Troubleshooting algorithms:
A book review of *Weapons of Math Destruction* by Cathy O'Neil

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Algorithms control our smallest, most miniscule choices, to our largest, life-defining decisions. Mortgage-backed securities, college rankings, online advertising, law enforcement, human resources, credit lending, insurance, social media, politics, and consumer marketing; algorithms live within each one of these – collecting, segmenting, defining, and planting each one of us into arbitrary, unassailable buckets. The algorithms and the data that feed this process is what data scientist and international bestselling author, Cathy O'Neil, calls Weapons of Math Destruction (WMDs). In her captivating, and frankly bone-chilling, account of the power amassed by algorithms, O'Neil sheds much needed light into the seemingly omnipotent world of destructive algorithms.

O'Neil cautions her readers about the inhumane use of mathematics in many of today's economic, educational, judicial, and social systems, arguing that WMDs prey on the most vulnerable segments of the population, perpetuating inequality, and social stratification. With the scrupulous power of mathematics, algorithms sort society into makeshift factions with uncanny speed and velocity. O'Neil argues that algorithms need to be disassembled, scrutinized, and rebuilt using human values.

O'Neil's candid perspective of the malignancy of algorithms emphasizes the need for transparency from the companies that build them - a ripe task for public relations and communications professionals. With its mandate of social servitude, public relations is accountable for ensuring its organization "behaves responsibly, transparently, and with the interests of all stakeholders in mind" (Arthur W. Page Society, 2018, p. 6). Thus, it is appropriate

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to suggest that communications professionals could act as the key dialogic players in exposing the ailments of algorithmic WMDs.

The common belief is that algorithms are scientific, objective, and fact-based constructs however, according to O'Neil, the opposite is true. The combination of an increasingly data-saturated and efficiency-driven society has increased the dependency on instantaneous (and humanless) algorithmic calculations (O'Neil, 2016). The controversy of these algorithms is that they are merely "opinions embedded in mathematics" and reflect subjective goals and ideologies (O'Neil, 2016, p. 21). Creators of said algorithms, unintentionally (or intentionally) weave "human prejudice, misunderstanding, and bias" into their models (O'Neil, 2016, p. 3), by-products vulnerable populations are forced to live with and communicators can rectify.

Throughout her book, O'Neil highlights the main characteristics of WMDs and elucidates their complexities into digestible chunks. WMDs, according to O'Neil, have three essential components, "opacity, scale, and damage," with special affinity for the rich and aversion for the poor. In her example of the predatory nature of online advertisements, O'Neil posits that "the playbook for predatory advertisers is to locate the most vulnerable and use their private information against them" (2016, p. 72).

For-profit universities give great insight into the exploitative design of WMDs. Universities like the University of Phoenix are "highly refined WMDs that target and fleece the population most in need" (O'Neil, 2016, p. 81). In 2010, the University of Phoenix spent twelve times more per student on recruitment efforts ($2,225) than Portland Community College did ($185) (O'Neil, 2016, p. 79). Further, the University of Phoenix invested a meagre $892 per student on instruction while Portland Community College invested a whopping $5,953 per student on instruction (O'Neil, 2016, p. 79).

Moreover, the malevolent power of WMDs is nowhere better concealed than in the feedback loops of predictive crime models. O'Neil exposes the hidden complexities of fighting crime with Big Data and analytics and unveils the imperfections of PredPoll. PredPoll is a predictive crime model that forecasts when and where crimes will occur. PredPoll claims to be "blind to race and ethnicity… and doesn't focus on the individual" (O'Neil, 2016, p. 86). Upon deeper inspection, however, PredPoll is a system filled with prejudice, injustice, and toxic feedback loops.

To predict criminal behavior, PredPoll uses crime data from both high-profile crimes and nuisance crimes however "nuisance crimes are endemic to many impoverished neighborhoods" and O'Neil contends that incorporating these data into PredPoll "skews the analysis" (O'Neil, 2016, p. 86). Thus, with the constant feed of nuisance data flooding into the system, the platform becomes saturated with these minor crimes, justifying the increase of policing, leading to more

incarcerations, and perpetuating poverty in these areas (O'Neil, 2016). Despite its just intentions, PredPoll contributes to the criminalization of poverty and hence is undeniably a WMD (2016, p. 87).

Furthermore, unlike the relatively transparent, industry staple - the FICO score, e-scores are categorically pseudoscientific and capricious. Credit lending organizations are increasingly using a plethora of online behavior data to evaluate the creditworthiness of potential customers. These scores "are arbitrary, unaccountable, unregulated, and often unfair," thus classifying them as WMDs (O'Neil, 2016, p. 143).

With the growing stream of online data and incessant need for efficiency, the ability to rapidly sort and slot potential customers into ready-made buckets is paramount. Using data from a user's browsing history, purchase behaviors, "clickstreams and geotags," a company can infer "loads of insights about the potential customer" (O'Neil, 2016, p. 143).

This data however is largely pulled together using arbitrary data sources. To illustrate, when a user visits a website, the user's location is recorded and is then matched "to real estate data which draws inferences about that individual's wealth" (O'Neil, 2016, p. 144). This has severe and far-reaching implications for credit lending, insurance, and the end consumer. In fact, e-scores have been outlawed in ten U.S states because they tend to "disproportionately affect low income applicants and applicants of colour" (2016, p. 144). Thus, the superficial data collected for e-scores are undoubtedly manifestations of WMDs.

As these algorithms gain speed and amass more scale, we as a society need to question these models with unwavering scrutiny and skepticism. The welfare of society depends on the benevolent use of data. Communicators, argued to be an organization's corporate conscience, are in a unique position to expose this narrative. Algorithms filter, curate, and dictate the information consumed by the public, profoundly, "shap(ing) lives and outcomes as a consequence" (Willson, 2017, p. 142).

Numerous scholars argue that acting as a corporate conscience is a natural responsibility for public relations to assume - keeping organizations accountable for their actions, both internally and externally (Bowen, 2008). Although this book does not aim to provide communicators with a playbook for dismantling algorithms, it does provide communicators with a comprehensive understanding of the systems in place driving our decisions, conversations, and social progress.

If corporations exist to serve society, public relations has a role to play in rectifying this narrative. This book is a phenomenal resource for any communicator working within the boundless confines of today's digital world. O'Neil's work delivers a healthy dose of skepticism

and a glimpse into the systems that rule our lives. This healthy skepticism helps communicators and public relations practitioners recognize the intricacies of the modern algorithmic age, supporting these professions to unearth new conversations and fuel much needed change.

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