

The Governmental Topologies of Database Devices

Evelyn Ruppert

Open University, Milton Keynes, UK

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Abstract

In business and government, databases contain large quantities of digital transactional data (purchases made, services used, finances transferred, benefits received, licences acquired, borders crossed, tickets purchased). The data can be understood as ongoing and dynamic measurements of the activities and doings of people. In government, numerous database devices have been developed to connect such data across services to discover patterns and identify and evaluate the performance of individuals and populations. Under the UK's New Labour government, the development of such devices was part of a broader policy known as 'joined-up thinking and government'. Analyses of this policy have typically understood joining up as an operation of adding together distributed data about subjects, which can then be used in the service of government surveillance, the database state or informational capitalism. But rather than such technical or managerialist analytics, I argue that topological analytics capture what these database devices enact and do: they materialize the 'individuality' of subjects in intensified, distributed and fluctuating ways and materialize and intensify a logic of what Deleuze describes as modulating controls. Through examples of UK New Labour social policy initiatives over the past decade, I argue that topological analytics can account for these as immanent rather than exceptional properties of database devices and, as such, part and parcel of a governmental logic and ontology of subjects.

Keywords

control, database, digital devices, government, metrics, topology, transactions

Most government departments keep records, often in electronic format, that contain identification data about people and the services they have received. New information and communication technologies (ICTs) have

Corresponding author:

Evelyn Ruppert, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK

Email: e.ruppert@open.ac.uk

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advanced the digitization of these government records and the storing, maintenance, sharing and searching of large volumes of personal data. The UK public sector is estimated to have held some 300 million personal contact detail records in 2005 (Office for National Statistics, 2005: 7). Such identification databases are by far most advanced in the commercial sector where 'informational capitalism' has become a prime generator of knowledge (Thrift, 2005). Walmart, for example, holds 460 terabytes of consumer data and Tesco has two years of purchasing data for 14 million households (40% of the UK population).¹ Individuals also compile databases about themselves through a variety of applications and software for monitoring and tracking everything from dietary habits, training programmes, levels of happiness and spending practices to children's sleeping patterns (Wolf, 2010).

In all of these examples, various analytic devices are used to discover patterns and reveal things about who we are as individuals and populations based on patterns in transactions, activities and conduct recorded in different databases. At the policy level this has more generally come to be known as 'joined-up thinking and government' and 'connecting the dots' in databases (Amoore, 2009). Under New Labour, the UK government developed and implemented several databases based on this logic: one report identified some 46 databases – from law enforcement and child welfare to e-Borders – many of which involve data sharing across government agencies (Anderson et al., 2009). For this reason the report called the UK a 'database state'. Some of these databases developed out of New Labour's 'Transformational Government' strategy, which envisioned technology as an 'enabler' of policy and service delivery change:

Twenty First Century Government is enabled by technology – policy is inspired by it, business change is delivered by it, customer and corporate services are dependent on it, and democratic engagement is exploring it. Moreover modern governments with serious transformational intent see technology as a strategic asset and not just a tactical tool. Technology alone does not transform government, but government cannot transform to meet modern citizens' expectations without it. (Cabinet Office, 2005: 3)

Some of these database initiatives have been more fully developed and implemented than others, and under the Conservative-Lib Dem coalition government they will likely be reconfigured or perhaps abandoned.² To be sure, database government constitutes a science-in-the-making and is to varying degrees delivering the objectives of joined-up thinking. It is also subject to intense scrutiny. Academic reviews of databases are quite damning. In the field of social policy, child welfare databases are possibly 'not fit for purpose' (Shaw et al., 2009) and leading to many versions of

the population as practitioners variably interpret, record, and understand instructions and categories (Pithouse et al., 2009). Because these databases depend on diverse and complex socio-technical arrangements – of professionals, computers, software, forms, and all of the many actors involved in long chains of relations – their operation is highly variable and contingent, resulting in multiple actually operating systems in practice. But many of these criticisms have been lodged against central government programmes, whether or not databases are deployed as a solution or as a support. Through many devices central governments have long sought conformity, coherence and consistency in programmes and to tame the unruliness of local discretion and idiosyncratic practices through standards, forms, rules, tick boxes, procedures, reporting requirements and so on. Databases are just one such device introduced as a solution for taming and dealing with such multiplicity.

