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Addressability

Identification and Communicative Positions in Critical Sociological Perspective

Abstract

In this article we develop the concept of addressability to help us unpack processes of identification. We start from a foundational sociological account of addressing as laid out by Simmel, and use Luhmann's systems theory to identify tensions in the overlap between different systems. The dual character of addressing as reductive (in meaning) and constructive (of communicative positions) helps us understand a mode of knowledge production that generates its own recipients. By concentrating on the moment of addressing in this manner and developing the concept of addressability to explain its complexity, we seek to build an analytic concept that is useful for scholars who are interested in unpacking the construction of communicative positions in identification. We demonstrate the potential of this concept with an analysis of two moments of addressability in action that involve personal identification numbers. We conclude that the intersection and mutual challenge of these two approaches can help us connect different addressing moments while also moving beyond questions of surveillance and entitlement that routinely seek to capture the problem of identification.

Keywords: addressability, identification, identification numbers, systems theory, surveillance

OVER THE LAST two decades, critical debates around identification have come to centre predominantly on questions of surveillance (Lyon 2003; Bennett and Lyon 2008; Breckenridge 2014; Jacobsen 2021); exclusion (Ajana 2013; Hammar 2018; Hunter 2019; Chaudhuri 2020; Pelizza 2020; Banégas & Dalberto 2021; Manby 2021; Singh & Jackson 2021); and even denationalization (Salem 2021; Hayes 2022). While the politics of identification at the heart of these debates certainly represent a major contemporary concern and deserve continued academic attention, in this article we argue that they can eclipse important questions around "material participations" in identification encounters (Marres 2012).

The aim of this article is to develop the concept of addressability to help us further unpack processes of identification. We start from a foundational sociological account of the notion of addressing as laid out by Simmel (1997 [1908]), who identifies a tension between the use of names and numbers; we connect it to issues of state-driven organisational schemes (Scott 1998); and we use Luhmann's systems theory (drawing on a discussion of addressability by Fuchs 2005) to identify the cause of tension as the

overlap between two systems. Finally, we demonstrate the potential of this concept with a brief analysis of addressability in the application of identification technologies.

The motivation behind developing the notion of addressability is to shape a concept that is more granular than identification, but one that remains just as useful in analysing human-to-human interactions as it is in machine-to-human or even machine-to-machine interactions. Our concerns are in line with sociologists and scholars of surveillance in trying to understand what identification does in practice, but we focus our inquiry on the significance of the moment of address. As we argue further in the article, the dual character of addressing as reductive (in meaning) and constructive (of communicative positions) helps us understand a mode of knowledge production that generates its own recipients. By concentrating on the moment of addressing in this manner and developing the concept of addressability to explain its complexity, we seek to build an analytic concept that is useful for scholars who are interested in unpacking the construction of communicative positions in identification.

To this end, we start with Simmel's account of addressing which highlights how the intricate and shifting arrangements of positionings in society are rendered countable through layered grids of abstraction. We then turn to Luhmann's system theoretical approach to explain the nature of the social address not as a pre-existing entity, but as the result of an autopoietic – that is, self-generating – communicative process.

We juxtapose these two strands of theory to argue that the term *addressability* manifests in the tension between identification emerging from the social lifeworld and its capture in numbered, standardised frames of reference. We thereby move beyond the by now seminal argument put forward by political scientist James Scott (1998) about state knowledge production and the practice of *metis* by attending to the microprocesses that bring social positions into existence (rather than simply capturing them in standardised modes of state vision). In other words, we extend beyond representational notions of identification (i.e. hollow inclusion profiles in which individuals are merely sorted) and discuss how state registration systems themselves participate in the communicative process that brings about the social address in the first place.

Addressability and Critical Data Studies

Scholars from a wide variety of disciplines have contributed to critical data studies with analyses of the reproduction of inequality and marginalisation through data as a medium (c.f. O'Neil 2016; Eubanks 2018). Sometimes these outcomes are a result of biases that creep into systems through unintended consequences of using complex data sets (Kitchin 2014), and sometimes they are direct representations of unequal or unfair bureaucratic systems being translated to digital domains (Benjamin 2019). Issues such as the availability of very large data sets for wealthy organisations, and the potential problems of unequal access that follow from them were detailed by boyd and Crawford (2012) in the early days of the field, while other scholars have also highlighted similar issues in policy-making and regulation (Rieder and Simon 2016), as well as in the complex networks of accountability formed by these systems (Reddy, Cakici, and Ballestero 2019).

