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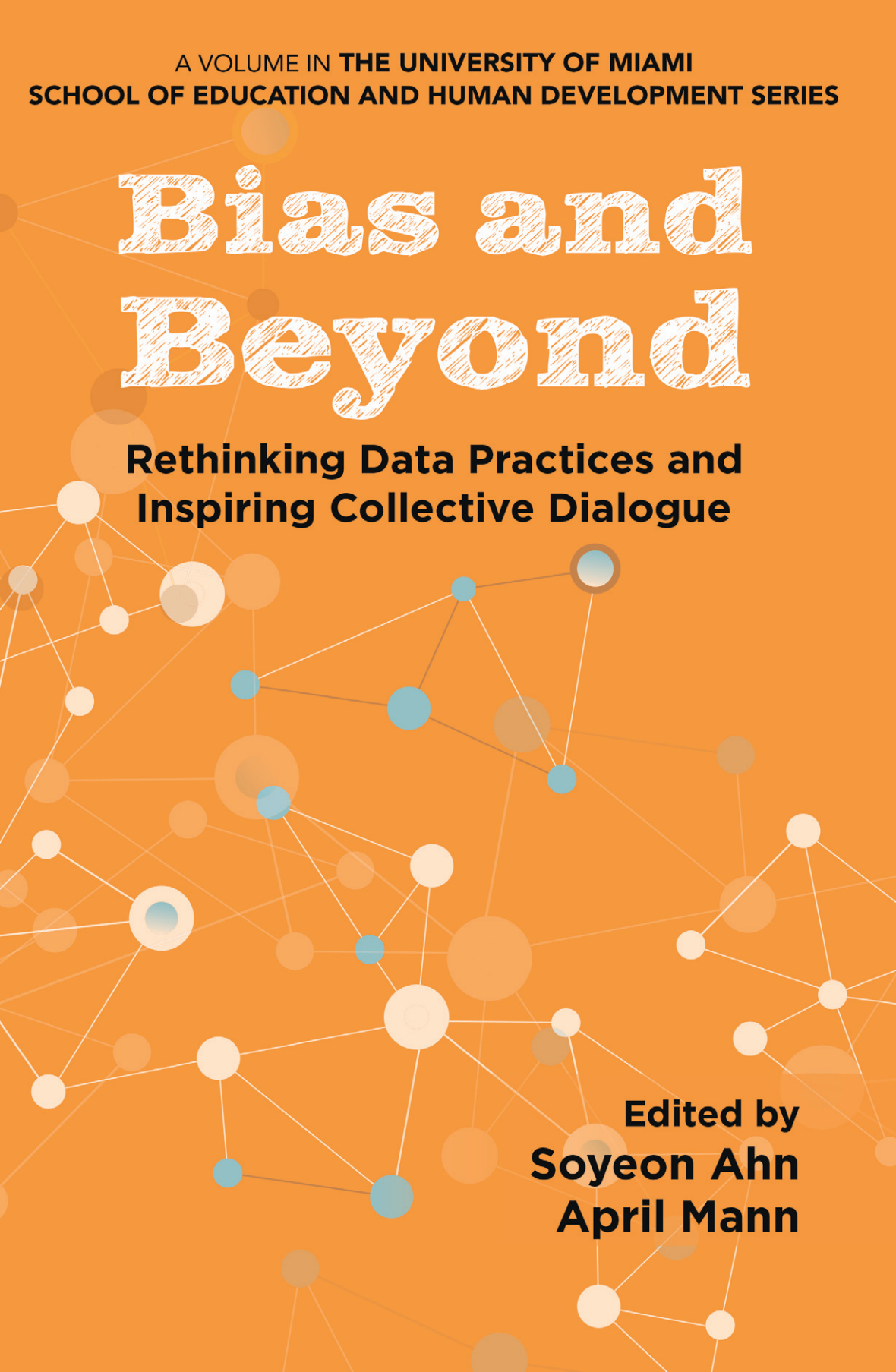
Bias and Beyond

Rethinking Data Practices and Inspiring Collective Dialogue



Edited by
Soyeon Ahn
April Mann

Bias and Beyond

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Soyeon Ahn
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PREFACE

In recent decades, the volume and diversity of data generated daily have increased extraordinarily. To process this surge of data, computational models and algorithms have been developed, and these models and algorithms shape decision-making across sectors, including public health, education, public policy, and business. In addition, technological innovations have used this data to enhance the efficiency and convenience of our daily lives.

