Tampere University

PINJA LEHTONEN

The Technologization of European Union Border Control

Political Agency Steering Societally Significant Practices

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ACADEMIC DISSERTATION
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during the project. I wish to also extend my gratitude to my mentor, the wonderful Jaana Tyynismaa, who helped me to significantly enhance my self-knowledge.

Prior to publication, this work has been evaluated by my pre-examiners, Professor Vicki Squire (University of Warwick) and Adjunct Professor Tanja Tamminen (University of Turku and the Finnish Police University College), as well as the internal appraiser Professor Juha Vuori (Tampere University). I am grateful for the thorough feedback you three have given me during the review process. I would also like to thank the anonymous reviewers and the editors of the international journals in which my work has been published, especially the editor of New Perspectives, Dr. Benjamin Tallis (Prague Institute of International Relations), for his excellent feedback and suggestions for improving my article.

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father's courageousness, his ability to take up tasks without hesitation and his reassurance for seeing the positive sides to things. As a family we faced a devastating loss when my younger brother Ilmari's life was taken in 2017. Despite this heartbreak, my parents have been able to retain their curiosity for life as vibrant as ever. I thank them for the solid foundation their upbringing has given me in life. Besides their willingness to always listen to me and help me, they have given me a home where the love for culture and respect for nature as well as the quest for social justice were significant. I have had the privilege to grow up in an environment where political issues were discussed openly from many perspectives and critical thinking was valued. I dedicate this work to my parents.

Tampere, 17 May 2020

Pinja Lehtonen

ABSTRACT

This dissertation studies political agency, which shapes automated border control (ABC) policies and the ensuing border control practices in the European Union (EU). In the articles of which the dissertation is composed, we research the subjective orientation of parliamentarians and stakeholders involved in the decision-making processes on the technologization and digitalization of border control. The motivation for the research initially came from the European Commission's push to harmonize and automate border control in the Schengen area of free mobility. Essentially, the Commission has been advocating for harmonized, electronic, automated border control gates, which use sensitive biometric identifiers, such as fingerprints recorded on the electronic passport to speed up border control for the masses and allow for the border control officials to concentrate on 'high-risk' travellers.

Automated border control is a part of a wider trend where societal surveillance has shifted from a physical process at the border to a complex information technology driven data governance and surveillance apparatus. The EU is a prime example of an actor pushing for an assessment of the 'risks' travellers pose before they travel utilizing a large amount of passenger data. Large registers of people's personal information, ranging from dietary restrictions to iris scans are now used and shared to determine the risks, and for several reasons, this warrants critical scrutiny. For instance, it is tempting for multi-function institutions such as governments to subsequently use data of registers for purposes other than those for what it was collected. In the EU it is now envisioned that e.g. national law enforcement agencies would have access to border control data to solve crimes classified as serious and to combat terrorism. The potential 'function creeps' may become dangerous, e.g. for any kinds of minorities, political opponents of governments etc. since societal conditions change over time but the data remains on record.

The aim of the first two articles of the dissertation is to understand what kind of automated border control devices and practices are politically acceptable to the participants acting as decision-makers and experts in EU Member States. We study Finnish decision-makers' subjective orientation in our first iteration and compare

those of four EU Member States in the second one. This is a novel line of enquiry given the lack so far of studies at the level of Member States. Existing literature has overall been quite theoretical and not empirically, especially experimentally rich. The novelty value is also tied to the fact that these policies and technologies are somewhat new and have thus not yet been studied in detail from the societal and political point of view.

In the third article, we also establish another new avenue of research: we research how people with disabilities should be taken into account when designing technologically reinforced border control systems in the EU. Furthermore – as a leap towards the more abstract and broader issue of how International Relations (IR) should research subjective agency – the fourth article argues for the potential in combining a recent IR venture in ontology, namely Alexander Wendt's (2015) quantum social ontology with the main methodology applied in the thesis, Q methodology.