Notwithstanding this variability, others have argued that child welfare databases are the culmination of developments over the past 30 years which have involved a shift in the practice of social work from a narrative to a database ‘way of thinking’, with the result that social work now operates less on the terrain of the ‘social’ and more on the terrain of the ‘informational’ (Parton, 2008). Furthermore, the effects of databases are said not only to be reconstituting how social work is practised, but also reordering and regulating workflows and monitoring practitioners and their engagements (Garrett, 2009). They are not only surveilling workers but also designed to follow and watch people (Anderson et al., 2009). This interpretation is most often the point of criticism and resistance:

Concerns about state-sponsored ICT systems in children’s services raise issues about inappropriate surveillance and net-widening, threats to citizen privacy, data security and quality, and the unreflective assumptions within policy about universal technology systems, such as CAF [Common Assessment Framework], to engage effectively with the complexity of child and family needs. (Pithouse et al., 2009: 601)

Yet, despite their claims about the rise of an all-knowing panoptic state, it is safe to say that, while the UK state has lots of data, it is struggling under the weight of myriad non-interoperable and often incomparable and conflicting datasets. Indeed, numerous database initiatives have stalled or have been significantly redesigned as a result (e.g. the NHS National Programme for IT).³ Rather than an all-knowing state, what we have instead is a plethora of partial projects and initiatives that are seeking to harness ICTs in the service of better knowing and governing individuals and populations. There are technological, economic and political reasons for this, especially in relation to data privacy and confidentiality. Be that as it may, efforts abound to create

standardized, interoperable and dynamic databases to support evidence-based policy, enable individually tailored and targeted services, reduce costs, and provide robust population statistics for analysis and research.

In this article I take a different approach to thinking about these database initiatives. The critiques outlined above typically interpret the joining up of data as a simple operation of connecting information about subjects compiled at different government locations, which can then be used in the service of government surveillance, the database state or informational capitalism. These can be understood as technical and managerialist analytics of what joined-up databases do in relation to knowing and governing individuals and populations.⁴ Failures can be explained as the result of technical challenges, and operational variations and complexity can be explained as either indications of system failure or success in adapting to local circumstances and the idiosyncrasies of practice.

Rather than thinking of complexity, variation and uncertainty as effects of joined-up databases, I argue that these properties are immanent to the government logic and conception of the subject that joined-up databases advance. To start, I adopt an ontological rather than epistemological framing as put forward by Law and Singleton (2005). An epistemological framing posits that these different analytics produce different perspectives on an object, which can be 'flexibly interpreted', and consequently objects are 'interpretively complex'. Complexity is thus a product of diverse analytics and multiple interpretations, rather than a quality of the object in question. Instead, an ontological framing understands objects as already and always multiple and complex, and 'moves us from multiple interpretations of objects to thinking about multiple objects themselves' (Law and Singleton, 2005: 334).

The problem then is that social science analytics (such as technical and managerialist ones) typically cannot account for such multiplicity and complexity. For this reason Law and Singleton propose topological analytics to understand how complex realities are 'enacted into being'. It is with this understanding that I engage topological analytics to interpret the conception of the subject and government logic that joined-up databases enact. I argue that, rather than being technologically determined, these databases are bound up with a particular ontology of the subject and governing logic, and that there is not a determinist but a dynamic relationship between the two (Agar, 2003). It is this conception that I explore through examples of policies developed by the UK New Labour government, which signal a changing relation to data as well as relation to quantification in social, commercial and governmental domains. It is a relation that is part of a technocratic infrastructure for knowing subjects and populations, not so much in relation to pre-defined categories of identity but in relation to what people do, their interactions, transactions, performance, activities and movements in relation to government.⁵

In the first section I specify a set of presuppositions about topological analytics that I then use to analyse social policy databases. I argue that these databases do not simply add up data about subjects but materialize ontologically different subjects in relation to what they do. While in social policy behaviour and conduct are generally constitutive of identity, I argue that joined-up databases materialize the ‘individuality’ of subjects in intensified, distributed and fluctuating ways. Second, such operations also materialize and intensify a neoliberal logic of control whereby enclosed spaces of governing give way to what Deleuze (1992) describes as modulating controls. It is this materialized and intensified individualization and logic of control that topological analytics open up and which I explore through examples of UK New Labour social policy initiatives over the first decade of the 21st century.

Topological Analytics

I first conceive of these databases as ‘devices’ as they are government schemes devised to both calculate and intervene in the performance of individuals and populations, and consist of an ensemble or system of relations. That is, they are oriented to a governmental purpose and, as such, the terminology is most closely aligned with what Foucault defined as *dispositif*:

a heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid. Such are the elements of the apparatus. The apparatus itself is the system of relations that can be established between these elements. (Foucault, 1980a: 194)

In this light, database devices consist not only of inscriptions but *strategic orderings* and relations between many governing actors and elements. Actor-network theory (ANT) is helpful in specifying and advancing this understanding of relations by attending to the role of ‘immutable mobiles’ in enabling such arrangements to ‘hold’ in some relational or functional manner between sites, and to form more or less stable networks (Law and Singleton, 2005). But what often happens is that devices (their elements or relations) tend to change and the network ‘fails’. A solution that is often advanced is to explore how a network struggles to maintain the stability of its devices. But this means that invariance becomes only a principle because in practice devices can be mutable and multiple (Mol and Law, 1994).⁶ Topological analytics provide a way of thinking of devices that accounts for such instabilities of devices and the mutability of their elements, relations and boundaries.