However, these advances also bring significant societal concerns. Data governance, privacy, the quality and application of collected data, as well as policies and practices derived from advanced data collection are among the emerging challenges. Many people outside of the data sphere may not be aware of the critical role data plays in decision making. This has led to widespread data illiteracy and a gap in knowledge, experience, and skill between those who create and control data and those most affected by its use. This gap is exacerbating social disparities among individuals and communities at local, regional, and global levels.

These challenges have inspired the creation of this book. In it, we both explore the multifaceted issues around data and issue a call to action. Throughout the chapters, we explore the use and misuse of data and search for tentative solutions that can function iteratively to engage with the changing data landscape. By critically engaging with the transformative power and implications of data, we hope to promote more inclusive and responsible approaches to its creation and its use.

This book not only invites reflection but also serves as a practical guide for action. The insights and recommendations presented here can empower readers to address challenges and issues within their own contexts. Whether you are a researcher seeking to refine methodologies, a policymaker aiming to develop more representative policies, or a partitioner seeking for more inclusive practices, this book provides perspectives and tools to make changes.

At the core of this book lies the concept of the data lifecycle – a structured yet iterative process which describes the way data is created and used to drive the decision-making process. The data lifecycle, although varied across different disciplines, typically encompasses the following four stages: (1) formulating questions/problems; (2) measuring, collecting, and manipulating data for analysis; (3) analyzing and communicating the data to inform policies and practice development; and (4) refining these policies and practices through iterative reprocessing of the previous steps.

Our book traverses throughout the data lifecycle, highlighting the importance of using diverse data types - quantitative, qualitative, numbers, strings, audio, and video - to deepen our understanding of global phenomena and tackle complex societal challenges. Therefore, our discussions here extend beyond scenarios involving exclusively quantitative data, which is frequently but mistakenly regarded as the only form of data. Additionally, we recognize that data within the lifecycle can be either structured or unstructured, and it may vary significantly in volume, from small to large.

While we are all, consciously or unconsciously, involved in the data lifecycle, we do not all have the opportunity to engage fully in this process. Often data collection, analysis, and decision-making are managed by a select few or groups, excluding individuals and even whole communities. This intentional and unintentional exclusion can lead to policies and practices that do not represent the needs of those most impacted. Such exclusion highlights the long-lasting barriers that can limit representation and equity for all individuals and communities in the data lifecycle, reinforcing existing biases.

Thus, another core principle of our book involves addressing the challenges of applying Diversity, Equity, and Inclusion (DEI) principles throughout the data lifecycle. By reconsidering how problems are defined and how data is collected, analyzed, interpreted, and used, it is possible to better ensure that all groups, including historically marginalized groups, are represented, and that data-driven decisions support less biased, more equitable and more sustainable outcomes.

Our book examines some of these issues and provides guidance on critically evaluating traditional data practices and understanding how to implement data practices that prioritize inclusion, representation, and ethical accountability. By empowering readers with the knowledge and skills to actively engage in the data lifecycle, the book highlights the potential of data when used responsibly, ethically, and inclusively.

This book is intended for anyone involved in the collection, analysis, or application of data—researchers, educators, policymakers, and practitioners. It also seeks to engage those whose lives are most impacted by policies and practices, encouraging them to become more knowledgeable and skilled and thus active participants in data life cycle. By empowering a

diverse audience with the knowledge and perspective to engage with data, this book attempts to bridge the gap between those who create and control data and those most affected by its use.

We aim for this book to serve not merely as an academic exploration but as an invitation to reflect on how data impacts our lives, communities, and broader society. The book prompts readers to consider who has access to data and its analysis for decision-making, thinking critically about how data can be leveraged for social good. This book hopes to provide a variety of perspectives on the challenges encountered during the data lifecycle, offering insights into how citizens can contribute to a datasphere that is more conscious and active. A more conscious use of data, we believe, will facilitate more equitable, less biased, and more inclusive data-driven decision-making.

Our book covers four phases of the data lifecycle, presented through nine distinctive yet interconnected chapters. Each offers unique perspectives, with authors sharing their own reflections on the challenges they have encountered, and the insights shaped by their individual positionalities, experiences, and expertise. To encourage active engagement and dialogue with the authors, we have intentionally chosen to preserve the authors' distinct voices and messages rather than standardizing the tone across chapters. We consider the multiplicity of voices in this book to better represent the complexity of the challenges encountered throughout the data lifecycle.

