

When Numbers Run Out: Civil Registration and the Performativity of Methods

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Abstract

In the early 2000s, authorities in Sweden and Denmark recognised that their personal identification numbers were about to run out but followed different interventions to resolve the same issue. In this paper, I start from these cases to analyse personal identification numbers as methods for knowing and governing populations. I draw on two assertions from the study of methods within STS: Methods are performative, and they produce multiple objects and realities. I demonstrate how such identification numbers enact individuals and populations simultaneously, and I identify a fundamental tension between them: one emphasising the representational potential of the part and another favouring the coherence of the whole. I conclude that issues surrounding personal identification numbers in use across all Nordic countries can be traced back to a fundamental tension in addressing individuals that is impossible to resolve via technical modifications, although those interventions are crucial for keeping the systems operational.

Keywords: Identification, Numbers, Civil Registration, Methods, Performativity.

Introduction

In 2009, the Swedish government recognised that they were about to run out of numbers. The *personnummer* (personal identification number), originally introduced in 1947 and currently used in nearly all citizen-state interactions, was nearing capacity and would soon be unable to represent people born on certain dates. The problem was connected to the inclusion of the date of birth in the number itself: because some dates of birth were overrepresented in the Swedish population, soon there would be no more space left to register new people.

On 29 January 2009, the government proposed a change in the civil registration law to the parliament (SR, 2009a) to resolve the looming issue. Instead of assigning the exact date of birth, they suggested that personal identification numbers would be generated using an adjacent available date in the same month as the birth date of the individual. Following a debate in the parliamentary chamber, the proposition to change the civil registration law was accepted on 25 March 2009 (SR, 2009b)¹.



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This lack of addressing capacity was not a problem unique to Sweden; the neighbouring state of Denmark, which uses a similar personal identification number called *CPR-nummer*, had already encountered and resolved the same issue in 2007 (CPR, 2021). However, their solution did not require modifying the date of birth. Instead, the structure of the four digits that follow the date of birth was changed, creating more address capacity while preserving the accuracy of the date of the birth.

Minute modifications involving technical details of civil registration technologies such as those I present above might appear trivial, but due to the ubiquity of the personal identification number in both Denmark and Sweden, these small changes had much more significant consequences for not only the residents who carry such numbers, but also for the branches of public administration who rely on the accuracy of the numbers.

The crucial point is that these kinds of identification numbers, used by not only Sweden and Denmark but all Nordic countries², are not simply for tools for civil registration. They have become *de facto* identifiers in many everyday tasks. Picking up prescription medicine at the pharmacy or accessing the loyalty programme of a supermarket chain might involve typing in the personal identification number, or the final four digits of the number might be used as the code for a keycard to access a storage locker or to enter the gym. Signing up for a mobile phone contract often requires one to present such a number, and for those who do not have regular personal identification numbers often encounter new challenges when laws surrounding the numbers change (Garcia, 2022).

As such, for nearly everyone who holds a Swedish *personnummer*, the Danish *CPR-nummer*, or the Nordic equivalents, the idea of having a different date of birth in their number would be at the very least surprising and it is likely to be outrageous for many. So, how did Sweden end up here, and how did Denmark avoid it? The answers to those questions are surprisingly pertinent for STS scholarship as they reveal much about the performative potentials of identification methods.

On the everyday use of Nordic identification numbers

In the Nordic countries, an identification number is assigned to every citizen at birth. And to those born with one, this identification number is an unremarkable construct: a number that everyone has, and that everyone has always had. Over the last five years I have bothered many friends and colleagues who were born with the number by asking them whether they could remember the first time they wrote their number down, or the first time they got it wrong. Almost none of them could point to a specific moment, although many guessed that it must have been early in primary school. Of course, this says as much about my age and location as anything else: The vast majority of those I have spoken to were born in Sweden after 1960. Since the four digits were introduced in Sweden in the late 1960s, anyone born around or after that date is likely to remember the number as an unchanging entity. Just two of my older colleagues, born in the early 1950s, could remember a time before the four digits were added to their numbers.

In contrast, those who receive the number later in life—for example by moving to a Nordic country to study or work—often find it novel and sometimes even shocking due to its ubiquity, but partially also because the number really does make many things more convenient. Booking a doctor's appointment is easier, picking up medicine from the pharmacy is easier, opening a bank account easier, even renting a flat is easier, once the newly arrived resident is in possession of a personal identification number. Not only that, but the ubiquity of the number in everyday life is rarely remarked upon aside from moments of malfunction or rupture, as befits any infrastructure. Unsurprisingly, these friends and colleagues who moved to Sweden later in life could provide much more specific answers about when they had first written down their number ("as soon as I opened the letter from the tax office"), and the first time they had gotten it wrong ("the first time I tried to say it out loud").

There is of course a third category: Those who have never had such a number. For them, whom I have spoken to most often at conferences, the number tends to invoke the spectre of the surveil-

lant state out of control—again, mostly an indication of the kinds of fields I work in rather than any sort of a representative sample—and there is much substance to their critique. The histories of numbering people in Europe are fraught with the worst excesses of violence committed by states against their own citizens. The literature on the topic is vast, and the surveillant capacities of new technologies for tracking and recording the daily lives of individuals for the purposes of social sorting, whether in service of the state or in the hands of multinational corporations, should give us all pause (Ball et al., 2012; Gilliom, 2001; Lyon, 2001; Monahan, 2013). However, my goal in this paper is not to argue for what the Nordic number should or should not do, but rather to demonstrate what it does in action.