The thesis is empirically driven, and the first three articles report the results of our empirical work carried out with Q methodology, a questionnaire and interviews. The work is critical of 'armchair research', which the research concerning (European) border control often is, although it recognizes the important ethical arguments of IR's critical security studies. The interest in empirical work is reiterated in the fourth article, which presents ideas on how to operationalise Wendt's ontological notions with the help of Q methodology in (future) empirical social scientific work. The heuristic background of the dissertation is in 'practice-oriented' IR. This includes commitments to pragmatism and practice theory, but also criticism of those theory traditions, since research making use of them paradoxically does not often progress beyond the level of theoretical constructs and theoretical feuds within IR.

The dissertation finds three distinct factors or view types on ABC in both the first and second articles. The latter are more significant, since the first article is a 'pilot iteration' for Finnish participants, while the second compares political views in Finland, Romania, Spain and the United Kingdom. Article II finds that the views on ABC are tied to the political affiliation rather than e.g. the nationality of the participants. Participants espousing the first view were politically oriented to the (centre) left and were worried about the potential erosion of civil liberties, the lack of due process and the disadvantages of technocracy in the context of ABC. Participants supporting the second view came from (centre) right political parties and welcomed technologically enforced border control with its risk profiling approach as an increase in security and efficacy. The third view was supported by Eurosceptic (far) right parties and used the core strategies of populist argumentation.

Its supporters were concerned about increasing immigration and demanded that border control be organized nationally.

The third article finds that a universal design concept in (ABC) technology development should be adopted both from the standpoint of equal rights and usability, and thus also the efficacy of the technology. It also finds that accessibility of people with disabilities is feasible from the technological, economic and operational points of view, especially if this accessibility requirement is made in the tenders of ABC technology and vulnerable groups such as people with disabilities are involved in the design processes.

Finally, the fourth research article finds that there is ample potential for combining Q methodology and the quantum social ontology in future work on subjective agency in IR, which is regrettably an understudied area of IR, as the concepts 'international' and 'politics' would not exist without human agency. The compatibility of the methodology and the views on ontology – whether the quantum view is indeed taken as an ontology, an analogy or a heuristic – stems from their shared principles as regards measuring states of mind and states of matter, their rejection of rational choice and their belief in creative potential in agency.

Keywords: accessibility, automated border control, European Union, Q methodology, quantum social ontology, Smart Borders, subjective agency

TIIVISTELMÄ

Tämä kokoomaväitöskirja tutkii poliittista toimijuutta, joka muovaa automatisoituun rajatarkastukseen liittyvää politiikkaa ja siitä seuraavia poliittisia käytäntöjä Euroopan unionnissa (EU). Väitöskirja koostuu artikkeleista, joissa tutkimme kansanedustajien ja valiokuntatyössä kuultujen asiantuntijoiden subjektiivista suhtautumista rajavalvonnan teknologisointiin ja digitalisointiin. Euroopan komissio on ajanut rajavalvonnan automatisointia ja yhdenmukaistamista vapaan liikkuvuuden Schengen-alueella, mikä motivoi tutkimaan aihetta. Komissio argumentoi yhdenmukaisten, sähköisten, automaattisten rajanvalvontajärjestelmien puolesta. Näissä järjestelmissä käytetään arkaluonteisia biometrisiä tunnisteita, kuten sormenjälkiä, jotka on tallennettu sähköisen passin siruun. Niiden tarkoituksena on nopeuttaa suurten matkustajamäärien rajatarkastusta ja samalla keskittää rajavalvojien huomio ”vaarallisiin” matkustajiin.

Automaattinen rajavalvonta on osa suurempaa yhteiskunnallista kehityskulkua, jossa valvonta muuttuu fyysisestä prosessista yhä monimutkaisemmaksi tietoteknologian avulla toimivaksi, henkilötietoja suuressa määrin hyödyntäväksi valvontakoneistoksi. EU:n rajavalvonta ilmentää hyvin tällaista toimintatapaa: se pyrkii arvioimaan matkustajien mahdollista vaarallisuutta ennen kuin he matkustavat keräämällä ja analysoimalla suuria määriä matkustajien henkilökohtaisia tietoja. Riskiarvioita johdetaan tietorekistereistä, joihin on tallennettu tietoja ruokavalioista iiriskuviin. Tätä tarvitsee tarkastella kriittisesti – monen alan toimijoita, kuten valtioita, saattaa esimerkiksi myöhemmin houkuttaa käyttää tietoja muuhun tarkoitukseen, kuin mihin ne on alun perin kerätty. EU:ssa kaavaillaan parhaillaan, että esimerkiksi kansalliset poliisivoimat saisivat pääsyn rajanylityksen sormenjälkitietokantoihin ratkaistakseen vakaviksi määriteltyjä rikoksia ja torjuakseen terrorismia. Kun tietojen käyttöä laajennetaan tällä tavalla, se voi koitua vaaraksi esimerkiksi vähemmistöille tai valtaapitävien vastustajille, sillä yhteiskuntien olosuhteet muuttuvat, mutta henkilötiedot pysyvät rekistereissä.

