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Quantitative care: Caring for the aggregate in US academic population health sciences

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Abstract

Academic quantitative population health scientists (AQPHS) in the US care for populations with an ostensibly apolitical set of quantitative methods. This *quantitative care* has three interconnected components: AQPHS care *about* populations, they care *for* their data sets and models, and they care *with* these models' outputs. In the process their ideals of objectivity compete with, and enable, a moral ideal of political advocacy. Slipping between knowledge and intervention, the "real" and the imagined, and individuals and populations, AQPHS produce knowledge that they hope will change public narratives about marginalized populations. In doing so they draw on *ideal types*, converting quantitative findings about populations into speculation about individual behavior. AQPHS' ideal types both precede and tautologically reemerge from their science.

Keywords

population health; quantitative science; ideal types; care; morality; progressivism; race; class; United States

The election of Donald Trump in November 2016 as president of the United States sent a jolt through the US scientific community. Seen as an enemy of free scientific inquiry that stood poised to slash funding for research, the Trump administration inspired many US scientists to shed their veneer of political objectivity (Harmon and Fountain 2017). On April 22, 2017, hundreds of thousands of scientists filled city streets around the country in the March for Science. The next day my Facebook feed overflowed with images of defiance. "Proudly marching for sanity today!" posted a laboratory biologist friend, alongside a photo of her holding a sign reading, "Science Not Silence!" An academic physician, his face flushed with righteous indignation, held a sign reading "Real Facts Cure!" For many of my colleagues in the population health sciences, however, there was notable online silence.

"I wanted to go, but in the end I just felt maybe it wasn't a good idea," Dayna, an epidemiologist, told me by telephone the Sunday after the march.¹ "People already think my work is political. We're not in a lab, we're talking about race, we're talking about class, we're talking about inequality. So yeah, we have to take that extra step to make sure we're staying objective. But that doesn't mean I'm not worried." What was she worried about,

¹I use pseudonyms for all scientists in the interest of protecting confidentiality.

exactly? She laughed—a short, crisp, nervous laugh. “Oh God, so many things. Whether all the grant funding will disappear. But really, it’s kind of more existential than that, you know? It’s like, even if that doesn’t happen, maybe people aren’t going to be using science to try to make things better anymore. And then why am I doing this?”²

Why *was* Dayna doing the work that she did? Was she, as a professional scientist, a moral actor who stood ready to provide a necessary foil to the state, as Émile Durkheim (1992) suggested? Or was she instead pursuing a “professional project” of social mobility and prestige (Larson 1977)? Like most other academic quantitative population health scientists (AQPHS) I knew who worked in the United States, Dayna occupied a middle ground: she had come to her profession out of intellectual interest and a desire for the respect she believed she would be accorded as a scientist, but she also came to it with a sense of moral purpose (Mason 2016). That moral purpose was anchored in a politically “progressive” vision of a more just society, to which she hoped her scientific research might contribute.³ As such, she pursued both a professional project and a moral one.⁴

Trump’s election seemed to threaten both projects at once, yet AQPHS in the US worked hard to maintain a clear separation between the two. This was a difficult task because of how the two projects inherently overlapped. One of the fundamental goals of population health is to uncover and understand patterns in how diseases differentially affect different populations. AQPHS in the US drew the boundaries of their study populations along heavily politicized fault lines of race, gender, immigration status, and socioeconomic status (SES, a metric that combines income, occupation, and educational background). Their findings therefore often had immediate political implications. AQPHS both embraced these implications and insisted that they not in turn affect the scientific inquiry itself. To ensure this, they constructed what they saw as a firewall between the neutral production of scientific knowledge and the politico-moral delivery of scientifically informed interventions or policies.

Simon, a sociologist, explained to me in an interview that while he hoped the results of his research would be used to advance social justice, in his capacity as a scientist he tried to expunge himself of any “values-based motive.” Marvin, a health economist, told me, “I’m constantly trying to check my own bullshit.” Others, when I brought up the subject of a moral agenda, simply refused to acknowledge that they had one at all.

The difficulties that AQPHS experienced in maintaining a firewall between moral purpose and scientific rigor were compounded by the methods they used. Unlike those in “hard” sciences like physics or chemistry, AQPHS only rarely work with primary experimental data. Instead, they usually rely on secondary data sets—composed of quantified

²Most of the fieldwork conversations recounted in this article, including this one, were re-created from my notes and were not recorded. There may be small inconsistencies between written quotations and the speaker’s exact syntax.

³My interlocutors often described their political views as “progressive.” Progressivism in US politics implies a belief that the government should use its powers to protect and support marginalized populations by protecting civil liberties, reducing economic inequalities, funding social programs for the poor, and making laws to protect racial and gender equality.

⁴Political progressivism was not an inevitable characteristic of this moral project. For example, in 2008–10, during fieldwork I conducted in China among AQPHS (Mason 2016), my interlocutors rarely couched their work in terms of improving the health of vulnerable populations. Instead, their moral projects focused on protecting both nation and world *from* these populations, which they presumed to be inherently unhealthy and therefore dangerous.

compilations of answers to survey questions, health records data, and census information—to find statistical evidence of associations between risk factors and population health trends. They can thus rarely if ever establish direct causation, and their results always leave room for interpretation (Desrosières 2002; McKim and Turner 1997). “We work hard to get at the truth,” Dayna told me in an interview. “But it’s not always as clear as if you’re in a lab.” Getting at the truth meant, among other challenges, constantly protecting against the potential encroachment of bias (Shapin 1994).

The upshot was that AQPHS were left to realize their politically charged moral projects through a self-consciously neutral and apolitical set of quantitative methods (Ferguson 1994). I call the process by which they did this *quantitative care*. *Quantitative care* refers to how AQPHS cared for, and with, numbers, within the confines of a local moral world in which objectivity remained an unimpeachable standard (Daston and Galison 2007; Latour and Woolgar 1979; Shapin 1994). The quest to reach the ideal of objectivity competed with—and enabled—a moral ideal of advocacy for one’s scientific object.