In this paper, I analyse the Swedish and Danish personal identification numbers as methods for knowing and governing populations. To do so, I draw on two assertions from the study of methods within Science & Technology Studies: Methods are performative (Law, 2004), and they produce multiple objects and realities (Mol, 2002) Through my analysis, I demonstrate how such identification numbers enact individuals and populations simultaneously, and I identify a fundamental tension between them: one emphasising the representational potential of the part and another favouring the coherence of the whole. I conclude by arguing that issues surrounding these Nordic identification numbers can be traced back to a fundamental tension in addressing individuals that is impossible to resolve via technical modifications, although those interventions are crucial to keeping the systems operational.

Nordic identification numbers

While most countries across the world use some form of tax identification number for administrative purposes (OECD, 2021), and many other European states assign unique identifiers to the whole population beyond taxation purposes, the Nordic³ identification numbers have several properties that allow us to understand them as a ‘family’ of numbers. The first similarity is their syntax. They all begin with the date of birth, sometimes include a separation symbol—usually a dash, occasion-

ally a plus sign—and end with four or five digits, the assignment of which follows relatively similar rules across the five countries⁴. Equally significant is the similarity in their everyday usage in that they tend to appear in encounters with non-state institutions and companies just as much as they do in the context of civil registration. Finally, in all Nordic countries, the unique identification numbers assigned to citizens and residents remain with them for life.

These numbers are highly useful from the perspective of the state, as they allow for the generation of accurate statistics on the population, especially when combined with a system for the registration of births and deaths in a timely manner. Employment, welfare, migration, and education are all governed with the help of identification numbers in the Nordic countries. As such, these numbers have been of interest to statisticians and epidemiologists (Ludvigsson et al., 2009) due to the key role that they play in state-held registers which are highly valuable for research in both disciplines. Beyond these two groups, the last decade has seen a steadily growing interest in understanding the number from humanities and social sciences perspectives. Notable publications have covered the history of the number in Iceland (Watson, 2010), Denmark (Krogness, 2011), and Sweden (Paulsson, 2016), while two master theses have provided interaction design-centric histories of the number in Norway (Frestad, 2017), and Finland (Wessman, 2018).

In a study of the history Danish population registers and the CPR number, Bauer (2014) describes how the personal identification number moved from its role as administrative infrastructure to a biomedical resource used for population health research. Drawing on previous scholarship on studies of calculation, the history of statistics, and science studies perspectives, she argues that population data do not merely represent populations but act as infrastructures that produce populations. This key infrastructural role is also emphasised in Nordfalk and Hoeyer’s (2020) analysis of a failed system for citizens to opt out of register-based research in Denmark.

In line with Verran and Lippert’s (2018) observation that numbers often feature in STS scholarship, Tupasela et al. (2020) highlight the role of iden-

tification numbers across the Nordic countries in their analysis of the emergence of a “Nordic data imaginary” where health and welfare data collected by the state is shared with the private sector to boost economic growth. Alastalo and Helén (2021: 16) take the Finnish personal identification number *henkilötunnus* as their object of analysis when they argue that the number “epitomizes an intersection of political practices of governing people and advanced data management technology” and acts as a means for the state to both care for their citizens and to control them.

The performativity of identification methods

To claim something is “a method” is to say that it obeys a set of rules for organising knowledge, that it orders some things in a certain way while othering the rest. In studies of method in STS and related fields, previous work has established the notion that methods are performative. They do “not only describe but also help to produce the reality that they understand” (Law, 2004: 5), and they enact multiple objects and realities (Mol, 2002). These multiple objects and realities do come into conflict with one another; occasionally “one reality wins” (Mol, 2002: 53–86), and at other times they co-exist in tension with one another. They also come with their own experts, and the institutions that uphold the validity of the method.

There are two key moments in understanding how methods enact realities. As Lury and Wakeford describe:

“Our proposal, then, is that the inventiveness of methods is to be found in the relation between two moments: the addressing of a method – an anecdote, a probe, a category – to a specific problem, and the capacity of what emerges in the use of that method to change the problem.” (Lury and Wakeford, 2012: 7)

The moment when a method is applied to a problem, and how the problem changes because of that application are both crucial to understanding the consequences of methods. Focusing on these two moments does not imply that the prob-

lem itself exists independently of the methods; the moments themselves are simply analytical tools to help us bracket a process so that it can be understood. The inventiveness of methods, as a way of studying methods is itself an invention, as also expressed by the notion of “the double social life of methods” (Law et al., 2011).

Connecting these perspectives to identification and state practices is the notion of subjectivation; methods shape the subjectivities that we all inhabit, for example in how subjects are brought into being by methods used by the state such as the population census (Ruppert, 2011). Understanding methods as forces of subjectivation (Cakici and Ruppert, 2020), that is, socio-technical arrangements that configure the agency of subjects to act, allows us to seek how social and political subjectivities can arise from the technical features of identification methods. In relation to Nordic identification numbers, the date of birth and the following digits each codify assumptions about the size of the population, its rate of growth, as well as about age and gender, which I describe in greater detail in the following sections.

Methods contribute to the construction of the objects they set out to study, but this is not to say that methods of population statistics are the only devices for creating subjects; rather, as with many other devices, they have the potential to construct new subjects as they claim the population and the individual as their objects.

