

## INTERVIEW

# Exploring Interdisciplinary Pedagogy with "Data in Social Context"

Featuring Marcia Davitt, Leanna Ireland, and Emma Stamm. Introduction by Tom Ewing

Virginia Tech, US

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This feature brings together three current and former instructors teaching as part of the Data in Social Context (DiSC) program at Virginia Tech. The DiSC program teaches students to use humanities skills, such as close reading, contextual interpretation, ethical reasoning, and empathy to understand data as a representation of human experience and understanding. The current and former instructors for the "Introduction to Data in Social Context" course discuss pedagogical strategies, interdisciplinary education, and the opportunities and challenges in exploring what it means to be human when so many elements of daily lives are measured by numbers, managed by algorithms, and classified as data.

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## Introduction

The Data in Social Context (DiSC) program at Virginia Tech teaches students to use humanities skills, such as close reading, contextual interpretation, ethical reasoning, and empathy to understand data as a representation of human experience and understanding. In the last three years, more than eight hundred undergraduates have completed DiSC courses, which feature a project-based, problem-oriented, and collaborative approach. These courses are designed to strengthen disciplinary training while emphasizing interdisciplinary inquiry. DiSC has been taught by tenured faculty, adjuncts, and graduate teaching assistants from programs, such as the Alliance for Social, Political, Ethical, and Cultural Thought (ASPECT), Science, Technology, and Society (STS), and Sociology.

"Introduction to Data in Social Context" addresses a modern epistemological challenge by asking what it means to be human when so many elements of our daily lives are measured by numbers, managed by algorithms, and classified as data. Its approach to data is in keeping with generations of humanists who examine literary works, personal diaries, visual arts, written correspondence, and government documents as representations of reality. Digital media are similarly shaped by the interests, identities, and politics of agents, objects, and subjects. Most of all, data exist in a dialectical relationship with operations of power, the functioning of social structures, and the expression of collective

and individual identities. As American higher education prepares students to live and work in a world where computation is increasingly pervasive and powerful, it is imperative that students understand data in social context. The DiSC initiative brings lasting benefits to individuals, institutions, and society as a whole.

This feature on Data in Social Context brings together perspectives from three current and former instructors of "Introduction to Data in Social Context:" Marcia Davitt, an instructor and research associate in STS; Leanna Ireland, a Ph.D. Candidate in Sociology; and Emma Stamm, a recent graduate of the ASPECT Ph.D. program. SPECTRA asked Davitt, Ireland, and Stamm to respond to a series of questions regarding their pedagogical techniques and approach to the vision of DiSC.

*Question 1. Describe your academic background and interests, and the ways in which Data in Social Context connects with your current research and career endeavors.*

**Marcia Davitt:** Prior to returning to pursue my graduate education, I worked for many years as a software designer and healthcare information systems professional. As such, I had regular interaction with hospital clinical and administrative staff with respect to data collection, presentation, and interpretation. I observed firsthand how technological innovations and the growing capacity to collect and store

data were shaping healthcare delivery practices. Many hospital clinical and administrative staff expressed concerns about new technologies impeding their ability to engage with patients. Thus, early on, I became an observer of the unanticipated consequences of technologies aimed at increasing efficiencies, streamlining workflow, and providing access to important data on demand.

I later obtained a master's degree in Environmental Science and Policy where my thinking about the intersection of technology and society took on ecological and social justice dimensions. I obtained my Ph.D. from the Department of Science, Technology, and Society at Virginia Tech, where my dissertation involved critiquing the ecological and socio-economic implications of the assumptions shaping the design and implementation of renewable energy technologies.