Rather than a given theory, social scientists generally identify a few key properties of the topological from mathematics and have then taken these up to study social phenomena. One property is a non-Euclidean and non-topographical conception of space, which Celia Lury (2009) has described as follows:

Topology in mathematics does not start with a space but starts with a problem (an equation) then explores the space in which it has a solution. So while geometry had classically been understood as the perception and organisation of a static, homogenous space that might be projected reliably into the future, topology offers a way of thinking about processes of actualization in n-dimensional spaces in terms of probabilities, not certain futures. To put this another way, space, problem and solution are co-constituted in topological mathematics. If this is indeed so, then it suggests that what is involved in thinking topologically across disciplines is neither induction nor deduction but abduction. And abduction does not involve either metaphors or tools – but speculative reason or reasonable guesses.

Thus, rather than static and predictable, a topological space (or object or subject) is mutable, its boundaries changeable and modulating in unpredictable ways giving rise to probabilistic rather than predictive reasoning. Law and Singleton (2005) state this differently: that objects have no clear boundaries and are made up of heterogeneous mixtures of variable elements with unstable relations that can be discontinuous, unpredictable and generate varying patterns of absence and presence. Yet, as Law (2002) notes, while some properties are changing others are continuous and retained. The challenge of a topological analytics is to identify the possibilities and properties of different forms of continuous transformation, that is, ways of deforming objects while securing their continuity.

Drawing on these understandings, I conceive of topological analytics as involving a series of interrelated presuppositions: the co-constitution of a space, problem and solution resulting in varying rather than fixed boundaries and a logic of abduction or reasonable guesses; and invariance alongside varying and heterogeneous elements and relations that can be folded and reordered and generate shifting patterns of present and absent elements. These properties form the analytic starting point for conceptualizing the ontology of the subject and governmental logic of database devices. To start, I specify the content of government databases as being made up of transactional metrics, and then I take up these topological analytics in relation to a number of social policy initiatives and database devices.

Population Metrics: The Stable and the Transforming

Government administrative databases constitute a particular kind of measurement and data on subjects. They consist of past, current and ongoing measurements of conduct recorded through established means of data collection (e.g. tax, national insurance or school records). The databases track the transactions of individuals in relation to government services: their registration of life events, income earned and taxes paid, licences obtained, schools attended, cars purchased, borders crossed, visas acquired, benefits received, visits made to hospitals and so on.⁷ They also contain records of 'encounters' with governments and log changes in individual lives. The data is generated as a by-product of everyday administrative transactions with government and is deemed 'better information' in part because it is considered dynamic measurements of what people 'actually' do and need, which change over time and space and thus require constant monitoring and evaluation.⁸

To be sure, transactions have long been the basis of government administrative systems and the mainstays of government record keeping, monitoring and evaluation, and, in social policy, conduct and behaviour have been key indicators and registers of identity. What is new is the digitization of these records, the possibility of real-time tracking of transactions and the potential to join up transactional data distributed across government sites and functions. In other words, digitized data are transforming government knowledge practices.

Administrative databases and the identification of correlations and patterns in transactions across governing sites constitute particular kinds of operation and measurement that I call population metrics – measures that identify and evaluate the performance of individuals and populations (Ruppert, 2010). Population metrics work in much the same way as metrics operate in business, government and academia, to evaluate and compare the performance and progress of people, groups and things. For example, in education, league tables and scores evaluate schools, in universities, bibliometrics measure academic performance and in health care, standards such as wait times evaluate service delivery. The same logic applies to how transactions are used in government to identify individuals and populations and evaluate their performance.

But before transactions can be combined, reassembled and correlated, 'identity management' is required to confirm, verify or authenticate identities, prove eligibility and entitlement to public services and benefits, trace and track transactions and movements, and join up databases across sites and functions. In addition to assigning a unique identifier or code, identity management involves recording what are considered relatively stable biographical identifiers and locators that can include name, date and place of birth, gender, and address and biometrics. Identity management thus involves the stabilization of a set of

biographical and/or biometric classifications or 'single source of truth' about individuals that is kept up to date (Varney, 2006: 38).

For the UK government, identity management is achieved through the use of unique identifying numbers and codes. There are numerous such identifiers in circulation: national insurance, pupil, health, and driver licence numbers.⁹ Once identities are managed in this way, then individuals and populations can be known in relation to their multiple transactions and movements.

Identifying: Multiplicities and Singularities

Identity management constitutes an understanding of individuals as being made up of a set of unchangeable and stabilized identifications. Once identity management is in place, then it is possible to track, trace and infer knowledge about individuals and populations through the linking of multiple transactions, which become the dynamic and relevant metrics to be measured, monitored and analysed. This understanding of individuals was most comprehensively laid out in the UK Labour government's 'Transformational Government' strategy, which sought to use new technologies to transform the 'business of government' by joining up and sharing data and services rather than duplicating them. Multiple sources of information are deemed necessary to provide complete pictures of customer needs and behaviours, which are multiple and complex (Varney, 2006). People do not fit into the usual group categories (the elderly, the student) but rather – from the governing point of view – have changing and multiple needs that require 'responsive services' (Cabinet Office, 2006b: 8).