This process of construction is nowhere clearer than in the domain of expert practice as made visible in the reports, papers, and regulations (Hull, 2012; Mathur, 2016; Mitchell, 2002). Personal identification numbers construct a site of intervention for policies that target subjects as unique individuals. This site is then accessible by other knowledge practices, whether in the name of state policy, e.g. the population census, or individual taxation, or for private enterprise such as linking a mobile phone contract to a personal identification number. It serves a dual-purpose in that it allows the formation and addressing of groups based on the properties of the number (“everyone born on May 18th, 1998”) or in the addressing of individuals separately (“the person assigned the number 19560101-0101”).

It is not only external actors that intervene in the site of the personal identification number; self-conceptualisations also find their realisation in the very same site. The individual indicators of date of birth and legal sex at birth are both concerned with specific bodies, and both have become sites of contestation that are also targeted for intervention by the state.

In short, the composite form of the personal identification number as a date of birth followed by a set of identifying digits brings into being a unique method; one that gives rise to interventions that can target parts as individuals and wholes as the total population. It is in relation to these perspectives that I analyse Nordic identification numbers as methods that enact populations.

Identification and categorisation

Nordic identification numbers are but one example of a highly diverse group of identification methods. Earlier research on identification and registration has established the importance of these methods for knowing and governing populations (Anderson, 2015; Hacking, 1990; Ruppert, 2014), as well as its many risks when it comes to ever-expanding surveillance of subjects (Kertzer and Arel, 2001; M'charek, 2000; Nobles, 2000). These activities can be understood as attempts to make society and people legible to the state, and constitute central problems of statecraft (Scott, 1998).

Numbers have always played a prominent role in the exercise of state power in this manner. The history of statistics and its methods for handling uncertainty have been widely studied as social accomplishments (Daston, 1988; Desrosières, 1998; MacKenzie, 1981; Porter, 1996; Stigler, 1990). In this sense, numbers are the foundation on which contemporary states are built, whether in creating populations by counting them (Hacking, 1990), exercising power through experts (Mitchell, 1991), or shaping people and territory from a distance (Scott, 1998).

Since the origins the modern state dovetail with that of centralised identification systems, both seemingly mundane technologies such as identification cards (Caplan and Torpey, 2001) as well as biometric technologies and new infrastructural projects have been the focus of scholarly

attention. Bennett and Lyon (2008) collect the diverse implementations of this identification technology in different geographies and through different technologies. Spektor (2020) describes a case where concerns about security seek to both mobilise and oppose new identification technologies, while Thiel (2020) highlights the role of interoperability in public debates and political decisions surrounding identification infrastructures, and Singh (2019) argues for seeing such technologies as translations that distribute accountability and control across bureaucracies.

Scholars have studied issues of categorisation and identification as performative methods. Grommé and Scheel show how statistical identity categories for migrants and minorities constitutes a site for the enactment of national identities, therefore bringing into being more than just the groups that they name (Grommé and Scheel, 2020). The changing objects and enacted realities also affect the method itself. For example, Dagiral and Singh (2020) show how digital identification infrastructures in France and India are changing the relationship between the state and the citizen by making each legible and accountable to one another in unforeseen ways. Moreover, Pelizza has argued that by viewing identification as performative, we can also see beyond the notion of identification as nothing more than a flawed representation; performativity foregrounds the process of translation and makes visible both the limitations and the materiality of the process (Pelizza, 2021). This focus on materiality also highlights the role of routine practices and social relations of humans which are often essential to the stabilisation and regular functioning of digital identification infrastructures (Chaudhuri, 2019).

Studying identification numbers

In my analysis of identification numbers, I draw on official reports and information published by state institutions in charge of the identification number systems in the Nordic countries. Typically, these are the tax offices and statistics agencies, but also include institutions that are specifically responsible for the administration of the number, for example *CPR-kontoret* (the Danish central person registry office). When describing instances

of numbers running out and the change in civil registration law, I have also made use of Swedish parliamentary records from 2009, as well as news articles that reported on related issues in Sweden and Denmark between 2010 and 2022. Finally, I have used reports and guides published by *Skatteverket* (the Swedish Tax Agency) and *CPR-kontoret* when explaining the internal structure and the technical details of the personal identification number systems. I sorted the documents into three categories (parliamentary records, expert reports, and news), labelled according to country of origin, publishing institution, language, and publication date. Then, I developed a coding frame based on registration of life events which resulted in three themes relating to events (birth, death, migration), and four themes related to features of civil registration systems (population register, identification number, syntax, semantics). While this coding frame did not necessarily map the documents to a singular timeline, in the following sections I present the various parliamentary debates, reports and changes in law in chronological order for clarity.

As I described in the introduction, both Denmark and Sweden faced the problem of running out of personal identification numbers. In Sweden, the solution was to change civil registration laws to allow for numbers not matching the date of birth to be assigned to citizens and residents in 2009. In Denmark, the problem arose earlier due to the smaller representational capacity of the number, but their solution involved changing the internal structure of the number. Importantly, it is these very structures that encode assumptions about the world that the number inhabits, and changing one is to change the other as well. However, to understand the social and political implications of the internal structure of the number, we first need to understand how the personal identification number is constructed in the Nordic countries.

Making Up Numbers

Despite the name, the Nordic personal identification number is in fact a composite of several numbers that obey different rules. The first sequence is the date of birth where digits denote the day, the month, and the year. The second sequence

of four or five digits are primarily used to distinguish between different people born on the same date, but throughout the history of the number they have been used as indicators for the region of birth, the legal gender, checksum (error detection), and even whether the bearer belongs to the royal family.

