Making Crime Visible in the Digital Age: The Ethnomethods of Data Policing

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Abstract

As digitalization advances, police officers can rely on data traces to expand their capacity to infer suspicion. Despite reasonably warning about the potentially intrusive and prejudicial character of data-driven policing techniques, criminal justice scholars have yet to engage with the epistemological bases by which officers make deductions from data, including concerning legal admissibility. This article proposes that examining data policing using thick descriptive accounts of lived police work provides insights into police officers' judgments of what constitutes "reasonably objective" crime analysis. Drawing from ethnomethodology's contributions to police work and technological practices, I examine how the symbolic processes by which officers highlight criminologically relevant phenomena from seemingly decontextualized data points reproduce and reshape long-established methodical police work.

Introduction

Rapidly expanding surveillant capabilities have contributed to changes in work and investigative practice within law enforcement agencies, furthering neoliberal governance arrangements, whereby technology advances the contraction of the state. Efficient and nearly instantaneous access to different data sources (e.g., criminal history, financial records, GPS location data, etc.) have altered techniques by which investigators produce a "reasonable suspicion calculus." Instead of relying on previously laborious records searches (Ericson, 1981), police officers can infer suspicion of individuals from easily acquired data traces generated in everyday life. Despite reasonably warning about the potentially intrusive and prejudicial character of data-driven policing techniques and how they reproduce long-standing societal inequalities (Brayne, 2017; Eubanks, 2017; Ferguson, 2017; Osoba & Welser IV, 2017), criminal justice scholars have yet to engage with the epistemological bases by which officers make deductions from data, including concerning legal admissibility.

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This article proposes that examining data policing informed using thick descriptive accounts of lived police work provides insights into police officers' judgments of what constitutes "reasonably objective" crime analysis. In the following sections, I (a) argue that previous studies have adopted a technologically deterministic account in discussing data-driven practices and (b) propose an alternative ethnomethodological framework for examining the contingent social processes associated with data policing. The empirical analysis focuses on a case study where police officers explained in a public forum how they had used a suspect's GPS locational data to establish that his presence and movements in the city were consistent with burglary activities. Because officers render seemingly decontextualized data points observable-and-reportable (Garfinkel, 1967) evidence of criminal activity to an audience, this case study allows us to provide a thick description of the epistemological bases of the deductions they make from data.

Background

Ferguson (2014) proposes that as surveillance technologies evolve, inferences from personal data may sufficiently justify the seizure of a suspect, independent of in situ police work (e.g., patrolling, collecting witnesses' statements, etc.), marking a shift from "small" to "big" data policing. However, as law enforcement agents adopt strategies to circumvent algorithmic-based suggestions and retain their professional autonomy, implementing massive datasets in the criminal justice system *displaces* police discretion into less visible parts of the organization instead of removing it (Brayne and Christin, 2020). Between uncritically following data-driven recommendations or rejecting them entirely, there is a gray area regarding how officers use discretion to make sense of data.

Recent studies have challenged the epistemological basis for claiming that data-driven practices provide wide-scale, granular models of human conduct (Kitchin, 2014). Reducing data into mathematical models obscures the processes by which data are generated and the political and social mechanisms permeating them (Lake, 2017). As a result, "people are, at best, thinly described" (Blank, 2008: 1). To address this limitation, researchers must complement data traces with more contextualized *thick data*[1] (Geertz, 1973)—obtained through ethnographic methods—to gain insight into individuals' actions and practices producing data (Blok et al., 2017; Bornakke and Due, 2018). Social scientific studies and police inquiries share questions regarding how adequately to represent data—or, in the police context—to address what can be reasonably deduced from some trace evidence of human conduct.

Thus, to make deductions from data, officers articulate professionally based knowledge analogous to social scientists' qualitative inquiry, making "small" and "big" data policing *epistemologically distinct and mutually constitutive practices* (see Mair et al., 2015). Recognizing this complementary character avoids ascriptions of police practice as the result of data interventions, focusing instead on the interaction between police investigators and their data tools. Ethnomethodological studies about police work (Bittner, 1967, 1970; Sacks, 1972; Meehan, 1986) and technological practices (Suchman, 1992, 1995) provide

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[1] Thick data includes detailed accounts of human behavior and its environment, allowing researchers to elaborate on why and how people act the way they do.

an alternative framework that foregrounds their agentic role in the outcomes of adopted data methodologies.

