Original Article

Scripts of Alterity: Mapping Assumptions and Limitations of the Border Security Apparatus through Classification Schemas

Annalisa Pelizza[1] [ID] and Wouter Rudi Van Rossem[2] [ID]

Abstract

This article empirically maps and compares types of knowledge produced about people on the move by the European border security apparatus. Exploring two complementary analytical moments, the article addresses the stabilization of power and contingent practices within such apparatuses. We argue, first, that analyzing classification schemas implemented in data systems used within the European apparatus can reveal assumptions and limitations about people on the move—what we call "scripts of alterity." Second, the comparative mapping of scripts of alterity reveals a de facto division of labor between scales of governance that would otherwise be invisible in policy. Utilizing the new Ontology Explorer software method as well as discursive analysis, we identify four scripts of alterity, which

[1]Department of Philosophy and Communication, University of Bologna, Bologna, Italy
[2]Faculty of Behavioural, Management and Social Sciences, University of Twente, Enschede, Netherlands

Corresponding Author:
Annalisa Pelizza, University of Bologna, via Zamboni 38, Bologna 40126, Italy.
Email: annalisa.pelizza2@unibo.it

materialize relations in data systems and are thus relatively stabilized. Third, we identify as "de-inscriptions" forms of resistance specific to scripts of alterity. These can still be contested and we account for three contingent practices of de-inscription from scripts of alterity by conducting ethnographic observation of data systems' use. Finally, we summarize three contributions that the "scripts of alterity" concept makes to the science and technology studies and to the critical security studies literature on the securitization of cross-border mobility.

Keywords

security, script, migration, apparatus, border, classification

Introduction

Since the late 1990s, cross-border mobility and migration have been framed as a matter of security, with people on the move being enacted as security subjects (Bigo 2001; Amoore 2006; Aradau et al. 2006). In Europe, the securitization of migration has escalated after terrorist attacks like the ones in Paris in November 2015, Brussels, Nice, and Berlin in 2016, among others. Fueled by Eurosceptic constituencies and nationalist anti-immigrant resentment (Schimmelfennig 2018), high-profile political responses followed, like hardline pushbacks against the principle of non-refoulement (Fill 2021). Securitization has had consequences for European multilevel integration as well. In the aftermath of the 2015 "crisis of solidarity on migration," securitization has brought European member states to act unilaterally (Biermann et al., 2019), thus undermining a joint response in migration and asylum management (Pelizza and Loschi 2023).

In recent years, critical security studies (CSS) scholarship on borders and mobility has engaged with science and technology studies (STS) to investigate the apparatuses that securitize the border (Amicelle et al. 2015; Andersson 2015; Aradau 2018). Apparatuses are networks of heterogeneous elements—from policy to policy makers, from institutions to data systems—which produce diverse types of knowledge to establish what and who belongs to the realm of possibility, and what does not. Border apparatuses increasingly rely on digital components that make unknown people "legible" to European authorities (Pelizza 2020) and sort them into categories of differential risk (Dijstelbloem and Broeders 2015).

For their part, STS scholars have analyzed the political consequences of the digitization of the border (Dijstelbloem 2021; Trauttmansdorff and Felt 2021) and its logistic and temporal arrangements (Pollozek and Passoth 2019; Pollozek 2020; Olivieri 2023). In addition, scholars have described how security apparatuses enact alterity and enmity through classifications inscribed in data systems (van der Kist et al. 2019; Suchman 2020; Amelung 2021), and how the securitization of cross-border mobility has longer-term implications for the institutional order (Broeders and Dijstelbloem 2015; Pelizza 2020). Overall, these STS studies go beyond an instrumental understanding of the digital components of apparatuses and instead assume their agency.

Considering these developments, it is curious that research has not yet systematically mapped and compared the types of knowledge about people on the move produced at the border.[1] And yet mapping and comparing diverse types of knowledge can be crucial to understand the border apparatus. One tendency of CSS scholarship is their reliance on theoretical literature sources (e.g., Pötzsch 2015) or focus on individual data systems (e.g., Bellanova and Glouftsios 2022)—at the expense of empirical comparison between systems. Furthermore, while classifications have been rightly criticized as asymmetrical mechanisms of risk calculation and exclusion, the technical schemas underpinning classifications have rarely been analyzed. Nor has the STS new wave on digitized border and mobility bridged this gap yet. However, as STS early studies on infrastructures have taught us, comparing classification schemas can make visible power relations related to knowledge production (Bowker and Star 1999). This is especially so for European multilevel integration, where power relations across European Union (EU) and national governance levels might not yet be visible in policy.

This paper aims to bridge this gap by analyzing the classification schemas underpinning data systems used at the European border[2] and comparing the resulting types of knowledge about people on the move. Using the new Ontology Explorer method and software tool, we identify four types of knowledge that we call "scripts of alterity." We drew on technical documents, system screenshots and eighteen interviews collected in Greece (twelve), Italy (four), and at the European Commission (two) since 2017, as well as on ethnographic observation at four identification and registration centers in Greece (methodological details are provided in the fourth section).

In this paper, we argue that analyzing classification schemas implemented in data systems used at the border can expose hegemonic assumptions and limitations about people on the move (third section). We compare the differences in the scripts of alterity (fifth section) and describe their

implications for the European order. Notably, we spot a de facto division of labor between national and supranational governance levels (*Division of Labor by Design* subsection). These findings can eventually uncover tensions between member states and EU agencies—reminding us that the European order is not stabilized (Grommé and Ruppert 2020). We further develop the paper by describing how people on the move can resist scripts of alterity. Following the analogy with scripts, we identify "de-inscriptions," three forms of resistance specific to scripts of alterity (sixth section).

We introduce the conceptualization of "scripts of alterity" in relation to security apparatuses to address one of the recurrent topics explored in this special issue of *Science, Technology, & Human Values*: the distinction between power stabilization and contingent practices. Drawing on actor-network theory's (ANT) dualism between scripts and de-inscriptions, we identify two complementary moments that, taken together, encompass stabilization and contingency (fourth section). In the first moment, we analyze scripts of alterity as materializations of power-laden relations in data systems. As the outcomes of security apparatuses materialized in durable data systems, scripts of alterity are relatively stabilized. Only at certain costs can these assumptions still be contested (Bowker and Star 1999; Callon 1995). And still, the meaning of technological systems emerges contingently in being performed. In the second moment, we thus conduct ethnographic observation of data systems in use at the border. The two analytical moments are complementary: mapping the scripts of alterity designed to upkeep the border is a necessary step to explain the possibility of resistance.

The concept of "scripts of alterity" contributes to the STS and CSS literature on migration management and cross-border mobility in three respects. First, it addresses the risk of legitimizing hegemonic standpoints by reviving the concept of "de-scription," which is useful to describe standpoints without naturalizing them. Second, thinking in terms of scripts of alterity allows researching the stabilization versus contingency tension as complementary analytical moments. Third, it questions the original STS formulation of scripts assuming intentionality.

Digital Classification Schemas: Objects of Analysis, Methodological Entry Points, and Sources of Knowledge

The conceptualization of apparatus has played an important role in studies of the securitization of cross-border mobility. Michael Foucault first

introduced the term "apparatus" in the mid-1970s, and political theory has since further developed it (e.g., Agamben 2009; Perugini and Gordon 2017). For Foucault (2009, 4), the apparatus (dispositif) of security is the contemporary rationality dominant over other historical mechanisms, like the legal rationality and the disciplinary mechanism. Unlike earlier mechanisms, the security apparatus is characterized by quantification of risk and probabilistic thinking.