A shared notion among works cited here is that the power of data arises from two important features: how it travels across different domains with ease when compared to other knowledge practices; and how (digital) data refers to, represents, or addresses its (physical) object. The former has been the focus of much attention outside of scholarly domains, with the most prominent example being the General Data Protection Regulation (GDPR) which limits or prohibits the transfer of certain types of data. The latter feature, however, has remained under-explored in scholarship in critical data studies and surveillance studies (with notable exceptions, like Beauchamp 2019; Amaro 2022). This is particularly relevant in contexts of excesses of addressability where addresses are created solely for addressing's sake, that is, for purposes of surveillance. The arguments presented by Simmel and Luhmann – that addressability points to a profoundly social communicative and normative process of inclusion within a social address space – serve as an anchor for our critique. In view of the continued failure of the emancipatory promise of identification technologies to include marginalised populations (Buolamwini & Gebru 2018; Benjamin 2019), we hope that our discussion can help us shift our gaze towards processes of "technicising" personhood (Blumenberg 2015) and their coupling to the construction of addresses already worthy of recognition.

Moreover, a focus on addressability allows us to emphasise that the intersecting of human activity with the systemic ways of ordering things according to an overriding singular principle (Scott 1998) represents a site of intervention in and for itself. In this light, addressability can help us move beyond questions of surveillance and entitlement that routinely seek to capture the problem of identification and its technologies. As a liminal concept that bridges identification in terms of its anchoring in numerical representation and the lifeworld alike, addressability potentially lends itself to new forms of critique.

Theoretical Framework: Addressability and Autopoiesis

In "The Sociology of Space" (1997 [1908]), Georg Simmel discusses two examples of the tension between naming things and numbering things. In the first example, he describes how houses with numbered addresses differ from houses that bear unique names, and he states that the named house "must give its inhabitants a feeling of spatial individuality, of belonging to a *qualitatively* fixed point in space" (ibid.:149). In other words, there is a qualitative difference between named houses and numbered houses; naming instead of numbering grants houses "unmistakability and personality of existence" (ibid.), but also introduces a trade-off: Names are only meaningful for locating things if people know about them, otherwise they are nearly useless as descriptions of how to find a place.

In contrast, numbers come as part of a larger structure that helps locate a point in space when houses and streets are systematically numbered. Unlike names which carry meaning because of their presence in language directly, numbers acquire meaning only in reference to a set of rigid structural rules larger than themselves which is then communicated in language. This can be as simple as an increment/decrement relation

where street number five is located next to street number six, or the mapping of odd and even numbers to different sides of a road to make it easier to locate individual houses.

The other example that Simmel points to is the designation of hotel guests according to their room number: The inhabitant itself becomes the number in the eyes of the organisation, for example as seen in the statement "number three checked out earlier today", because as far as the management of the facility is concerned, the name is temporary and ever-changing while the room number is permanent. The number is the more meaningful construct for management as taking care of the rooms is their responsibility regardless of who resides in them. This does not make it any less jarring for guests staying in the room when they overhear themselves referred to as a number, e.g. when the resident of room eight overhears the statement "number eight has left for the day but left their suitcase."

In these examples, when a number is substituted for the name, there is a qualitative change: The signifier carries significantly less meaning for the inhabitants of the house or the hotel room, although the same transformation can make it more meaningful for other groups such as city planners or hotel management. Simmel uses these two examples to set up a tension between names and numbers in relation to the sociological position of the person. He argues that as lives of individuals differ greatly from one another, any attempt at organising people into a numbered space encounters immediate resistance.