The Ethnomethods of Data Policing

Bittner's (1967) classic article about policing skid-row discusses the relationship between methodical police work and law enforcement technologies; his insight grasps an essential epistemological dimension of officers' use of data. Since individuals living on skid-row did not possess address, occupation, marital status, etc., life there "lacks a socially structured background of accountability" (Bittner, 1967: 706). People's ascription into different societal memberships (i.e., occupational, familial, etc.) renders them findable; if a skid-row inhabitant disappears, it becomes difficult to conduct a systematic search (e.g., visiting one's work or talking to their relatives). More importantly, this lack of structure imposes limitations to the deployment of policing technologies:[2]

> It is commonly known that the police are expert in finding people and that they have developed an exquisite technology involving special facilities and procedures of sleuthing. It is less well appreciated that *all this technology builds upon those socially structured features of everyday life that render persons findable in the first place* (Bittner, 1967: 706; emphasis added).

Importantly, Bittner explains that police officers acquire and maintain knowledge about those socially structured features of everyday life as a response to the local contingencies of their work. He later develops this idea while elaborating on the notion of area knowledge. Since it is unrealistic for officers to acquire factual knowledge about every person, place, and event in their beat, area knowledge possesses a provisional character, functioning as a *scheme of interpretation*, allowing them to "connect the yet unknown with the known through extrapolation and analogy" (Bittner, 1970: 91). Thus, officers do not merely possess area knowledge but *use* it as part of methodical police work (Meehan, 2019). In this respect, Harold Garfinkel (1967), the founder of ethnomethodology and Bittner's mentor, explains that sociality is accomplished in situ as people produce meaning moment-by-moment. Ethnomethodology focuses on the body of knowledge and practices by which individuals interpret and act on the circumstances they find themselves in. It proposes that the social constitution of knowledge cannot be analyzed—sociologically, at least—independently of its original context (Heritage, 1984).

Therefore, what Bittner (1967) terms "those socially structured features of everyday life" constitute ad hoc knowledge officers continuously develop, maintain, and adapt as a response to the local contingencies of their work. To claim that police technology *builds upon* them seems to anticipate later ethnomethodological contributions to work, science, and technology (Suchman, 1987; Garfinkel, 1986; Button, 1993; Lynch, 1994). Suchman and colleagues explain that new technologies reproduce and transform pre-existing socio-material practices, generating a sense of everyday life experience: "The common move is a shift from a view of objects and actions as pre-established and normatively determined in their significance, to an appreciation for the enacted, irreducibly relational constitution of material and social order" (Suchman et al., 2002: 175).

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[2] See also "data holes" (Ferguson, 2017).

Recent critical data studies have drawn from ethnomethodology to move away from the *algorithmic drama*—whereby algorithms figure as influential yet intricate entities (Ziewitz, 2015)—focusing on how the figures of algorithms are consequential in practice, deriving their meaning from local contexts. Instead of making sense of algorithms, these contributions treat algorithms as epistemic objects actors use to make sense of observations (Cetina and Woermann, 2021; Neyland, 2019; Suchman et al., 2002). Likewise, officers' use of data builds upon, reproduces, and reshapes long-established methodical elements of police work through which they make criminologically relevant observations visible—namely, *the ethnomethods of data policing*.

In this respect, the reasonableness of officers' claims about this type of evidence depends on how much they articulate their professional expertise and commonsense knowledge to order data points to highlight known patterns of criminal activity. Making sense of data involves constructing relationships of equivalence and correspondence, i.e., ascertaining that each datum equally quantifies and corresponds to exterior features of the world. However, this logic rests upon researchers' culturally and socially embedded narratives to make sense of data (Dourish and Gómez Cruz, 2018). What Bittner terms "socially structured features of everyday life" do not comprise external facts of the world so that surveillance apparatuses can objectively and unproblematically capture and represent them. Instead, they amount to "culturally available tropes" (Dourish and Gómez Cruz, 2018: 8) that law enforcement personnel draw from to make sense of data. In this way, data is indexical in an *ethnomethodological sense* (Dourish and Gómez Cruz, 2018; Garfinkel and Sacks, 1970), deriving meaning not from dyadic relationships to external events/entities but from social, material, cultural, and contextual resources actors use to establish said correspondences.

My approach draws from these contributions to examine how law enforcement agents use data (particularly GPS location data) as an *epistemic object* to render one's involvement in criminal activity "observable-and-reportable" (Garfinkel, 1967) to a public meeting audience. Examining the constitutive order and local organization of a singular occasion of interaction provides a thick description of the emerging properties of the phenomenon officers render accountably visible (see Schegloff, 1987).