As an example, if a person born on 30 October 2022 were to be issued a *personnummer* in Sweden today in line with the Swedish guidelines (Skatteverket, 2021), the number might look like the following:

20221030-5013

If the same person were to be issued a *CPR-nummer* in Denmark, according to the Danish guidelines (CPR, 2021) they might receive the following number instead:

301022-4127

The numbers look similar aside from the difference in how the day, month, and year is represented. The former is in YYYYMMDD order using eight digits, while the latter is in DDMMYY order using only six digits. The date is followed by a dash to separate the suffix comprising four digits. By combining the date of birth with four additional digits, it would be possible to uniquely represent up to ten thousand individuals per day—or 3.6 million per year—in the absence of any other constraints, but in practice the four digits are used for other purposes as well, and the representational capacity is significantly smaller.

Regardless of the exact capacity, however, this kind of structure comes with an assumption of how about many people are likely to be born on any given day, and how that might change in the future. What the designers of the number must have had in mind for the kinds of numbers used in the Nordic countries were expectations of a certain population; closer to ten million rather than one billion. In other words, embedded in the design of the number itself is a population projection based on the assumption of sustained reproduction. Such political visions are often built into infrastructure, as Bowker and Star (2000) have also argued, and the Nordic identification number, in its capacity to act as an addressing infrastructure for the state, is no different.

The other feature shared across all Nordic identification numbers is the use of the date of birth based on the Gregorian calendar. Using the calendar for the registration of births is not unusual by any means; the right to birth registration is contained in the United Nations Convention on the Rights of the Child, Article 7 (UN General Assembly, 1989), and for most birth registration systems this means recording the birth event together with the date of the event. In Sweden, the calendar provides yet another link between dates and individuals through the tradition of a name day, itself a remainder of the calendars for the “saint of the day”, that is, the association of specific dates with specific names of saints.

When numbers run out

It is currently possible to be assigned a personal identification number that differs from your actual date of birth in Sweden, because numbers for some dates have already run out. The reason for the limited capacity of personal identification numbers is in how they are generated from using the date of birth, but to understand how such numbers could possibly run out, we need to understand two other factors that contributed to the issue.

The first is migration to Sweden from other countries: Since the Swedish number can only address one thousand people per date of birth (in practice this number can be slightly lower due to reserved digits), and numbers are rarely released even if people move out of Sweden, it is possible to see how some days could come close to maximum capacity; extremely unlikely, but theoretically possible. Note that the number can represent approximately 36 million individuals per century (assuming a lifespan of a hundred years) and birthdays tend not to be uniformly distributed, i.e., some months tend to have more births than others; under these conditions more than one thousand people resident in Sweden could share the same date of birth for a given day. However, this is highly unlikely given the current population of Sweden⁵. In fact, a Statistics Sweden report published in 2016 estimated that approximately 300 numbers out of one thousand are claimed for each date under regular conditions (SCB, 2016).

The second factor that led to numbers running out was the decision to assign arbitrary dates of birth to people arriving in Sweden if they did not possess the kind of documentation recognised by the Swedish Migration Agency. If someone arriving in Sweden either did not hold an identification document that indicated the date of birth, or if the document itself was not recognised as a legitimate document by the Migration agency, then the individual in question was assigned either January 1st or July 1st as their day of birth, depending on which half of the year they declared their date of birth in. The required conversions from the Hijri calendar to the Gregorian calendar may have also played a role in this decision, as noted by one Skatteverket employee interviewed by Sverige Radio in 2019 (Boucheloukh and Axelsson, 2019). This decision gradually led to irregularities in population statistics, initially concentrated around certain years in the 1970s and 80s, as January and July 1st both seemed to indicate days where the number of births were higher than in the rest of the year (SCB, 2016: 18). However, a more serious problem soon arose: Since the personal identification number can only address a theoretical maximum of one thousand people per day, the artificial birth date assignments eventually exhausted the available supply of numbers for January 1st and July 1st of certain years. The issue was initially addressed by multiple state institutions in a series of reports and followed by a change in the civil registration law in 2009 (SR, 2009b) which allowed for personal identification numbers to be generated using an adjacent available date if the exact date of birth happens to be unavailable in the system.

As I discussed in the introduction, this lack of addressing capacity was not unique to Sweden. A similar problem was also recognised in Denmark in the early 2000s. A common feature of the Swedish and the Danish identification numbers is the use of an independent checksum digit within the number that allows for error control⁶. The trade-off is that such a feature also uses up a digit that could otherwise be used to increase the addressing capacity of the number. It is this feature that was removed from the Danish identification number on October 2007, resulting in an

increase in the addressing capacity by a factor of ten (CPR, 2021).

In short, the Swedish and Danish authorities faced similar problems of identification numbers running out but settled on different technical solutions to increase the addressing capacity of the numbers. In the Swedish case, legislation allowed for people to be assigned personal identification numbers that do not match their date of birth, therefore allowing the dates that fill up to overflow into the next available date. In the Danish case, the removal of the checksum functionality increased the capacity of the number by a factor of ten, preserved the accuracy of the date of birth, and resolved or at least postponed the problem for several decades.

Discussion: The socio-politics of numbers

While the modifications to the Swedish and Danish identification systems I outlined in the previous section may appear minor, the scope of these technologies—national identification numbers that cover the whole population—spread their consequences far and wide.