Marvin explained that quantitative analysis, in its focus on populations rather than individuals, itself became a kind of “moral device” that “allows us to adjudicate between interventions with advocates who are all convinced that theirs is most important.” He described an example that he often gave to students in which he argued that it is immoral to devote public money to saving a single child from a school bus accident instead of, say, putting that money toward school nutrition programs that would benefit many children. “The moral point for me is that if we’re persuaded too much by the anecdotes or the subjectivity of one family, we risk leaving lives on the table,” he told me. The loss of a single child in a traffic accident is a personal tragedy. But letting oneself be swayed by one tragedy might prevent one from making things better for the rightful object of care: the population as a whole.

Quantitative care as practiced by AQPHS comprised three interconnected elements: AQPHS cared *about* populations, they cared *for* their data sets and models, and they cared *with* these models’ outputs. The AQPHS I knew morally assessed the deservingness of “vulnerable populations”—including racial/ethnic and sexual minorities, immigrants, and the poor—and concluded that societal treatment of them as *undeserving* was unjust and needed to be remedied (Katz 1989; Willen 2012). The best remedies, they believed, would emerge from rigorous, objective, quantitative methods. AQPHS thus carefully produced, tended, and defended their numbers. Through intimate care relationships with aggregates of numbers, AQPHS strove to provide care from afar to aggregates of people.

Often slipping between knowledge and intervention, the “real” and the imagined, and individuals and populations, AQPHS produced knowledge that they hoped would change the narrative about, and support policies friendly toward, their chosen populations. In doing so they drew on a set of *ideal types* (Schutz 1967; Weber 1949). The ideal types of quantitative care were imagined individuals, forged in large part from AQPHS’ own value systems, that stood in for members of vulnerable populations. Ideal types drove choices about which populations AQPHS studied and which interventions they imagined. They also were re-

created with every study that AQPHS did: ideal types both preceded and then tautologically reemerged from their science.

Quantitative care carries with it many of the same well-documented dangers previously associated with other attempts to quantify human experience. Caring with numbers may flatten the experiences of individuals (Adams 2013; Stevenson 2012); may be paternalistic or even colonialist (Farmer 2003; Spivak 1988); may lead to a slippage in categories that leaves out those most in need of care (Mason 2016); and may lead to ill-fated misadventures in social engineering (Scott 1998). Rather than evaluate or critique the effects of quantitative care, however, I focus instead on how and why AQPHS chose to engage in it. My goal is twofold: to show that AQPHS cared—however imperfectly—and to trace the moral contours of how and why they did so (Martin, Myers, and Viseu 2015).

My argument stems from two years of participation in US-based population health science conferences, seminars, collaborations, and one-on-one conversations from 2013 to 2015 as a member of an interdisciplinary population health training program funded by a foundation dedicated to addressing health inequities in the United States.⁵ My interlocutors, who ranged from postdoctoral fellows to senior scholars, trained in public health and social science fields, including sociology, epidemiology, economics, psychology, and biostatistics. Although not all population health scholars relied on quantitative methods, I focus on the majority who dealt primarily in numbers and who rarely met face-to-face with the individuals whose data they analyzed.

This group of scientists was relatively racially diverse, but was socioeconomically and politically homogenous: nearly all were middle class, highly educated, and politically progressive. Because several interlocutors had multiple racial identities—and because most shared the same approach to quantitative care regardless of their race—I note the race of my interlocutors only in instances in which it is pertinent to the discussion.

The ethnographic examples that I highlight are taken from my experiences as a participant in the training program over two years, as well as from a more formal role as a participant observer at a program-sponsored conference in May 2015. I supplemented auto-ethnographic and participant-observation data with semistructured interviews by telephone with four AQPHS in 2016, as well as more informal phone and email conversations with program participants from 2015 to 2017. My analysis is also informed by my participation in population studies seminars as a faculty affiliate of Brown University's Population Studies and Training Center, and by previous ethnographic fieldwork conducted among AQPHS in China (Mason 2016).

I begin with an overview of how AQPHS enacted quantitative care. Ethnographic examples illustrate how quantitative care was produced and discussed in academic population health settings, and how AQPHS used and reproduced ideal types. I then ground the practice of quantitative care in existing literature on care and introduce the three interconnected phases of quantitative care: caring *about* populations, caring *for* data sets and models, and caring

⁵I refrain from using the program's name as a privacy precaution.

with quantitative outputs. The following three sections then examine these phases in turn. I conclude by considering the future of quantitative care in the context of new challenges to objectivity in the current US political era.

Ideal types and quantitative care

On the first day of the conference I attended in May 2015, a professor of public health presented data, collected from families living in Chicago, on the effects of poverty on child development. The data focused on poor children who were chronically exposed to prenatal and early-childhood “stressors”—such as chaotic households, unstable families, or parental mental illness. These children, her analysis showed, were more likely than unexposed, higher-income children to have difficulty with “self-regulation.” Poor self-regulation can in turn lead to a variety of behavioral problems in school and beyond.⁶ The presenter expressed hope that her work might spur policy makers to commit more resources to interventions that could mitigate the stress of poverty on affected children.

Her presentation came on the heels of the 2015 Baltimore riots, which followed the death in police custody of 25-year-old Freddie Gray.⁷ During the Q&A session a (white male) colleague asked whether the (white female) presenter was worried about how a racist society might interpret her science. Might not this finding about poor self-regulation in a mostly black and Latino population feed into recent racist discourses labeling black Baltimore protesters “thugs” who were unable to control themselves? The presenter’s face reddened as she replied that this problem “keeps me up at night.” She guarded against it, she said, by communicating her findings as clearly as she could to guard against “misinterpretation,” and by making sure to also point out the “positive things” she found in her data about growing up in low-income households—such as increased adaptability and coping mechanisms. Another audience member later told me that this episode reminded him that as “elite researchers,” he and his colleagues have the luxury of deciding “what to ignore and what to focus on.” With that luxury, he said, comes responsibility.