It is this conception that informed many specific UK social policy initiatives.¹⁰ The Social Exclusion programme was based on the understanding that relative disadvantage is caused by linked, multiple health and social problems and risk factors that sometimes 'interact' to multiply their overall effects (Cabinet Office, 2006a). A key solution promoted was the joining up of databases to identify individuals at risk of social exclusion, such as those who are 'poverty plus' or have 'chaotic lives and multiple needs' (2006a: 76). Database devices that materialize this conception of the joined-up subject have been most significantly advanced and implemented in two key areas: child welfare and youth justice. I will thus focus on these examples in the remainder of the article.¹¹

The Integrated Children's System (ICS) – an e-social care record system and database for managing information on children who are or may be in need – is designed to collect and record a great amount of detailed information from different practitioners (social workers, head teachers, counsellors, police, health care workers and so on) and to predict children who may be at risk of abuse or potentially in need (Department for Children, Schools and Families, 2007). The data are

recordings of transactions and interactions between practitioners and children and their parents, including contact information, assessments, service planning and service review. The logic is that, by joining up data, children can be identified in relation to a combination of needs, an understanding that no one practitioner could ever possibly attain because the subject's relations and interactions are distributed among several service points. It is only by connecting and integrating the data that a child in need or potentially at risk of abuse can be made visible. Each child's combination of singular transactions with government agencies, when categorized (e.g. failing grades, non-attendance at school, criminal record), produces a metric or measurement of needs along a continuum from no additional needs, additional needs to complex needs.

The Youth Justice Board Management Information System (MIS) involves a similar conception of young people. Each local authority in England and Wales has a multi-agency Youth Offending Team (YOT), with representation from the police, the probation service, social services, the health service and education.¹² YOTs enter cross-agency individual-level data into the system and the data is then used to assess children and young people (10–17 years of age, what I will refer to as 'youth') and their likelihood of (re)offending. The MIS assembles biographical and transactional data (evaluations, assessments, interventions, judgments, sentencing) of young offenders compiled across distributed government sites: schools/colleges, police, general practitioners, health service providers, social services, housing, voluntary organizations, courts and so on. The data includes case-level information compiled by myriad practitioners (police, housing officers, social workers): offences details, court data (charges, sentencing), intervention records (e.g. assessments, plans, dates of contacts, outcomes), assessments of assets at various stages of contact (12 dynamic factors that are scored, such as living arrangements, education, lifestyle, substance use, emotional health), indicators of vulnerability and risk (based on a series of questions), restorative justice interventions, parenting interventions (meetings) and mental health and substance abuse interventions (referrals, assessments, treatments).¹³ Collectively, these constitute a series of metrics that measure the performance of youth in relation to myriad government services.

The two programmes and their related database devices are based on the logic that the subject is made up of unique combinations of distributed transactional metrics that reveal who they are and their capacities, problems and needs. An individual is not simply a child or youth, but rather a combination of needs and services. The population to which they belong is thus based on associations not so much with others but patterns in their transactions. Existing disadvantage, for example, is detected in relation to combinations of transactions for benefits, employment support, health care, mental health services, alcohol services, housing and supported housing, homelessness services, policing, prisons, courts and

drug services. Children and youth are discovered through combinations of multiple transactions that vary and change. In other words, new and emergent subjects can be discovered and made up by these technologies: the youth at risk of (re)offending or the child with complex needs. While similar kinds of subjects may have been previously identified, database devices introduce a change in criteria, detection and reporting that capture new people as part of these populations. Furthermore, they intensify individualization by assembling ever more and diverse metrics to specify subjects while identity management secures their continuity within their transforming and changing constitution.

Thus, rather than abstractions or disembodiments, these constitute particular materializations of both subjects and populations. The transactional metrics of subjects and their performance in relation to practitioners constitute a kind of 'surface' rather than determinist or causal understandings (Savage, 2009). But it is through the assembling of data distributed across distant government sites that patterns and associations in the performances of subjects are detected. Government sites and their contained data are thus 'folded' and brought closer together by and into the database device. Additionally, rather than transporting immutable mobiles to different sites to stabilize forms and relations and exert control from a distance (as conceived by ANT), it is an assembling device that gathers diverse and distributed elements constituted by heterogeneous arrangements and practices.