In the Swedish case, it became possible to assign people personal identification numbers that do not match their date of birth, even when their actual date of birth is recognised by state authorities. Thus, the personal identification number is no longer a completely reliable indicator of the date of birth. Admittedly, this group is likely to make up a fraction of the population, but the undoing of deep-seated assumptions about the factuality of numbers still creates problems for other systems that rely on those numbers⁷. We can easily imagine an example where a form requires someone to submit both their personal identification number and the information on their passport. If the date of birth on those two do not match, a form-checker might easily throw up an error or outright refuse a form. Similarly, a border control agent unaware of the minutiae of Swedish personal identification numbers might suspect the individual of wrongdoing due to mismatches birthdates in the provided documentation. In fact, this was exactly the case that was reported by SR in 2019 that I cited earlier where a Syrian citizen

with a Swedish residence permit was stopped and questioned at the Greek border while returning from vacation (Boucheloukh and Axelsson, 2019).

In the Danish case, the consequences become apparent in a longer chain of dependencies. Since the checksum digit was repurposed to make space for additional numbers, any systems that relied on the previously intended functionality of the checksum⁸ erroneously started flagging some numbers as invalid after the change. The problem was sufficiently widespread that the CPR office was required to make a public statement declaring that “even though CPR office has been asking since 2007 for IT systems to be built to handle numbers that do not contain the modulo 11 digit”, the office is still receiving questions and complaints from individuals whose numbers were rejected by IT systems (CPR, 2022). In the statement, the CPR office also stated that such systems should at minimum allow for CPR numbers without the modulo 11 digit to be entered manually.

In comparing the two cases, we see that the intervention of the Swedish authorities preserved the integrity of the system at the cost of the accuracy of individual representation. In other words, the coherence of the whole was prioritised over the specificity of the parts. Consequently, a group of individuals will need to personally account for the changes wherever they encounter friction, while the existing administrative systems can continue to function as before. The Danish case demonstrated exactly the opposite: the specificity of the parts was preserved at the cost of reducing the coherency of the whole. However, since the intervention removed the very mechanism built to check the validity of the number in local contexts, it left individuals who encounter issues with no clear understanding of the reasons for the problem, as the absence of the checksum nearly impossible to recognise in the number itself compared to seeing two different birth dates in two different documents. At the same time, as the checksum was always meant for national systems rather than international systems, the Danish state was able to intervene in the process as demonstrated by the statement published by the CPR office regarding the checksum digit. In that statement, the responsibility for handling the problem was placed at the

level of IT system implementation at local authorities using CPR numbers, rather than on the person bearing the non-compliant number.

I have narrated these two moments of change in the national identification systems of Sweden and Denmark to argue that the use of the date and time for registration may appear mundane, but it is by no means free from social and political assumptions. As Bourdieu (2015: 20) has described, we only need to look at the ubiquity of the calendar as a shared organising practice to see the hegemonic power of the state over life. The calendar is one site where the state exercises an often-invisible power over social relations, and a state-issued number that includes the date of birth inherits the same form of power. It is easy to accept that the calendar—understood as the state-sanctioned method for compartmentalising time—is likely to remain stable, and that stability is one of the factors that makes Nordic identification number a reliable method for addressing individual state subjects.

This stability across time allows personal identification numbers to construct an equally stable site of intervention for policies that target subjects as unique individuals. It is this site that is then accessible by other knowledge practices, whether in the name of state policy, e.g., the population census, or individual taxation, or for private enterprise such as linking a mobile phone contract to a personal identification number. It serves a dual-purpose in that it allows the formation and addressing of groups based on the properties of the number (“everyone born on May 18th, 1998”) or in the addressing of individuals separately (“the person assigned the number so and so”). Drawing on Deleuze (1992), Bauer argues that in this process the individual and the population are no longer conceived as opposites as the “‘dividual body’ is reassembled and enacted through statistical strata” (Bauer, 2014: 207). It is this melding of the individual and the population that defines the Nordic identification number; its immense utility to statisticians, epidemiologists, tax offices and many other state institutions arises from its power to enact the individual and the population as sites of intervention.

The significance of addressing parts and wholes via numbers was already highlighted by Georg Simmel:

“This contrast in ways of naming things reveals a complete antagonism in the sociological position of the individual within the spatial sphere. The individualistic person, with their qualitative determinacy and the unmistakability of their life contents, therefore resists incorporation into an order that is valid for everyone, in which they would have a calculable position according to a consistent principle. Conversely, where the organisation of the whole regulates the achievement of the individual according to an end not located within him or herself, then their position must be fixed according to an external system. It is not an inner or ideal norm but rather the relationship to the totality that secures this position, which is therefore most suitably determined by a numerical arrangement.” (Simmel, [1908] 1997: 149–150)

Simmel’s argument is that if individuals are not considered in terms of innate characteristics, then they can only be distinguished or judged on the basis of relations to a larger whole, and numbers are well-suited for this kind of work, although they are rarely meaningful as individual entities. To make sense of them, there is always a need to know about other numbers in relation to each other, for example to judge whether they indicate a quantity or form a sequence⁹. Forming the kinds of relations that then derive meaning from a totality depends on making things align with one another and become commensurable¹⁰. In the case of the Nordic identification number, combining the stability of the site of intervention based on the calendar and the relationship of individual sites to the whole, generates addressable subjects of the state¹¹.