We could read this scene as an example of “white fragility” (DiAngelo 2011): confronted with her potential complicity in the perpetuation of racial stereotypes, the presenter experienced “racial stress” and retreated into a defensive posture. While this may be an accurate description of what I observed, I pose a different question. If we take the presenter’s motivations on her own terms—if we accept that she genuinely intended her research to redress rather than reinforce racial inequalities—then how might we understand her presentation, as well as the discussion that followed, as a form of care?

To answer this question, it is helpful to consider Michel Foucault’s (1982) discussion of power and care. For Foucault, power over populations depended on power over individuals, and the provision of *care*—which Foucault saw as inextricable from power—involved both.

⁶In several cases, I have altered, obscured, eliminated, or made deliberately hazy the details of the science involved or the circumstances in which the scientists were speaking, to prevent individual scientists from becoming identifiable and thus vulnerable to professional consequences.

⁷On April 19, 2015, Gray, who was black, died of a spinal cord injury while being transported by police. Protests against police brutality followed, with some protests becoming violent. Media outlets—and President Barack Obama—referred to violent protesters as “thugs.”

This intersection of care with knowledge-power entailed the “development of knowledge of man around two roles: one, globalizing and quantitative, concerning the population; the other, analytical, concerning the individual” (Foucault 1982, 784).

American AQPHS occupied a critical position in the decentralized webs of (bio)power and care that Foucault described. Residing in neither the government nor the private sector, AQPHS produced knowledge about populations intended to help better manage their biology. As was evident in the above ethnographic example, AQPHS understood their roles in these power structures; in fact they grounded their commitment to care in the sense of responsibility that they felt came with this power.

AQPHS pushed back, however, against the Foucauldian insistence that knowledge about populations is inseparable from knowledge about individuals. From the perspective of AQPHS, producing knowledge about the “population” was distinct from producing knowledge about individual lives; in fact, these two things need not intersect at all. Yet the individual and population did overlap within the bounds of AQPHS’ intellectual imaginaries.

As she analyzed her data, the Chicago study researcher brought with her an image of what an average individual in her population was like, how he or she behaved, and why: her *ideal type*. In Alfred Schutz’s (1967) phenomenological reinterpretation of the Weberian concept, ideal types are the shortcuts we use to imagine how certain types of people in certain types of circumstances will behave, without having to understand anything about them as individuals.⁸ When we encounter new individuals whom we categorize as being part of a certain group, we draw on our past experiences, as well as a set of assumptions steeped in our sociocultural contexts, and expect them to behave in a predictable way. For example, to draw on one of Schutz’s examples, when we meet a postal clerk, we expect that she will behave in a way commensurate with our understanding of what a postal clerk does—that is, she will responsibly mail our letters after we hand them over (1967, 197). We do not usually consider what in that particular postal worker’s circumstances may cause her to behave differently (203). Drawing on ideal types allows us to move through a world of strangers without having to get to know everyone personally.

AQPHS relied heavily on ideal types of individuals when interpreting the significance of aggregated data. They constructed their ideal types by combining existing scientific evidence, personal experiences, and assumptions anchored in the shared value systems of their scientific community. Drawing on progressive values, the presenter in the above vignette conjured an ideal type of a poor person of color in Chicago who was exposed at a young age to poverty and instability and whose undesirable behavior was therefore not his fault.

⁸Ideal types, as understood by Max Weber (1949), are abstract constructs that are based on, but do not directly reflect, an empirical reality. They are strategic simplifications that social scientists can use as heuristic devices for modeling social phenomena of interest. For Weber, ideal types were simply pragmatic tools.

In contrast, Schutz (1967) argues that the process by which actors subjectively construct ideal types—a process that Weber insufficiently elaborated, since this was not his project—is critical for understanding what functions they serve (Psathas 2005). According to Schutz, people elaborate their own ideal types through their experiences with concrete people and then apply these abstractions to their interactions with anonymous Others. For Schutz, ideal types are the product of the observer’s own expectations. It is Schutz’s latter elaboration of ideal types that I found particularly helpful for understanding quantitative care.

Perhaps with some version of this ideal type already in mind, the presenter designed a study that tested for potential associations between poor self-regulation and prenatal and early-childhood exposures to social stressors. After analyzing her data, she concluded that structural inequalities encountered very early in life could help explain the high prevalence of maladaptive behaviors among poor children of color. She recommended that policies be put into place to mitigate these effects by providing better services to families and addressing the social determinants of health. Intact throughout this exercise was the presenter's ideal type: the victim of an unjust society, who was most definitely not a thug.

In reproducing her imagined ideal type through quantitative analysis, the presenter both blurred the conceptual boundaries between population and individual and reframed the moral import of quantitative deviance. The historical sorting of people into normals and deviants relied in large part on the "notion that one can improve—control—a deviant subpopulation by enumeration and classification" (Hacking 1990, 3). The mathematical "average" became conflated with the moral concept of "normal" such that "the normal is average"—it is not only "how things are" but also "how they ought to be" (Hacking 1990, 163). Those who deviated from the average were not merely different—they were bad.

The presenter argued instead that poor people of color may be numerically deviant, but they are not morally deviant. As a group their behaviors and health outcomes deviated from the average, but these divergences did not stem from moral failure. Thus she tried to disentangle a quantitative deviance in numbers from a qualitative deviance in morality.

One could easily imagine a scientist with a different political viewpoint coming to a very different conclusion from these same findings. She would perhaps point not to an unjust society but to an irresponsible mother who failed to provide a safe environment for her fetus. Or an unsympathetic scholar might read into these findings evidence that racist stereotypes about black male behavior have a scientific basis—precisely the scenario raised during the Q&A session.

An example from a lunch conversation at the same conference illustrated a similar tension surrounding politically inflected ideal types. Fran, a sociologist, was telling me about a recent study of a lottery-based expansion of Medicaid that the state of Oregon began undertaking in 2008 (Medicaid is a federal program that provides health insurance to the poor and disabled in the US). To her disappointment, the study showed that the expansion of Medicaid *increased* rather than *decreased* the use of emergency rooms in Oregon (Taubman et al. 2014). Fran worried that this could provide fodder for opponents of Medicaid expansion—those who claim that Medicaid increases costs and fails to stem ER "overuse." Those who, as she put it, "care about this population"—that is, about the Medicaid-using poor—would be disappointed with this result.