In my current research, I interrogate the discourse surrounding the digital revolution. In particular, I critique the metaphors (e.g. "wireless" and "the cloud") that conceal the high-maintenance, high-energy-consuming infrastructures required to support information communication technologies (ICTs). I believe people need to think more critically about the growing dependence of our daily existence on technologies that rely so heavily on extractive practices. Few people really think about the provenance of their technologies or the costs of Big Data, particularly in terms of the fossil-fuel consumption, ecological degradation, and socio-economic injustices linked to the manufacture, shipping, use, recycling, and dumping of ICT components (e.g., PCs, iPads, smartphones).

**Leanna Ireland:** I have a master's degree in Criminology and Criminal Justice Policies and am currently completing a doctorate in Sociology and a graduate certificate in Urban Computing. My research interests broadly fall under the umbrella of digital criminology, which explores digital society, technologies, and criminal justice.

Data in Social Context is directly connected to each of my three main research areas. The first involves privacy awareness and privacy enhancing technologies (PETs). In this area, I have looked at parental support for technological security measures and the effects of both legal environments and data and privacy protections on interest and usage of PET applications. The second area, and the primary focus of my dissertation, looks at the outsourcing of crime control to the crowd. These crowdsourcing processes involve digital communities and networks, platform moderation decisions, privacy protection, and surveillance. The last area of research centers on the ways humans interact with digital spaces and technologies. In this area, I have conducted a project on "algorithm aversion," which looks at the human distrust of algorithmic predictions as a source of judicial error. Another project in this vein investigates automated cyberbullying detection systems and their influence on bystander interventions.

**ES:** I recently completed my Ph.D. in Cultural and Social Thought. My research lies at the intersection of Critical The-

ory, New Media Studies, and Philosophy of Technology. I primarily deploy theoretical approaches, but also draw from empirical technoscience research.

Data in Social Context crystallizes a number of my academic interests. Ten years ago, as I was completing my undergraduate degree, I became curious about the connection between philosophy, politics, and digital networks. However, none of my courses indicated a link between digitality and the humanities. I was not aware that this research area already had a canon. In the early stages of my master's degree, I was introduced to humanities and social science studies on digital media. In 2014, I participated in a university-sponsored conference on the topic of digital labor. These experiences were formative and led to my decision to pursue a Ph.D.

My dissertation investigates the ways in which the nascent field of psychedelic psychiatry challenges epistemic virtues reinforced by Big Data. I am relatedly interested in machine learning and artificial intelligence as applications which embody the epistemic principles of data science, and the connection between capitalism and digital epistemology. The work I've done under the auspices of Data in Social Context complements my scholarly pursuits. My involvement with DiSC began in the summer of 2018, when I joined a pedagogy workshop designed to include graduate teaching assistants in the development of DiSC courses. Over a series of weeks, we discussed topics such as course instruction and syllabus design. I began to think about the connection between the DiSC program and my research. I participated in a similar workshop the following summer, and taught "Introduction to Data in Social Context" for the first time in the Winter 2019–2020 semester. I am currently completing the Spring 2020 semester. Although the transition to online teaching was challenging, it provided timely materials for discussion. In general, I've found that a sort of symbiosis emerges in my DiSC courses. I teach content that has compelled me for years, and students share feedback influenced by their own use of technology.

*Question 2. What are the strengths/weaknesses of DiSC's interdisciplinary approach? In other words, what are the benefits of teaching across three departments and assigning content from a wide array of disciplines?*

**LI:** Interdisciplinarity allows for a wide array of experiences within the Data in Social Context framework. Some of my students, for example, are Computational Modeling and Data Analytics majors, while others are completing humanities degrees. The data analytic majors often approach the topic in a data-driven manner while the humanities students tend to consider the social or historical implications of the decisions. This is a common tension in society at large, so it is great that the classroom can be a place to openly observe and discuss this tension. The students themselves are then exposed to diverse perspectives on the topics. Relatedly, it allows students to work and to develop collaboration skills with other students from different disciplines.

Interdisciplinarity presents an obstacle in that levels of data and digital literacy vary within the class. The content is often rudimentary to ensure all students are on the same page. With the course being just one semester, we cannot explore certain topics with great depth.

