Meeting times: None

Lecture:

Lab:

1. How does the  "last empirical watershed movement" differ from the current one? The last watershed moment was characterized

Focus: Quantification and measurement. | - Focus: Big data, which is vast amounts of information.

Method: Imported math and stats from science fields. | - Method: Requires new tools and methods to analyze big data.

Perspective: Shifted to focus on individuals and numbers. | - Perspective: Will likely lead to new ideas about how society works.

Research Approach: Tested preconceived ideas (hypothesis-driven). | - Research Approach: Likely to lead to changes in theories (data-driven).

Long-standing Tradition: Became the norm and persisted for a long time. | - Emerging Trend: Currently happening, causing a shift in research thinking.

Impact: Resulted in widespread use of statistical methods and hypothesis testing. | - Impact: Expected to change how researchers work together and use resources.

In summary, the last "watershed" moment led to a focus on statistics and hypothesis testing, while the current moment is characterized by the rise of big data and the need for new analytical methods, likely leading to changes in how researchers understand social phenomena and collaborate.

The last empirical watershed movement was marked by a focus on quantification and measurement. Its perspective shifted way from ethnographic community studies and began to focus on individuals and numbers. Concentrating on testing preconceived ideas, proving hypothesis about things that were currently happening. Leading to a widespread use of hypothesis testing and statistical methods. The current one is marked by rise and use of big data, the main focus is around developing new tools and techniques to analyze the vast amounts of data that is available which leads the current watershed movement to be data driven instead of hypothesis driven and is causing a shift in concentration to predictive modeling or trying to predict where the emerging trends will come to the surface of society. This will likely lead to changes in how researchers collaborate and understand social phenomena.

1. Summarize the differences between how fields like engineering and sociology differ in their approach to research.

Fields like engineering and sociology differ significantly in their approach to research in several key aspects:

**Research Goals**:

* + **Engineering**: Engineers primarily aim to create practical solutions or technologies that address real-world problems. Their focus is on designing and implementing solutions to achieve specific outcomes.
  + **Sociology**: Sociology seeks to understand and explain social phenomena and human behavior. The primary goal is to develop theories and explanations for why certain social events or behaviors occur.

**Theoretical vs. Applied**:

* + **Engineering**: Engineering research tends to be applied, emphasizing the development of practical tools, technologies, or systems to solve problems. It often has an atheoretical perspective, focusing on functionality.
  + **Sociology**: Sociology is more theoretical, with an emphasis on building and testing theories to explain social phenomena. It seeks to advance knowledge and understanding of societal issues.

**Collaboration**:

* + **Engineering**: Engineering research often involves collaboration among many researchers or engineers. Teamwork and coordination are common in engineering projects.
  + **Sociology**: Sociology research typically involves fewer coauthors and is often conducted by individual researchers. It tends to be a more solitary endeavor.

**Research Outputs**:

* + **Engineering**: Engineering research results are frequently presented in the form of practical solutions, algorithms, or technologies. These results are often implemented as products or systems.
  + **Sociology**: Sociology research outputs are typically in the form of research papers or publications that contribute to the theoretical understanding of social phenomena.

**Publication Cycles**:

* + **Engineering**: Engineering research often has shorter publication cycles, with conference papers being common. The focus is on rapid dissemination of practical findings.
  + **Sociology**: Sociology research papers tend to have longer publication cycles, with more extended journal articles. The emphasis is on in-depth analysis and theoretical development.

**Citations and Consensus**:

* + **Engineering**: Engineering research tends to cite more recent work and aims for higher consensus within the field, with standardized techniques and practices.
  + **Sociology**: Sociology research frequently cites older references and may have lower consensus due to diverse theoretical perspectives and approaches within the field.

In summary, engineering and sociology differ in their research goals, the balance between theory and application, collaboration practices, types of research outputs, publication cycles, and citation patterns. These differences reflect the distinct cultures and objectives of these fields.

1. Why do the authors recommend a synthesized forensic social science approach to research with big data?

he authors recommend a synthesized forensic social science approach to research with big data for several reasons:

**Balanced Approach**: The forensic social science approach combines both applied and theory-driven perspectives. It allows for a balance between deductive and inductive approaches to data analysis. This balance is crucial when dealing with the vast and complex landscape of big data.

**Guided Exploration**: This approach enables researchers to use theory as a guide for exploring the data while also allowing for inductive discovery. It means that researchers have a structured framework to start with, but they are open to unexpected findings and patterns in the data.

**Serendipitous Discoveries**: The authors highlight that big data analysis can involve an overwhelming number of features and variables. By using theory as a sensitizing guide, researchers are more likely to identify relevant patterns and relationships in the data, even those that may not have been initially anticipated. This can lead to serendipitous discoveries.

**Efficient Use of Resources**: In contrast to throwing a multitude of features at a research question without guidance, a forensic social science approach can be more efficient in terms of resource utilization. It ensures that researchers focus their efforts on exploring variables and relationships that are theoretically relevant.

**Long-Lasting Contributions**: The authors argue that in the long run, a forensic social science approach may lead to more robust and lasting contributions to knowledge. It encourages critical comparisons of approaches and the development of explanations, which are essential for advancing scientific understanding.

**Adaptability**: This approach is adaptable and suitable for dealing with unstructured textual and audio-visual data, which are prevalent in the era of big data. It allows for the exploration and theorization of the processes by which meaning is negotiated through interpersonal interactions in these data types.

**Synthesis and Narrative**: The forensic social science approach is well-suited for synthesizing information and creating narratives that help researchers and society at large make sense of the multitude of findings generated from big data. It allows for the development of overarching explanations.