Case Study

Data come from a CompStat meeting held by a Police Department in the Washington D.C. metropolitan area on July 16, 2018. The recording was obtained from the department's YouTube Channel,[3] and it lasts for an hour and seven minutes. CompStat is a management and technological system that aims to optimize police departments' efficiency and transparency by gathering and analyzing crime-related statistics (Bratton, 1999). Nationwide, CompStat meetings are leadership management processes where district commanders account for their efforts to reduce criminality. The format of these meetings varies by district, but often departments hold them as public hearings to increase transparency and improve their relationship with the community. In this case study, officers present the city's current crime trends compared to previous years and explain how their strategies have contributed to a recent decline.

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[3] https://www.youtube.com/watch?v=E2RTfa3qx-Y&t=9s%20 (Accessed May 14, 2022).

Because CompStat meetings aim at promoting transparency and accountability by presenting the department's efforts to reduce criminality, they constitute valuable material for ethnomethodological inquiry. It allows us to examine how law enforcement personnel make assertions about GPS location data concerning what orderly aspect of human conduct it signifies while at the same time accounting for their professional competence to make such interpretations. Manning (2008) explains that officers mobilize *rationalizing forces* during crime-analysis meetings, i.e., vocabularies of motive that justify and account for police work's effectiveness in *its own institutional and organizational terms*. "The means of policing that are discussed are not assessed for their efficacy; they are assumed to be efficacious" (Manning, 2008: 13). By assembling motives and rationalities regarding criminals' modes of activity, officers account for their tactical strategies to suppress them. In this respect, the approach proposed here aligns with realist criminology (Young, 1987), as it examines how crimes derive their ontological status from working consensus involving law enforcement agencies and members of the public.

Thus, as personalized suspicion emerges partially from police officers' a priori knowledge regarding "normal features of crime" (Sudnow, 1965), including *known perpetrators*, a central organizing feature of their account is moving from intelligence gathering to establishing relevant (legal) evidence of criminal activity. That is, officers' practices for making sense of data and identifying suspects are deeply intertwined so that the former does not precede the latter.

Steps of the Meeting

Initial Remarks

The meeting begins with a brief introduction by the Chief police officer, who goes through the agenda for the day before calling on stage the department's crime analyst to discuss crime trends in the city. The first part of the crime analyst's presentation establishes (a) that the overall number of criminal occurrences has been declining over the past two years and (b) the department's newly enhanced strategies to arrest prolific offenders have contributed to such success. The crime analyst displays a table containing seven types of criminal occurrences (homicide, rape, robbery, assault, burglary, larceny, and auto theft) over a ten-year span (2008–2017). According to the analyst, the arrest of one particular prolific offender—Maurice Oak (pseudonym)—had a significant impact on crime statistics, particularly on the number of burglary occurrences, which remained constant until his arrest in 2016 (following his arrest, the number of burglaries dropped from 126 in 2015 to 55 in 2018). Furthermore, the crime analyst argues that novel technologies have enhanced departments' understanding of the criminal environment in the city, allowing them to identify and target prolific offenders, such as Mr. Oak. Thus, officers use a detailed narrative of an investigation to account for the newfound efficiency of the department in reducing criminality.

Roughly half of the one-hour meeting discusses how police officers have used GPS location data from the suspect's cellphone to track down his location over time and establish that the presence of his phone signal in the city was consistent with burglary occurrences. Since phone data alone does not prove, legally speaking, a person's whereabouts (people may lose their phones), or involvement in criminal activity (people may have different reasons to visit the city), officers require additional forms of evidence to build a case against

the suspect. Before discussing the suspect's GPS location data—referred to as "telephone data"—the crime analyst outlines some of the strengths and limitations of this technology. Interestingly, his initial remarks capture an aspect of current critical data studies, i.e., big data's lack of context and the necessity to combine it with additional thick data (Kitchin, 2014; Lake, 2017). Much of his subsequent presentation focuses on addressing the limitations outlined below:

Extract 1

> The telephone data for us was useful because we knew that we were barking up at the right tree. Because with the telephone data we can see where people are going, we can see when people are sleeping, when they wake up, all this kind of information that are useful for us, and we could track his movement over a long-extended period of time. And we crossmatched this telephone data against our burglaries, and we noticed that every time we had the burglars, he was coming to [name of the city]. Unfortunately, to send somebody to jail is not enough the telephone data because I can come to [name of the city] for any reason; I don't need to commit burglaries here. You know, I could have a friend, I could have other reasons… "I just like to walk in [name of the city]." So, we needed to have something else that is putting together the telephone data, but we need additional evidence that it's reporting our investigation.