This analysis is in line with James Scott's argument that high-modernist projects were all designed for "standardized citizens" (Scott 1998:346), generic people who resembled one another, needed similar things, and had no opinions or histories. They were entirely free of "particular, situated, and contextual attributes". In the projects that Scott analyses, these individuals are considered less-than-human and remain undifferentiated, in contrast to the elites whom these projects consider as possessing unique and individual attributes. Scott identifies the "resolute singularity" of high-modernist projects, that is, their tendency to focus on one and only one process (e.g. growing wood, delivering shelter, providing medical services) as the primary reason for this reductionism. However, any site can be put to multiple uses because that is how space and humans interact, and the singular focus eventually brings down such projects. Scott also identifies how such projects can succeed with the backing of authoritarian states, and he argues that such expressions of force are always damaging and come at a human cost. Both Simmel and Scott grapple with the consequences of intersecting highly variable human activity with the regular and systemic ways of ordering things according to an overriding singular principle.

This is where another strand of sociological thought, Luhmann's system theoretical approach, helps us further the investigation. For Luhmann, communication precedes any communicative position and instead autopoietically, out of itself creates its own constructions (Luhmann 2002 [1992]:155–168). Radically speaking, the social address is the result of communicative acts and hence cannot precede any form of social interaction (Fuchs 2005:41). In Fuchs's analysis of Luhmann's core concept of addressability,

then, it is *not* the subject that attracts certain expectations generated and arranged by other subjects, based on which communication can then subsequently unfold. Instead, the social world is itself constructed through communication's core function of selectively identifying distinct recipients or entities in the world, which as a prerequisite need to be able to distinguish between self and other, and hence can be conceived of as producers of communication (i.e., entailing self-referentiality rather than mere information, i.e., merely being thematised) (Fuchs 2005:44, 53; cf. Søe & Mai 2022).

Luhmann's basic sociological concept of addressability is central to our argument as it points us to identification's existential foundations in the lifeworld. As Fuchs notes "the social address is a matter of survival" (Fuchs 2005:41, *our translation*) as there can be no consciousness of either the self or of the other in the absence of addressability (ibid.:43). In the contemporary context of complex, diversified social systems, addressability as a communicative process coalesces into multiple "condensation points" where communicative positions are assigned and enacted (ibid.:43, *our translation*), are subsequently amplified through repeated communicative acts and thus enhanced in their definition (ibid.:48). The result, following Fuchs, is the arrangement of complex inclusion and exclusion profiles, or of "who or what can be thought of as address of a specific communicative act" (ibid.:44, *our translation*). In other words, the functional differentiation of the social world generates the need for the construction of partially coded social addresses with limited self-referentiality (e.g., in the economic system, social addresses are devised that enable the formation of contracts and the facilitation of payments; Fuchs 2005:52,55). From this perspective, by providing the foil for complex arrangements of social positions, addressability generates the very social facts that make up our social world and only subsequently lend themselves to various forms of capture (ibid.:43).

At this point, we return to the question of how the complex, and necessarily fluid "social" map of communicative positions is captured in Simmel's grid of numbered address spaces. In our view, the tension between the numbered space and the sociological position of a person manifests as a resistance because the former is discrete and fixed while the latter is relational and ever-changing within specific constellations of partial addresses. Moreover, finding a place in the numbered space for a person to occupy is reductive because it replaces the relational, communicative constitution of the person with the ordered relations of the number, which come with assumptions about hierarchy which function at the level of metaphors of size and of order; one is smaller than two, one comes after two, etc. (whereas the "pluricontextual" and fluid addressability of Luhmann is generally non-hierarchical [Fuchs 2005:52]).

In other words, we can reinterpret Simmel's example of named houses versus numbered houses as situations belonging to two different systems: Named houses communicate locally not only their location but also their history and heritage, whereas numbered houses communicate the way all houses in a street, a district, or a city have been organised into a coherent whole. As such, the shift is not merely a change in signifier, these are the products of different systems which happen to intersect; or in systems theory terms, they are structurally coupled to one another although

they necessarily remain operationally closed. The administrative system where local authorities make sense of a city is coupled to the social system in which residents go about their everyday life.