Chapter 1 sets the stage by offering an overview of the ethical, methodological, and societal challenges that emerged from the data revolution of 2010 to 2020. The author highlights the relationship between data collection and social inequities, stressing the need for critical reflection on biases and underlying assumptions. She calls for conscientious and deliberate engagement in the data lifecycle, particularly concerning data governance and tools, to reduce biases, enhance equity, and address ethical dilemmas, especially in advanced computation models and algorithms, such as AI.

The subsequent three chapters explore potential challenges that may occur during data collection and the subsequent measurement of phenomena. The chapters offer authors' insights and recommendations for addressing these challenges effectively. Chapter 2 critically reviews traditional survey methods used for collecting participants' social identities, focusing on measuring race, ethnicity, gender, and sexual orientation. The authors offer recommendations to address the systematic exclusion of marginalized populations and improve inclusivity. They aim to adopt more inclusive data practices and thereby achieve a more accurate representation of diverse identities in research and practices.

In chapter 3, the authors examine the way course evaluation data may provide unreliable measurements of diversity, equity, and inclusion (DEI). They present empirical evidence, based on an analysis of student response data for a DEI item, highlighting potential biases and misrepresentation.

They emphasize the importance of thoughtful and deliberate practices in designing survey items to ensure that data collection accurately captures participant views on complex issues, such as DEI, especially when the results are used for high-stakes decision making.

Chapter 4 builds on these themes, underscoring the importance of critically examining biases in test item(s) which are purportedly used to advance DEI. Drawing on case studies from multiple disciplines such as medicine, education, and law, the authors discuss how biased testing can lead to high-stakes negative consequences for individuals and communities. The authors advocate for the use of best practices in designing test items, including psychometrics and statistical methods such as Differential Item Functioning (DIF) analysis, panel reviews, stakeholders' involvement, and clear policies and practices, to address these biases and mitigate their impacts.

The remaining four chapters discuss how various data analytic approaches—qualitative, quantitative, and mixed methods—can identify and address potential biases in data to inform policies and practices. Using empirical data examples provided by the authors, discussion begins with qualitative methods in Chapter 5, transitions to statistical analyses in Chapter 6 through Chapter 7, and concludes with mixed methods in Chapter 8.

Chapter 5 examines the concept of bias in qualitative research, framing it as a potential influence that may distort findings while also recognizing subjectivity as a central element of methodology. The authors advocate for positioning subjectivity as an asset rather than a flaw, although this perspective might raise questions about rigor and validity. By acknowledging potential threats to rigor and offering strategies to accurately represent phenomena or individual experiences, the authors emphasize the importance of reflexivity and preparation to achieve a shared understanding between the researcher and participants.

Chapter 6 examines the extent to which research findings reflect diverse socio-cultural and ethnic groups, based on a thorough analysis of meta-analytic reviews published in a leading peer-reviewed educational journal. The authors highlight significant gaps in inclusivity and provision of unbiased evidence, particularly for historically marginalized populations. In response, they offer recommendations to improve the representativeness and generalizability of research findings, promoting more inclusive practices that better serve all individuals and communities, regardless of their backgrounds.

Building on concerns discussed in Chapter 6, Chapter 7 introduces the egocentric network analysis as a tool to explore the social networks and dynamics of people of color. Through empirical data analysis, the authors uncover critical differences across socio-demographic backgrounds in key dimensions of people's social networks. They offer practical recommendations on how social networks analysis can draw more equitable and representative policies and practices to better support people of color.

Chapter 8 expands on the recurring themes of systematic biases embedded in data and analysis throughout the book, using large educational data analysis, wherein racial discrimination in housing and school funding led to educational inequities. Using the QuanCrit framework, the authors illustrate how systematic racism is embedded within data, policies, and algorithms, echoing earlier discussions on bias in data collection and analysis. The chapter provides actionable insights for dismantling systematic disparities in education by incorporating racial measures in statistical modeling and policymaking.

The final chapter, Chapter 9, provides a comprehensive overview of mixed methods research, highlighting its capacity to address complex research questions and advance social equity. The authors particularly discuss core quality criteria to ensure rigor, suggest ways mixed methods can reduce biases and promote inclusivity, and conclude with recommendations for further development of this research approach.