While Foucault (1980, 194) never provided a clear-cut definition, in a late interview, he identified a security apparatus as the network that can be established between heterogeneous human and nonhuman elements such as "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." The reference to the "the said as much as the unsaid" implies questions about how we come to know an apparatus (Agamben 2009, 2). Foucault sees a mutual relationship between apparatuses and knowledge:

> The apparatus is thus always inscribed into a play of power, but it is also always linked to certain coordinates of knowledge that issue from it but, to an equal degree, condition it. This is what the apparatus consists in: strategies of relations of forces supporting, and supported by, types of knowledge. (Foucault 1980, 196)

The security apparatus produces certain types of knowledge, and at the same time, it is limited by them. Inverting the relation, accessing types of knowledge is crucial to know an apparatus. To identify the types of knowledge produced by and limiting an apparatus, one starting point is the need for apparatuses to classify subjects. Characterized by quantification of risk and probabilistic thinking, apparatuses are inherently classificatory:

> I think we can speak here of a technique that is basically organized by reference to the problem of security, that is to say, at bottom, to the problem of series. [. . .] I think the management of these series that, because they are open series can only be controlled by an estimate of probabilities, is pretty much the essential characteristic of the mechanism of security. (Foucault 2009, 20)

A security apparatus is thus a mechanism tasked with classifying events and things into series. Series' classification schemas are therefore likely to prove consistent methodological resources to access the types of knowledge

produced by and limiting an apparatus. Think for example at the limited number of options used to classify deviant behavior, which concomitantly defines what is "deviance." To the very core, this constitutes the fundamental intuition of ethnomethodology, and also of early STS work on classification infrastructures (Bowker and Star 1999). Classification schemas simultaneously constitute the methodological entry point to study what they are supposed to represent and the force shaping it.

This duality of classification schemas is becoming even more evident with the increasing digitization of contemporary life, where classification schemas are made durable in digital databases as data schemas. Noortje Marres's (2017) work has insightfully identified the inherent duality of the digital in ethnomethodological terms. She (p. 117) has pointed out that "the digital presents both an object and a resource of social life."

We suggest that classification schemas show this duality: they organize knowledge and action while they make these activities methodologically accessible. Classification schemas thus constitute methodological entry-points that allow scholars to follow the production of knowledge in action. Therefore, studying the classification schemas underpinning data systems used in cross-border mobility is expected to concomitantly make types of knowledge available for analysis and provide insights on how people on the move are enacted as security subjects.

Moreover, comparing the results of the analysis provides evidence about the producers of classification schemas. In addition to the object/method duality recognized in ethnomethodology and infrastructural studies, we identify a third level of analysis: classification schemas can also reveal knowledge about those who produced them—usually an authority. Thus, comparing different schemas can spot diverse assumptions by diverse authorities active in the apparatus which produced them. In the case of the European multilevel governance of cross-border mobility, comparing classification schemas might reveal differences and similarities, or even a division of roles, between authorities.

Strangely enough, classification schemas have only marginally been conceived of as resources in CSS and STS research about apparatuses of security. More precisely, classifications have been extensively (and rightly) criticized as the mechanisms through which people are excluded and expelled, but schemas have rarely been empirically analyzed and systematically compared. This may be because Foucault did not apply the concept of apparatus to the management of migrant mobility (Walters 2011); "Apparatus" was introduced in the field only recently by CSS concerned

with the datafication of security and the increasing digitization of the border (Pötzsch 2015; Allen and Vollmer 2018; Sontowski 2018).

Most of these studies adopt a performative understanding of border technologies and data systems. Kloppenburg and van der Ploeg (2018) have shown that biometrics are involved in producing and enacting gender and ethnic classifications. Amicelle et al. (2015) have pointed out that security devices are performative because they draw legal, gender, race, and class boundaries. A performative understanding of classificatory practices is a tenet of STS research concerned with the production of alterity and enmity, too. Suchman (2020, 179), for example, has proposed "apparatuses of recognition" as "apparatuses through which the architecture of enmity is put in place and into practice." STS research in migration management has accounted for border crossers as "enacted" (Mol 2002) as security subjects (Ruppert 2013; Broeders and Dijstelbloem 2015; van Reekum 2019; Pelizza 2021).

Despite this attention to performativity, CSS and STS have paid less attention to classification schemas as methodological resources and sources of knowledge about producers. Three notable exceptions have empirically studied the classification schemas through which people are enacted as security types. First, Van der Ploeg and Sprenkels (2011) systematically analyzed the classification schemas used in the Dutch migration policy to register migrants. While the police was mandated to reduce twelve classes of subjects into five, the authors identified ninety identity categories in which people were administratively labeled in migration policy. Second, Dijstelbloem and Broeders (2015, 32) examined a broader range of European data systems to identify three risk classes: "those who are trusted in the eyes of the migration state, those who are not, and those who are suspect and/or require further scrutiny." Third, M'charek et al. (2014) have identified racialized "phenotypic others" enacted by five different border management systems. Their empirical analysis of data-based othering comes closest to our comparative goal here: it spots different configurations of Europe "depending on the specific technologies in place and the matters of concern involved" (p. 476).

Beyond these studies, little research in CSS and STS has empirically analyzed or compared classification schemas. This article aims to bridge these gaps and compare the types of knowledge produced by the four main data systems being used at the European border. By drawing on ANT's concept of "script," the next section conceptualizes the types of knowledge resulting from the analysis of classification schemas as "scripts of alterity."

Introducing Scripts of Alterity

The notion of "script" was introduced in ANT (Akrich and Latour 1992; Latour 1992) to refer to the designed instructions for action, the affordances of an artifact offered to users. For example, a beeping alarm requires car users to fasten their seat belt. Through scripts, artifacts exert normative power by prescribing instructions to users. Yet scripts have a second, correlated meaning as assumptions. In exerting normativity, scripts reveal designers' assumptions about intended users: their expected skills, goals, interests, and limitations. While intended users are a projection, an ideal, actual users may or may not adhere to assumptions. In other words, understanding assumptions is a way to study designers' imaginaries, more than actual users.

With "scripts of alterity," we draw on the second meaning of scripts as assumptions. We use this term to describe assumptions about the expected skills, goals, interests, and limitations of the "others"—unknown people moving to and across Europe. For example, scripts can assume that border crossers have low education, come to Europe to increase their income, and have an interest in hiding their identity. Being assumptions, scripts of alterity do not speak so much for actual people on the move but of their producers. Scripts of alterity correspond to the types of knowledge produced by the apparatus. How can we know them?

Scripts of alterity are not immediately accessible: they are inscribed in digital data systems used at the border. As scripts can only be known through artifact analysis, so scripts of alterity can be known by analyzing the classification schemas implemented in data systems used at the border. If classification schemas are both objects of analysis and methodological resources, then by analyzing classification schemas, we can study how people on the move are enacted as intended others as security subjects. The next section discusses our mixed methods in obtaining scripts of alterity, which primarily involved analyzing classification schemas implemented in digital data systems (i.e., data schemas).

As a concept, script of alterity can be productive for CSS and STS concerned with the securitization of cross-border mobility. Firstly because scripts of alterity are analogous to policy formation: they "express in condensed terms the hegemonic forms of social order and reiterate . . . legitimizing narratives" (Feldman 2005, 678; see also Feldman 2012). Studying a hegemonic standpoint a well-known dilemma in CSS: should scholars analyze apparatuses' assumptions at the risk of legitimizing and naturalizing them, or should they renounce studying hegemonic

standpoints? As Trauttmansdorff (2022, 88) has put it, "[a]ny study on the inner operations of the digital border regime bears a considerable risk in reproducing and normalizing its language and logics." In studying classification schemas, we should acknowledge and avoid the risk of normalizing and reproducing hegemonic perspectives.

At the same time, in the vocabulary of script (Akrich and Latour 1992), we find a term to help address this dilemma: "de-scription." De-scription refers to the translation of a script from artifacts into text, words, and concepts. Translating a script from artifacts into words opens the possibility of critique: in fact, it is a preliminary condition for critique. It is in de-scribing, in translating implicit, embedded normativities into discourse that the possibility of analysis, critique, and resistance emerges. With the concept of script of alterity, we borrow from script theory the practice of making implicit normativities explicit. In de-scribing hegemonic assumptions and limitations that would otherwise remain implicit in data systems, scripts of alterity ground the preliminary conditions for critique.

Secondly, script theory provides another term to address the risk of reproducing hegemonic perspectives: "de-inscription." De-inscriptions refer to the gap between intended and actual use. Where a script refers to instructions and assumptions about intended uses and ideal users, actual users may correspond to that ideal or not. When they act as expected by designers, actual users subscribe to the script (Akrich and Latour 1992). Alternatively, they can resist, appropriate, and subvert the script by de-inscribing, by using the artifact in ways that were not imagined by designers.