Returning to the Simmel quote above, it is not only the enumeration of people and the crafting of a population alone that is of interest, but the possibility that numbers can be made to envelop a totality, or how a totality can be accomplished through these numbers: People are born, people die, the formatting of numbers changes, dates and calendars are swapped, but the idea of addressing a space through incrementing numbers, or describing that space through

quantity persists throughout. It is this feature of the method that stabilises the population as a totality. The numbers belong to an orderly continuity, each day following from the next, and each day containing a finite number of people born on that day. That orderly continuity is the totality that persists past the birth and death of individuals. The interventions of the Swedish and Danish authorities to modify the national identification numbers challenge this continuity and foreground the tensions between the coherence of the whole and the representational potential of its parts, with consequences for all who carry such numbers.

Conclusion: The aftermath of performative power

In this paper, I have argued that the personal identification number enacts individuals and populations simultaneously. This is because of the composite form of the number—the date of birth followed by a set of identifying digits—brings into being a unique method that can address both individuals and the total population. However, these two sites of intervention, which I have theorised as parts and wholes, are at tension with one another. The former shapes a consecutive totality through the enumeration of calendar days while the latter provides features specific to the individual number. This is the fundamental tension that exists at the heart of the number; given the current structure and the syntax of the Nordic identification number, a richer representation of the individual through increased features in the number can only come at the expense of group coherence, and vice versa.

When other events bring the tension to the foreground, such as when the numbers ran out in Sweden and Denmark, technical modifications can bring solutions in the form of compromises by emphasising one site over the other. In the two cases I examined, the technical modifications served to keep the system functioning by finding a balance between group coherence and the features of individual numbers. The Swedish intervention preserved the former, while the Danish one did the opposite. However, as the tension is fundamental to the construction of the method, neither could resolve it.

What makes this tension significant beyond its representational capacity is that in the Nordic countries, the personal identification number sits at the heart of a centralised system of civil registration. Thus, any changes to the system, no matter how trivial, have the potential to affect all individuals in the population. As with a pebble dropped into still water, the technical modifications to the personal identification number produce ripples that travel far because the intervention is at the very centre of the web of relations.

In both Sweden and Denmark, the technical modification was successful in the sense that the numbers are no longer at risk of running out. However, as I described in the issues faced by a Swedish resident at an international border and numbers being refused at the citizen service centres due to outdated software, the full consequences of the changes are still unfolding after nearly 15 years. In both cases, it is the individual bearing the problematic personal identification number who suffers the negative consequences directly, and due to no fault of their own.

It is not that personal identification numbers used in the Nordic countries are inherently good, evil, democratic, or totalitarian. It is that they are potent tools of statecraft that sit at the core of civil registration, and therefore have the potential to affect the lives of all who carry them. That is why any changes to these numbers, no matter how minor or mundane they might appear, can disrupt the lives of many.

In STS scholarship, this kind of tension has been theorised in connection to how methods, objects, facts, practices, etc. enact realities. Those realities can and do exist in parallel, but also come into occasional conflict. In his discussion of Annemarie Mol's interpretation enactment (cf. Mol, 2002), John Law describes it as attending to "the continued practice of crafting" (Law, 2004: 56). With my analysis, it is this feature that I seek to highlight in relation to identification systems, broadly understood.

We can conceptualise all identification systems as attempts to contain that very same tension between individual representation and group coherence. By attending to their continued practice of method, whether through analysing new legislation, following the actors, or seeking to

understand the technical changes to the systems, we cast light on what sites of intervention they bring into being. Those sites are where we locate the subjects and subjectivities of methods, and

it is from that vantage point that we can begin to ask questions about the political projects that these methods make possible.

References

- Alastalo M and Helén I (2021) A code for care and control: The PIN as an operator of interoperability in the Nordic welfare state. *History of the Human Sciences.*: 09526951211017731.
- Anderson MJ (2015) *The American Census: A Social History*. 2nd ed. New Haven: Yale University Press.
- Ball K, Lyon D and Haggerty KD (eds) (2012) *Routledge Handbook of Surveillance Studies*. Routledge International Handbooks. London: Routledge.
- Bauer S (2014) From Administrative Infrastructure to Biomedical Resource: Danish Population Registries, the “Scandinavian Laboratory,” and the “Epidemiologist’s Dream”. *Science in Context* 27(2): 187–213.
- Bennett CJ and Lyon D (eds) (2008) *Playing the Identity Card: Surveillance, Security and Identification in Global Perspective*. London: Routledge.
- Boucheloukh N and Axelsson S (2019) Allt fler får personnummer med ‘fel’ datum. *Sveriges Radio*, 6 September. Available at: <https://sverigesradio.se/artikel/7293962> (accessed 27 December 2022).
- Bourdieu P (2015) *On the State: Lectures at the Collège de France, 1989 - 1992*. Cambridge: Polity Press.
- Bowker GC and Star SL (2000) *Sorting Things Out: Classification and Its Consequences*. Cambridge: MIT Press.
- Bratton BH (2015) *The Stack: On Software and Sovereignty*. Cambridge: MIT Press.
- Cakici B and Ruppert E (2020) Methods as forces of subjectivation: experiments in the remaking of official statistics. *Journal of Cultural Economy* 13(2): 221–235.
- Caplan J and Torpey JC (2001) *Documenting Individual Identity: The Development of State Practices in the Modern World*. Princeton: Princeton University Press.
- Chaudhuri B (2019) Paradoxes of Intermediation in Aadhaar: Human Making of a Digital Infrastructure. *South Asia: Journal of South Asian Studies* 42(3): 572–587.
- CPR (2021) Opbygning af CPR-nummeret. Available at: <http://cpr.dk/cpr-systemet/opbygning-af-cpr-nummeret> (accessed 23 April 2021).
- CPR (2022) Personnumre uden kontrolciffer (modulus 11 kontrol). Available at: <https://cpr.dk/cpr-systemet/personnumre-uden-kontrolciffer-modulus-11-kontrol> (accessed 24 February 2023).
- Dagiral É and Singh KM (2020) Governance and Accountable Citizenship Through Identification Infrastructures: Database Politics of Copernicus (France) and National Register of Citizens (India). *Science, Technology and Society* 25(3): 368–385.
- Daston L (1988) *Classical Probability in the Enlightenment*. Princeton, NJ: Princeton University Press.
- Deleuze G (1992) Postscript on the Societies of Control. *October* 59: 3–7.
- Desrosières A (1998) *The Politics of Large Numbers: A History of Statistical Reasoning* (ed. RD Whitley; tran. C Naish). Cambridge, Mass.: Harvard University Press.
- Frestad HN (2017) *The Norwegian National Identification Numbering System: The History of a Design Process*. Master’s Thesis. NTNU.
- Garcia R (2022) Här nekas Silvana mobiltelefoni – nya lagen skapar problem. *SVT Nyheter*, 21 December. Available at: <https://www.svt.se/nyheter/lokalt/smaland/ny-lag-asylsokande-kan-sta-utan-mobilabonnemang> (accessed 22 December 2022).
- Gilliom J (2001) *Overseers of the Poor: Surveillance, Resistance, and the Limits of Privacy*. Chicago: University Of Chicago Press.
- Grommé F and Scheel S (2020) Doing statistics, enacting the nation: The performative powers of categories. *Nations and Nationalism* 26(3): 576–593.
- Hacking I (1990) *The Taming of Chance*. Cambridge: Cambridge University Press.