**ES:** The social study of digital media is inherently interdisciplinary. Interdisciplinarity accommodates a holistic and integrative perspective on digital applications across social milieus. We have the freedom to not only choose from various empirical, theoretical, and methodological techniques, but to indicate the ways in which the subject matter calls disciplinary orthodoxy into question.

History, STS, and Sociology are ideal departmental homes for Data in Social Context. Historical case studies establish a link between past and present, and point to the fact that today’s techno-social problems have meaningful precedents. STS frameworks clarify the connection between empirical, technical, and conceptual approaches to digital applications, establishing a link between theory and practice. sociology illuminates the role played by data in upholding structural power dynamics, but also speaks to the utility of digital devices in political activism.

For all of its benefits, however, interdisciplinarity has its shortcomings. DiSC courses will never suffer from a dearth of applicable methods, texts, and theoretical frameworks. Because these courses accommodate so many different modalities, instructors must emphasize cohesion and meaningfulness in their syllabi. To this end, I work to ensure that students grasp the relevance of each individual assignment and the way it relates to the overarching course objectives.

*Question 3. Have you found that one particular framework or pedagogical strategy – for example, a historical focus, or relying heavily on data visualizations or statistical data – is particularly effective?*

**MD:** I find it valuable to encourage students to interrogate claims that equate objective research with value neutrality. It seems like stating the obvious – all human endeavors are value-laden. However, many students struggle with this. As I listen to students’ comments and read their essays on this topic, I realize how challenging it is to destabilize the myth of value-free research. By shedding more light on the thought processes which inform research procedures, I’m able to help many students understand where values enter into the process. Towards this end, I devote a segment of several classes over a handful of weeks (involving both group and individual work) to leading them through the steps involved in developing a research question and methods for data collection and analysis. The values come into play at the very first stage when students are asked to write down one or more topics/themes of interest to them. As they share their topics with the class (e.g. artificial intelligence, mass incarceration, intellectual property policy), they state the

factors motivating their choice. The exercise demonstrates to students that the decision to pursue a particular research topic is value-laden.

Many of the assigned readings critique the myth of value-free data either explicitly or implicitly. One particularly valuable source in this regard is Stephen J. Gould’s *The Mismeasure of Man*. Gould provides detailed case studies of how implicit bias shaped 18<sup>th</sup>-, 19<sup>th</sup>-, and early 20<sup>th</sup>-century research practices aimed at the reification and quantification of intelligence. These cases provide an excellent platform from which to launch discussions that address the meaning and purpose of objectivity. We kick off this segment with Gould’s definition of objectivity: “Objectivity must be operationally defined as fair treatment of data, not absence of preferences. Moreover, one needs to understand and acknowledge inevitable preferences in order to know their influence – so that fair treatment of data and arguments can be attained!”<sup>1</sup> Gould makes this statement within the context of situating himself and clarifying his own particular standpoint.

Another valuable source comes from data journalist Meredith Broussard. In her book *Artificial Unintelligence*, Broussard demonstrates that human bias is embedded in machine learning algorithms. She states: “Here’s an open secret of the big data world: all data is *dirty*. All of it. Data is made by people going around and counting things or made by sensors that are made by people. In every seemingly orderly column of numbers, there is noise. There is mess. There is incompleteness. This is life.”<sup>2</sup>

I also engage students using concept mapping exercises. These consist of focusing on a single concept or phrase (e.g., data provenance or symbolic violence) that emerges from the readings and generating ideas around the concept. Undertaken as a group exercise, the concept mapping is not only a useful ice-breaker, it also serves as a valuable lesson in the social construction of knowledge. In summing up the exercise, I point out to students how the mapping exercise serves as both an exchange of ideas and a generator of new ones.