Script theory remains ambiguous about the intentionality of de-inscriptions. While for Foucault resistance as counteract is assumed as intentional, script theory is more ambivalent about whether de-inscriptions also include uses that are unintentionally different from designer's plans. In the field of migration management and cross-border mobility, resistance, frictions, and struggles are constitutive elements of bordering (Mezzadra and Neilson 2013). Resistance is said to take multiple forms as appropriation, subversion, recalcitrance, and insubordination (Dijstelbloem et al. 2017; Scheel 2017; Mora-Gámez 2020; Schinkel 2020), but it always entails some intentionality. With the concept of "de-inscription," we instead borrow from script theory the possibility that resistance is not necessarily intentional. Classification schemas can be unwillingly contested, data might not match the required field, officers might not enter data as expected. We thus suggest that using "de-inscription" instead of "resistance" for the time grants more pliability to our analysis. Thinking of resistance as

de-inscription suggests that the agency of actual people on the move is not necessarily intentional: it can take place by being unable to reduce past living experience into skills, interests, goals, and limitations assumed by scripts of alterity. This extended definition of agency, we argue in the conclusion, redistributes responsibility from people on the move to authorities.

Two Complementary Moments to Account for Stabilization and Contingency

The distinction between scripts and de-inscriptions suggests an asymmetrical relation between scripts of alterity and de-inscriptions elicited by people on the move. While CSS scholars are more likely to frame this relation as a tension between hegemony and subjectification, from an STS perspective, we can see it as a tension between stabilization and contingency. Being distributed among various authorities (which increases the alignment labor necessary to bring about even minor modifications) and made of the durable "stuff of bits" (Dourish 2017), scripts of alterity can be seen as relatively stabilized. At the same time, de-inscriptions are always possible, at higher or lower costs (Callon 1995), because resistance practices take place mainly in the contingent encounter between people on the move and the security apparatus.

We accounted for both stabilization and contingency in our methodology by identifying two complementary moments for analysis. First, paraphrasing a well-known STS tenet, we could say that scripts of alterity are apparatuses made durable: stabilized moments in which the security apparatus materializes its power-laden relations in data systems.[3] Given the obstacles to modifying data systems that are up and running, scripts of alterity are unlikely to change in the short-term. This moment corresponds to the de-scriptive phase where embedded normativities are made explicit by analyzing and comparing classification schemas. De-scribing scripts of alterity makes it possible to recognize de-inscriptions from those scripts. So, the second moment aims to understand apparatuses by finding de-inscriptions from the scripts of alterity identified in the previous phase. This moment thus mobilizes ethnographic observation of actual use of data systems at the border.

These two analytical moments are complementary: mapping the scripts of alterity designed to uphold the border reveals stabilized relationships of power and, at the same time, is a precondition for the ensuing analysis of contingent de-inscriptions. To operationalize these moments of analysis, we

compared the scripts of alterity inscribed in the three EU mandated data systems enacting the European border: European Dactyloscopy (Eurodac), the Schengen Information System II (SIS II), and the Visa Information System (VIS). In addition to these three, and in order for our comparison to include systems at different scales of governance, we analyzed the national data system used at the Greek border: the Greek Register of Foreigners (GRF).

Eurodac is an EU data system introduced in 2003 to support the application of the Dublin Regulation (Regulation No. 604/2013; also known as the Dublin III Regulation). The Dublin System sets the criteria and mechanisms for establishing which EU member state is responsible for examining asylum applications based on the principle of first entry. Eurodac was deployed to prevent asylum seekers from lodging a protection application in more than one member state. The system collects fingerprints from asylum seekers and compares those data with fingerprints already stored on its servers. When a hit occurs, it can mean the claimant has submitted an asylum request elsewhere.

Since 2011, SIS II supports intergovernmental cooperation on law enforcement and external border management among state authorities participating in the "Schengen Agreement Application Convention." The system allows authorities to check criminal perpetrators, people denied entry into the Schengen space, missing persons, data on stolen or lost objects. Authorities use SIS II at the EU border and beyond to check the identity of third-country nationals entering Europe to sort out people with criminal records or to seize objects.

VIS is used to exchange visa data of third-country citizens temporarily traveling to Europe. It is used in European member states' consulates outside Europe, as well as at Schengen and national borders, to check visas are valid. VIS is one of the largest biometric databases in the world, registering both granted and refused visa applications. Finally, the GRF was developed by the national information systems branch of the Greek police and is used mainly at the border to register, identify and process asylum requests.

All these four systems are in use at the (Greek) border for the purposes described above. They are not (yet) interoperable[4] and are used in variable order, depending on the situation at the point of entry—although fingerprinting on Eurodac is usually given priority.

Now to the first moment in our analysis. From 2017 to 2020, the authors collected data from the three European data systems (Eurodac, SIS II, and VIS), and the first author collected data about the GRF and its use at four Greek registration and identification centers. Data schemas are the formal

classification schemas or, more precisely, they can be used to infer classification schemas. A data schema specifies categories (such as "nationality," "country of origin," "name"), sets of attributes ("Afghan," "German," "Turkish" are attributes of the category "nationality"), and relationships between database entries. As such, data schemas provide "thin" data compared to the "thickness" of ethnographic observation (Geiger and Ribes 2011).

In order to turn those thin traces into thick descriptions, for the first moment of analysis, we designed a two-step methodology. The first step utilized the Ontology Explorer method and web tool developed in the context of the Processing Citizenship project (Van Rossem and Pelizza 2022) to quantitatively analyze and compare the four data schemas. The different formats in which data schemas were made available to us (regulations, screenshots, technical documents, and interviews) were harmonized through Computer-Assisted Qualitative Data Analysis Software (CAQDAS; for more details, see Van Rossem and Pelizza 2022). Next, the Ontology Explorer software tool was used to compare the data schemas corresponding to the four data systems. In comparing the data schemas, quantitative analysis paid specific attention to the presence, absence and frequency of data categories and attributes. The guiding idea was that comparing multiple systems' data schemas can foreground the data categories present in some but missing in others, thus bringing out assumptions and limitations about intended people on the move inscribed in a specific system. Drawing on these preliminary results, the more fine-grained discursive analysis in the second step took stock of the presence/absence comparison previously conducted to focus specifically on the categories and attributes that appeared as specific of a data system, that is, which were absent from the other data systems. Through this means, we identified the categories and attributes that characterize each script of alterity, and—most importantly—to detect differences and absences between scripts.

The resulting map of scripts of alterity informed the second analytical moment, when we tried to grasp the meaning of technological systems during their use. The first author conducted ethnographic observation of data systems in use to identify de-inscriptions from the scripts of alterity. Ethnographic observation was conducted in multiple periods for a total amount of five weeks from March 2017 to 2019 at the Greek registration centers mainland (Fylakio center) and on the islands (Samos, Chios, Leros). It involved observing all stages of cross-border management, from preregistration to asylum request lodging.

Describing Scripts of Alterity

We identified four scripts of alterity inscribed in the data schemas used in European and Greek national data systems for migration management and cross-border mobility control. While we do not expect that these scripts of alterity can be found in other security subfields, the analysis of their data schemas reveals their classificatory mechanisms and suggests an analytical method to further study scripts of alterity.

Comparative Analysis Using the Ontology Explorer Method

The comparative analyses conducted through the Ontology Explorer show that all systems collect data "native" to each individual system, like the date on which data were first recorded, system-specific identifiers, and the ID of the inputting operator. The three European systems (Eurodac, SIS II, and VIS) have only few data categories in common, namely biometric finger-print data and gender. SIS II and VIS have slightly more data in common, like biographical data (people's date and place of birth, nationality, and names). SIS II and VIS also include additional biometric data, such as facial photos. All three European systems collect categories unique to that system. The Eurodac data schema, for example, includes categories about the asylum procedure, such as the date of registration and the place where a person's application was first examined. The SIS II system features various categories of data that provide supplementary and undocumented information, like different names or aliases a person might use. Also, noteworthy is the possibility of describing a person's physical and behavioral characteristics. Finally, the VIS has the most extensive set of categories to capture a person's biographical data and travel. Biographical information includes data about their family, occupation, residence, and education. Information about a person's travel includes data regarding their travel documents, travel itinerary, and personal ties in Europe.