- Hull MS (2012) *Government of Paper: The Materiality of Bureaucracy in Urban Pakistan*. Berkeley: University of California Press.
- Kertzer DI and Arel D (2001) *Census and Identity: The Politics of Race, Ethnicity, and Language in National Censuses*. New Perspectives on Anthropological and Social Demography. Cambridge: Cambridge University Press.
- Krogness KJ (2011) Numbered Individuals, Digital Traditions, and Individual Rights: Civil Status Registration in Denmark 1645 to 2010. *Ritsumeikan Law Review* 28: 87–126.
- Law J (2004) *After Method: Mess in Social Science Research*. London and New York: Routledge.
- Law J, Ruppert E and Savage M (2011) The Double Social Life of Methods. CRESC Working Paper Series, Paper No. 95.
- Ludvigsson JF, Otterblad-Olausson P, Pettersson BU, et al. (2009) The Swedish Personal Identity Number: Possibilities and Pitfalls in Healthcare and Medical Research. *European Journal of Epidemiology* 24(11): 659–667.
- Lury C and Wakeford N (eds) (2012) *Inventive Methods: The Happening of the Social*. London: Routledge.
- Lyon D (2001) *Surveillance Society: Monitoring Everyday Life*. Buckingham: Open University Press.
- MacKenzie DA (1981) *Statistics in Britain, 1865-1930: The Social Construction of Scientific Knowledge*. Edinburgh: Edinburgh University Press.
- Mathur N (2016) *Paper Tiger: Law, Bureaucracy and the Developmental State in Himalayan India*. Cambridge: Cambridge University Press.
- M'charek A (2000) Technologies of Population: Forensic DNA Testing Practices and the Making of Differences and Similarities. *Configurations* 8(1): 121–158.
- Mitchell T (1991) The limits of the state: Beyond statist approaches and their critics. *American Political Science Review* 85(1): 77–96.
- Mitchell T (2002) *Rule of Experts: Egypt, Techno-Politics, Modernity*. Berkeley: University of California Press.
- Mol A (2002) *The Body Multiple: Ontology in Medical Practice*. Durham: Duke University Press.
- Monahan T (ed.) (2013) *Surveillance and Security: Technological Politics and Power in Everyday Life*. New York: Routledge.
- Nobles M (2000) *Shades of Citizenship: Race and the Census in Modern Politics*. Stanford: Stanford University Press.
- Nordfalk F and Hoeyer K (2020) The rise and fall of an opt-out system. *Scandinavian Journal of Public Health* 48(4): 400–404.
- OECD (2021) Tax identification numbers (TINs) - Organisation for Economic Co-operation and Development. Available at: <http://www.oecd.org/tax/automatic-exchange/crs-implementation-and-assistance/tax-identification-numbers/> (accessed 2 March 2021).
- Paulsson A (2016) The Welfare State That Wanted to Keep Track of Its Citizens: Personal Identity Numbers as Administrative Technology. *Modernizing the Public Sector: Scandinavian Perspectives*: 80–95.
- Pelizza A (2021) Identification as translation: The art of choosing the right spokespersons at the securitized border. *Social Studies of Science* 51(4):487–511.
- Porter TM (1996) *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton: Princeton University Press.
- Riksdagsförvaltningen (2019) Avvikande personnummer Interpellation 2018/19:296 Angelica Lundberg (SD) - Riksdagen. Available at: https://www.riksdagen.se/sv/dokument-lagar/dokument/interpellation/avvikande-personnummer_H610296 (accessed 28 February 2023).