Väitöskirjan kaksi ensimmäistä artikkelia selvittävät, millaisia rajavalvonta-automaattien ja rajavalvonnan toimintatapojen tulisi olla, jotta ne nauttisivat poliittista kannatusta. Tutkimme ensimmäisessä artikkelissa suomalaisten poliitikkojen ja valiokuntatyöskentelyssä kuultujen asiantuntijoiden näkemyksiä

aiheesta. Toisessa vertailemme neljän EU-maan vastaavien toimijoiden näkemyksiä. Aihetta ei ole tutkittu aiemmin jäsenvaltioiden näkökulmasta. Aiempi tutkimus on myös usein jäänyt melko teoreettiseksi, ja siksi tutkimme käytäntöjä empiirisesti ja kokeellisesti. Väitöskirjan uutuusarvoa lisää se, että tämä politiikanala ja politiikkaa toimeenpanevat teknologiat ovat jokseenkin uusia eikä niitä ole vielä tutkittu kattavasti yhteiskunnallisesta ja poliittisesta näkökulmasta.

Kolmannessa artikkelissa luodaan niin ikään uutta tietoa: tutkimme sitä, millaisin tavoin vammaiset henkilöt pitäisi ottaa huomioon, kun teknologisia rajanvalvontajärjestelmiä kehitetään EU:ssa. Neljännessä artikkelissa taas käsitellään laajempaa ja abstraktimpaa kysymystä siitä, miten kansainvälisen politiikan tieteenalalla tulisi tutkia (poliittista) subjektiivista toimijuutta ylipäätään. Siinä yhdistetään tuore kansainvälisen politiikan ontologiahanke, Alexander Wendtin (2015) kvanttilainen todellisuuskäsitys ja väitöskirjan muissa artikkeleissa käytetty tutkimusmenetelmä, Q-metodologia.

Väitöskirja painottuu empiiriseen, kokeelliseen tutkimukseen. Sen kolme ensimmäistä artikkelia raportoivat Q-metodologialla, kyselytutkimuksella ja haastatteluilla keräämämme aineiston analyysiä. Työssä suhtaudutaan kriittisesti ”nojatuolitutkimukseen”, jota (EU:n) rajavalvonnan tutkimus usein on. Silti siinä tunnustetaan aiemman kriittisen turvallisuustutkimuksen tärkeät eettiset argumentit ja teoreettiset löydökset. Kiinnostus empiiriseen tutkimukseen toistuu myös neljännessä artikkelissa, joka esittää ajatuksia siitä, miten Wendtin ontologisia käsitteitä voitaisiin tuoda empiirisen tutkimuksen tasolle Q-metodologian avulla tulevaisuuden yhteiskuntatieteellisessä tutkimuksessa. Väitöskirjan heuristinen tausta-ajatus on käytäntöihin suuntautuvassa kansainvälisen politiikan tutkimuksessa. Tähän sisältyy sitoumuksia tiedontuotantoon kansainvälisen politiikan pragmatismin ja käytäntöteorian tavoin. Työssä kuitenkin myös kritisoidaan näitä tutkimusperinteitä, sillä niitä hyödyntävä tutkimus jää paradoksaalisesti usein käytäntöjen teorisoimisen ja kansainvälisen politiikan sisäisten teoriakamppailujen tasolle pääsemättä varsinaiseen käytäntöjen tutkimukseen.