Although police officers can use telephone data to access private aspects of the lives of their suspects, ascertaining that someone's presence in the city is consistent with burglary occurrences is merely circumstantial evidence. The legal burden demands the ruling out of counter-intuitive accounts for why the phone was where it was at any given time. In this way, instead of replacing officers' discretionary decision making for identifying reasonable causes for suspicion (as Ferguson (2014) suggests), using in law enforcement still requires that the deductions officers make from it align with civilians' civil rights. Officers can use data traces to infer a suspect's location, but these provide little insight into the actions that have generated them or who was actually conducting those actions (Bornakke and Due, 2018). Rendering data useful for policing purposes (not to mention legal-evidential purposes for court) requires further elucidation, including what constitutes valid/objective indicators of whatever data are representing. In other words, investigators have to bridge *interpretative gaps* (Heritage, 1984) between telephone data evidence and the factual order of the world it signifies—in this case, burglary incidences.

Much of the presentation focuses on addressing these interpretative gaps. The crime analyst does so by establishing the suspect's criminal identity, determining places where the suspect's presence at specific times is consistent with what officers already know about this criminal identity, and providing further evidence linking the suspect to these locations. In doing so, he builds upon his knowledge about socially structured features of everyday life (Bittner, 1967) to incorporate notions of parsimony in inference, constructing the reasonableness for his deductions from data.

Identifying a Suspect

The presenter calls one of the department's sergeants on stage to further discuss the investigation—more than providing factual information, Sgt. Lake reenacts step-by-step law enforcement personnel's use of area knowledge. His narrative comprises a temporal arc

of how officers have progressively collected evidence leading to Mr. Oak's identification as a suspect, describing puzzling circumstances surrounding the burglary incidents in the city. The suspect's involvement with burglary activities is derived from the narrative as a logical or "obvious" solution to these puzzles—the strength of Sgt. Lake's claims reside precisely in how he constructs his descriptions of events so that the audience can progressively arrive at the same conclusions as law enforcement personnel. Notice that the sergeant does not mention the use of telephone data; however, his narrative outlines essential aspects of the suspect's conduct that will serve as the inferential basis for making sense of data. In Extract 2, he provides the officers' rationale for conducting in situ investigations:

Extract 2

> The plan was they have to be coming into the community through a particular route. (…). [T] here's only so many streets that they could come into or that they could leave. So, we've had 12 officers deployed on the first night. It was a Wednesday night, which was the most popular night that we had residential burglaries, and we had units with MDC[4] so they could run tag numbers for every vehicle that drove past them. (…). Sure enough, the Park Police Sergeant saw a car that drove by; she ran the tag and came back as a rental vehicle. She then saw it again, drive-by again, and thought, "that is suspicious; why is that car driving through here?" And then, because of a neighbor in the community that knew about the burglary problem recognized a suspicious vehicle in front of their house and gave the tag number to the dispatcher. [The] dispatcher read it over the air, the park sergeant recognized: "hey, that's the tag that I ran earlier; I'm gonna get out and look around and see what I can see." And she just happened to walk upon a house where she heard a loud bang in the backyard. She started walking up the driveway, and she saw a ladder propped up to the second story- of the window of a house, and she saw the suspect with the mask on standing there. So, he ran through the woods. She called out for everyone to help; he eventually was able to make his way back to his car and get out of the area before he was ever caught. But we had that tag number."

This account demonstrates how the deployment of surveillance apparatuses (in this case, a dispatch communication system to run car plates) is enacted through officers' situated knowledge and expertise. That is, law enforcement personnel rely on professionalized understandings of people's routinized patterns of action (Bittner, 1970; Garfinkel, 1967) to anticipate future conduct and set up methods for capturing or identifying suspects in the course of committing a crime or at least observe them doing so. The sergeant explains that the perpetrator(s) were coming from outside the city, meaning they would have to drive by specific routes to get there. Since burglaries happened on Wednesday, they would be more likely to identify suspicious circumstances by deploying units on that night of the week. This demonstrates the confluence of "big" and "small" data: the small, individual-specific location data derived from cell phone records and the "big" time data derived from CompStat.

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[4] *CrimeStar Mobile Digital Communicator*, a secure digital dispatch/data communications system for field officers.

While in the field, the officers rely on area knowledge to identify suspicious circumstances that warrant further investigation. According to the presenter, the sergeant identified a rented car driving around the city and thought it was suspicious. Notice that the suspicion did not arise from any irregularity associated with the vehicle (e.g., its registered owner had a suspended license). Indeed, driving a rented car is not a violation of any sort; however, its presence occasioned "probable cause" for further investigation by the observing office in reflection of several factors, namely: the known transient character of the suspect whose cellphone data suggests they travel from out-of-city to commit burglaries; the time of both week and day being conducive or likely for burglaries to occur; the citizen report of an unknown vehicle with the same license plate, etc. The gestalt contexture produces the vehicle as suspicious instead of merely lost. Moreover, it is not just that a rental car is in the neighborhood that sets the sergeant in motion, but rather that the officers identified the car driven in specific ways that diverged from categories of normal appearances (Sacks, 1972).