Comparing the three European data schemas with the data schema underpinning the Greek national system—the GRF—reveals some specificities of the latter. First and foremost, while the GRF collects many categories similar or closely related to those included in the European systems, some other security-related categories (e.g., data about criminal offenses, prior travel intentions) are not present. Some differences can be observed between categories common to all systems. For example, data about a person's occupation or residence differ across systems run by national and European authorities. Whereas the VIS seems concerned with the person's
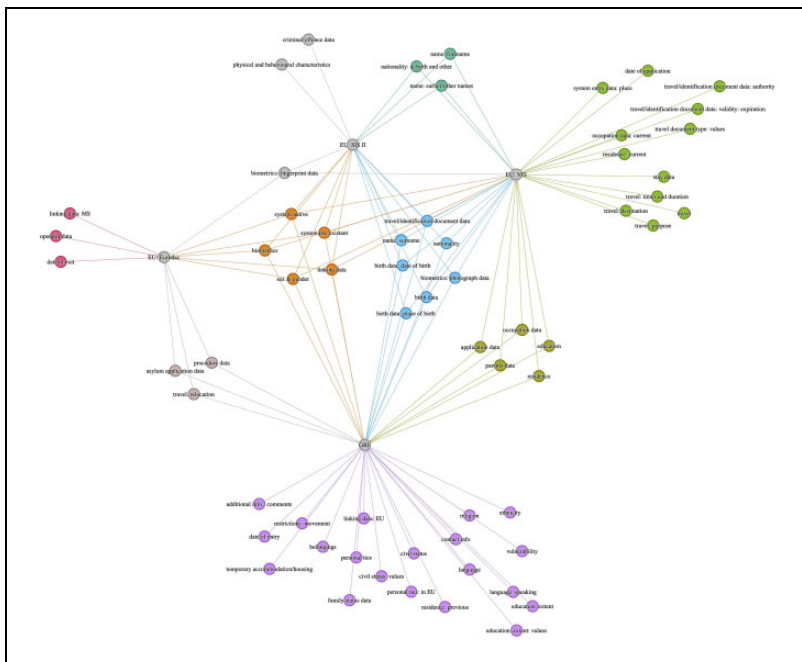
Figure 1. The network generated through the Ontology Explorer and visualized as a force-directed network with the help of the Gephi tool for layout and color coding.

current situation, the GRF covers previous information about a person's life. In addition, the GRF collects supplemental personal data about persons, like languages spoken, contact information, family, and marital status. Also notable is the inclusion in the GRF of data regarding a person's ethnicity, religion, and vulnerabilities.

Figure 1 visually summarizes the findings of this comparison.[5] At the top of the network are data categories specific to EU systems. In the middle are data common to two or more systems, with data shared by all systems in the center. Color coding and grouping distinguish the systems between categorical co-occurrences. At the bottom of the figure are data specific to the GRF.

A More Fine-grained Analysis

Drawing on this preliminary comparison, discursive analysis identified one or more scripts of alterity corresponding to each data schema. More

precisely, discursive analysis focused on categories and attributes which the preliminary comparison had identified as specific to a system. As Table 1 shows, the GRF collects a range of basic data: name, nationality, gender, ID, photo and date of birth. It also includes less mundane categories, like name of father and mother, religion, ethnic group, educational level, spoken languages, profession, family situation and number of children, and sociocultural ties with Greece.

Such a panoply of personal data are expected to be necessary to perform a broad set of functions, beyond administrative and security tasks, including accommodation, family reunification, health care, asylum, and integration in the job market. Designing integration policies without data about professional and linguistic skills would indeed be difficult. Drawing on this evidence, we suggest that the GRF enacts people on the move as long-term stayers, eligible for societal integration.

The script of alterity for Eurodac is very different.[6] Eurodac's mission is to identify asylum seekers through their fingerprints, so that they cannot apply in more than one EU member state. It stores the digital fingerprints of people claiming asylum in one of the EU member states and alerts authorities if someone claims asylum in another member state. Table 2 shows data collected in Eurodac.

The Eurodac script of alterity is composite. Many data categories included in the GRF are not collected in Eurodac, such as religion, ethnic group, educational level and languages spoken, profession, family situation, and sociocultural ties. Instead, Eurodac collects many data that are systemnative: they did not exist before the person was recorded in the system (e.g., Eurodac number, place and date of registration, ID of registration officer). This characterizes Eurodac as a self-referenced index, in which information acquires meaning in the context of the system itself. More precisely, fingerprints and other personal data receive meaning from indexical data that bind them within a series of relations meaningful in the Dublin system. Furthermore, people are assumed to be unforthcoming about their previous asylum requests: their fingerprint data are collected to be compared with fingerprints collected in other places and times to avoid "asylum shopping" and also for crime detection purposes. Data are used to connect a biometric-based identity with other systems in order to devise whether an asylum application has already been lodged elsewhere. In this case, asylum seekers will be dislocated to the country of first asylum request, and their request will be there processed. This lack of trust and a broader security turn are reinforced by planned developments on the system, which may include a security flag, which officers can use to add their assessment of whether an

Table 1. Data Categories Collected by the Greek Register of Foreigners.

Basic Data			Personal Documents		
			Type of document	Identification no. of the doc	Accompanying files
Surname	Mother's name	Photo of the person	Residence permit	the doc	
Name	Mother's surname		Other		
Father's name	Country of birth				
Nationality					
Estimated nationality					
Estimated date of birth					
Declared date of birth					
Sex/gender					
Religion	Ethnic group	Education level	Marital status		Additional info
Profession	Communication language	Languages (other)	Contact details		
	Mother tongue				
Other Data					
Sent to EURODAC	Expression of interest for application of international protection		Bed allocated to foreigner		Member of family
Yes/no	Yes/no		Defined/not defined		
Last place of residence (country)	Expression of interest for voluntary return		Date of departure		
	Yes/no				
Valuables kind (pieces)	Number of asylum request				
Withholding of objects					

Source: Pelizza and Van Rossem (2021), authors' elaboration from system interface.

Table 2. Data Categories Collected by Eurodac.

Data Collected by EURODAC
(a) Fingerprint data
(b) Member State of origin, place, and date of application for international protection
(c) Sex
(d) Reference number used by the Member State of origin
(e) Date on which the fingerprints were taken
(f) Date on which the data were transmitted to the Central System
(g) Operator user ID
(h) Date of arrival after a successful transfer [a]
(i) Date when the person left the territory of a Member State [a]
(j) Date when the person left or was removed from the territory of a Member State [a]
(k) Date when the decision to examine the application was taken [a]

[a] Data collected when applicable and in compliance with relevant articles.
Source: European Regulation (EU) No 603/2013 of the European Parliament and of the Council.

applicant constitutes a security threat (EDRI 2022; Council of the European Union 2022).

All in all, this analysis suggests that Eurodac enacts people on the move as foreigners expected to stay only temporarily, not eligible for integration (for which those types of data would be necessary). We propose to label Eurodac's script of alterity as a short-term irregular immigrant. Irregularity is an important feature here because it marks a turning point in the system as it becomes a genuine law enforcement instrument, gathering a large amount of data supposedly informing whether a person could be considered a "security threat" (EDRI 2022). Our findings agree with a growing body of legal scholarship on the securitization of EU large-scale IT systems (Balzacq 2008; Curtin 2017; Galli 2020).

The second European system, SIS II, collects names of people and objects previously involved in criminal activities (e.g., guns, lost documents), missing people, and witnesses.[7] Like Eurodac, SIS II collects data that are specific to the system, like Schengen ID, data/place/reason for fingerprinting, links to other alerts issued in SIS II. Most importantly, it collects data categories that assume that people may wish to hide their identity.[8] To counteract this, SIS II collects data about aliases and physical or long-term characteristics that are difficult to falsify. One category in particular reveals the script of alterity enacted by SIS II. Tick-boxes signal whether someone is armed, violent, has escaped or poses a risk of suicide. When ticking a box once, this attribute becomes permanent: being violent is

conceived of as a permanent condition, a personality trait, rather than a temporary reaction to a threatening situation (very common when people are caught at the border by armed police). This evidence accords with what Suchman (2020) has described as the expanding temporal and spatial boundaries of what comprises an imminent threat. Here, the imminent threat of a person who might behave irrationally when caught at the border is temporally expanded and becomes a permanent personality trait. This qualifies one of SIS II's scripts of alterity as a *potentially threatening subject*.

For the last of the EU systems, VIS, our analysis again focused on data that are system specific. On the one hand, categories such as main destination and duration of the intended stay, purpose of travel, intended date of arrival and departure, border of intended first entry or transit route, and details of the person issuing an invitation enact applicants as travelers. On the other hand, applicants are assumed to be settled individuals in their country of origin and asked to provide information on residence, current occupation, and employer. This is an apparent paradox.