As such, the boundaries of government databases become permeable and what is assembled – included/excluded, present/absent, inside/outside – of the database device can vary and change. What 'makes up' the subject and the population, or what could be called the boundaries of the social, is thus mutable as varying metrics can be joined up, arrayed and correlated across sites and databases. Such arrays do not assemble all data but do so selectively and thereby create unstable patterns of absence and presence. Yet the biographical metrics of identity management provide a 'core of stability' (Law and Singleton, 2005) that enables governing sites to be brought close together. What then is mutable is the transactional metrics and relations between performances that make up the subject, and for social policy these are key matters of concern.¹⁴

In this regard, database devices are materializations of what Latour (1998) has called a traceable social that is rendered visible, not by extracting it from something else but by making it observable. ICTs are usually depicted as communicating information stripped of the encumbrances of social relations and location (Strathern, 2000). Rather, ICTs do not abstract and detach from the social only then to be put back into it but are part and parcel of the very relations that get materialized in data. Rather than occupying a 'space of flows' or a virtual information-alized world, data is itself a materiality that can be assembled in multiple ways by folding in heterogeneous data from distributed sites.

Such traceability does not reveal an overarching society but a multiplicity of links and orders made up of aggregations of individuals. In relation to populations such materializations are of course not new. Governments and social scientists have long produced materializations, from censuses and maps to other inscription devices. As such, the point is not that materializations are becoming more abstract but that social orders are being materialized in new ways and in specifically more traceable ways that are enabling the making and identification of new connections and the capacity to see populations being made and remade, to see populations as being composed and recomposed.

But so too is the individual subject being materialized in intensified ways, as a monad, a being composed of a 'vast crowd of elements' (Latour, 2010: 10) that only joined-up databases and their visualizations can identify.¹⁵ Both the individual and the population are beings beyond human perception and thus database devices are required to mediate and make them visible. What are those elements? They are the interactions and transactions of a child with government agencies and her/his identification as a child in need – that is, each child is an interiorization of a whole set of relations, interactions, assessments and evaluations, or what I have called metrics. The child does not occupy one subject position nor multiple subject positions but, in relation to government, is a multiplicity. And the population is an aggregation of individuals who are themselves also aggregations of multiple elements. What is assembled then is not the product of any one relation or performance but numerous ones such that the enactment of both the subject and population is more precarious, indeterminate and unpredictable.

This conception of the individual as a monad is suggested in the Transformational Government agenda (Cabinet Office, 2006b). It advanced the understanding that people rarely fall neatly into categories and associate themselves with different groups at different times depending on their particular needs, and so interventions must be responsive to their unique needs (Cabinet Office, 2005). Each person is conceived of as a singularity; not a member of a group or having a generalized group identity, but made up of a singular composition of performances that need to be guided and shaped. Database devices both materialize and intensify this composition while at the same time enabling it to mutate and change.

Governing: Singularities

In sum, patterns among transactional metrics are measures of the relative performance of children or young offenders who are not placed into categories of normality or abnormality. Categories are the disciplinary techniques that Foucault first described, which generally operate through classification schemes and statistics that categorize and organize

individuals into populations – the poor, the criminal or the delinquent – and govern through what Deleuze (1992) also described as spaces of enclosure such as the school and prison. However, as Foucault (2003, 2007) argued in his later lectures at the Collège de France, such technologies of discipline that concentrate and enclose give way to a positive power and technologies that expand, where '[n]ew elements are constantly being integrated: production, psychology, behavior', 'allowing the development of ever-wider circuits' which 'lets things happen' (Foucault, 2007: 45).¹⁶ It is an inventive power that works by inclusion and enables transformation and innovation through the interplay of coexisting government interventions (education, welfare, police and so on) that get materialized by the database device and 'whose effect will be greater than the sum of its component parts' (Deleuze, 1992: 3). That is, rather than a simple operation of addition, the database device is generative of new and emergent subjects and populations.

Importantly, it is through 'fine-grained' individualization and what Foucault described as 'a series of fine and constantly observed differences' (2003: 46) that differential normalizing is achieved. This is the ontology of the subject that the database devices materialize, as a monad made up of complex, unique, dynamic and always varying metrics. While children can still be generalized into patterns of likeness or similarity, immense detailed data on them is maintained and linked to a pattern. In this regard there is multiplication and complexification rather than simply the generalization of the individual into a category. Rather than a series of categories, children are located along a continuum of need where various services and interventions can be said to 'co-exist in one and the same modulation' (Deleuze, 1992: 5). Amoores and de Goede (2008) develop a similar argument in relation to security practices where transactional data is used to classify people not in relation to categories but according to degrees of differential risk. At the same time, such devices seek to 'hold' the individual in relation to the whole population by maintaining his/her specificities and variations, and making these traceable and visible. The population is the aggregation of these specificities and variations, such that each child occupies a singular point within the pattern of needs of the 370,000 children in England and Wales (statistic cited in Shaw et al., 2009).