On the same night, while investigating complaints about a suspicious car driving around a residential neighborhood, the same officer encountered what appeared to be evidence of an ongoing break-in. Sgt. Lake does not explicitly assert that the man wearing a mask was the same person driving the rented car; however, the co-occurrence of two suspicious events suggests a possible link between them. The significance of the link is probably immaterial since a law enforcement agent observed a burglary act on the same night, and no further evidential deduction would be required in court.

This initial part of the account establishes a series of questions: who was driving the rented car? And who was wearing a mask in what appeared to be a burglary in progress? Even though the suspect ran away, the officers could use the tag number to identify the person driving the vehicle. Sgt. Lake continues his narrative:

Extract 3

[F]rom that tag number, we found out who rented the vehicle. And, she was initially very apprehensive, I would say. [She] didn't want to give up his name, but we pressured her, we stayed on her, we went to her work, we talked to her boss, we talked to her mom every day, and we press her until she finally gave up the name: Maurice Oak, and as soon as she did, the light switched. Maurice Oak, we've locked them up twice in [name of the city] back in 2006, 2007 for a residential burglary. He just had disappeared; he hadn't been in the area with- his name never came up again, but as soon as she said Maurice Oak, we knew we were onto the right guy. So, we did a full-court press on him and we just looked at every video that we had- we looked at, you know, every contact that he was with, we looked through you know search warrants for his phone. (…). He used to sell his- stuff that he stole at liked yard sales because he knew that he'd get caught if he sold at a pawnshop, he still got caught because he stole one thing in a pawnshop this time. (...) So, he got smart, he started stealing electronics, which you can get a lot more money for, and you can clean them so you can clear out a laptop and nobody knows who it belongs to.

Once they identified the woman who rented the car, officers pressured her to discover who was driving the vehicle on the night of the investigation. Officers do not treat the woman as a candidate guilty party despite the fact she rented the car, nor does Sgt. Lake provides

the basis for her dismissal as a suspect. Contrastingly, once the name of Maurice Oak is brought up, the sergeant treats that information as a new finding ("…until she finally gave up the name: Maurice Oak, and as soon as she did, the light switched (…) we knew we were onto the right guy"). Thus, during the presentation, Sgt. Lake uses his professional vision to highlight "unaccountable aspects" of a suspect's actions. When the person presumed to be driving the rented car turns out to be someone previously arrested for burglary, "committing burglary again" is made the "obvious" solution to the puzzle.

Moreover, officers use the knowledge of Mr. Oak's previous criminal conduct to deduce the appropriate narrative that explains the current data in their possession, i.e., the GPS location data is indicative of further criminality *because Oak is the kind of person known to do this type of crime*. The sergeant catalogs aspects of Oak's modus operandi that made his activities less visible to typical police investigative techniques—namely that Oak did not resort to selling stolen goods at pawn shops, opting to sell at less visible yard sales instead. This also avoids stolen goods becoming part of the surveillant assemblage as it is less common for serial numbers to be checked in a less formal marketplace. Similar to how officers rely on routinized patterns of action set up methods for capturing offenders, the suspect anticipates law enforcement's efforts and avoids them. Nonetheless, the suspect still went to this type of establishment at least once, constituting an important piece of evidence against him.

Notice that officers' area knowledge involves many typifications regarding *who* belongs *where*, regarding with suspicion the presence of individuals whose appearances indicate they belong to other socio-demographic neighborhoods (Weitzer, 1999; Meehan and Ponder, 2002). As such, the sergeant's account adds more context to the crime trends they are discussing, which they subsequently use to make sense of otherwise decontextualized GPS location data. Interestingly, there are elements of this context left unstated. For instance, the sergeant does not give their reason for dismissing the woman who rented the car as a potential suspect, possibly presuming that the audience understands that the person they identified does not fit the description of the suspect. Instead, they pressured her to find out who was using the car on the night of the investigation, indicating they had expectations regarding who the suspect was—or, at least*, they categorized the offender in some way that excluded the woman as a suspect*. The identification of a person who had been arrested for burglary retrospectively accounts for the reasonableness of the sergeant's claims and further informs the crime analyst's analysis of GPS location data.