The paradox reveals that travel is defined as a temporary condition: it is assumed that people will return home and will not overstay in Europe. Although the EU VIS regulations were updated in 2018 to incorporate details about long-term visas and residency permits, the script of alterity continues to assume a temporary situation. Hence, VIS's script of alterity could be defined a resident traveler, and it reveals the double nature of VIS: travelers are assumed to be rights-holders (who can travel to Europe regularly) only insofar as they keep residence in their country of origin. It is assumed they will go back before their visa expires. If they do not, assumptions will be betrayed.

In the next section, we compare these four scripts of alterity with an eye on their consequences for the multilevel European order.

Division of Labor by Design

As anticipated in the third section, analyzing scripts of alterity promises to throw light not so much on the actual identity of people on the move, but on the security apparatus enacting the European border.[9] In particular, it allows a comparison of the assumptions and limitations by diverse authorities in charge of diverse systems. We can wonder, for example, whether diverse scripts of alterity are complementary or overlapping, and which practices they facilitate or hamper, depending on the categories and attributes information systems collect. This type of analysis appears particularly promising

for European multilevel governance of cross-border mobility. Comparing different scripts of alterity might reveal differences between authorities: we may identify divisions of labor or "geographies of responsibility" (Oudshoorn 2011) among diverse authorities or governance scales involved in the security apparatus. Given scripts of alterity's stabilized character, their comparative analysis is expected to trace divisions of labor that are unlikely to change in the short term.

In this sense, this subsection contributes to studying the stabilizing end of the stabilization-and-contingency tension. Drawing on the preliminary analysis conducted with the Ontology Explorer, a distinction between national and supranational scales of governance is notable, with clear differences in the categories and attributes collected by the three European systems on the one hand and by the Greek system on the other. Such differences were then confirmed by discursive analysis. The three European systems, and especially Eurodac and SIS II, create self-referenced digital indexes, in which personal and biometric data acquire meaning in the context of indexical data. These two data systems also focus mainly on security and biometric data, and fall short of collecting other personal data, like linguistic or professional skills. On the other hand, not all security-related categories are collected in the GRF and, most importantly, the GRF collects supplemental personal data, like linguistic skills, contact information, family, and marital status. Furthermore, the GRF collects sensitive data regarding a person's ethnicity, religion, and vulnerabilities (see Table 1).

It is important to note that the GRF is not and will not be interoperable with the European systems. While a major interoperability strategy is being pursued by the European Commission and eu-LISA (the Commission's agency for the operational management of large-scale IT systems in the area of freedom, security, and justice), its focus is on furthering interoperability only among European systems and does not involve national ones (see EU 2019a, 2019b). As a result, personal data collected by the GRF are not expected to be shared with other EU member states, which will continue to receive only data from European systems.

Taken together with the comparison of scripts of alterity, this clarification reveals a de facto division of labor between national and supranational scales of governance. The European systems only allow functions based on hit/no-hit queries based on biometrical data. Some functions like societal integration and job placement, which require more fine-grained personal data, can only be completed at the national level by authorities with access to data on the national system. Therefore, on the basis of data collected at

the border, EU agencies and non-frontline countries are only enabled to carry on security functions.

This finding does not imply that Greek authorities are more receptive to integrating people on the move than non-frontline European authorities. It is better interpreted in light of the broader European data architecture and the origin of the GRF: designed by the police IT headquarters in Athens around 2015, the GRF was heavily subsided by the EU Commission DG HOME, which played a role in shaping the European architecture of migration management data (interview with DG HOME officer, June 2017). The difference in categories makes visible not so much the goodwill of Greek authorities but a (lack of) intergovernmental cooperation on integration by design. In this light, the comparative analysis of scripts of alterity reveals a division of labor that—while not being formalized in policy—de facto shapes the European order.

De-inscribing Scripts of Alterity

In order to account for stabilized crystallizations of power into scripts of alterity, we complemented our analysis of scripts of alterity with ethnographic observation of their use. This constitutes the second moment of the analysis, focused on the contingent contestation in practice of the security apparatus deployed at the European border. Here, we focus specifically on de-inscriptions from scripts of alterity, that is, from assumptions and limitations about people on the move.

We undertook ethnographic observation at registration centers in the Greek mainland (Fylakio center) and on the islands (Samos, Chios, and Leros) at multiple times, for a total amount of five weeks from 2017 to 2019. Our observations revealed three practices of de-inscription from scripts of alterity: alternative proofs, categorical stretching, and unmatching declarations. Of course, we do not claim that these exhaust the full analytical variety of de-inscriptions: these three practices provide an initial typology of de-inscriptions from scripts of alterity, with further research currently being conducted (e.g., Olivieri 2023).

First, "alternative proofs" relate to alternative ways of establishing one's identity (Pelizza 2020). They are open requests made by people on the move to officers during identification and registration. It is quite common for people to ask police and registration officers to be identified neither on the basis of passports nor biometrics but by school certificates, family trees, or other documents reporting personal data and life achievements. Pelizza (2020) notes this practice is an effort to reject the standard process of

identification that relies on biometric data and documents issued by police authorities and instead to assert the legitimacy of alternative forms of identification based on documents produced by other authorities. This practice can be conceived of as a form of de-inscription from hit/no-hit systems using biometric indexes. We observed its use mainly as an act of de-inscription from Eurodac's "irregular immigrant" script of alterity. In this de-inscriptive practice, political agency unfolds as an explicit and intentional contestation of the legitimacy of policing epistemic sources (i.e., the bare body or the police issuing passports in the country of origin).

"Categorical stretching" is a second type of practice challenging the scripts of alterity (Pelizza 2020). It involves implicit contestation from people on the move to Western classifications established as global benchmarks. Pelizza (2020) reports the example of seventeen men who self-identified as siblings. Having left their village in sub-Saharan Africa together and having reached the EU border still together was sufficient, in their view, to qualify as siblings. By so doing, migrants challenged the European nuclear family model and de-inscribed themselves from a script of alterity that did not include non-European classifications of family relationships. Another example of categorical stretching happens when children try to register as adults and vice versa (FRA 2018), thus challenging the definition of adulthood. This practice de-inscribes from Eurocentric classifications and asserts alternative classifications based on lived experience. Categorical stretching can be conceived of as a means of de-inscribing mainly from data systems that contain personal information. We observed its use with the GRF script of alterity as "long-term stayer." In this de-inscriptive practice, political agency unfolds as an implicit but intentional contestation of the legitimacy of classifications.

A third practice of de-inscription is "unmatching declarations," unintentional mismatches between data schemas and data reported by applicants. For example, inaccurate birth date recordings often involve cases where only the birth year is known, so the date are recorded as January 1 of that year, and discrepancies can also result from variations in calendar systems (FRA 2018).[10] A telling case of unmatching declaration was observed during registration procedures at the Fylakio center in Greece:

> A hot day in July 2018, mosquitos and flies infest the narrow alleys and barracks at the identification and registration center in Fylakio. Amina (fictional name) crossed the border today with her family from Turkey and across the river Evros. They were caught by the police along the river and brought to the center. She has already gone through the first stage of identification in a

different shed and is now being registered on the GRF as part of her asylum claim. She is sitting on one side of the desk, the Greek asylum officer sits in front of her—the desktop computer between them, the interpreter to her left, the researcher conducting ethnographic observation[11] and her translator further next, still at hearing distance. Two other asylum officers are present in the shed, attending to their own issues. Amina, the interpreter and the asylum officer are collaboratively filling the GRF through questions and answers. When asked in her language about her profession, Amina declares to be a school director. As the interpreter translates, the ethnographer notices the asylum officer's puzzlement. The officer stops the Q&A procedure and asks for support in Greek to the two colleagues present in the shed. They seem puzzled, as well, then answer in Greek. The officer reflects about the answer and the inputs something in the GRF. Given her noninterferential mandate, the ethnographer takes advantage of a break to ask the officer and the assisting translator what had happened. Apparently, Amina's profession did not fit the script: "school director" was not an option available on the scroll-down menu of the GRF, and neither was "teacher." After consulting with colleagues, the asylum officer found a solution in the attribute "other profession." At the end of the procedure, the asylum officer and the interpreter take a break. The ethnographer reaches the two other asylum officers who went smoking outside the shed. They spontaneously report that "school director" is just one case among many of data schemas that fail in providing for categories and attributes declared by applicants. Other exemplary cases are "pilot," "flight attendant," "teacher."