Tutkimuksen tuloksina kahdessa ensimmäisessä artikkelissa ovat kolme erilaista katsantokantaa siitä, miten automaattista rajavalvontaa tulisi kehittää. Jälkimmäisen artikkelin tulokset ovat merkittävämpiä, sillä ensimmäinen on esitutkimus suomalaisille osallistujille, kun taas toinen vertailee poliittisia näkökantoja Espanjassa, Iso-Britanniassa, Romaniassa ja Suomessa. Toisen artikkelin tuloksista ilmenee, että poliittisten toimijoiden mielipiteet ovat riippuvaisia heidän puoluepoliittisesta katsomuksestaan eivätkä esimerkiksi kansallisuudesta. Ensimmäisen näkökannan (keskusta-)vasemmistolaisia kannattajia huolestuttivat

mahdollinen kansalaisten perusoikeuksien loukkaaminen, oikeusturvan rikkominen ja teknokraattisten toimintatapojen haitat rajavalvonnassa. Toista näkökulmaa puolustivat (keskusta-)oikeistolaiset poliitikot, joiden mielestä teknologialla toimeenpantu rajavalvonta riskiprofilointeineen parantaa turvallisuutta ja rajavalvonnan tehokkuutta. Kolmatta näkemystä kannattivat euroskeptiset (ääri-)oikeistolaiset poliitikot. Näkemys perustuu populistisille argumentaatiotavoille, ja sen kannattajat olivat huolissaan maahanmuuton lisääntymisestä ja vaativat, että rajavalvonta-asiat järjestettäisiin kansallisella tasolla.

Kolmannen artikkelin tulokset puhuvat esteettömän suunnittelun puolesta rajavalvontateknologian kehittämisessä. Esteetön suunnittelutapa parantaisi matkustajien tasavertaisuutta ja samalla myös järjestelmien helppokäyttöisyyttä ja tehokkuutta. Esteettömyys olisi helposti toteutettavissa teknologiselta ja taloudelliselta kannalta. Artikkeli suosittaa, että vammaisten matkustajien esteetöntä pääsyä automaattiseen rajatarkastukseen tulisi vaatia, kun teknologiaa tilataan, ja haavoittuvaiset ryhmät, kuten vammaiset henkilöt, tulisi ottaa osaksi suunnitteluprosessia.

Neljännen artikkelin tulokset osoittavat, että Q-metodologian ja kvanttilaisen todellisuuskäsityksen yhdistäminen hyödyttäisi kansainvälisen politiikan subjektiivisen toimijuuden tutkimusta. Tällaista tutkimusta on tehty valitettavan vähän kansainvälisen politiikan alalla, vaikka käsitteitä ”kansainvälinen” ja ”politiikka” ei olisi olemassa ilman ihmisen toimijuutta. Metodologian ja kvanttiontologian yhteensopivuus – käytettiin sitä sitten todella todellisuuskäsityksenä, analogiana tai heuristiikkana – juontaa juurensa niiden yhtenevistä periaatteista koskien esimerkiksi mielen ja materian tilojen mittaamista ja siitä, että ne hylkäävät rationaalisen valinnan teorian ja uskovat toimijuuden luovuuteen.

Avainsanat: automatisoitu rajatarkastus, esteettömyys, Euroopan unioni, Q-metodologia, subjektiivinen toimijuus, yhteiskuntatieteiden kvanttilainen todellisuuskäsitys, älykkäät rajat -kokonaisuus

CONTENTS

ABBREVIATIONS

ABC	Automated border control
EDF	European Disability Forum
EES	Entry/Exit System
e-gate	electronic automated border control gate
ESTA	Electronic System for Travel Authorization (of the United States of America)
ETIAS	European Travel Information and Authorization System
EU	European Union
Eurodac	European Asylum Dactyloscopy database
Europol	European Union Agency for Law Enforcement Co-operation
Frontex	European Border and Coast Guard Agency
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IR	International Relations
IT	information technology
MP(s)	Member(s) of Parliament
MS(s)	Member State(s)
PCA	Principal Component Analysis
PNR	Passenger Name Record directive
RTP	Registered Traveller Programme
SIS (II)	the (Second Generation) Schengen Information System
UK	the United Kingdom
VIS	Visa Information System

ORIGINAL PUBLICATIONS

I Lehtonen, P. & Aalto, P., 2016. Policy Requirements for Automated Border Control Systems: A Q Methodological Study of Finland in the Context of a Large European Research Project. *Operant Subjectivity*, 38(2), p. 1–14.