"If you're a liberal, you don't like these data," she explained—a statement that simultaneously conjured a "liberal" ideal type of the noble Medicaid recipient, and voiced her anxiety that this particular study might instead support an opposing "conservative" ideal type of the Medicaid recipient who takes advantage of the system.⁹

In neither of these cases were AQPHS falsifying data, working with foregone conclusions about what quantitative outcome they would produce, or ignoring inconvenient truths. Indeed, as scientists who were constantly on guard against any threat of bias, they tended to bend over backward to avoid these practices. The room for maneuvering was instead created in how they chose and designed their projects and in how they then interpreted, presented, and communicated their findings—whatever those findings turned out to be—in collaboration with other like-minded AQPHS. Regardless of the numbers that the models produced, or even the scientific conclusions that were reached, scientists usually buttressed their ideal types and rejected explanations that disrupted them because they saw in their results proof of how they already felt. “The personal ideal type,” as Schutz (1967) tells us, “is itself always determined by the interpreter’s point of view. It is a function of the very question it seeks to answer” (190). AQPHS enacted quantitative care not by “biasing” the data but by interpreting their results in a way that allowed them to reproduce their ideal types.

Care and the numerical aggregate

In contrast to the population-based approach that my interlocutors took, recent scholarship in the anthropology of care has highlighted the importance of intersubjective, embodied experiences of hands-on care for individual lives (Aulino 2016; Buch 2013; Livingston 2012; Mattingly 2014). Yet “it is impossible that we will always be able to provide direct care to all of those to whom we might feel some responsibility,” as Joan Tronto (1993, 144) reminds us. As such, we must, as Fiona Robinson (2011) suggests, “challenge the assertion ... that care matters in the context of intimate, personal relationships but that it is irrelevant, or dangerous in ... the public realm” (31).

Public or indirect care certainly poses its own dangers, as multiple anthropologists have documented. “Regimes of care” implemented by governments, can, according to Miriam Ticktin (2011), “end up reproducing inequalities and racial, gendered and geopolitical hierarchies” (5). Well-meaning scientists, bureaucrats, and grant funders also may end up hurting more than helping when they attempt to provide care at a distance, because they avoid attending to actual *people* (e.g., Adams 2013; Farmer 2003). Instead, these do-gooders rely on what Ian Hacking (1990) calls an “avalanche of numbers” (5) to understand the situation, and those numbers, the story goes, hide and mislead (Adams 2016). People’s lives become reduced to data points or to “bare life” (Agamben 1998; Redfield 2013). The implication is that engaging with individual lives embedded in their complex social worlds is necessary to understand and effectively act on human suffering. Failing to engage with the subjectivity of individuals can even be “murderous,” as Lisa Stevenson (2012, 601) suggests in the case of Canadian bureaucrats’ attempts to care for Inuit populations.

This dichotomy of embedded intersubjectivity versus disembodied number crunching, however, holds us back from properly engaging with the lived experiences of those who are deeply invested in caring by numbers. Understanding the moral projects of AQPHS is a

⁹*Liberal* is another term for someone in the US who holds progressive values and generally supports federally funded programs for the poor. “Conservatives” often seek to limit the reach of such programs, arguing that recipients may take advantage of taxpayer generosity.

critical companion to standard critiques of quantification, because it allows us to separate critique of methods from presumption of morals. Explained Simon in an interview, “Anthropologists aren’t wrong that a lot of quant people do dehumanize people. [...] But it’s not intrinsic to the method. A lot of people have a different sort of sensibility.”

Care provided at a distance by the state need not be cold or ineffective, and intersubjective care itself depends on state structures and institutions that support it, as Tatjana Thelen (2015) observes. Furthermore, in some cases the state can, at least in some capacity, stand in for intersubjective care or provide for it when family or friends are unwilling or unable to do so. At the same time, intimate care practices can also produce negative effects, just as attempts to provide care at a distance can (Bourgois and Schonberg 2009; Garcia 2010). “Care should be released from the overly positive normative framework and seen as a process with an open outcome,” writes Thelen (2015, 507). From this perspective, characterizing the work of AQPHS as “care” is compatible with anthropologists’ insistence that attempts to care from afar may cause more harm than good, because *all* attempts to care may cause more harm than good.

Quantitative care, however, is indeed different in kind from most forms of intersubjective care. It runs along a reverse hierarchy: whereas hands-on care is more often provided by the relatively powerless to the relatively powerful (Buch 2013; Tronto 1993), quantitative care is provided by the relatively powerful to the powerless. Men are also better represented among AQPHS who care than they are among interpersonal caregivers. Finally, while AQPHS care *about* vulnerable populations, the entities that they directly care *for* and *with* are inanimate, mathematical abstractions.

To best understand quantitative care, it is helpful to differentiate what it means to “care about,” to “care for,” and to provide “caregiving.” For example, for Claire Ungerson (1983), “caring *about* someone, in the sense of feeling affection for them ... has little implication for how people spend their time... . On the other hand, caring *for* someone, in the sense of servicing their needs, may have little or nothing to do with caring *about* someone” (1983, 31). As for “caregiving,” Francesca Cancian and Stacey Olicker (2000) suggest a definition of “feelings of affection and responsibility combined with actions that provide responsively for an individual’s personal needs or well-being, in a face-to-face relationship” (2). Under this rubric, caregiving would not include, for example, “a husband’s or government agency’s provision of the money that supports caregiving” (Cancian and Olicker 2000, 2). In other words, providing resources from afar to a care recipient may be a form of care, but it cannot be considered *caregiving*, which instead requires hands-on engagement. Along these lines, Tronto (1993) differentiates among four “phases” of care, including “caring about,” “taking care of,” caregiving, and care-receiving. Only the third requires hands-on engagement, and even in this case expressions of emotion are not a given: caregiving may or may not require, as Hilary Graham (1983) puts it, “both love and labor” (13; see also Aulino 2016; Kleinman 2007).

