and often end up without further treatment, homeless, or back in jail.

Through the technical project, the team hopes to identify specific characteristics of the cohort of inmates who meet serious mental illness criteria in the Central Virginia region and start to spark discussion about the treatment of severely mentally ill inmates. The team will partner

with several members of the community to grasp a holistic view of what resources the mentally ill population have available for them in and outside of their respective jails.

The scope of this project is limited to jails in the Central Virginia region and the counties within it. The project does not plan to analyze data outside of these regions. The team will receive and merge data from several sources, including OAR, TJACH, DOC, ACRJ, JACC, and Region 10 Community Services. The focus will primarily be on those six sources, but the team may acquire additional data in the future. For instance, the team hopes to receive data from the U.Va. Hospital Emergency Room. While the hope is to mitigate the number of people wrongfully detained solely based on mental illness, that is not the primary focus of this project. The primary focus of this capstone is to better characterize those who meet criteria for a severe mental illness and better link them to mental health treatment after they leave their respective jail.

The first step of this project is the acquisition of the data from the aforementioned sources. This step has proven to be quite challenging in the past, as it requires team members to go through privacy training and for data owners to sign agreements for the use of private, identified data. The team will schedule meetings with the data owners to provide a compelling argument as to what analysis can be done that will mutually benefit the data owners and the mentally ill inmate population. For this, the team will assign one or two team members to each data owner to ensure a more personal relationship. Once this step is complete and the data is acquired, it will be cleaned and better understood through the use of Excel, Microsoft Access, SQL, and RStudio software. This step will involve matching the inmates and their attributes across the various datasets obtained. Linking the data sets is essential so the team can follow an individual from each data source. This will create a rough timeline of each inmate's interactions

with different entities such as Region 10 Community Services or ACRJ. After properly cleaning and ensuring the data is in a workable form, the team will perform data analysis. This will include looking closer at a mentally ill inmate's characteristics and his or her treatment at different locations. The team will also perform data analysis to meet data owners' needs and answer any questions they express. This step will be completed using several data analysis techniques including but not limited to statistical and regression analysis and geospatial analysis. For this, the team will use Excel, SQL, RStudio, Minitab and Tableau software. Figure 2 below shows an overview of the design methodology for the technical project. This methodology must be followed sequentially for the project to succeed. If one stage stalls or fails, the rest will follow in the same manner.

Figure 2. Design Methodology for Technical Project: The design methodology needed for the technical project to progress (O'Brien, Oliphant, Williams, Boland, 2019)

Overall, the goal of the technical project is not directly to make recommendations to the data owners, but rather to provide them with accurate and actionable information which they can use to make better informed decisions regarding mentally ill inmates. The team also hopes the technical project will spark conversation about problems with the local criminal justice system. At the end of the second semester, the team will provide a final presentation to the data owners expressing any statistical findings and answering any outstanding questions. Throughout the year, team members plan to stay in regular contact with data owners. During these meetings, data owners will be informed of new findings and will have the opportunity to express any new research questions they want the team to analyze. These meetings will ensure that the team's objectives are aligned with the data owners' developing ideas. At the end of the year, the team

will submit a paper for the Systems and Information Design Symposium (SIEDS), encapsulating all of the work done by the 2019-2020 capstone team.

THE ETHICS OF SECONDARY DATA ANALYSIS AND ITS EFFECTS ON SOCIETY

As already stated, in the technical project, the team will use secondary data from OAR, TJACH, DOC, ACRJ, JACC, and Region 10 Community Services. Sarah Irwin, Faculty of Education, Social Sciences and Law at the University of Leeds, defines secondary analysis as "the use of already produced data to develop new social scientific and/or methodological understandings" (Irwin, 2013). The use of secondary data involves an agreement by the primary data collector to share information with a secondary party. Through this, a gap between subjects and the secondary researchers is created. This idea is represented below in Figure 3.

With this data transfer, ethical considerations arise. How can secondary analysts strive to minimize harm to the subjects while maximizing any benefits with this gap? How can secondary researchers ensure they have enough information to perform a holistic analysis in this space? The STS project will analyze the ethics of using secondary data for the technical portion and evaluate the ways data analytics can influence changes in society. Researchers often overlook their responsibility to deal with data ethically and focus on the analysis aspect. The project hopes to provide criteria on the best ways to handle secondary data from acquisition to analysis to societal implementation of

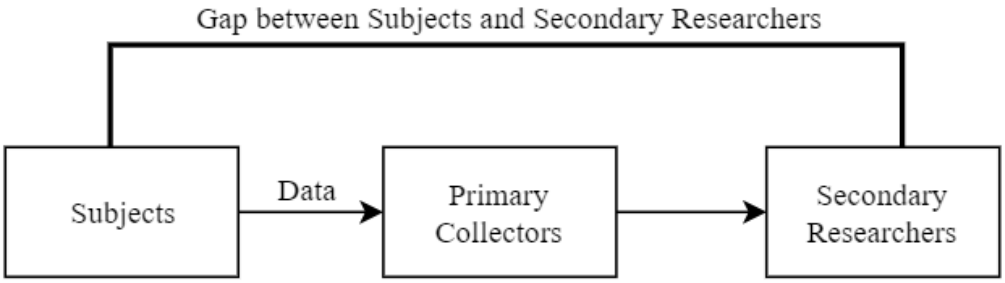

Figure 3. Process of Data Transfer: This illustrates the ethical problem created through the transfer of data in the technical project (Created by Deaver, 2019).

results. The STS topic also hopes to examine how the analysis of data can influence changes we in society through social constructivism.