In summary, the authors recommend the synthesized forensic social science approach because it offers a balanced, efficient, and adaptable framework for conducting research with big data. It encourages theory-guided exploration, which can lead to meaningful discoveries and lasting contributions to knowledge in an era where data analysis is increasingly complex and multidimensional.

1. Why do the authors feel engineering will colonize the social sciences?

The authors express the belief that engineering is likely to colonize the social sciences, particularly in the context of big data research, for several reasons:

**Applied Focus**: Engineering is primarily concerned with creating practical solutions and technologies that address real-world problems. In the age of big data, there is a strong emphasis on developing algorithms and tools to make accurate predictions and achieve specific outcomes. This applied focus often takes precedence over theoretical explanations.

**Profit Orientation**: Engineering solutions are highly valuable, both financially and symbolically, because they address companies' concerns for profit and economic success. This profit-driven motivation places engineering research in a dominant position, as companies prioritize solutions that directly impact their bottom line.

**Resource Investment**: Granting agencies and institutions tend to allocate more funding and resources to engineering problems and student training than they do to the social sciences. This greater resource investment further strengthens the position of engineering in research and innovation.

**Employment Opportunities**: Engineers, with their skills in data analysis, machine learning, and algorithm development, are often seen as better positioned for employment in industries that rely on big data analytics. As a result, social scientists may need to adapt to a computer science approach and use social science merely as a supplementary tool to assist with data interpretation.

**Rapid Technological Innovation**: Engineering fields are at the forefront of technological innovation and development. In the fast-paced world of technology, practical solutions and technological advancements often take precedence over theoretical understanding.

**Public Faith in Black Boxes**: As more technological gadgets and systems become "black boxes" that users trust without fully understanding how they work, the role of engineers in creating these systems becomes increasingly significant. Users often have faith in the functionality of these technologies without needing to understand the underlying theories.

**Immediate Application**: Engineering solutions tend to have immediate applications and can directly influence user experiences and outcomes. This immediacy contrasts with the slower, more theory-focused approach of social science research.

**Consumer-Centric Approach**: In industries such as social media and digital information mining, engineering plays a crucial role in shaping user experiences and preferences. Engineers are tasked with improving the quality of these experiences to retain users and increase profits.

In summary, the authors believe that engineering will colonize the social sciences because of the applied nature of engineering research, its profit orientation, resource advantages, employment opportunities, and its dominance in the rapidly evolving technological landscape. These factors position engineering as a leading force in the era of big data, potentially overshadowing the theoretical and explanatory focus of the social sciences.

1. What could be the pitfalls of this colonization? (Based on the reading, but also your own thoughts and observations.)

Certainly, based on the information provided in the text and general considerations related to the colonization of the social sciences by engineering in the context of big data research, we can extrapolate potential pitfalls:

**Loss of Theoretical Depth**: If engineering dominates social science research, there may be a risk of reduced emphasis on theoretical understanding and explanation of complex social phenomena. This could result in a shallower understanding of the underlying dynamics.

**Narrow Problem Framing**: Engineering-driven research may prioritize specific, profit-driven problems over broader societal or ethical issues. This could lead to a myopic focus on problems that have immediate practical applications but neglect broader societal concerns.

**Ethical Concerns**: The emphasis on practical solutions and profit orientation may lead to ethical concerns, particularly in cases involving data privacy, surveillance, and algorithmic biases. Ethical considerations may take a back seat to technical solutions.

**Overemphasis on Technological Solutions**: Engineering-dominated research may favor technological fixes for social problems, even when social, cultural, or policy-based solutions are more appropriate. This overemphasis on technology may not address the root causes of complex issues.

**Dependency on Engineers**: Social scientists may become increasingly dependent on engineers and their technical expertise to conduct research. This dependency could limit the autonomy and independence of social science research.

**Fragmentation of Knowledge**: If engineering takes the lead in big data research, there may be a risk of fragmented knowledge. The integration of social science theories and findings with engineering-driven research may be lacking, leading to a disjointed body of knowledge.

**Loss of Public Trust**: If social science research primarily serves profit-driven engineering goals, it may erode public trust in the objectivity and societal relevance of social science research. This loss of trust could have broader implications for the field.

**Neglect of Contextual Factors**: Engineering-driven research may underemphasize the importance of understanding the contextual factors that influence social phenomena. This could result in solutions that do not consider the nuances of cultural, historical, and contextual factors.

These extrapolated pitfalls align with the general concerns that can arise when engineering colonizes the social sciences, particularly in the context of big data research. While not explicitly outlined in the provided text, these potential pitfalls highlight the challenges that need to be addressed when balancing the applied and theoretical aspects of research in this interdisciplinary field.

They feel that engineering will colonize the social sciences for a large number of reasons. The nature of engineering research to find solutions to real world problems which tends to have precedence over that of theoretical explanations. In the era of big data companies will often prioritize engineering research over social sciences because it affects their bottom line. Resources that, at one time, would have gone toward social sciences could potentially go to engineering. The engineering field is also on the forefront of employment opportunities and the rapidly evolving technological environment. These factors allow engineering to be in a position to be a leading force in the era of big data and this may overshadow the theoretical and explanation-based focus of the social sciences.

The authors seem to believe that engineering colonizing social sciences could be good if a balance could be struck and much of that depends on the methods that the companies want to employ. If a balance cannot be struck there is the possibility of a shallower understanding of social issues which would lead to neglect of broader societal concerns.