Together, these nine chapters follow the path of the data lifecycle, offering diverse perspectives, critical insights, and practical recommendations to uncover biases and create more inclusive and less biased data-driven research and practices. The chapters are organized around the structure of the data lifecycle, but readers are encouraged to engage with the book in a way that best suits their interests and needs - whether by exploring specific chapters or following the sequence as intended. Each chapter reflects the unique expertise and lived experiences of the authors, acknowledging the limitations of any single book to address all tools and approaches available to conduct research across disciplines.

Our hope is that this book is a foray into the topics introduced here, aiming to open dialogue and encourage reflection rather than provide definite answers. Readers are invited to evaluate challenges and issues from their own experiences and expertise within their own contexts. Through increased public awareness and constructive dialogue, our aim is to inspire continuous, iterative improvement in how data is collected, analyzed, and applied. We look forward to this book serving as a foundation - an invitation to critically examine past practices, rethink current methodologies, and collaboratively shape a future where data-driven research and policy practices are more inclusive, less biased, and more representative of all individuals and communities.

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CHAPTER 1

RETHINKING DATA LIFE CYCLE PRACTICES: THE VALUE OF APPLYING REFLEXIVITY METHODS TO CURRENT DATA PRACTICES

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ABSTRACT

The data revolution has demonstrated its potential to provide evidence that can improve decision making and transform lives. While its benefits have been consequential, researchers, ethicists, and popular and social policy advocates suggest that efforts to better manage the "datasphere" are necessary (Bergé et al., 2018). This chapter offers a brief overview of some current concerns and advocates for researchers to become more conscious about the potential for bias in their data management practices and to deploy more conscientious engagement with data governance policies and tools. In this exploration of the current landscape governing the data lifecycle, we suggest that efforts to better sensitize data producers and users to the unobserved, but influential, sociological forces embedded in the questions they ask, the methods they use, and the experiences that "count," may help avoid perpetuating misconceptions or cementing biases into accepted knowledge.

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Keywords: Big data movement; data life cycle; data equity; ethical paradoxes; data governance; knowledge production; reflexivity

The "Roaring Twenties" (1920–1929) and the "Swinging Sixties" (1960–1969) were decades of such profound political, socio-economic, and cultural shifts that they defined a generation, changed a nation, or transformed human experience. The technological sea change in the decade spanning from 2010 to 2020 prompted such similarly disruptive socioeconomic and cultural change that it may deserve its *own* distinctive appellation.

What sets that decade apart? During this period, data collection and production technologies captured, measured, stored, and leveraged private individuals' data—our interests, behaviors and activities—at a scale unprecedented, even unimaginable, in human history. No subject or metric was too trivial or personal to track and share. Forging beyond traditional metrics, such as life expectancies, we began to track what we ate, how many steps we took, or how many times we visited a particular retailer (and the route we took to drive there). This freer exchange of information has produced a "tsunami of data" (Vidal, 2017).

While the benefits of the data revolution have been widespread and consequential, such vast quantities of data and attendant sociological, cultural, and political changes have energized age-old, ethical questions and introduced new ones (D'Ignazio & Klein, 2023).

The promise of the digital economy prompted some researchers from science, technology, engineering, and math fields, the social sciences, and the humanities to suggest that emergent data technologies could make traditional scientific methods in research seem obsolete, or at least outdated (Anderson, 2008). In their view, big data technologies could "inherently" provide "meaningful and insightful knowledge about social, political, and economic processes" by revealing previously unseen or even unimagined patterns and relationships (Anderson, 2008; Kitchin, 2021). Harari (2016) asserted that *data-ism* has gone further still, beyond research, becoming a new religion. Harari argued in *Homo Deus* that data-ism is now the prevailing scientific worldview, unsaid, unconscious, but shared by the scientific establishment throughout the world, relegating humans to the role of mere algorithms for generating data (Harari, 2016). Although some might disagree with that characterization, such data-ism sets the context for the emergence of the "Big Data phenomena" and its transformative effects on many professions and businesses (Donatha, 2017; Lohr, 2013). Anticipating the direction of big data, Prensky (2009) suggested that such research would mean that

> scientists no longer have to make educated guesses, construct hypotheses and models, and test them with data-based experiments and examples. Instead,

> they can mine the complete set of data for patterns that reveal effects, producing scientific conclusions without further experimentation because they can rely on analysis of a complete, digitally stored data set. (Enhancing our ability to conduct deeper analysis section, para. 1)