Inferring Appearances of Criminal Activity from Data

Having established a reason for suspecting that Mr. Oak is responsible for the burglaries, the crime analyst returns on stage to explain how telephone data has contributed to the investigation. "Telephone data," in this context, comprises a collection of data points indicating the suspect's estimated latitudinal and longitudinal coordinates across time (ranging from "likely better than 2500 m" to "likely better than 25 m"). Table 1 illustrates what "raw" location data looks like. Ordering seemingly uncontextualized telephone data involves a) identifying data points linking the suspect to specific places consistent with burglary activity; b) establishing the time of the suspect's visit to these locations in relation to other events of interest. That is, the crime analyst uses the suspect's telephone data to claim that he visited a pawnshop after a burglary occurred.

Table 1 Example of "Telephone Data"

Date	Connection on time (GMT)	Latitude	Longitude	Location accuracy	Date time (et) calcu- lated by analyst	Approximate location based on longitude and latitude
6/12/16	16:04:51	39.33728	− 76.71326	Location accuracy likely better than 400 m	6/12/16 12:04	6006 Liberty Rd
6/12/16	16:04:58	39.33673	− 76.71315	Location accuracy likely better than 400 m	6/12/16 12:04	6005 Liberty Rd
6/12/16	16:14:01	39.335.27	− 76.70831	Location accuracy likely better than 300 m	6/12/16 12:14	5603–5605 Liberty Heights Ave

First, he displays a pawn shop database screenshot indicating that the suspect sold goods on December 6—including a Randall Wilson College pendant. The house of a former dean from the same college was robbed the previous day, thus implicating the criminal nature of the transaction:

Extract 4

So, this is pawn data. It's an extraction of a pawn database, and he pawned something; it was a pin jewelry, 10 carats 340 grams torch pendant, Randall Wilson College. It's a college, as you might know. And he did it on the 06/12/2016 at 12:13 [pm]. We had a burglary between 6/11 at 11:00 and 06/12 at 17:30; it was on Main Avenue. The Randall Wilson College that we know is a college in Pennsylvania linked to the residence of that house. Meaning, the father of one of the residents was a former, as you say, I believe, dean of that college. So, we were able to link the two things, one and one.

The crime analyst highlights two events of interest: a burglary between June 11th and June 12th and Mr. Oak's visit to a pawn shop on June 12th. The torch pendant the suspect pawned was used to establish a connection between these occurrences: (1) Oak's phone has generated a data signal at the pawn shop; (2) the item pawned was from a college; and (3) the dean of the college was robbed the day before the pawn transaction. Linking these events outlines a narrative informing how to analyze GPS location data from the suspect's cellphone signal. See extract 5:

Extract 5

"*So, these are the latitude and longitude where Antonio was* [presenter displays a table containing the suspect's telephone data; see Table 1]*, and in here says location 'accuracy likely better than 300 meters'. So, AT&T is doing an estimate say: "Okay, right, I believe based on what I know about my network, that this telephone is 300 meters from this latitude and longitude." And this is the address that- this column I created and is telling me where it is, and I could see through the mapping that here there is the pawnshop and here is the signal from the cellphone* [displays a map indicating the suspect's location by the time his signal was found near the pawnshop; see Fig. 1]*. So, this is when he pawned the things, and it's confirmed by his photograph* [displays the screenshot of a pawnshop database, see Fig. 2]*."*

Maps (Figs. 1 and 2) indicate Mr. Oak's *likely* geographical position in relation to a burglary scene on June 11th (12: 14 pm) and to a pawnshop on June 12th (9: 28 pm). These visual representations ascribe graphical and mathematical properties to the suspect's movement across space and time and, in doing so, make it *visible* (Lynch, 1985) to the audience. They order uncontextualized telephone data so that the suspect's otherwise inaccessible conduct becomes observable. However, telephone data and maps do not objectively and unproblematically index Mr. Oak's movement patterns; the logic of correspondence (Dourish and Gómez Cruz, 2018) is not legally sufficient given the other explanations that could produce "reasonable doubt" about the connection between location, suspect and cellphone.