Quantitative care combines several of the distinctions that Tronto and others draw among different aspects of care, while also highlighting how the object of *care* and the object of *caregiving* may differ. AQPHS were participating in at least three types of care activities, all

of which were tied together by their imaginaries of ideal types, and all of which entailed some element of both “love and labor”: they cared *about* populations, they cared *for* their data sets and models, and they cared *with* their models’ outputs. The desired product of these layers of care was to improve the health of “deserving” populations (Willen 2012).

Caring about populations

For those AQPHS who grew up in immigrant communities or who strongly identified with communities of color, it felt obvious which populations deserved their care. “I grew up in these neighborhoods and feel a sense of obligation to do something good,” explained a health policy scholar who immigrated to the US from Mexico as a child. Another who identified as a sexual minority threw himself into showing the effects of discrimination on LGBTQ health.

In the absence of a personal connection to a particular population, however, the choice was not always clear cut. AQPHS also chose projects because their mentors were working on them, a colleague had invited them, or “the funding was available.” These pragmatic concerns highlight the fact that, as Johanna Crane (2013) points out, “inequality is a valuable opportunity” (168). But to reduce the “caring about” in quantitative care to pure opportunism would be a cynical interpretation that Crane also urges us to avoid. Even those who came to a particular population tangentially usually came to care about it. Several senior AQPHS I knew who had spent their entire careers working to understand health disparities originally came to their specific topics, as one put it, “totally serendipitously.” What was not serendipitous was this investigator’s set of values. “I grew up believing that health inequality is wrong,” he told me. For a scientist to care about his or her object of study, he must first, as Martin Aryn, Natasha Myers, and Ana Viseu (2015) suggest, “have the capacity or willingness to respond, to be called into action, to be hailed by that object or phenomenon. In short, a person who cares must first be willing and available *to be moved by* this other” (11).

White, heterosexual AQPHS in particular tended to link the set of values that moved them to care about their study populations to a left-leaning political viewpoint they had held since childhood. Thomas, a white biostatistician, told me, “My parents were always Democrats and all that, and then in college, you know, we read all this stuff, and my eyes were opened, and I just felt like, this is really not OK.” Nearly 30 years ago, Michael Katz (1989) noted in the *Undeserving Poor* that white American liberals like Thomas tended to believe that “only the intervention of sympathetic elites [like themselves] could begin to lift poor people out of their degraded and helpless conditions” (20).

This biopolitical commitment to helping the poor has long been a defining characteristic of intellectual liberalism (Farmer 2003; Katz 1989). The ideal types that liberals imagine as the “deserving” poor, on the other hand, have been less stable. For Thomas and his colleagues, deserving populations included poor people of color, LGBTQ populations, and immigrants. This list is both more and less expansive than it once was. For example, the following describes an ideal type of a poor person championed by liberal social scientists in the 1960s: “poorly informed, authoritarian, conventional in moral and social opinions, ‘pragmatic and

anti-intellectual,’ and committed to an ideal of masculinity that stressed ruggedness, action, and ‘physical prowess’” (Katz 1989, 21). For liberal educators in particular, this ideal type deserved to be saved, primarily through policies instituted by the state, such as equal access to education (Katz 1989).

Fifty years later, the ideal type of the rugged anti-intellectual has transformed into a conservative hero whose deservingness liberals found themselves questioning. As recognition grew that the disaffection of white, low-income men who fit the above description had helped sway the 2016 presidential election, the question of which populations AQPHS should be caring about became increasingly complex.¹⁰ A population that most AQPHS I knew had more or less ignored suddenly reemerged in the form of an ideal type that was both deserving (because of declining life spans, high rates of chronic illness, and high levels of economic insecurity) and undeserving (because of the presumed racism of this group and its apparent role in electing a hated figure to the presidency).

When I reached Carol in February 2017, shortly after Trump’s inauguration, she sighed heavily when I brought up this topic. “I’ve been thinking about this a lot,” she said as she walked breathlessly to her office. “If you look at the data, it’s true that life expectancy among those folks is falling, the opioid crisis is crazy. [...] I think as scientists we have to pay more attention to this problem. But is this something I’m going to feel really passionate about, making things better for rednecks in Kentucky? Probably not. That’s not where my heart is.”¹¹

Caring for data sets and models

AQPHS cared *about* their study populations via their imaginaries of ideal types, but the direct recipients of their care were not people—aggregates or otherwise—but numbers. “Most of us are playing with the same data sets for years and years,” Marvin told me. “So when I see data using my data sets, I have such an intimacy.”

AQPHS tended their numbers carefully—they massaged them, fed them, shaped them, and defended them. The numbers responded to these acts of care, by, as my informants put it, “cooperating” or “not cooperating,” or at times “rebellious.” A good care relationship produced “beautiful” or “elegant” results, while a bad one produced “ugly” or “messy” results.

One day in the spring of 2014, I met Kevin for lunch in a lounge of one of the many medical facilities located near the public health school where I was working. Kevin popped a Tupperware container into the microwave and then sank into a couch with a groan. “My data hate me today,” he said. “They don’t want to cooperate with anything that I do.” Kevin was working with survey data from a national sample on mental health care-seeking practices among Latino men. “I’ve been working with this data set for forever. I know it like the back of my hand. But there’s some bug in my code, and I can’t figure out what it is. I keep getting

¹⁰Low-income white men without a college degree voted for Trump over his opponent by large margins.

¹¹*Rednecks* is a slur used to describe poor white people who live in rural areas of the US. Kentucky is one of several states considered emblematic of where “rednecks” live.

these results that make no sense.” Did he have ideas for fixing the problem? “I’ve been playing with it for days, but no luck,” he said. “Doesn’t my damn model know that I already spend more time with it than I do with my girlfriend?”