On the one hand, big data has been transformative by empowering individuals interested in social change, giving them new ways to analyze and understand their experiences of systemic or institutional inequities. Previously unknown or veiled disparities within societies, especially for historically marginalized groups, were no longer so easily concealed. Governments, influential NGOs, mega-foundations, and research institutions shared their findings, using data to reveal resource gaps and inequities (Canali, 2016). In addition to its impact on scientific research and public policy, data gave businesses an extraordinary opportunity to stimulate and drive the growth of their enterprises (Forbes Technology Council, 2020). Organizations such as Alphabet (Google's parent company), Amazon, Apple, Meta (Facebook), X (previously Twitter), and Microsoft, invented technologies and applied strategies to become some of the largest repositories for collecting, storing, and analyzing individuals' personal data points. They capitalized upon these billions of personal data points and transformed them into *their* companies' unique and proprietary assets. As in the sciences, the conversion and leveraging of data insights into ever more valuable "products" and "byproducts" (Dammann, 2019) underpinned the big data phenomenon.

But today, many feel that the early unfettered optimism of the data revolution has been replaced by a collective wariness and anxiety. This *zeitgeist* stems from compelling evidence that both lay people and experts have also been producers and purveyors of data operating within a *laissez-faire* attitude that has created a vast web of flawed data practices (Marcus, 2018). The lack of consistent guardrails for managing data, combined with the speed at which these technologies are being adopted, has allowed discreditable "information" to be distributed to unsuspecting or unsophisticated audiences at lightning speed. Even for credible information, the current methods of collecting, protecting, and managing data have proven woefully inadequate in managing the enormous opportunities and associated ethical challenges (Pike, 2019). These data technologies have permeated the private and public sectors so rapidly that prevailing data management and governance practices were and are still overwhelmed. Businesses, in particular, seem to be operating with ad hoc data collection and storage practices, incomplete research and analyses, ineffective quality controls, and governance practices that have proven to be inadequate for guaranteeing data use or provenance (Deur, 2024). According to McKinsey's annual *Global Survey*, many managers give short shrift to data compliance as a "strategic objective" and view it as purview of the legal or compliance teams (Edquist et al., 2022; Marcus, 2018). As of

2021, few organizations (17%) had dedicated resources for data governance, and only 30% thought it was a top priority (Edquist et al., 2022).

However, as data usage has grown, the rules and expectations around it have skyrocketed, producing an array of ethical, legal, and financial challenges. Researchers, ethicists, and popular and social policy advocates suggest that if society is to take full advantage of the potential value of the data revolution, we must also *understand* the vulnerabilities of new data technologies and practices. From the problem formulation to the data collection, data manipulation, data analysis, and data reporting, the issues of security, privacy, and ownership suggest that we must learn to manage the data life cycle differently.

First, however, we take a step back to examine how data becomes information and information becomes knowledge.

HOW DATA BECOMES KNOWLEDGE

Since long before society became literate, the desire to explain a phenomenon, extract meaning from a set of events and actions, or understand the relationships between or among individuals and their world has been an essential force in the human experience (Campbell, 1949). Individuals relied on intuition, superstition, or mythology to answer their questions about the world around them. However, individuals' singular experiences did not contribute to the creation of general knowledge because what was *worth* knowing was managed through a matrix of social, religious, and political beliefs and relationships held by a privileged few. From the ancient world through to the Reformation (1517–1600, Europe), churches and kings (or priests and monarchs, or other religious and state leaders) throughout the world held "monopolies of knowledge" that served to reinforce their power and positions in society (Innis, 1952, pp. 14–15).

The first efforts to systematically challenge this knowledge matrix dates to the 17th-century, where empiricism, along with methodologies for collecting data, standardizing experimentation and systematizing documentation, would be considered "scientific" approaches and therefore reliably accurate for explaining relationships between and among phenomena. In communicating observations and interpretations to others, data could be converted from instinctual impressions to information and knowledge through scientific inquiry, experimentation, analysis, and application. An instructive figure in this transformation is John Graunt, who pioneered data collection and analysis methodologies. Using crude, self-created methods, Graunt sought to address a question that was as much a political flash point as a scientific inquiry: What was the current population of London?