Fig. 1 Suspect's estimated location in relation to the pawnshop (obtained from his cellphone signal)

Fig. 2 Suspect's estimated location in relation to a burglary scene (obtained from his cellphone signal)

The crime analyst uses the pawnshop database to confirm—at least for *investigative purposes*—that the suspect visited the establishment on June 12th at 12:13 pm. In this case, the meaning of telephone data is contingent upon its precision in capturing a "factual order" of the world (Heritage 1984, 161)—i.e., Mr. Oak's geographical position at particular times. Yet, regardless of how accurately officers can estimate one's latitudinal and longitudinal coordinates, there is an "interpretative gap" (Heritage, 1984) between

geographical position and the deduction that the position is for the purpose of criminal conduct. The analysis of the suspect's coordinates does not pinpoint Mr. Oak to any location specifically (also, it does not establish that he was, indeed, in possession of his cell phone at that time), raising concerns about accuracy and legal significance. In this respect, the location data shows the contention between what one might reasonably deduce on the balance of probabilities and what one might *prove* "beyond a reasonable doubt." Unlike other locations within the suspect's estimated coordinates ratio, pawnshops are places consistent with police officers' area knowledge about burglary activity[5] (see extract 4). Building upon his "occupational" knowledge about burglars and their modes of action, the crime analyst treats the suspect's presence near one of these establishments as evidence of criminal activity. GPS location data estimates *where* a person was likely to be at a particular time, and photographic evidence confirms the validity of the assumptions based on location data, each leading to the officers' reasonable conclusions employing area knowledge for *why* they were near particular locations.

The presenter then completes the palimpsest by adding data inputs to validate the assumptions from the other data. Having established the suspect's visit to the pawnshop, officers need other forms of *legal*, courtroom-relevant evidence to confirm the suspect's presence at burglary scenes. For that, the crime analyst presents surveillance camera footage and photographs from a search warrant in Mr. Oak's house. He proceeds to compare the clothes the burglar caught on tape was wearing with similar pieces of clothing found at the suspect's place:

Extract 6

> It's very important the assistance of the community because you provide us videos. We were able to crossmatch how he was dressed with the clothes that we recovered during a search warrant at his house. So, we were able to discover that, for instance- so, this is a backyard intrusion [presenter shows a slide with a burglary incident report]. So, this is the photograph from the video that the community provided us [present shows a slide containing CCTV footage and photos from a search warrant in Mr. Oak's house; see Fig. 3] and this is the hat that- we see that in his house and that it's confirmed also by the telephone data. (…). So, the same story here. This is an actual burglary on Baltimore [Avenue]. So, he's wearing the same police-style jacket that has been seized by our Police Department detective. So, this is the jacket [presenter shows a slide containing CCTV footage and photos from a search warrant in Mr. Oak's house; see Fig. 4], you see this button here, that's the button here, that's the elastic band, and that's the elastic band. (…). He wanted to look like a cop because (...) he wanted to- in case the community would ask him, "Hey, what are you doing in the garden?" He would say, "I work for the police." So, he had a badge; he had- he was looking like he had this jacket at this a police jacket with the things to put the rank.

The crime analyst presents two slides containing two pictures each (Figs. 3 and 4). The first one is a black and white CCTV footage depicting a burglar during a backyard intrusion—the man in question is wearing "police-styled jacket" and a "camo military hat." The other two images show similar clothes that officers recovered at Mr. Oak's

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[5] See "category-bound activities" (Sacks, 1992).

2015-12-07 1811 UNIT BLOCK OF PINE
BACKYARD INTRUSION

| Camo Military Style Hat | Camo Military Style Hat |

Fig. 3 CCTV footage of a burglary in progress and photographs from a warrant search in the suspect's house

house. Photographs taken of the suspect's clothes function as a diagrammatic rendering (Lynch, 1985) of the CCTV footage. They remove visual inconsistencies related to the footage's poor video quality, allowing for comparisons. The crime analyst orients the audience's attention to both jackets' buttons and elastic bands to argue that they are the same ("*So, this is the jacket, you see this button here, that's the button here*"). Thus, possession of clothes visible in a video of the suspect is treated as a positive basis for identifying the suspect. Importantly, the crime analyst is not simply establishing that Mr. Oak was caught on tape in an individual burglary occurrence; by referring to how the suspect *typically* dresses, the crime analyst makes inferences about a broad pattern of criminal activity. He explains that the suspect would "dress like a cop," even possessing a fake police badge. This outfit would allow him to claim that he was doing investigative work if individuals ever spotted him and saw his presence in an area as suspicious. Aside from locating him at burglary sites, the presenter treats Mr. Oak's clothes as further evidence of his status as a prolific burglar.