These devices thus work vitalistically – they aggregate individuals to assess the relative health of a population (the number of children with different degrees of need or the number of youth at risk of (re)offending). This is of course the general problematic of governing, which is to know the nature and then govern and regulate the forces of the whole, that is, the population, the referent object of biopolitics (Foucault, 1997). It requires specific totalizing procedures – that is, techniques that can constitute an entity out of various individual parts – all the rates, profiles, patterns and probabilities necessary to manage, regulate and maximize

the potential of a changing population (Dillon and Lubo-Guerrero, 2008). The social policy programmes mentioned above and the database devices in question seek to do so and to maximize populations: to identify and target a population of people who are socially excluded or at risk of being so; and to protect children by sorting them into categories of need and intervening in their development. Such identifications are then the basis of governing which seeks to prevent an increase in the number of certain kinds of people (socially excluded, abused child, teenage mother, youth offender).¹⁷ That is, once identified as a probability – children at risk of abuse or youth at risk of (re)offending – then individualizing interventions can be defined. In this regard, susceptibility is not identified following a logic of induction or deduction but instead abduction: through patterns in joined-up data probabilities, reasonable speculations and precautionary principles lead to the identification of possible kinds of people.

In this way biopower and governing are integrated: the former track, regularize and manage populations and the latter guide and shape individual bodies (Foucault, 1980b). For while identification is based on a person's metrics, interventions consist of tailored and individualized rather than collectivized strategies. The individual may be generalized to become part of a population (totalizing) but at the same time her/his singular identification or 'fine-grained' individuality is maintained, thus opening her/him up to singularized governing interventions (individualizing).

This is the logic of 'modernising of public services', which involves defining personalized packages of public services (Office for National Statistics, 2005). People are conceived as passive recipients of packages of services formulated from distributed data about them and targeted to meet their needs but not seen by them.¹⁸ It is multiple transactions and their performances in relation to government services that reveal their problems and needs. Metrics are not based on a causal model but on patterns, regularities and a surface of interfaces and connections between measurements of what people do.

But targeted government interventions further generate varying and unstable relations. Metrics are a 'species of nominalism' (Hacking, 2007: 294) whereby being classified and named a 'child with complex needs' is only part of the dynamic. In addition to the experts and technologies of identification and their diagnostic practices, bureaucratizing practices then intervene to guide and shape and sometimes 'correct' people. Ian Hacking, in his many writings, has argued that both processes are involved in 'making up people': a new metric can bring into being a new conception and experience of a way to be a person. Furthermore, there is a 'looping effect', a process by which a metric may interact with the people through governing interventions that reinforce the 'identity' of a person so discovered (Hacking, 2007).¹⁹ Because of these two processes,

people are moving targets: metrics interact with people and change them and since they are changed they are not quite the same kind of people as before. Thus as people change metrics also change and become modulating such that populations are in a constant process of differentiating. Database devices thus also evolve alongside the performances of individuals and are not separate from them such that the technique and people are co-constituting. Hence, rather than a fixed shape and pattern of social structures and differentiations, populations are modulating differentiations. This challenges the usual way that population is understood, as consisting of people with different traits and behaviours that can be identified, categorized and governed. But this also means that governing interventions must also modulate and change in relation to 'moving' people. Not only must interventions be personalized and individualized, they must also change in relation to the changes that they have in part constituted.

Governmental Topologies

The foregoing is a conception that does not simplify but constitutes what Deleuze called a 'complicating machine' (Rajchman, 2000). But it is not complicating because of the availability of large volumes of digital data, the computational power of computer technologies and the myriad socio-technical relations that make them up. Rather, it is complicating because database devices materialize and intensify a conception of subjects and populations as always coming into existence through sets of modulating transactional metrics and relations where change is immanent in conduct. It is transactional metrics that differentiate and are productive of who people are and it is through their performance, or doing, that individuals and populations are registered and identified. The usual categories of sociological and social policy interest such as 'group identifications' or 'backgrounds' (e.g. ethnicity, religion, class, gender) and causal and depth models give way to 'surface' phenomena such as descriptions of patterns, links and regularities in conduct (Savage, 2009). The former are relatively fixed (date of birth, place of birth), or change slowly and predictably (age), or can be captured in subjective identifications (ethnicity) and constitute the relatively immutable elements of identity management. However, transactions change, and so metrics modulate as they track, measure and evaluate performance. The transactions of individuals dynamically constitute population, and it is relations between rather than detailed descriptions of transactions that matter. The object of interest is thus not the substantive elements of culture but their links and transformations, not some essential properties but instead relations (Lash and Lury, 2007). So while capturing identity preoccupies techniques such as censuses, joined-up administrative databases locate differences in relation to multiple registers of conduct that define both who

people are and who they are possibly becoming. In this regard, population metrics are akin to what Rogers (2009) has called 'post-demographic'.

In the introduction I specified a set of properties of topological analytics for understanding the database devices described above and the subjects and logics that they enact. With these analytics I argued that they constitute a social space by assembling and folding in dispersed data to generate heterogeneous and changeable mixtures of varying metrics and relations. At the same time, they enact individuals as sets of stable properties or identifiers such that subjects can be traced and tracked and understood as always in the process of changing and becoming. Transactions are the transforming and informing of who people are and their joining up constitutes metrics that evaluate and measure the performance of individuals and populations. But metrics and governing interventions are also dynamic and redefined and reformulated and deformed as a consequence of the looping effect between names and the named.