Following Simmel, addressability is an admission that, reductive as it may be, a sociological position can be translated into a numbered space. Individuals are addressable because it is possible to come up with ways to reduce the complexity of the sociological position by discarding nearly everything that makes the person a person. According to Luhmann (and Fuchs), addressability is not merely representational but emerges out of the functional differentiation of society and its associated forms of inclusion/exclusion into partial addresses.

It is worth nothing that our conceptualisations, as well as those of Simmel and Luhmann, rely on either the notion of the individual human for the former and or the individual communicative position for the latter. These are necessarily products of a historically and culturally specific mode of thought. Other ways of conceptualising units and groups have also been documented. For example, Roy Wagner's account of a concept he observes among some Melanesians that he terms the fractal person, where the part/whole distinction does not apply as fractality "prevents the differentiation of part from whole" (Wagner 1991:171), expresses a different conceptualisation. The fractal person exists at different scales but always preserves its own one-ness or wholeness. Working with such a conceptualisation would of course question the very possibility of self-contained and discrete communicative positions communicating, as fractality is the existence of parts at different scales without ever forming a whole, or alternatively, always forming a whole of their own. While we have treated communicative positions as distinct and discrete yet pluricontextually constituted, Wagner's contribution reminds us that this analysis can only follow from our assumptions of the basic units of interaction.

The two facets of addressability help us in explaining contemporary concerns surrounding identity, surveillance, and data. We consider addressability to be simultaneously reductive and generative, and in line with the above two definitions, we conceptualise identities as being both a simplification of the social world, and an expansion of the communicative position to technological domains where communicative acts occur not only over vast distances but also between humans and other digital technologies. In later sections we analyse two moments of addressing where we unpack this issue further.

Material

In this article, we combine perspectives from sociology, anthropology, and science and technology studies (STS) to discuss the potential of a conceptual shift from identity/identification as a formatted data practice to the foundational notion of addressability. The contribution of this article is rooted in our long-term ethnographic observations and archival as well as documentary studies of highly diverse population data systems in Scandinavia, the UK, and Ghana. While the scope of this article does not allow us to

explore empirical material from each case in depth, our understanding of addressability has been shaped by the variety of forms of interactions with identification technologies in our respective fields.

While Europe's largely consolidated population data systems help us understand the power of Simmel's system of abstracting social addresses into a numerical grid of distinct address spaces, not yet consolidated systems of population registration such as Ghana's can be insightful for foregrounding the complex interplay of social and technical forms of addressing individuals, and how these systems co-constitute each other. This is not to say that African societies such as Ghana are in any way closer to "the social" than "the technical". On the contrary, contemporary techno-enthusiasm and optimistic investment in population data infrastructuring and other "trust infrastructures" across the continent (e.g. in digital finance, Breckenridge 2021; Breckenridge & James 2021) allow us to observe the fluidity and dynamic arrangements of abstract notions of personhood as they are writ through material devices deployed to discipline populations. Again, we propose to mobilise the notion of addressability to connect the two mechanisms and make sense of their mutual co-constitution.

In the next section, we analyse two moments of addressability involving personal identification numbers. We begin by defining the kinds of numbers used in the Nordic countries. We then highlight the dual character of addressability – as the reductive translation (Simmel) and the act that both constructs and inhabits a communicative position (Luhmann via Fuchs) – in two moments where such numbers are assigned to newborns shortly after birth in Denmark.

Analysis: Addressability in Action

In Nordic countries, personal identification numbers are administered at the national level. They are assigned to all citizens at birth, and to other residents when they declare their resident status in the country. These numbers are often invoked in interactions with state institutions in charge of healthcare, taxation, and education, among others, and accessing such services without a number can be challenging or sometimes even impossible.