Care for numbers, like care for people, could be an exhausting, daily slog that threatened to overshadow other aspects of AQPHS’ lives (Ungerson 1983). Compared with person-to-person caregiving, it carried considerably less physical strain, more social status, and higher salaries. Yet, like physical caregiving, caring for numbers required a close, daily “intimacy” with the object of care. It also sometimes resulted in physical and emotional discomfort. Sitting in a chair staring at a computer screen all day led to aches and pains, which, together with the anxieties associated with the precariousness of unreliable grant funding, could produce distress.

Much of the daily work of caring for numbers involved searching for and fixing flaws in one’s model and then defending the integrity of the model in front of one’s peers. Defending models could be a tense process. In some cases, hardly was a researcher able to get through the first minutes of a presentation without receiving a barrage of aggressive questions from colleagues. For example, during the first few minutes of a population health talk I attended in the fall of 2014, I jotted down the following questions from the audience:

Go back to slide 3—I don’t understand where those last two numbers at the end of the table come from.

On slide 2 you stated that x moderates y , but it looks from figure 3 on slide 3 like it’s the other way around—am I missing something?

Your p -values are pretty high. What makes you sure they are significant?

Why didn’t you run a chi-squared test? Shouldn’t you always run a chi-squared test in this situation? You should really have run a chi-squared test.

Part of what made colleagues’ debates over models so rigorous—and why AQPHS told me they were so necessary—was that statistical models did not, nor were they intended to, represent “reality.” Statistical objects are both real and constructed at the same time, as Alain Desrosières (2002) suggests: they are created according to certain conventions and assumptions of regularity that do not exist in nature, yet they also reflect a degree of reality, predicting or describing real phenomena. Sometimes, however, scientists or consumers of science confuse the mental shorthand of statistics for physical “reality,” without acknowledging the difference between the two (Desrosières 2001).

There were several layers of nonreality that all AQPHS recognized must be woven into a model if it were to produce anything of value. For example, researchers had to decide which assumptions they were going to make about the data, as well as which pieces of data they were going to use as proxies for the “real” phenomena they were trying to represent. In both cases, researchers understood that their assumptions and proxies did not reflect what “really” happened in the world, but they hoped they would be *true enough* that their models would “work”—that is, that they would provide usable results. For example, one of the most common assumptions that AQPHS made was that of a “normal distribution”—meaning that all of one’s data points put together would form a bell curve. Even though natural

distributions are rarely *completely* normal—most have data points that lie outside the curve—the trick was to make sure they were close *enough* to normal to allow the math to work.

While assumptions like normality were standardized and testable, choosing proxies involved more wiggle room. For example, when studying the relationship between depression and stress, researchers used proxies for “stress” if direct measures were not included in their data sets. One way to do this was to substitute in events commonly understood to cause stress—for example, “adverse life events” like job loss, divorce, or the death of a family member—which *were* available in the data set.

Researchers also “corrected for” factors like SES or gender, to isolate the effects of other variables, like race or sexual orientation. This required a researcher to pretend, for the purposes of his model—and ultimately, for the purposes of generating data on the population about which he cared—that he could separate the experience of race from the experience of sex or class, even though most AQPHS readily acknowledged that in reality this was impossible (Crenshaw 1991).

Once all these assumptions, proxies, and corrections were put into place, a model could be developed. The most common statistical tool that AQPHS used when building a population health model was a regression. A regression is a mathematical function that represents the data’s “best fit”; it is used to extrapolate from a limited sample of data points to make predictions about the population as a whole. Normally, when a researcher performs a linear or logistic regression, not one of the individuals in the population being studied is directly represented on the regression curve or line.¹² Instead, the curve is “fit” to the available sample of data points, with the differences between the data points and curve recorded as “residuals.” “Outliers” are those points that do not fit the regression curve at all and fall outside an otherwise predictable pattern.

The less deviation in the regression’s individual data points—the smaller the residuals and the fewer the outliers—the better the “fit.” But any statistician would be rightly skeptical of a regression in which the data points did not deviate at all—that is, in which they overlapped with the regression curve itself. As such, a regression—a mathematical model of how a *population* behaves—does not directly represent the behavior of “real” *individuals*. Once one finds a regression that fits the data, the resulting graph replaces the individual data points, and the people they describe, with a smooth shape that encompasses no one but represents everyone.

In sum, although AQPHS designed their models to apply to real-world problems, the scientists themselves acknowledged that the models did not directly represent anything “real.” Instead, using a set of imperfect assumptions, proxies, corrections, and fits, AQPHS cared for their numbers as best they could, with the hope that care for “real” populations might then follow.

¹²The difference between a linear and logistic regression lies in what kind of dependent variable it produces. A linear regression produces an infinite number of possible outputs. A logistic regression produces only a certain number of outputs, which represent categories—for example, “yes” or “no.” Graphically, a linear regression is represented by a line and a logistic regression by a curve.

Caring with outputs

AQPHS insisted that their job was only to produce knowledge about populations and not to develop population health interventions. Many also found employment at public health schools, however, which carried explicit mandates to translate research into action—in other words, to figure out ways to care *with* numbers. The grant funding structures that supported them also encouraged AQPHS to spend time thinking about policy applications and other interventions (e.g., National Institutes of Health 2016). Professional expectations of neutrality, however, demanded that they prevent these pressures from bleeding into their scientific methods. Several of my interlocutors warned that losing sight of the firewall between producing knowledge and potential applications—especially those with political consequences or undertones—could both undermine the science and fail to serve the population in question. One AQPHS told me in an interview,

Sometimes people are willing to look past certain results in order to satisfy some sort of political agenda. But [...] if these claims get shot down eventually by more rigorous work, then the credibility of those making future claims is called into question. So it's harder going forward from a political point of view to make claims in favor of advancing the status of subordinate groups.

Partially mitigating this problem was the fact that most AQPHS did not explicitly produce data for the purposes of changing policy. Instead, they were concerned with a subtler project: shaping public narratives about frequently demonized populations. Some hoped to accomplish this right at the moment of study design. For example, during the 2015 conference a sociologist described how he used a large data set to show a correlation between certain environmental contaminants and certain negative social behaviors among populations exposed to those contaminants. The researcher suggested that his results showed that toxin exposure might contribute to even seemingly distant and unrelated social ills. He told me that he hoped that his findings might provide support for those seeking to push policy makers to pass legislation or launch other interventions to reduce environmental exposures in poor neighborhoods and communities of color.