But rather than being 'new' it is an ontology of the subject and governmental logic that perhaps only now can be materialized and intensified through and with a database device. For Latour (2010), it is the ontology of individuals and the social that was advanced by Gabriele Tarde in the 19th century. While Durkheim sought to understand the individual in relation to the whole of a society and structuring social laws, Tarde sought to follow individual monads and their formation into aggregates and multiple social orderings. Latour argues that it was in part a lack of information and the incapacity to grasp the multiple and complex qualities of individuals and their aggregations that resulted in the dominance of the Durkheimian understanding rather than the Tardean conception of the social. Now, with the proliferation of digital data and devices, he argues that Tarde's conception can be realized. I am not interested in the Durkheim versus Tarde debate, nor in recovering Tarde for sociology, but rather how this understanding is useful for interpreting the relation between devices and governing logics. Database devices make it possible to materialize a conception of population as a space of relations consisting of multiple aggregates of individuals with fixed metrics (biographies) along with complex and always-varying ones (transactions, conduct). This is not a conception determined but rather intensified and materialized by information technologies. Similarly, it is a materialization and intensification of what Foucault called the 'fine grain of individuality' and the singularity of the case (2003: xxii) and of a government logic elaborated by Deleuze (1992) as modulating control.

To conclude, by deploying topological analytics I have argued that database devices enact and advance a particular conception of subjects and governmental logic. Other analytics are certainly possible.

For example, in relation to youth justice database devices structuralist analytics advance the argument that risk assessments obscure and aggravate existing social inequalities; actuarial analytics identify the problems of individual interventions based on inferences and population-wide probabilities; managerialist analytics establish the shortcomings and failures of risk criteria and scales; and political analytics identify discriminatory and human rights consequences of risk assessments based on what youth might do.²⁰ I have also noted different social theory analytics such as Foucault's *dispositif* or Latour's actor-networks. But rather than offer topological analytics as an alternative perspective, I adopted an ontological stance to argue that different reals are enacted by different analytics. It is a stance that understands phenomena as already and always multiple and complex, and does not deny other possibilities but positions these as questions of 'ontological politics' (Mol, 1999). All analytics order and enact the world in ways that make some elements and relations present while absencing others (Law and Singleton, 2005).

What elements and relations do topological analytics make present? Principally, they emphasize variable, unstable and modulating relations, uncertainty, permeable boundaries and abduction as *immanent* rather than *exceptional* qualities of database devices. While there have been numerous critiques of neoliberal strategies, little attention has been paid to how databases and new analytics are advancing an ontology of subjects and populations as sets of unstable, transforming and generative transactional relations, and likenesses and identifiers of who they are and 'of a potential future person yet to come' (Amoore, 2009: 18).²¹ Instead, social science analytics remain fixed on categories of identity and techniques of better knowing and governing the subject. However, not only government but also commercial, social and political practices involve the enacting of multiple forms of association and identification that are more variable, unstable and modulating than 'older' forms of identity. This is what topological analytics capture. Government database devices intensify these qualities through what Foucault described as dividing practices that extend through 'ever-wider circuits' (2003: 45) and 'series of fine and constantly observed differences' (2003: 46). Such differential practices are materialized and intensified by database devices, which are constituted by and generative of uncertainty and instability in both how the subject is known and governed.

To conclude, if managerialist analytics attend to how governing practices are deterministic and aim to stabilize forms and relations, then topological analytics start with the assumption that 'the world is messy' and that 'we cannot know it by insisting that it is clear' (Law and Singleton, 2005: 350). Or, as Mol et al. have stated in relation to care practices, 'we do not bracket *failure* and *fragility*, but face up to them' and learn to live 'with the erratic' (2010: 10, emphasis in original). By adopting these presuppositions I am not claiming that topology offers a

better analytic (and indeed I have emphasized that analytics are not perspectives on but enactments of objects and subjects). Instead, it makes qualities such as fragility and uncertainty present and thereby opens up a different line of inquiry and set of questions about the governing consequences of database devices. Here I will suggest a few. If complexity, uncertainty and instability are understood as intrinsic rather than indications of system failure, then what does this mean for practitioners who must take decisions? Do these qualities demand more rather than less human judgement and intervention? If the identity of people is mutable then does this open up or close down the capacity of subjects to intervene in their identification? Are they rendered more passive or does uncertainty afford them opportunities to challenge or confound identification?²² In other words, topological analytics turns our attention to questions of how practitioners and subjects work with rather than seek to tame complexity and instability and the possibility that these elements are not exceptions but givens and part and parcel of a governmental logic and ontology of subjects.