Missing attributes are exemplary cases of limitations inscribed in scripts of alterity. In the GRF, people on the move are not expected to be school directors, nor teachers, nor pilots. Their identity must be enacted according to those limitations. Amina's decade-long work experience as school director was not reflected in the residual classification of "other profession." Through the limitations introduced by the script of alterity, the apparatus de facto deleted her professional identity. At the moment the officer filled the residual category, Amina stopped being a school director and was enacted as an unspecified professional, an unskilled asylum applicant. This case very clearly shows the coextension of enactment and normativity assumed in the conceptualization of scripts of alterity. In Amina's case, disentangling normativity and enactment is impossible: she was prescribed to adapt her lived experience to the data system and was concomitantly enacted according to such limitation. Not only do scripts of alterity prescribe users' behaviors, but in doing so, they also enact them.

Security apparatuses act by imposing limitations, but unmatching declarations de-inscribe from such scripts of alterity. They do not fit established assumptions and assert the irreducibility of lived experience. The practice of unmatching declarations can be understood as a form of de-inscription from all scripts of alterity that fall short of providing for the multiplicity of migrants' life trajectories. In this de-inscriptive practice, political agency unfolds as an implicit and unintentional contestation of assumptions and limitations.

The unintentional character of unmatching declarations sets it apart from the other two forms of de-inscription we observed at the border, and from broader forms of resistance reported by the literature as above described. It challenges the Foucauldian formulation of resistance that assumes intentionality in resisting artifacts and forces us to wonder whether script theory can account for unintentional de-inscriptions. The concept of scripts of alterity can certainly account for unintentional de-inscriptions that would not normally be considered as resistance.

Furthermore, unmatching declarations involve practices of de-inscription beyond the in-situ interaction with the system (e.g., the refusal to being fingerprinted); it characterizes a longer-term relation between people on the move and scripts that do not take into account their diverse and multiple past life trajectories. Seen in this light, scripts of alterity can describe a condition that unfolds in the present in relation to the past. It is by reducing the past to scripts' assumptions and categories that the violence of the here-and-now of the border becomes evident.

Conclusion: The Contribution of Scripts of Alterity to STS and CSS

In this article, we have analyzed classification schemas in the context of a growing securitization of cross-border mobility. Classification schemas have been mobilized as objects of analysis, methodological resources, and as sources of knowledge about their producers. We conceptualized the outcomes of the analysis as "scripts of alterity" and compared the scripts of alterity of four digital data systems used at the European border. In light of the findings, we suggest that the conceptualization of scripts of alterity contributes to the STS and CSS literature on migration management and cross-border mobility in three respects. The first contribution addresses a topical issue in CSS, namely the risk of naturalizing hegemonic standpoints. Although this risk cannot be fully avoided, by our conceptualization of scripts of alterity revitalized the notion of "de-scription" as translation of

implicit normativities into discourse. Rather than a process of naturalization, de-scribing scripts of alterity is a necessary preliminary condition to critique and resist hegemonic assumptions and limitations that would otherwise remain implicit.

Second, the conceptualization of scripts of alterity contributes to the debate in STS and CSS by addressing the tension between stabilization and contingency foregrounded by this special issue of *Science, Technology, & Human Values* as a matter of complementary analytical moments. While we recognize the asymmetrical relations at play between apparatus and people on the move, we explain them not so much as a matter of hegemony versus subjectification (the explanans, so to say), but as a matter of stabilization and contingency (the explanandum). This choice is operationalized in our adoption of script theory: as scripts of alterity materialize the apparatus in data systems, their contestation through de-inscriptions is always contingent to the encounter with actual people on the move.

On the one hand, focusing on stabilization and comparing scripts of alterity has allowed us to spot implications for the European order that would have remained invisible if our methodological focus were only on contingency. Given the stabilized, durable character of data systems, the de facto division of labor between national and supranational scales of governance is unlikely to change in the short term. In themselves, these findings are expected to contribute to studies that look at "processing alterity" as processes of European reordering (Pelizza 2020; Pelizza and Loschi 2023). As Grommé and Ruppert (2020, 238) have established, the data grids and cubes of statistical infrastructures that enact European populations are far from coherent and unified, and produce "Europe not as a whole but as multiple spatial, temporal, social, and methodological topologies." Our comparative analysis of classification schemas contributes to highlighting this multiplicity by spotting power relations not just between apparatus and people but across scales of governance.

On the other hand, the methodological focus on contingency has allowed us to identify forms of resistance that challenge stabilization. Practices of de-inscription are not exerted against an ungraspable security apparatus but vis-à-vis identifiable scripts of alterity. Resistance by people on the move takes place in the context of data systems and their embedded scripts of alterity that attempt to reduce past life experiences into discrete categories. Our findings suggest research on the securitization of cross-border mobility should focus not only on the future dimension of resistance as mobilized by life expectations but also on the role of the past (see also Olivieri 2023).

Third and finally, our concept of scripts of alterity also has the potential to advance STS scholarship. Scripts of alterity can account for unintentional de-inscriptions that would not normally fall under the label of resistance, which is assumed to be intentional. Although ANT has traditionally predicated the disentanglement of agency and intentionality, it is not clear whether the notion of de-inscription assumes intentionality (Akrich and Latour 1992). The evidence of unmatching declarations suggests script theory must disambiguate this issue, so as to account for unintentional de-inscriptions. Additionally, we may wonder who has the responsibility to provide people on the move with fair and just identification. When their past life cannot be changed, it is authorities who must assure that assumptions and limitations inscribed in information systems adequately match the richness of experience.

Authors' Note

Acknowledgment

Declaration of Conflicting Interests

Funding

ORCID iDs

Annalisa Pelizza https://orcid.org/0000-0002-7720-5659
Wouter Rudi Van Rossem https://orcid.org/0000-0002-7943-2222

Note

1. While we use the term "border," we are not unaware of developments in border studies, which describe a multisited and deterritorialized "borderland" (Balibar 2009) or "borderscape" (Brambilla 2015). The data systems analyzed in this paper are not only strictly used at the borderline (e.g., Eurodac used to scan and compare fingerprints) but in the extended borderland (e.g., Eurodac used in crime investigations).
2. At the time of our ethnographic observations, four main data systems were used at the European border: VIS, Eurodac, SIS II, plus usually a national system. At the time of writing, the new European Travel Information and Authorization System (ETIAS), European Criminal Record System for Third Country Nationals (ECRIS-TCN), and Entry-Exit System (EES) systems are under development, so they were not included in this study because ethnographic analysis requires that the systems are deployed and in use.
3. We acknowledge that these two moments are not the only possible ones. For example, an analysis of scripts of alterity could proceed from design practices. Yet such an approach would pose temporal constraints because years have passed between the systems were designed and the users engage with them. To bypass this problem and the "thinness" of data schemas, we compared diverse systems.
4. It should be noted that the European Union's (EU) "Strategy towards a Fully Functioning and Resilient Schengen Area" includes developments to further interoperability among European data systems Eurodac, Schengen Information System (SIS) II, VIS, ETIAS, EES, and the ECRIS-TCN (see EU 2019a, 2019b). Leese (2022) provides an overview of how this new technological architecture will change the way identity is managed.
5. The Ontology Explorer is openly available at https://processingcitizenship.eu/ontology-explorer/. It represents data schemas as a network, enabling analysis through predefined queries and visualizations.
6. As ethnographic analysis requires that the systems are deployed and in use, we discuss here the version of the Eurodac system in use at the time of our

observations in 2017-2019. It should be noted that possible forthcoming changes to Eurodac will include the collection of more data, such as biometric facial image, surname(s) and forename(s), name(s) at birth and previously used names and any aliases, nationality(ies), and place and date of birth as per the "Eurodac recast" regulation (European Commission 2016; Council of the European Union 2022).

7. To study SIS II's script, we only look at data collected about people.

8. A similar logic of deceit is reported by Trauttmansdorff (2022) when describing the "red link" notifying the mismatch of data across systems implemented by the Multiple Identity Detector, one of the components established by the EU interoperability legal framework in the Area of Freedom, Security, and Justice (EU (European Union) 2019a).