I designed the syllabus around the constraints of large classes limited to 50-minute sessions and composed of students from a broad array of educational backgrounds. Rather than assign computational exercises that would require instructing them in the use of data tools, I engage the students in critiquing various presentations and interpretations of data sets. For example, we analyze and critique a statistical graph from the *The Bell Curve* depicted with critical missing information that leads readers into concluding along with the authors that there is a significant correlation between IQ scores and welfare dependency. In another case, we review how machine learning algorithms (mis)interpret statistics from the Titanic tragedy.

**LI:** In the first weeks of class, we discuss Rob Kitchin’s “Ways to View Data” from his 2014 book *The Data Revolution: Big Data, Open Data, Data Infrastructures and Their*

*Consequences.* In the book, Kitchin discusses six different ways to view data: technical, political, economic, ethical, spatial, temporal, and philosophical. As a class, we turn these “ways to view data” into a workable framework for the course by developing questions which connect with each of these viewpoints. These questions help students to critically assess the role of data in their lives. The framework allows students to see that society may value some viewpoints over others, and addresses the need for, and strength of, interdisciplinarity in all things data-related. Further, it reinforces the fact that all lenses are essential, and that the computational modeling approach is one among many perspectives on data.

To tailor my pedagogical strategy, I ask the students for their preferred teaching style and prepare the course accordingly. For this course, the preferred method was “hands-on.” As an illustration of that style in practice, in a lesson about the power of metadata and its impact on privacy, we took the position of a state investigatory body. After introducing the topic, in groups, each student received a piece of metadata about the same person. The person’s identity was fabricated, but the URLs and phone numbers, for example, were for real businesses (from information publicly accessible on the Internet). The students determined what information they could extrapolate from their single piece of data (they could search the information online), and then together placed these pieces into conversation. Their goal was to derive as much information as possible about the fabricated person’s identity.

*Question 4. How does Data in Social Context support students’ academic and professional goals? Is it only for students planning careers in which they will work directly with digital data? If not, how might the DiSC program support other professional paths?*

**MD:** While some students may not see the immediate benefits of the course, in terms of their chosen career path, learning how to critique claims “backed by the data” is an invaluable and broadly-applicable skill. Students who develop skills that enable them to delve beneath the surface to unearth hidden assumptions will be better poised to make a contribution in a variety of fields. The DiSC course can be instrumental in helping students to further define their identity and interests. Through course readings, students encounter a variety of professions — statistics, data journalism, mathematics, economics, social sciences — as well as creative applications of those professions. For instance, those with a bent toward mathematics may use their skills to create a system of algorithmic accountability and transparency. Those interested in data journalism may decide to investigate patterns that expose inequities in policing or education. Others may combine legal, business, and social justice interests by investigating how intellectual property laws inhibit algorithmic transparency and accountability.

**LI:** The course is beneficial in supporting students’ academic and professional goals. All careers are data careers, in one way or another, from knowing the sport scores for a football player to understanding HIPAA in the health field. DiSC provides students with data literacy and the opportunity to critically look at the data in front of them and its influence on their lives.

**ES:** DiSC seeks to undo prevailing myths about digital technology. These include the precepts that data are ideologically neutral and that digital infrastructure exists beyond the scope of humanistic critique. Throughout the semester, DiSC students reckon with their own presumptions about technology and social change. Perhaps more importantly, they learn how to formulate probing, insightful questions on their own. For these reasons, DiSC courses enhance students’ capacity for critical thought. This skillset will help them to thrive in a world which is increasingly fractured along ideological and epistemological lines.

On another note, digital technology is a ubiquitous presence. Even students who pursue non-digital careers (if such things exist anymore) will generate and use data on a continual basis throughout the course of their lives. The lessons conferred by DiSC pertain to all students, and will likely become more salient over time.