By organizing and analyzing recorded births, christenings, and deaths in London, Graunt revealed meaningful migration patterns which provided

the first data-based estimate of the city's population (Conner, 2024). This work was both precedent-setting and prescient. Graunt's work became an early example of data's life cycle. The data points he identified had been a messy assemblage of numbers—found in an assortment of ledgers, Bibles, and morgues. He organized and made sense of this voluminous, disorganized mass of data points and, even more importantly, communicated his findings broadly. No one else had aggregated and connected this data as evidence of a story or cogent narrative, much less a rational explanation for spread of the plague or shifts in the city's population (Slack, 1985; Sutherland, 2005).

Although Graunt's analysis could be perceived as a mere chronicle of individual births and deaths, his work offers an early example of the powerful influence of a new segment of knowledge producers: men who were part of the class of intellectuals or socio-economically privileged elites who had the time and intellectual training to engage in scientific methodologies. It also elucidates the interconnected relationship of knowledge and power often concealed within it.

As Gramsci's theories would suggest, Graunt's status as an intellectual presupposed his function as a deputy of the ruling class, enforcing its rules and behaviors (Gramsci, 1971). As a haberdasher, Graunt was not an aristocrat, but he was a member of society in good standing, educated in the accepted mores and values of the day. His social position and education provided the platform, the tools, and the foundation from which he could exercise his intellectual curiosity. According to the political and social norms of his time, the questions he asked were plausible and worthy of engagement in large part because he was a man of reasonable social status. And, although his social and economic status would fall precipitously in his later life, his findings function as a Foucauldian example of how

> all knowledge is possible and takes place only within a vast network or system of power relationships that allow that knowledge to come to be, in order for statements accepted as "true" in any context to be uttered, and in order for what counts as knowledge to be generated in the first place. (Fruhling, n.d.)

Consequently, knowledge and power were and are inextricably bound in the creation of each other and interwoven in support of each other's privilege and power.

But Graunt also displayed profound individual agency. In formulating and asking the question, he accomplished three things: (1) He decided that this data, seemingly detritus or dross, could instead become a valuable source for answering important social questions; (2) He set up the organizing principle for how to think about what the data revealed; (3) He decided which data points were to be included or excluded and which insights would matter. Graunt's insider assumptions, the questions he

asked, and the processes he used demonstrate the activities that converted loose data points into information. The refinement and conversion of that information into acceptable, unassailable, "knowledge" to be disseminated to the masses required human agency (Liamputtong, 2010). In other words, Graunt's findings were seamlessly transformed into "bona fide knowledge" as long as he followed certain conventions (Greenley, 1995).

Since Graunt's time, in practice and theory, data scientists and managers have been trained to believe that the data life cycle should be guided by experts in that specific subject matter domain (Keller et al., 2020). This is logical, as domain knowledge provides context to define, evaluate, and interpret findings at each stage of the data life cycle (Keller et al., 2020) However, the foundational practice of privileging domain knowledge and methodologies also suggests the many ways data can be corrupted. From collection to analysis to communication, there are myriad opportunities for flawed evidence or biases to enter and influence every point of the data life cycle (Ho & Beyan, 2020). Additionally, the demand from historically marginalized voices to be represented in and recognized as sources of knowledge has raised questions about the potential biases represented within those domains and their traditional practices. Scholars such as Mary Lou Rasmussen have raised questions about the domains themselves, asking *how* we have come to know what we know, *who decides* what knowledge means, *and who* knows what needs to be done (2009, 2017). The failure to include or represent such voices exposes the power/knowledge dynamic that has traditionally benefited each society's privileged elites. Scholars such as D'Ignazio argue that "data is never this raw, truthful input, and it is never neutral. It is information that has been collected in certain ways by certain actors and institutions for certain reasons" (Corbyn, 2020). In fact, Lyon (2014) notes that "*how* data are generated and framed always has decisive effects on the outcomes of analysis" (Critique section, para. 6). This combination of critical challenges reminds us that the data life cycle is neither ahistorical nor free of embedded sociological assumptions. Therefore, domain-based data professionals may now be ill-equipped to detect the insidious influence or mitigate the ethical consequences of bias in their work product. Hence, domain expertise is necessary, but it is not sufficient.