In this respect, Garfinkel's re-specification of Gurwitsch's gestalt contextures (Eisenmann and Lynch, 2021; see also Watson, 2022.) and adaptation of Mannheim's documentary method of interpretation (Garfinkel, 1967) provides an analytical framework. Appearances of criminal activity emerge from complex figure-ground arrangements, including GPS location data, statements gathered from witnesses, a suspect's known criminal history and officers' firsthand observations. None of these suffice the legal requirement to establish guilt independently, but when combined, they form a gestalt pointing to one's culpability. Thus, police, in this case, do not merely look at "data" outputs and conclude criminality

2016-02-13 1911 300 BLK ELM AVE
BACKYARD INTRUSION

Fig. 4 CCTV footage of a burglary in progress and photographs from a warrant search in the suspect's house

but instead leverage data as the intelligence of criminal activity to directly observe or legally gather direct evidence of the crime under investigation. Possessing similar clothes to the ones captured on CCTV footage, visiting a pawnshop, or driving a rented car does not constitute substantial evidence of criminal activity on their own, but in culmination, create a compelling case against a suspect. The culmination of telephone data analytics with smaller data on typical patterns of criminal activity, methods criminals use to hide these activities, typical patterns of movement across a specific geographical area, etc., produce the conclusion about *just this criminal's connection to just these crimes*.

Discussion

According to Sacks (1972), the general warrant of police methods for inferring suspicion does not stem from their professional status but from how ordinary persons can readily see the plausibility of their claims and make similar inferences, even without possessing the same expertise. Likewise, Dourish and Gómez Cruz (2018: 8) propose that strong data narratives require little or no interpretation/narration, and having a self-evidentiary character. In this way, the reasonableness of officers' assertions *about* and *through* GPS location data depends on how they weigh professional expertise regarding offenders' habitual modes of activity and the public's commonsense presumed knowledge. By weighing GPS

location data with other evidence and their area knowledge (Bittner, 1970), the presenters bridge interpretative gaps between seemingly decontextualized data points and the factual order of the world they purportedly capture. Thus, the data requires interpretive work to bring potentially equivocal pieces of evidence into line with what the officers can account for assuming about a suspect's actions and motives. Moreover, officers must balance their sensitivity to infer suspicion with the ground of legal admissibility, i.e., their claims must point to one's guilt "beyond a reasonable doubt."

However, if evidence from GPS location data (and other data traces by extent) requires further elucidation as to what aspect of the world it represents, how can it substantially contribute to police investigations? Would not it be just another observation regarding what investigators already know or assume about a suspect? If officers must account for the reasonableness of their claims about data on the one hand, on the other, they may use data to elaborate on the reasonableness of other assertions they make. In the context of the CompStat meeting, discussing GPS location data constitutes *doing tactical work* for an audience. The crime analyst's examination of the suspect's cellphone signal allows him to employ vocabularies of motives about typical, repetitive, and anticipated modes of criminal activity (Manning, 2008), accounting for their enhanced expertise to reduce criminality.

An early skeptical account of the implementation of information systems in police departments proposed that "[t]he social world that the police deal with does not come pre-coded or neatly packaged and self-assigned as coming under the transgression of one particular law or type of incident." (Benson, 1993: 89). Indeed, the sergeant's account illustrates how situated, on-the-street police work involves unpredictable, fleeting contingencies. It is unclear what sort of a priori expectations officers had regarding the suspect they were looking for (see Meehan and Ponder, 2002; Weitzer, 1999). Upon patrolling routes connecting the city to other locations, did all the cars receive the same scrutiny? Or perhaps another element ignited officers' suspicion about the vehicle (the officers only identified the rented car *after* reading its tag)? One of the sergeants then spotted what appeared to be a burglary in progress, but the offender escaped through the woods. Was the exact vehicle also spotted near the burglary scene? When the officers managed to identify the person who rented it, they pressured her to give up who was using it. Why did officers dismiss her as a suspect?

Having discussed how officers must fill data holes (Ferguson, 2017) between data points and the social order of the world they purportedly represent, the questions above suggest that the sergeant's account has its own interpretative gaps. Methodical on-the-street police work involves an orientation toward "unverbalizable"—or seen but unnoticeable (Garfinkel, 1967: 180)—elements of the social order. In contrast, by turning to GPS location data, the crime analyst more explicitly explains their grounds for suspicion and, retrospectively, affording *accountability*. Even though the social world officers deal with does not come "pre-coded or neatly packaged and self-assigned" (Benson, 1993), law enforcement agents still can use their ethnographic area knowledge to make crime visible through data points. If, on the one hand, decontextualized data is useless (Bornakke and Due, 2018), stripping data from their original context also excludes local, chaotic contingencies permeating its production, rendering suspects' movement patterns a *docile object* (Lynch, 1985). Tracking a suspect's cellphone signal removes inconsistencies and limitations of firsthand observations, ordering people, places, and events of interest, adding retrospective linearity to officers' narratives. The question then is not how officers identify appearances of criminal activity from data points but how they use them to render situated criminal conduct measurable, quantifiable, visible, and, consequently, *knowable*.

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