In the Q&A session a colleague asked about the potential for these findings to be twisted to support prejudice. Might someone see, in the apparent relationship between body chemistry and social ills, support for stereotypes that attribute social problems in poor communities to a biological predisposition to behave badly? The speaker agreed that misinterpretation was a danger but insisted that he and his colleague had designed the study specifically to protect against that danger. He explained to me later,

One of the reasons we chose the design we did was that there were no systematic differences in exposure across groups [included in the study]. So if an audience member asked me about this evidence being used to perpetuate group stereotypes, I'd have an easy answer: there are no group differences in exposure within the units we studied, so this evidence couldn't be used to suggest that one group versus another was inherently [predisposed to any outcome].

No matter what results he got, the researcher had already controlled the narrative at the stage of study design, where, he told me, “socially harmful conclusions cannot be drawn irrespective of the study’s results.”

Ironically for researchers in a discipline that defines itself by focusing on quantitative aggregates, AQPHS frequently transformed their care *for* numbers into care *with* numbers by converting quantitative findings into qualitative speculation about individual behavior. This slippage from population-level associations back to individual-level characteristics often provided much of the conceptual framework for the “Discussion” or “Conclusion” section of an AQPHS article, and it was a key moment when ideal types were reproduced and narratives created.

Understanding the incidence of disease in a population cannot be accomplished by understanding why individual members of the population become ill, as Geoffrey Rose (1985) notes in a classic article. For example, if a whole community has high rates of lung cancer, then studying why individual people within the community developed cancer may not tell you much about the population-level pattern: in Rose’s (1985) words, “the determinants of incidence are not the same as the causes of cases” (34). Failing to distinguish between individual and population causes also can result in the “ecological fallacy”—a faulty inference about individuals based on observations about the group. We cannot know that John in population A got lung cancer from air pollution, only that high rates of lung cancer in population A are correlated with high levels of air pollution.¹³ Yet when discussing possible mechanisms for their statistical results, AQPHS regularly slipped between population-level associations and individual-level causation, in a kind of quasi-ecological fallacy. They drew on ideal types of imagined individual members of a population to explain quantitative trends that technically held true only at the level of the population.

Populations themselves cannot think or act. This creates a bind for AQPHS: to explain possible mechanisms behind population associations, they must speculate about the behavior of individuals. But quantitative methods by design usually cannot predict an individual’s behavior. In fact, any link to particular individuals is erased through the modeling process; regressions by their very nature eliminate individual data points. AQPHS nevertheless applied associations found at the level of the aggregate to search for mechanisms at an individual level that was not mathematically accessible.

Most AQPHS were not particularly concerned about this leap, because they did not speculate about discrete individuals. Instead, their speculations involved imagining how an ideal-type individual would behave in a given situation. Ideal types leave “out of account all these changes and rough edges that go along with individuality,” Schutz (1967) argues. “Therefore, no matter how many people are subsumed under the ideal type, it corresponds to no one in particular” (184). For Schutz, a danger of ideal types lies in the interpreter’s forgetting or choosing not to acknowledge the difference between the actions of an ideal type, which is a product of the observer’s own mind, and the actions of a concrete individual

¹³This example also points to the difference between causation and correlation. The latter simply shows that two things are happening together.

living in the real world. AQPHS frequently blurred this distinction when they suggested that the significance of their quantitative findings lay precisely in their implications for real-life individual behavior.

These tensions were well illustrated in a conversation I observed between a graduate student in population health and his adviser as I ate lunch one day in a public health building lounge. The pair was looking over the results of the student's initial data analysis:

Student: So we ran the number of supermarkets opened in these five [low-SES] neighborhoods against each of these diagnoses. And we age-matched and corrected for income, race, ethnicity, and gender. But we didn't find much.

Adviser: What about this one? It looks like an uptick in diabetes diagnoses in that neighborhood.

S: Yeah, I don't know if that's an artifact or something. Because that one actually had the most supermarkets. And it's not a very big effect.

A: Statistically significant?

S: P less than .01.

A: OK, so that's sort of interesting. What do you think might account for that, assuming it's real?

S: Well, the stores might not be selling fresh fruit and vegetables, or have too much junk food.

A: Could be. Or could be that the stores are not convenient to where people are living.

S: Yes! [Points at a map on his screen.] The ones in this neighborhood are all pretty far from any bus stops and not in residential areas.

A: [Smiles, leans back, folds arms across chest.] Yes—not very accessible. Good. So this is a population that might not have a lot of access to cars, people are walking from buses, and they may be working two jobs, are trying to get food on the table for a bunch of kids, they are stressed, they are already overweight, maybe it's too much trouble to get to those stores, so they just go to the corner store instead.

Drawing on mutually recognizable ideal types, the student and his adviser slipped smoothly between talking about statistically significant population-level associations and speculating about the behavior of individuals. In an attempt to understand an observed statistical result, the adviser conjured an ideal type of an overweight, stressed-out, reproductively fecund poor person who eats in an unhealthy way out of necessity. This ideal type emerged from a combination of scientific data showing associations among poverty, obesity, and stress; commonsense intuition about the likely unwillingness of stressed-out obese people to walk long distances; stereotypes about family size and dinner habits in poor communities; and personal and political values that supported a sympathetic interpretation of the motivations

of poor people. The adviser and his student then collaborated in reproducing this ideal type. This exercise ultimately provided a framework for converting quantitative data into quantitative care, by providing statistical support and direction for interventions that might make healthy food more accessible to poor populations.