*Question 5. DiSC courses often touch on critical and ideologically inflected issues, such as surveillance and algorithmic bias. How do you present the ethical and political dimensions of digital technology to students who may be unfamiliar with them?*

**MD:** In the course description of my syllabus, I state that students will develop systemic literacy — “the thinking that deals with a world that is not computable, while acknowledging that it is irrevocably shaped and informed by computation.”<sup>3</sup> Throughout the semester I emphasize that we use data to represent reality, and that even at their best, these representations exclude aspects of reality which humans cannot reduce and quantify. We then use these limited representations to intervene in and shape that reality. Thus, it is critical for them to understand that data is always constructed within a value-laden context, and it is key that they develop the ability to interrogate that context. Furthermore, I believe it is important for students to realize that the tools we rely on to collect and to process data were and are designed by a very small group of the elite — primarily white, privileged males.

I frame the course as a counter-narrative to the dominant story propagated by a technical university that prioritizes engineering and science over other approaches to understanding the world. This narrative is reinscribed by a steady stream of Virginia Tech news and mainstream media that uncritically equates innovation with progress and the betterment of society. The hyperbole surrounding the new innovation center, including Virginia Tech’s (dubious) alliance with a taxpayer-subsidized firm renowned for its exploitation of

workers, serves as a noteworthy example. While the dominant narrative celebrates Amazon’s efficient warehouses, I indicate that efficiency can serve as a smokescreen for labor fragmentation, control and exploitation. Through this and other cases, I intend that my students ask questions that most people do not think to ask, and that they approach Big Data analytics and Big Data tools thoughtfully, skeptically, and critically. I outline my particular approach and rationale right from the start so that students uncomfortable with this technique can opt out before the semester gets underway. Still, I am pleased to note that many students in technical disciplines stick with the course and engage in class discussions, although they may at times experience discomfort.

Perhaps the most difficult segment of the course occurs toward the end of the semester, when we investigate the actual costs of big data from an ecological, energy-consumption, and social justice standpoint. I say “difficult” as it can be quite overwhelming for students to realize that underlying the convenience of their smartphones, iPads, and PCs is a vast infrastructure powered mostly by fossil fuels. Indeed many students find it disconcerting to realize that these devices are composed of materials that require highly extractive processes involving severe degradation of land, water, and air, along with the exploitation of child slave-labor.

**LI:** The content itself is not neutral – how could it be? The course places data within the social context, where humans are making decisions throughout the entire process. My course is structured in a way that introduces students to the human decisions at each stage of the research process, such as what gets counted or presented. I am explicit about this perspective upfront with the students (e.g., get the students

to see the authors’ values in their writing) and encourage them to disagree. However, I do not imply judgement of the values that are or are not included; instead, I only note that all data is social, and so value-laden.

### Notes

- <sup>1</sup> Stephen J. Gould, *The Mismeasure of Man* (New York: W. W. Norton & Co., 1996), 36.
- <sup>2</sup> Meredith Broussard, *Artificial Unintelligence* (Cambridge, MA: MIT Press, 2018), 103.
- <sup>3</sup> James Bridle, *New Dark Age: Technology and the End of the Future* (Brooklyn, NY: Verso Books), 4.

### Competing Interests

The authors have no competing interests to declare.

### Bibliography

- Bridle, James. *New Dark Age: Technology and the End of the Future*. Brooklyn, NY: Verso Books, 2018.
- Broussard, Meredith. *Artificial Unintelligence: How Computers Misunderstand the World*. Cambridge, MA: MIT Press, 2018. DOI: <https://doi.org/10.7551/mitpress/11022.001.0001>
- Gould, Stephen Jay. *The Mismeasure of Man*. New York, NY: W. W. Norton and Co., 1996.
- Herrnstein, Richard J., and Charles Murray. *The Bell Curve: Intelligence and Class Structure in American Life*. New York, NY: Free Press Paperbacks, 1994.
- Kitchin, Rob. *The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences*. Los Angeles, CA: SAGE, 2014. DOI: <https://doi.org/10.4135/9781473909472>

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