In comparison to random strings used as unique identifiers to link registers in any register-based system, the Nordic numbers have some distinguishing features (Cakici 2024). The most prominent is that the date of birth of the person is included in the number. As the age of the person is possible to determine for the identifier, this can cause issues; sometimes it amounts only to a socially awkward moment where the person has to unwillingly reveal their age to another or to a group of others in a crowded room, and at the other end of the spectrum it can lead to age-based discrimination, for example in the case of a job application where the applicants are asked to provide CVs which include their identification numbers. In some Nordic countries the number also includes the legal gender of the person at birth, which can have similar discriminatory consequences. In the Swedish *personnummer*, it was also possible to distinguish whether the person was born in the country or migrated later in life, and although this practice

was stopped in late 1990 (SCB 2016), traces of it remain in the numbers assigned prior to the change. In short, as unique identifiers assigned to people, Nordic identification numbers differ from random strings in that they communicate information about individual people.

As Simmel's reading shows, any attempt at understanding the role of "the number" in isolation is futile; numbers carry little meaning when considered independently of their position in a sequence. This is not only the case for addressing; the same goes when we indicate quantity. That is to say, what use is it knowing eight somethings when we have no reference for what one of that 'thing' might entail? Each element in the series points to the one that came before and the one that follows, after. In short, numbers are rarely meaningful as individual entities. To make sense of them we always need to know about other numbers in relation to the first, whether they indicate a quantity or form a sequence, and in those relations the tensions of inference are made clear. Moreover, as Verran's study of numbering practices teaches us, the enumeration itself can involve an oscillation between unity and plurality (Verran 2001:92–119).

The power of numbers is in their capacity for generating a space that addresses many elements. There are many other unique identifiers that link registers made up of random combinations of letters and numbers, and there are also other types of identification numbers used for more narrow purposes (e.g. numbers assigned to students in schools or universities). For addressing people, however, some features of numbers make them highly useful, especially in connection to the state-sanctioned calendar through the date of birth. Personal identification using the date of birth of the individual creates a constant that does not change throughout the lives of citizens, unlike other identifying information such as the name or place of residence (Thiel 2024).

Turning to how individuals are assigned unique identification numbers, the concept of addressability allows us to open up this process of numbering. Using these numbers, state subjects are requested not only to pay taxes, to receive welfare benefits, or to vote in elections, but the potential of addressing individual subjects also allows for other interventions to be imagined and other power relations to be constructed. These interventions often draw on logics of care and control simultaneously and exist in tension as they set out to serve heterogeneous populations with standardised solutions (Zakharova, Jarke, and Kaun 2024).

What makes the interventions interesting from the Luhmann/Fuchs perspective that we have laid out is that the communicative position constructed by addressability is also a site of intervention available to other systems. This is the issue we want to highlight in reference to a moment relayed to us during an interview that Baki Cakici conducted in 2019 in Copenhagen with a midwife educator (whom we will refer to as DH). We were told that personal identification numbers ("*CPR-nummer*") are often delivered by midwives, who obtain them either directly from an online system, or via the medical secretaries employed by the hospital. DH told us that when it is time to get the number, sometimes the parents would ask for a "good number". She interpreted this as a number that is easy to remember, but regardless, there is no way for the midwives to pick among a list of numbers as the system, in her words, "spits out one". While

the wish for a good number might sound curious to those who are not familiar with Nordic identification numbers, those who were assigned at birth might recognise the strange attachment that one forms with their identification number throughout life.

The quality of goodness that the parents seek with their request serves as a suitable example for extending Simmel's point on addressing. Addressability in this case indicates not only the loss of meaning in a solely reductive transformation, but also the potential for holding other kinds of meaning for others. In this case, the aesthetics of a number or the convenience of memorising it are foregrounded. At the same time, this act of addressing imbues the receiver with another meaning in the form of a communicative position. For example, when the newborn subject is addressed by the state in a bureaucratic encounter issued by the tax office, or when the parents log on to an online system on behalf of the newborn, the communicative position is also the site of intervention. While the action is taken by the communicative position (reading, logging in, etc.), the meaning of the activity is in the act of addressing that specific state subject. This structural logic of addressability holds independent of the medium: Both the official piece of paper and the digital identification app follow the same logic of addressability, and hold at different scales, e.g. whether it is built to address a country of one million people or a country of one billion people.