9. A preliminary discussion of these findings was published in Pelizza and Van Rossem (2021), noting that the overall argument of the two publications is radically different.

10. The recording of dates of birth can present challenges, as highlighted in the 2018 FRA (Fundamental Rights Agency) report, which draws on insights from a legal assistance provider for asylum seekers. The report recounts how many Afghans expressed their age or birth year based on the Persian Afghan calendar. However, converting these dates to the Georgian calendar, the standard in information systems, can be complex due to variations in year lengths and starting points between the two calendar systems. Accurate conversion tools are necessary to ensure alignment between the calendar systems, as inaccuracies may result in discrepancies in the registered date of birth in the Gregorian calendar format. The report by FRA points out that inconsistencies in registered dates of birth can create mistrust and suspicion toward asylum seekers, particularly when contrasting information is found in other EU member states' systems.

11. The first author of this article.

References

Agamben, Giorgio. 2009. *"What Is an Apparatus?" and Other Essays*. Palo Alto, CA: Stanford University Press.

Akrich, Madeleine, and Bruno Latour. 1992. "A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies." In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by W. E. Bijker and J. Law, 259-64. Cambridge, MA: The MIT Press.

Allen, W. L., and B. A. Vollmer. 2018. "Clean Skins: Making the e-Border Security Assemblage." *Environment and Planning D: Society and Space* 36 (1): 23-39. doi: 10.1177/0263775817722565.

Amelung, Nina. 2021. "'Crimmigration Control' Across Borders: The Convergence of Migration and Crime Control through Transnational Biometric Databases." *Historical Social Research* 46 (3): 151-77.

Amicelle, Anthony, Claudia Aradau, and Julien Jeandesboz. . 2015. "Questioning Security Devices: Performativity, Resistance, Politics." *Security Dialogue* 46 (4): 293-306. doi: 10.1177/0967010615586964.

Amoore, Louise. 2006. "Biometric Borders: Governing Mobilities in the War on Terror." *Political Geography* 25 (3): 336-51. doi: 10.1016/j.polgeo.2006.02.001.

Andersson, Roland. 2015. "Hardwiring the Frontier? The Politics of Security Technology in Europe's 'Fight against Illegal Migration'." *Security Dialogue* 47 (1): 22-39.

Aradau, Claudia. 2018. "From Securitization Theory to Critical Approaches to (in)Security." *European Journal of International Security* 3 (3): 300-305. doi: 10.1017/eis.2018.14.

Aradau, Claudia, B. Thierry, Basaran Tahsin, Didier Bigo, Bonditti Philippe, C. Büger, and Davidshofer Stephan. 2006. "Critical Approaches to Security in Europe: A Networked Manifesto." *Security Dialogue* 37 (4): 443-87. doi: 10.1177/0967010606073085.

Balibar, Étienne. 2009. "Europe as Borderland." *Environment and Planning D: Society and Space* 27 (2): 190-15. doi: 10.1068/d13008.

Balzacq, Thierry. 2008. "The Policy Tools of Securitization: Information Exchange, EU Foreign and Interior Policies." *Journal of Common Market Studies* 46 (1): 75-100.

Bellanova, Raoul, and Georgios Glouftsios. 2022. "Controlling the Schengen Information System (SIS II): The Infrastructural Politics of Fragility and Maintenance." *Geopolitics* 27 (1): 160-84. doi: 10.1080/14650045.2020.1830765.

Bigo, Didier. 2001. "When Two Become One: Internal and External Securitisations in Europe." In *International Theory and the Politics of European Integration: Power, Security and Community*, edited by M. Kelstrup and M. C. Williams, 119-40. London, UK: Routledge.

Biermann, Felix, Nina Guérin, Jagdhuber Stefan, Berthold Rittberger, and Moritz Weiss. 2019. "Political (Non)reform in the Euro Crisis and the Refugee Crisis: A Liberal Intergovernmentalist Explanation." *Journal of European Public Policy* 26 (2): 246-66. doi: 10.1080/13501763.2017.1408670.

Bowker, Geoffrey C, and Susan Leigh Star. 1999. Sorting Things Out: Classification and Its Consequences. Cambridge, MA: The MIT Press.

Brambilla, Chiara. 2015. "Exploring the Critical Potential of the Borderscapes Concept." *Geopolitics* 20 (1): 14-34. doi: 10.1080/14650045.2014.884561.

Broeders, Dennis, and Huub Dijstelbloem. 2015. "The Datafication of Mobility and Migration Management: The Mediating State and Its Consequences."

In *Digitizing Identities*edited by I van der Ploeg and .J. Pridmore242-60. London, uk: Routledge.

Callon, Michel. 1995. "Four Models for the Dynamics of Science." In *Science and the Quest for Reality*, edited by A. I. Tauber, 249-92. Basingstoke, UK: Palgrave Macmillan.

Council of the European Union. 2022. "Amended Proposal for a Regulation of the European Parliament and of the Council on the Establishment of 'Eurodac' for the Comparison of Biometric Data for the Effective Application of Regulation (EU) No 604/2013 and Directive 2001/55/EC." Interinstitutional File: 2016/0132(COD). Accessed March 6, 2023. https://data.consilium.europa.eu/doc/document/ST-10583-2022-INIT/en/pdf.

Curtin, Deirdre. 2017. "Security of the Interstice and Inter-operable Data Sharing: A First Cut." In *Constitutionalising the Security Union: Effectiveness, Rule of Law and Rights in Countering Terrorism and Crime*, edited by S. Carrera and V. Mitsilegas, 65-72. Brussels, Belgium: Centre for European Policy Studies.

Dijstelbloem, Huub. 2021. *Borders as Infrastructure: The Technopolitics of Border Control*. Cambridge, MA: The MIT Press.

Dijstelbloem, Huub, and Dirk Broeders. 2015. "Border Surveillance, Mobility Management and the Shaping of Non-publics in Europe." *European Journal of Social Theory* 18 (1): 21-38.

Dijstelbloem, Huub, Robert van Reekum, and , Willem Schinkel. 2017. "Surveillance at Sea: The Transactional Politics of Border Control in the Aegean." *Security Dialogue* 48 (3): 224-40. doi: 10.1177/0967010617695714.

Dourish, Paul. 2017. *The Stuff of Bits. An Essay on the Materialities of Information*. Cambridge, MA: The MIT Press.

EU (European Union). 2019a. "Regulation (EU) 2019/817 of the European Parliament and of the Council of 20 May 2019 on Establishing a Framework for Interoperability between EU Information Systems in the Field of Borders and Visa [. . .]." *Official Journal of the European Union*, L135. Accessed March 22, 2023. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0817&from=EN.

EU (European Union). 2019b. "Regulation (EU) 2019/818 of the European Parliament and of the Council of 20 May 2019 on Establishing a Framework for Interoperability [. . .]." *Official Journal of the European Union*, L135. Accessed March 6, 2023. https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32019R0818.

European Commission. 2016. "Regulation of the European Parliament and of the Council on the Establishment of 'Eurodac' for the Comparison of Fingerprints for the Effective Application of [Regulation (EU) No 604/2013]." COM(2016)

272 final. Accessed March 22, 2023. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016PC0272&from=EN.

European Digital Rights (EDRI). 2022. "Warnings against Arbitrariness and Mass Surveillance in EURODAC." Accessed March 22, 2023. https://edri.org/our-work/warnings-against-arbitrariness-and-mass-surveillance-in-eurodac/

Feldman, Gilad. 2005. "Culture, State, and Security in Europe: The Case of Citizenship and Integration Policy in Estonia." *American Ethnologist* 32 (4): 676-94. doi: 10.1525/ae.2005.32.4.676.

Feldman, Gilad. 2012. *The Migration Apparatus: Security, Labor, and Policymaking in the European Union*. Stanford, CA: Stanford University Press.

Fill, Alice. 2021. "Le politiche migratorie europee tra esternalizzazione e violazione dell'obbligo di Non-refoulement: Pushback, Pullback e Backscattering." *Studi Sulla Questione Criminale* 17 (3): 83-106.

Foucault, Michel. 1980. *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*. Edited by Chris Gordon. New York: Pantheon Books.

Foucault, Michel. 2009. *Security, Territory, Population. Lectures at the Collège de France, 1977-78*. Edited by Michel Senellart. Hampshire, UK: Palgrave Macmillan.