Data analysis is a fairly new area of academia. With the invention of the modern computer in the 1960s, academic figures brought together technology and mathematical statistics to create data analytics. John W. Tukey, a famous mathematician known for creating the statistical Tukey Test, wrote in "The Future of Data Analysis",

> "For a long time, I thought I was a statistician, interested in inferences from the particular to the general. But as I have watched mathematical statistics evolve, I have had cause to wonder and doubt… I have come to feel that my central interest is in data analysis… Data analysis, and the parts of statistics which adhere to it, must… take on the characteristics of science rather than those of mathematics… data analysis is intrinsically an empirical science" (Tukey, 1962).

Tukey then goes on to say that data is used to test hypotheses and recommend changes to society. It is from this point in data analysis that social constructivism can be seen. Deborah Johnson (2005), a former Chair of the Department of STS at U.Va., describes social constructivism as technology and society mutually shaping each other. She also states that society and technology change each other in a nonlinear fashion (p. 1791). Social constructivism could be applied to the analysis of secondary data in this project because data analysis is a new technology used to make business and societal changes.

Alberto Abadie, a professor of economics at MIT, and Enrioc Giovannini, a professor at the University of Rome Tor Vergata explored how data could be used to change policies at the Institute for Data, Systems, and Society (IDSS) conference at MIT. Giovannini stated, "We produce statistics because we believe facts can improve decision-making on many levels"

(2016). This is just one example of how data analysis can influence society. In the technical project, the team hopes to use the facts discovered with the secondary data analysis to produce discussion about unfair policies regarding the mentally ill inmate population. From the discussion, the team hopes concrete changes will occur within the organizations interacting with the mentally ill inmate population. The STS project will analyze this process and see how past studies and companies have caused both positive and negative changes to society through data analysis.

The use of data analysis in the technical project can also be thought of as the Handoff Model, an STS framework by Bernard Carlson (2013), former professor of STS in U.Va's School of Engineering and Applied Science. This process can be seen in Figure 4 below.

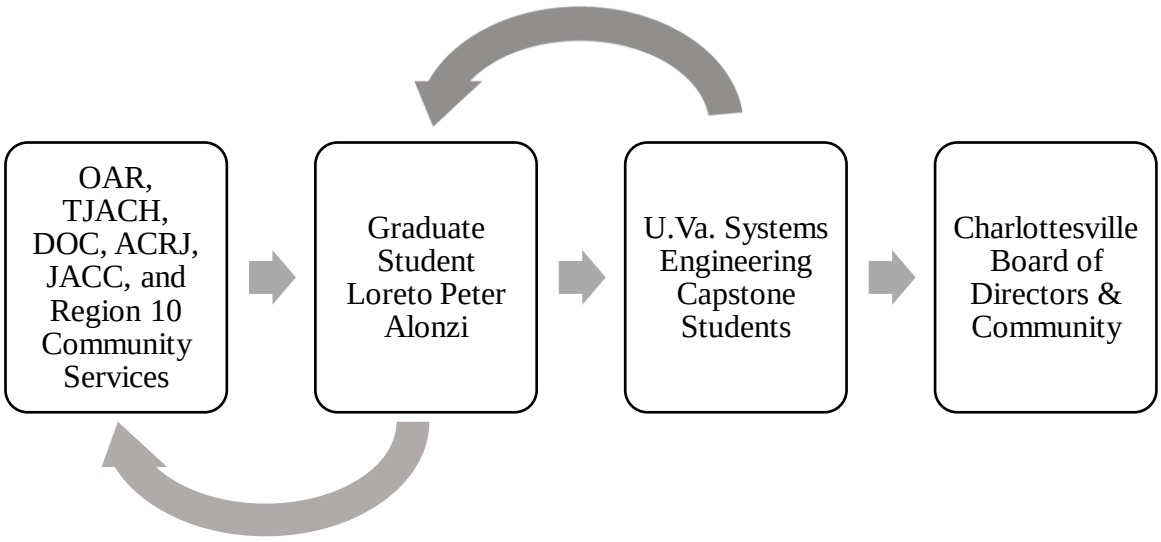

Figure 4. Handoff Model for Data Analysis: An adaption of Carlson's Linear Actor Network Model or Handoff Model (adapted by Claire Deaver from B. Carlson, 2013)

The initial actor is the primary data collector. This could be OAR, TJACH, DOC, ACRJ, JACC, or Region 10 Community Services. From here, the data is passed off to the team's graduate data science student and then to the team to be cleaned, analyzed and interpreted. This process is iterative. It isn't until the end user, the Charlottesville board of directors and

community, see the transformed artifact that the process is complete. A research paper is the expected output for this project, with clear instructions on how future capstone teams can ensure they are using secondary data ethically. It will also allow capstones to think about the possible social impact they could have on the community.

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