While addressability constructs the communicative position, the power relation underlying an act of identification remains unequal: One position has access to the mechanism that establishes the suitable answer to the question "who are you?", while the other position, referred to as "you" in the question, cannot make claim to a singular mechanism of establishing truth. What it does have is myriad paths which may all lead to an acceptable response: Providing a name, producing a document, uttering a number, or reaching for a biometric scanner all produce their own answers. Regardless, the final arbiter is the position that poses the question: the border guard, the police, the tax official, the ticket controller, etc.

Incidentally, this is precisely why identification over the internet is occasionally unnerving. Login pages have the absolute power to determine the truth of the responses they receive, and when the truth of the system does not match the truth of those who answer it, there are few ways to contest the result. "Forgot password?" buttons provide a way of out the conundrum for most mundane tasks, but each defers the establishing of truth to another venue where the same exchange repeats. A communicative act of identification involving two humans can always have a parallel negotiation where the economic system might provide an answer (e.g. when a corrupt bureaucrat accepts a bribe), identification involving a non-human interlocutor leaves no space for this kind of negotiation as the non-human is not a part of that economic system; instead the systems involved count how many login attempts are allowed in a given time, or whether another identification technology can be used to provide an acceptable response.

Our final example also draws from the same interview, where DH described an exchange that occurs occasionally between midwives and parents of newborn babies in the labour ward. Once the number has been assigned to a newborn, the attending midwife or another nurse might ask the parents for the personal identification number

of the baby. In some cases, the parents do not immediately recall the number and end up checking the bracelet worn by their newborn child for the number. During this exchange, parents sometimes voice discomfort and even shame, because they feel that there is an expectation to immediately know the number assigned to their child. According to DH, the pressure that the parents feel is understandable, but also surprising in that it would be unreasonable for anyone to memorise a number that quickly.

As noted, Nordic identification numbers carry information about the receiver, and because of their widespread use, those who receive them at birth tend to memorise them at an early age. Their parents, however, might have experienced a version of the above story. What we see in this moment is the beginnings of a shift from the name to the number. For the parents, both have equal value as they refer to the same newborn child, but while the name is already meaningful the number has not yet become meaningful aside from its immediate utility in accessing care within the labour ward.

Once again, this echoes Simmel's example of named houses. For example, if we take the name "the Daston house", Simmel's reading casts is as a meaningful label as it carries traces of the relationship between the name and the location. Daston might be the name of an ancestor, or a significant person who visited the house in the past; the point is that it denotes a relationship between the location and its history. In contrast, numbers used as addresses do not denote such histories, and they repeat; countless streets have houses numbered one, two, three, etc. What draws Simmel to this moment is how the internal link between the name and the location are broken, and how individuals – humans in the case of Simmel and communicative positions when seen from systems theory – with their inherent social complexity resist this reductive moment. Meaning is no longer derived solely from the relationship between the signifier and the signified, as it now exists in reference to a different system. The houses do not lose their uniqueness, but they do gain a new relationship to each other, which as we explained earlier, might be of use for groups other than the residents.

Conclusion

In this article, we drew on foundational sociological discussions of addressing by Simmel and Luhmann to define a more granular notion for unpacking the construction of communicative positions in identification, which we termed addressability. We defined addressability as having a dual character: A reductive transformation that breaks chains of meaning, and a potential for communication that in the same act constructs the communicative position. In Simmel, we saw the reductive transformation of the sociological position into numbered spaces, and in Luhmann a generative transformation of the communicative position into a recognised recipient. We demonstrated how our concept can be deployed analytically by concentrating on two instances of addressing involving the use of Nordic personal identification numbers.

While addressability is at its most salient when a communicative position is placed in a relation with a formalised state identification system, it resists being reduced to an act of administrative capture as it points to a more foundational act of constructing

meaning in others. This is critical, not least in view of the contemporary proliferation of identification technologies outside of the state bureaucracy. With many other actors participating in the construction of communicative positions, we are hopeful that our proposed lens of addressability allows us to paint a more granular picture of identification in its layered effects on human-to-human as well as machine-to-human interactions. As a critical intervention, the intersection and mutual challenge of the two approaches to addressability presented here can help us connect differing addressing moments while also moving beyond questions of surveillance and entitlement that routinely seek to capture the problem of identification.

Acknowledgements

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