Speculation about individual behaviors could also lead to tensions between those who invoked opposing ideal types. For example, one bitterly cold February afternoon, I participated in a discussion with a group mostly composed of AQPHS about a controversial hypothesis purporting to explain the so-called “black-white depression paradox.” The hypothesis in question (Jackson, Knight, and Rafferty 2010) sought to explain why, when “controlling” for other factors, the prevalence of physical, but not mental, illness was higher among black Americans compared with white Americans. Unsurprised by data consistently showing that physical morbidity was higher among black populations, most researchers were instead puzzled that mental illness did not follow this same pattern. James Jackson and colleagues (Jackson, Knight, and Rafferty 2010) put forward an elegant hypothesis: maybe black people were more obese—and therefore suffered higher rates of physical illnesses—in part because they ate “comfort food” in response to their higher levels of stress. And maybe this stress eating in turn had the positive side effect of relieving mental distress.

Drawing on logistic regression analyses of data on about 3,000 people from the 1980s, the authors found that the relationship between number of stressors and major depressive disorder became weaker if the model included unhealthy behaviors. They then explained this quantitative trend with intuitive understandings of individual behavior:

When individuals are chronically confronted with stressful conditions in daily life (e.g. poverty, crime, poor housing), they will engage in unhealthy behaviors (e.g. smoking, alcohol use and abuse, drug use, and overeating, especially of comfort foods) that help to alleviate the resulting symptoms of stress. However, these same behaviors silently contribute to physical health morbidities and early mortality. (Jackson, Knight, and Rafferty 2010, 933)

This explanation seemed to many in our discussion group to be making use of an ideal type that they disliked: the black person who lacks self-control and indulges in food and drugs.

Although the article was published by a prominent black researcher in a prominent public health journal, and it was supported by a follow-up analysis of more recent data (Mezuk et al. 2010), discussion participants looked for, and found, many ways to challenge the article’s narrative. “I just don’t think black people necessarily eat comfort food more than white people do. Don’t white people stress eat too? It seems like an ugly stereotype to me,” a white female participant said. Another colleague cleared his throat. “There are a lot of leaps that they have to make that I’m not buying.” Finally, one of the black participants spoke up. “My grandmother did make a lot of comfort food. But I also think that black folks just don’t recognize depression in the same way. [...] In black communities, being depressed and talking about your feelings, it’s not really a thing.” “What about resilience?” another white participant suggested. “They’re not talking about that very much, but that surely has a big role to play here.”

By the time we had this discussion, a rival article had already challenged the comfort food theory (Keyes, Barnes, and Bates 2011). The key point here is that in all these articles, and in our conversation in the discussion group, scientists were processing their numbers in good faith. In neither case were they taking any steps to bias the numerical results. But in making certain decisions—to conduct the research in the first place, to air a certain set of speculations about individual behaviors—scientists sought to shape a narrative about certain populations. Statistics on a population led to speculation about individual behavior that emerged from one's preferred ideal types. The stories they told reproduced a set of assumptions about the people behind the numbers. With this process, AQPHS attempted to take care of the populations they cared about.

Conclusion: The limits of quantitative care

Shortly after the comfort food discussion, my colleagues and I received news that my population health training fellowship, after 12 years of existence, would be terminated. The organization that had been running the program released a video explaining that more of its future research funding would be directed toward more direct development of population health interventions.

After hearing the news, my fellow postdocs and I gathered around a computer in my colleague's office, watching the video and ranting at the screen. But some reluctantly acknowledged that the foundation had a point. "I get it," one of the other postdocs later told me. "I mean, here we are using all this money to do really interesting work and have really interesting conversations, but at the end of the day they want results, and really it's hard to show that that's necessarily happened with what we do."

My postdoc colleague, in focusing on "results," raised a question that many AQPHS grapple with: How much can quantitative care really improve the lives of vulnerable people? This question has taken on renewed urgency for AQPHS in the US since the election of President Trump. The battle to control the narrative about different populations has never been fiercer. A sizable number of Americans have also been questioning the "reality" of statistical data as never before. And the world of quantitative social science was turned upside down when political scientists seemed to fail spectacularly in their attempts to predict the results of the election (Blakeley 2016; Drezner 2016). One colleague in political science explained to me that those who pointed to these failures were themselves failing to understand the difference between aggregate statistics and individual outcomes. Quantitative science may have predicted that there was a 95 percent chance that Trump would lose, but as Sarah Lochlann Jain (2007) says of cancer prognosis predictions, "Once you enter the population, you will only die or not die; you will not 70, or 42, or 97 percent die" (81). Those who predicted a Trump loss were not wrong—they simply failed to explain to the public the difference between aggregate statistics and individual outcomes.

At the same time, the slippage between the "real" and the imagined in the quantitative work that I have described—not to mention the ideological reproduction of politically progressive ideal types—could be seen as feeding into what my interlocutors described as growing right-wing paranoia that progressive scientists are biased. This is why the March for Science was

so controversial. It raised a number of uncomfortable questions: Can scientists continue to defend their work as purely objective? Should they even bother trying? Was the work of AQPHS feeding into a divisive society by producing only left-wing facts, as the Right charged? Or was it a necessary corrective to a right-wing agenda of made-up “alternative facts” (Bradner 2017)?

It is difficult to answer these questions, in part because care for populations is itself a politically progressive enterprise. That Americans should be caring for whole populations in the first place—that data-supported government policies should be made in the interest of keeping the downtrodden as healthy as possible—is a progressive ideal. More distressingly for my interlocutors, the idea that scientific data should drive social policy at all has increasingly become a progressive viewpoint as well.

Still, when I began my population health fellowship in 2013, AQPHS were caring for, and with, numbers under the assumption that most Americans agreed that high-quality statistics can help solve their country’s biggest challenges. Quantitative care served as a way for AQPHS to try to transform intimate care for numbers into care for real people from afar, by producing and reproducing ideal types. My interlocutors felt secure in their ability and right to work with a set of ideal types that remained relatively unquestioned within the confines of their progressive communities. What they found in the ensuing years was that this enterprise had become more controversial—and perhaps more consequential. “I definitely have more of a sense of purpose,” Carol told me. “But the science won’t change. I’m always going to be following the data. What people will make of that data—I feel like now I just really have no idea.”

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