



Big data and food retail: Nudging out citizens by creating dependent consumers[☆]

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ABSTRACT

The paper takes a critical look at how food retail firms use big data, looking specifically at how these techniques and technologies govern our ability to imagine food worlds. It does this by drawing on two sets of data: (1) interviews with twenty-one individuals who oversaw the use of big data applications in a retail setting and (2) five consumer focus groups composed of individuals who regularly shopped at major food chains along Colorado's Front Range. For reasons described below, the “nudge” provides the conceptual entry point for this analysis, as these techniques are typically expressed through big data-driven nudges. The argument begins by describing the nudge concept and how it is used in the context of retail big data. This is followed by a discussion of methods. The remainder of the paper discusses how big data are used to nudge consumers and the effects of these practices. This analysis is organized around three themes that emerged out of the qualitative data: path dependency, *products*; path dependency, *retail*; and path dependency, *habitus*. The paper concludes connecting these themes through the concept of governance, particularly by way of their ability to, in Foucault's (2003: 241) words, have “the power to ‘make’ live and ‘let’ die” worlds.

1. Introduction

The growth rate of data that is generated in the world has been exponential. Each year we generate more data globally than had been created in the five thousand years prior (Harris, 2016). To give one example: Walmart, with its roughly 12,000 stores in 28 countries, produces 2.5 petabytes of customer data *every hour* (Marr, 2017). A petabyte is one quadrillion bytes, or the equivalent of about 20 million filing cabinets' worth of text (McAfee and Brynjolfsson, 2012). The fact that big data is considered the next “big thing” is affirmed by investments into and sales reported by related sectors. Global revenues for big data analytics are expected to grow from US\$130 billion in 2016 to more than US\$203 billion in 2020—an annual growth rate of 11.7 percent (Press, 2017).

A recent global survey that included specialty stores, department stores, apparel merchants, supermarkets, electronics, home improvement and drugstore chains provides some insight into big data retail trends (Zebra Technologies Corporation, 2017). The survey's findings include the following reported expectations for the year 2021: 92 percent of retailers expect to offer “click and collect” (buy online, pick up at store), up from the 50 percent who offer it today (65 percent also

plan to experiment with innovative delivery services by 2021, e.g., delivering to workplaces and parked cars); 80 percent expect to know when specific customers are in a store, up from 36 percent today; and the majority of those surveyed expect to invest significantly by this date in “cameras and video analytics for customer experience” (75 percent), “predictive analytics” (75 percent), and “visual analytics for making sense out of IoT [Internet of Things] data” (72 percent).¹

Some 1.5 billion people globally have signed up for food retail loyalty programs (Pearson, 2015)—those ubiquitous cards or phone apps scanned prior to checkout. Some individuals have more 40 distinct cards in their possession (BBC, 2018). Yet these programs, as indicated in the prior paragraph, represent the tip of the iceberg when it comes to big data and predictive analytics in retail. A *lot* of data and *big* data are not synonymous categories, which explains why less than half of those memberships (42 percent) are active (Pearson, 2015). All that data has to be put to work in ways that generate perceived value for consumers and retailers, a fact reflected in how big data was initially characterized. The 3-vs: *variety* (e.g., structured), *velocity* (e.g., real time) and *volume* (amount) (Zikopoulos and Eaton, 2011). Additional characteristics have since been added to the list: e.g., *exhaustivity* ($n = all$), *fine-grained in resolution* (highly detailed, even highly personal), *relationality*

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¹ Internet of Things refers to network connectivity—“the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other)” (Morgan, 2014).

(linking databases), *veracity* (data can be messy, noisy, error prone), *value* (generate value), and *variability* (data can be context dependent) (Kitchin and McArdle, 2016).

While a growing body of critical food scholarship has emerged in recent years focusing on big data applications in agriculture (see e.g., Bronson and Knezevic, 2016; Carolan, 2017a, 2017b, 2018; Higgins et al., 2017), the interrogation of these tools at the consumption and retail end has lagged behind. (The one critical peer-reviewed piece turned up through multiple search attempts [Montgomery et al., 2017] is a “commentary” piece.) This omission is as startling as it is worrisome, in part for the reasons highlighted previously: the sheer amount of data collected and analyzed at the retail end, detailing not only what we buy but also the pathways (e.g., in store and online tracking) through which we shop, is growing exponentially. We need to understand, through a critical social science lens, what this all means.

This requires looking beyond the retail aisle when interrogating the impacts of big data; an analysis that leads to conversations about effects encapsulated under the umbrella term governance. To talk about governance shifts the conversation away from traditional top-down understandings of government (by the state) to a method of regulation and normalization that is relational, multidimensional, and endogenous (e.g., Deleuze, 1992; Foucault, 2003, 2007). Big consumer data, which I understand to be a diverse assemblage of human (e.g., eaters, software engineers) and non-human (e.g., 1s and 0s, algorithms, GPS technology) participants (e.g., Lupton, 2016), has, in Foucault’s (2003, p. 241) words, “the power to ‘make’ live and ‘let’ die” food worlds by shaping our understanding of what is possible. This paper explores how big data shapes eaters’ ability to imagine, anticipate, and practice certain food futures.