- Ruppert E (2011) Population Objects: Interpassive Subjects. *Sociology* 45(2): 218–233.
- Ruppert E (2014) Infrastructures of Census Taking. In: Darroch G (ed) *The Dawn of Canada's Century: Hidden Histories*. Montreal: McGill-Queen's University Press, pp. 51–78.
- SCB (2016) *Personnummer*. Bakgrundsfakta – Befolknings- och välfärdsstatistik 2016:1. Statistiska Centralbyrån.
- Schinkel W (2016) Making Climates Comparable: Comparison in Paleoclimatology. *Social Studies of Science* 46(3): 374–395.
- Scott JC (1998) *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.
- Selmer ES (1964) Personnummerering i Norge: Litt Anvendt Tallteori Og Psykologi. *Nordisk Matematisk Tidsskrift* 12(1/2): 36–44.
- Simmel G (1997) *Simmel on Culture: Selected Writings* (eds D Frisby and M Featherstone). London: SAGE.
- Singh R (2019) Give Me a Database and I Will Raise the Nation-State. *South Asia: Journal of South Asian Studies* 42(3): 501–518.
- Skatteverket (2021) Personal identity numbers and coordination numbers. Available at: <https://www.skatteverket.se/servicelankar/otherlanguages/inenglish/individualsandemployees/livinginsweden/personalidentitynumberandcoordinationnumber.4.2cf1b5cd163796a5c8b4295.html> (accessed 23 April 2021).
- Spektor M (2020) Imagining the Biometric Future: Debates Over National Biometric Identification in Israel. *Science as Culture* 29(1): 100–126.
- SR (2009a) Personnummer och samordningsnummer Proposition 2008/09:111 - Riksdagen. Available at: https://www.riksdagen.se/sv/dokument-lagar/dokument/proposition/personnummer-och-samordningsnummer_GW03111 (accessed 6 December 2022).
- SR (2009b) Personnummer och samordningsnummer Skatteutskottets Betänkande 2008/09:SkU28 - Riksdagen. Available at: https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/personnummer-och-samordningsnummer_GW01SkU28 (accessed 6 December 2022).
- Stigler SM (1990) *The History of Statistics: The Measurement of Uncertainty before 1900*. Cambridge: Belknap Press.
- Thiel A (2020) Biometric identification technologies and the Ghanaian 'data revolution'. *The Journal of Modern African Studies* 58(1): 115–136.
- Tupasela A, Snell K and Tarkkala H (2020) The Nordic data imaginary. *Big Data & Society* 7(1): 2053951720907107.
- UN General Assembly (1989) *Convention on the Rights of the Child*. 1577. United Nations. Available at: <https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-child> (accessed 27 December 2022).
- Verran H (2001) *Science and an African Logic*. Chicago: University of Chicago Press.
- Verran H and Lippert I (2018) After Numbers? Innovations in Science and Technology Studies' Analytics of Numbers and Numbering. *Science & Technology Studies* 31(4): 2–12.
- Watson I (2010) A Short History of National Identification Numbering in Iceland. *Bifröst Journal of Social Science* 4.
- Wessman E (2018) *Developments in personal identification - The Finnish henkilötunnus*. Master's Thesis. NTNU.

Notes

- 1 At the time of writing, it is still possible for personal identification numbers in Sweden to be assigned to an adjacent available date.
- 2 The Nordic countries are Sweden, Denmark, Norway, Iceland, and Finland.
- 3 Two Baltic states, Latvia and Estonia also assign identification numbers with similar properties, although the structure of the number differs slightly for the former and significantly for the latter.
- 4 One reason why these numbers resemble one another in syntax is because the experts and institutions that developed them were aware of each other's work. For example, in relation to the design of the Norwegian systems in 1960s, the experts voiced a desire to improve on the already existing system in Sweden (also see Frestad, 2017 for a history of the design process; Selmer, 1964).
- 5 Prior to 1990, the Swedish personal identification number also included digits that indicated the county of assignment which decreased its capacity significantly, and occasionally required regions to 'borrow' capacity from one another.
- 6 One function of the checksum digit is the prevention of transcription errors. Since the number was designed to be copied from place to place by hand, writing down digits one by one, its inclusion in the original design is aimed at preserving the integrity of the number. In the past the checksum would have also provided a small measure of security against fabricated numbers if the forger were not knowledgeable in the internal structure of the number, although in more recent times this checksum has been trivially easy to replicate given that all the documentation is publicly available over the Internet.
- 7 It is also worth noting that in 2019 the issue of numbers running out was brought up by Angelica Lundberg, a representative of the nationalist right-wing party Sweden Democrats, during a debate with the finance minister at the time, Magdalena Andersson of the Social Democrats (Riksdagsförvaltningen, 2019). Lundberg's argument was self-contradictory in that it asked for significant resources to be put in the service of resolving an issue that affects those who have migrated to Sweden, while at the same time positioning her party as being against the use of resources in this manner. However, regardless of the content of the argument, the consequences of the technical change in the personal identification number had political significance even at the parliamentary level.
- 8 The checksum digit is generated using a modulo 11 operation where each digit of the number is multiplied by another number called the weight. These are then summed together and divided by 11. Finally, the remainder is subtracted from 11 to obtain the checksum digit (CPR, 2021).
- 9 Verran's study of numbering practices describes how enumeration itself can also involve an oscillation between unity and plurality (Verran, 2001: 92–119).
- 10 Schinkel (2016) has argued that such alignment must begin by providing a basis for differentiation, and that this activity can be understood as "comparity work" (Schinkel, 2016: 377).
- 11 The notion of addressability has been employed by Bratton (2015) to analyse the power of information and communication technologies globally. Bratton (2015, 191–218) argues that the ability to assign addresses is "critical to any geopolitical system".