FRA (European Union Agency for Fundamental Rights). 2018. *Under Watchful Eyes: Biometrics, EU IT-systems and Fundamental Rights*. Brussels, Belgium: EU Publications. Accessed March 22, 2023. https://fra.europa.eu/en/publication/2018/under-watchful-eyes-biometrics-eu-it-systems-and-fundamental-rights.

Galli, Filippo. 2020. "Interoperable Databases: New Cooperation Dynamics in the EU AFSJ?" *European Public Law* 26 (1): 109-30.

Geiger, R. Stuart, and David Ribes. 2011. "Trace Ethnography: Following Coordination through Documentary Practices." *2011 44th Hawaii International Conference on System Sciences*, 1-10. doi: 10.1109/HICSS.2011.455.

Grommé, Francisca Eric, and . 2020. "Population Geometries of Europe: The Topologies of Data Cubes and Grids." *Science, Technology, & Human Values* 45 (2): 235-61. doi: 10.1177/0162243919835302.

Kloppenburg, Sanneke, and I. van der Ploeg. 2018. "Securing Identities: Biometric Technologies and the Enactment of Human Bodily Differences." *Science as Culture* 29 (1): 57-76. doi: 10.1080/09505431.2018.1519534.

Latour, Bruno. 1992. "Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts." In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by W. E. Bijker and J. Law, 225-58. Cambridge, MA: The MIT Press.

Leese, Matthias. 2022. "Fixing State Vision: Interoperability, Biometrics, and Identity Management in the EU." *Geopolitics* 27 (1): 113-33. doi: 10.1080/14650045.2020.1830764.

Marres, Noortje. 2017. *Digital Sociology: The Reinvention of Social Research*. Cambridge and Malden, MA: Polity Press.

M'charek, Amade, Schrammand David Skinner. . 2014. "Topologies of Race: Doing Territory, Population and Identity in Europe." *Science, Technology, & Human Values* 39 (4): 468-87. doi: 10.1177/0162243913509493.

Mezzadra, Sandro, and Brett Neilson. 2013. *Border as Method, or, the Multiplication of Labor*. Durham, NC: Duke University Press.

Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*. Durham, NC: Duke University Press.

Mora-Gámez, Fredy.. 2020. "Beyond Citizenship: The Material Politics of Alternative Infrastructures." *Citizenship Studies* 24 (5): 696-711. doi: 10.1080/13621025.2020.1784648.

Olivieri, Luana. 2023. "Temporalities of Migration: Time, Data Infrastructures and Intervention." PhD diss., University of Bologna, Bologna, Italy.

Oudshoorn, Nelly. 2011. *Telecare Technologies and the Transformation of Healthcare*. Basingstoke, UK: Palgrave Macmillan.

Pelizza, Annalisa. 2020. "Processing Alterity, Enacting Europe. Migrant Registration and Identification as Co-construction of Individuals and Polities." *Science, Technology, & Human Values* 45 (2): 262-88. doi: 10.1177/0162243919827927.

Pelizza, Annalisa. 2021. "Identification as Translation: The Art of Choosing the Right Spokespersons at the Securitized Border." *Social Studies of Science* 51 (4): 487-511. doi: 10.1177/0306312720983932.

Pelizza, Annalisa, and Chiara Loschi. 2023. "Telling 'More Complex Stories' of European Integration: How a Sociotechnical Perspective Can Help Explain Administrative Continuity in the Common European Asylum System." *Journal of European Public Policy*. doi: 10.1080/13501763.2023.2197945.

Pelizza, Annalisa, and Wouter Van Rossem. 2021. "Sensing European Alterity. An analogy between sensors and Hotspots in Transnational Security Networks." In *Sensing In/Security: Sensors as Transnational Security Infrastructure*, edited by Nina Klimburg-Witjes, Nikolaus Pöchhacker, , and C. Bowker. , 262-86. Manchester, UK: Mattering Press. doi: 10.28938/9781912729111.

Perugini, Nicola, and Nicholson Gordon. 2017. "Distinction and the Ethics of Violence: On the Legal Construction of Liminal Subjects and Spaces." *Antipode* 49 (5): 1385-405.

Pollozek, Silvan. 2020. "Turbulences of Speeding Up Data Circulation. Frontex and Its Crooked Temporalities of 'Real-time' Border Control." *Mobilities* 15 (5): 677-93. doi: 10.1080/17450101.2020.1801304.

Silvan, Pollozek, and Jan Hendrik Passoth. 2019. "Infrastructuring European Migration and Border Control: The Logistics of Registration and Identification at

Moria Hotspot." *Environment and Planning D: Society and Space* 37 (4): 606-24.

Pötzsch, Holger. 2015. "The Emergence of Iborder: Bordering Bodies, Networks, and Machines." *Environment and Planning D: Society and Space* 33 (1): 101-18. doi: 10.1068/d14050p.

Scheel, Stephan. 2017. "The Secret Is to Look Good on Paper: Appropriating Mobility within and against a Machine of Illegalization." In *The Morders of "Europe": Autonomy of Migration, Tactics of Bordering*, edited by N. De Genova, 37-63. Durham and London, UK: Duke University Press.

Schimmelfennig, Frank. 2018. "European Integration (Theory) in Times of Crisis. A Comparison between the Euro and the Schengen Crisis." *Journal of European Public Policy* 25 (7): 969-89. doi: 10.1080/13501763.2017.1421252.

Schinkel, Willem. 2020. "State Work and the Testing Concours of Citizenship." *The British Journal of Sociology* 71 (3): 556-71. doi: 10.1111/1468-4446.12743.

Sontowski, Sina. 2018. "Speed, Timing and Duration: Contested Temporalities, Techno-political Controversies and the Emergence of the EU's Smart Border." *Journal of Ethnic and Migration Studies* 44 (16): 2730-46. doi: 10.1080/1369183X.2017.1401512.

Suchman, Lucy. 2020. "Algorithmic Warfare and the Reinvention of Accuracy." *Critical Studies on Security* 8 (2): 175-87.

Trauttmansdorff, Paul. 2022. "Imagining, Enacting, and Justifying Future Borders. The eu-LISA Agency and the Digital Transformation of the Border Regime." PhD diss., University of Vienna, Austria.

Trauttmansdorff, Paul, and U. Felt. 2021. "Between Infrastructural Experimentation and Collective Imagination: The Digital Transformation of the EU Border Regime." *Science, Technology, & Human Values* 48 (3): 635-662. doi: 10.1177/01622439211057523.

van der Kist, Jasper, Huub Dijstelbloem, and de Goede Marieke. 2019. "In the Shadow of Asylum Decision-making: The Knowledge Politics of Country-of-origin Information." *International Political Sociology* 13 (1): 68-85. doi: 10.1093/ips/oly029.

van der Ploeg, Irma, and Sprenkels Isolde. 2011. "The Migration Machine and the Machine-Readable Body." In *Migration and the New Technological Borders of Europe*, edited by H. Dijstelbloem and A. Meijer, 68-104. Basingstoke, UK: Palgrave Macmillan.

van Reekum, , Robert. 2019. "Patrols, Records and Pictures: Demonstrations of Europe in the Midst of Migration's Crisis." *Environment and Planning D: Society and Space* 37 (4): 625-43.

Van Rossem, Wouter, and Annalisa Pelizza. 2022. "The Ontology Explorer: A Method to Make Visible Data Infrastructures for Population Management." *Big Data & Society* 9 (1). doi: 10.1177/20539517221104087.

Walters, W. 2011; "Rezoning the Global. Technological Zones, Technological Work and the (Un-)making of Biometric Borders." In *The Contested Politics of Mobility. Borderzones and Irregularity*, edited by V. Squire, 51-73. London, UK/New York: Routledge.

Author Biographies

Annalisa Pelizza is professor of science and technology studies at the University of Bologna. She is vice president of STS Italia. Her research on "Governance by Data Infrastructures" studies how data systems and practices can entail long-term but unnoticed transformations in modern institutions, which are often buried in technical minutiae.

Wouter Rudi Van Rossem is a doctoral candidate at the University of Twente in the Netherlands and is currently based in Bologna as part of the Processing Citizenship project. His research focuses on data matching in transnational commercialized security infrastructures. He analyzes, among others, various procedures for reidentifying clients in bureaucratic systems and the developments of global security and identification technologies in different contexts.