Given the ubiquity of data and society's dependence on it, for data to be more accurate, it must become more representative and precise. Users and makers of data—which is now all of us—must develop new skill sets for detecting and decoding how and where flawed evidence or bias could be influencing our conclusions. The questions that are asked, the methods that are used, and the conclusions that are drawn can thus be part of a vicious circle or a virtuous circle of knowledge generation. Therefore, none of us, especially those who make data-based decisions, can abdicate our role

in shaping or communicating data (D'Ignazio & Klein, 2023; Hesse et al., 2015). However, without an understanding of how a person's life experiences and worldviews may affect a data point's meaning or value, we do little to mitigate the potential to generate inaccurate, harmful information or partial truths (Dodgson, 2019). It is therefore crucial to reimagine new ethical methodologies for gathering and deploying data insights. Critical frameworks can help guide responsible management of the data life cycle, and one framework that can be especially useful for improving data practices is reflexivity.

REFLEXIVITY

As suggested earlier, the fast-paced evolution of the data landscape is challenging every aspect of data management regimes. The principles and methods that have served the field for generations have also reflected and reinforced biases leading to misrepresentations or exclusions of particular groups or perspectives (Dastin, 2018) Consequently, as we move into the middle of the next decade of big data, more effective practices for detecting and decoding how and where flawed evidence or bias could be influencing findings or outcomes becomes essential. Reflexivity is a time-honored methodology often used in the social sciences because it facilitates

> a researcher's conscious and deliberate effort to be attuned to one's own reactions to respondents and to the way in which the research account is constructed, it helps identify and explicate potential or actual effect of personal, contextual, and circumstantial aspects on the process and findings of the study and maintain their awareness of themselves as part of the world they study. (Berger, 2015, p. 3)

With consistent prompts for critical reflection, data users can consistently assess the potential impact of their perspectives, assumptions, and biases throughout the data lifecycle's stages. By embedding such reflexive practices into data management regimes as core professional principals, rather than elective choices, knowledge producers can better (a) assure historical contextualization, (b) avoid introducing unwitting assumptions and cultural expectations into their data, (c) spotlight anomalies that could perpetuate bias or inequity in their final work product, and (d) mitigate the risk of accumulating flawed data or incautiously applying problematic data and data practices (Canali, 2016; Dodgson, 2019).

Concerns about untrustworthy data and data sources finding its way into the knowledge generation cycle have produced attempts to address historical biases (McCollough, 2000). However, those efforts did not mitigate the impact of the challenges that have led to some of ethical dilemmas

including issues surrounding individual privacy and security (Bormida, 2021). Consequently, deploying reflexivity is not simply an attempt to correct for bias. The goal is to prevent flawed or incomplete data, unverified or partial conclusions from entering unchecked into the data life cycle. Emphasizing the responsible use of data, critical thinking and context-awareness while applying data-driven approaches to social issues also requires the use of reliable methods that ferret out Ensuring that data are also more inclusive and multiculturally representative can improve the quality and integrity of knowledge derived from that data (Fassinger & Morrow, 2013). However, building and implementing new protocols such as reflexivity into data management practices has proven to be a daunting task.

These sophisticated technologies and data management practices are increasingly accessible to laypersons and experts alike, and milliseconds separate theory from real-time activation by official or casual decision makers. Additionally, the outsized influence of governments and private entities, particularly in business and community-based organizations, has disrupted and fragmented attempts to create a systematic, uniform set of principles that govern international and national data practices and ethical standards. The difficulties in development and implementation of new governance data practices are a function of what I call *ethical paradoxes in progress*. An ethical paradox in progress is a complex ethical situation or dilemma developing or unfolding in real-time. Society is still grappling with defining the terms, "ethics" in question, and calculating the meaning and consequences for ignorance or violation. We have not yet reached a consensus on the relevant principle(s), and therefore, neither understand the norms nor the standards for appropriate recourse in the face of uncertainty or unsavory action. Reflexivity can assist us here as well, promoting transparency in decision-making and data handling. It encourages data users to acknowledge any perspectives, values, and/or assumptions that might influence the interpretation of a data set. By integrating reflexivity into statistical methods, model choices, and data visualization techniques, organizations and researchers can work against reinforcing or introducing bias, power differentials, cognitive impairments, cultural differences, or situational pressures.

CHATGPT AND AI

While this essay has attempted to encourage decision-makers to be hyper-aware of intangible, influential forces and adopt a uniform set of principles that govern international and national data practices and ethical standards, the release of ChatGPT and other artificial intelligence (AI) tools have amplified the need to recalibrate our thinking about the use of data and these technologies. The language-based algorithms are based entirely