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Notes

1. Wal-Mart estimate from Hays (2004) and Tesco estimate from Andrew Fearn, presentation at the 'New Populations' workshop, Open University, Milton Keynes, 30 April 2009.
2. At the time of writing, the Conservative-Lib Dem coalition government had scrapped Identity Cards and the ContactPoint children's database.
3. NPfIT started in February 2002, with the goal of replacing all NHS computer systems with a new centralized system. Since April 2005, it has been run by an agency of the Department of Health called Connecting for Health (CfH). According to some assessments, 'NPfIT is in serious trouble with systems being delivered years late or not at all', and there are many 'public concerns about the safety, privacy and functionality of a number of systems' (Anderson et al., 2009: 12). In August 2011, after a major review by the Cabinet Office, which found progress to be 'dismal', the project was taken over by the central government's IT team with the objective of shifting 'elements of NHS IT into the "common ICT infrastructure" envisaged for the whole public sector' (Cross, 2011).
4. The terminology of 'technical and managerialist' analytics is from Law and Singleton (2005).

5. See Savage and Burrows (2007) and Amoore and de Goede (2008) for discussions of how transactions have become key registers of identification in commercial and border management security practices.
6. Law and Singleton (2005) cite several examples of empirical case studies that have shown how such stability does not hold in practice, such as de Laet and Mol's (2002) study of how a water pump used in the villages of Zimbabwe is a mutable mobile.
7. Government records can contain data on a person's history of bankruptcies, tax liens, civil judgments, criminal background, civil litigation histories, outstanding warrants, professional licences, records of property and land ownership, marriage, birth and divorce records, and business licences.
8. For examples, see arguments in Cabinet Office (2005) and Department of Health (2008).
9. Under New Labour, the UK government began to consolidate these into a single government identifier through the Identity Card and National Register. However, the Conservative-Lib Dem coalition government scrapped the programme and alternatives are being investigated, such as joining up identifiers used by the Identity and Passport Service (IPS), Department for Work and Pensions (DWP) and the Driver and Vehicle Licensing Agency (DVLA).
10. For comparison to joined-up databases used in border management see Amoore (2006).
11. Versions of these database devices are continuing under the Conservative-Lib Dem coalition government.
12. The most common version of the MIS is the electronic Youth Offending Information System (eYOIS), which is used by almost three-quarters of YOTs and designed by the software company CACI. The eYOIS enables data exchange between independent systems, electronically and in 'real time'. It assembles data on multiple events, relations and transactions of youth with distributed justice and social welfare offices to manage interventions and evaluate their risk of (re)offending.
13. See Youth Justice Board (2010) *YOT Data Recording Guidance*. In 2009/10, there were 157 YOTs: 139 in England and 18 in Wales (Youth Justice Board, 2010). On 14 October 2010 the Coalition government announced the Youth Justice Board would be abolished and its functions moved to the Ministry of Justice. The practices and uses of the MIS have been retained.
14. For example, Bateman (2011) notes how a youth justice database device called Asset assembles different metrics about youth to establish categories of youth at risk of (re)offending. Minor adjustments to the metrics can significantly change the numbers of youth falling into different categories of risk and thus the assessments are 'sufficiently loose' and alterable.
15. This understanding of monads draws from Leibnitz's formulation as taken up by Bruno Latour (2005, 2010) and Chunglin Kwa (2002).
16. See Amoore and de Goede, who take up this distinction in relation to a security practice that 'preempts, visualises and opens to circulation' (2008: 174).
17. See Ian Hacking (2007) on the making up of 'kinds of people'.
18. As described in Sir David Varney's report on service transformation (Varney, 2006).

19. Through examples such as autism, obesity, child abuse and multiple personality disorder, he argues that a number of practices constitute 'engines of discovery' in the making up of people. These include practices of counting, quantifying, setting norms and establishing correlations.
20. These critiques have been made of youth justice risk-led practices that tailor sentencing to fit with the unique circumstances of the individual (also referred to as the 'scaled approach') and outlined by Bateman (2011). Rather than what youth have done, risk assessments are based on what they might do. Risk assessment is carried out through a database device called Asset, which assembles different metrics (or what is called 'ratings') about youth such as their living arrangements, family and personal relationships, education, training and employment or substance misuse. By adding up these metrics an overall risk score rather than the seriousness of the crime committed is used to determine a corresponding sentence.
21. For examples of arguments about the neoliberal logic of government databases see Bellamy et al. (2005) and Henman (2010).
22. See for example the discussion in Ruppert (2011) with regard to how database devices render subjects interpassive.

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Evelyn Ruppert is an Open University (OU) Senior Research Fellow with the Centre for Research on Socio-cultural Change (CReSC) and co-convenes the Social Life of Methods theme. She also co-directs the Enactments Programme of the OU's Centre for Citizenship, Identities and Governance (CCIG). Her work is in the sociology of governance and explores how methods of enumeration such as censuses and administrative databases enact populations and make particular forms of power and intervention possible.