Much of the enthusiasm for big data lies in the belief that these techniques offer actors, from food firms to public health officials, a third option, exemplified in the nudge (e.g., Kittur 2016). This pathway, called libertarian paternalism (Thaler and Sunstein, 2009), avoids the pitfalls associated with the overbearing Nanny State on the one hand and dog-eat-dog neoliberalism on the other. Big data-driven nudges, as they are put to work in retail settings, exemplify this soft power (Brown et al., 2011). The term itself—nudge—tries to convey that “libertarian paternalism” is not an oxymoron. To embrace the nudge, proponents would suggest, is to embrace freedom: the freedom of others (retailers, the government, public health officials, etc.) to tell you what to do (and eat) and the freedom to ultimately make that choice as a consumer for yourself.

Rooted in behavioral economics and social psychology, the nudge speaks to how behaviors are shaped by many factors—rules of thumb, social cues and norms, built environments, etc. According to nudge scholars, the world is full of choices but not all are presented evenly. Understanding this “choice architecture” will improve understanding about why people choose what they do, knowledge that in turn can be used to nudge consumers “in directions that will improve their lives” (Thaler and Sunstein 2008: 5).

This study takes a critical look at how food retail firms are using big data, including predictive analytics, Artificial Intelligence, and the like. It does this by exploring specifically the effects of these techniques as they relate to questions of governance—to the type of food worlds and eaters (i.e., consumers or citizens) afforded through these practices. Marketing research on the subject abounds, exploring such questions as whether these technologies increase purchase frequency of particular food items (e.g., Wu et al., 2015) and if marketing campaigns are more influential when employing data-driven digital marketing practices (e.g., Andrews et al., 2015). As a work of *critical* scholarship, this paper separates itself from these earlier apolitical analyses.

A critical interrogation is essential in light of trends in market concentration throughout the foodscape, though market power in the retail sector is particularly focused (Carolan, 2018; Winson, 2013). In Australia, New Zealand, Finland, Norway, and Sweden, 99 percent, 99 percent, 91 percent, 91 percent, and 91 percent, respectively, of their

entire food retail sector is captured by five retail firms—in the US, the figure is approximately 60 percent (Carolan, 2018: 194). What is stocked in these stores in turn speaks to a remarkable level of concentration throughout supply chains—aisles filled with products by the likes of Nestlé, PepsiCo, Coca-Cola, Unilever, Danone, General Mills, Kellogg’s, and Mars. As explained in a report by Oxfam (2013), roughly 10 companies control close to every major food and beverage brand in the world.

I detail how big data-driven nudges have the potential to replicate and extend this kind of consolidation by directing eaters toward particular retail environments and brands. Meanwhile, while perhaps more subtly but of no less consequence, these practices encourage habits, and a habitus (Bourdieu, 1977), that affords us thinking and acting more like consumers and less like citizens; an effect, I argue, which further threatens the agency of individuals and communities to take back control from a highly corporatized and concentrated foodscape.

This paper draws upon a mix of qualitative data. Twenty-one individuals were interviewed who oversaw the use of big data applications for purposes of shaping the retail experience. These face-to-face interviews are layered with data from five consumer focus groups composed of individuals who regularly shopped at major food chains along Colorado’s northern Front Range.

The “nudge” serves in this paper as an entry point into broader conversations around governance, as it also leads to discussions about choice and convenience—two other concepts that are far more political than we are often led to believe. The argument begins by describing what is meant by the nudge concept, along with the idea that the big data-driven nudge “preserves choice” (Hanks et al., 2012: 371, my emphasis). Included in this review are some critiques directed at the concept, specially pointing out how it is blind to power rationalities while holding onto a narrow definition of freedom and empowerment (Goodwin, 2012). This is followed by a discussion of methods. The remainder of the paper discusses how big data are used to nudge eaters in highly consequential ways. A key component of the analysis involves detailing how these techniques afford eaters that think and act more like consumers rather than citizens.

The analysis is organized around three themes that emerged out of the qualitative data. Each theme progressively expands the scope of discussion for interrogating the effects of big data-driven nudges: path dependency, *products*; path dependency, *retail*; path dependency, *habitus*. The paper concludes by bringing these emergent themes together under the term governance, discussing specifically the type of eaters these platforms, in the words of Foucault (2003: 241), make live and let die.

2. Nudge: third way or more of the same

Homo economicus: the unit of analysis in mainstream economics—an abstracted agent with fully formed interests that are pursued rationally (Legget, 2014). Behavioral economics, in contrast, views individuals as having incomplete knowledge. Taking this position requires an understanding of how behaviors are shaped by cues and rules of thumbs, which can operate at conscious and unconscious levels. This position has been famously articulated in *Nudge: Improving Decisions about Health, Wealth and Happiness*, by Thaler and Sunstein (2009). Sunstein worked in the (US) Obama administration in the Office of Information and Regulatory Affairs while Thaler was as an unpaid adviser to (UK) Prime Minister Cameron who established the Behavioural Insights Team, known colloquially as the “Nudge Unit”. Thaler won the Nobel Prize for Economics in 2017 in which he was recognized for his work in this area.

A nudge is “any aspect of choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler and Sunstein, 2009: 6). Thaler and Sunstein famously give the example a food services director for a school who notices that where food is displayed in

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