II Lehtonen, P. & Aalto, P., 2017. Smart and Secure Borders through Automated Border Control Systems in the EU? The Views of Political Stakeholders in the Member States. *European Security*, 26(2), p. 207–225.

III Oostveen, A.-M. & Lehtonen, P., 2018. The Requirement of Accessibility: European Automated Border Control Systems for Persons with Disabilities. *Technology in Society*, 52, p. 60–69.

IV Lehtonen, P., 2019. How Quantum Ontology and Q Methodology Can Revitalise Agency in IR. *New Perspectives*, 27(3), p. 37–61.

AUTHOR'S ROLE AND CONTRIBUTION IN THE CO-AUTHORED PUBLICATIONS

I and II: Designing and carrying out the Q methodological research process from start to finish was Pinja Lehtonen's responsibility. Professor Pami Aalto (Tampere University), who is also Lehtonen's thesis supervisor, contributed by supervising the research process and by making revisions and additions particularly in the discussion of Article I and in the conclusions of Article II. Professor Aalto was also involved in determining the scope of the articles and the idea to research these issues in the context of the FastPass project (2013–2017), of which both authors were a part.

III: Dr. Anne-Marie Oostveen (University of Oxford) conceived the idea of researching one of the conclusions of Lehtonen and Aalto's previous work (Article II) more thoroughly. Lehtonen and Oostveen designed the research approach, questionnaire and interviews together as they both worked for the FastPass project. The statistical analysis of the questionnaire data was Oostveen's responsibility as was the initial work of creating the narratives of the four themes (findings). They both worked on the findings and methodology sections and edited those. Oostveen and Lehtonen conducted four of the 14 interviews together, while Oostveen conducted three interviews on her own and Lehtonen seven. Lehtonen was responsible for developing the theoretical background ('introduction') and the societal commentary based on the theory ('conclusion'). Lehtonen also contacted some 80 disability organizations and 50 online platforms representing and/or run by people with disabilities in order to obtain the survey responses. Oostveen and Lehtonen assisted each other and revised each other's contributions throughout the process.

In this dissertation the work leading up to these articles is described and discussed in the 'we' form. The author does not distinguish which parts she completed on her own but instead adheres to the academic convention in presenting co-authored research.

1 INTRODUCTION

In this dissertation I present four research articles that analyse the technologization of border control in the European Union from political and societal points of view. The first two articles research the political agency steering automated border control in the European Union by studying the subjective orientation of parliamentarians and stakeholders involved in the decision-making processes of the technologization and digitalization of border control. The aim of these Q methodological contributions is to understand what kind of automated border control devices and practices are politically acceptable to the participants acting as decision-makers in four EU Member States. The third article researches how groups with special needs such as people with disabilities should be taken into account when designing technologically reinforced border control systems in the EU. It uses a questionnaire for travellers with disabilities and expert interviews for technology developers, airport management and politicians.

Furthermore – and as a leap from the shaping of border control policies and practices to the more abstract and broader question of how International Relations (IR) should research subjective agency – the fourth article of this dissertation argues for the potential in combining a recent IR venture in ontology, namely Alexander Wendt's (2015) quantum social ontology with the main methodology applied in the thesis, Q methodology. The thesis is empirically driven, and the first three articles report the results of experimental empirical work carried out mostly with Q methodology. The interest in empirical work is reiterated in the fourth article, which presents ideas on how to operationalize Wendt's (2015) ontological notions with the help of Q methodology in (future) empirical social scientific work.

The present dissertation begins with an introduction to the context of the study, i.e. the political debate on technologically reinforced border control in the European Union (EU), including e.g. the decision-making roles of European institutions and Member States. I also present the existing research and note the gaps therein, followed by research questions. This contextualization is followed by a chapter introducing the theoretical commitments, namely practice-oriented IR as a heuristic guide for knowledge creation. I then present Q methodology and describe how it

was applied, after which I present the findings of the research articles. The concluding chapter discusses the theoretical and methodological significance of the research articles.

The dissertation is addressed to an academic, social scientific audience. It argues for the need to do more experimental and empirical analyses on border security as practice, since these are currently limited. It also argues for the study of political subjective agency, which so far has been underresearched. The aims of knowledge creation are practical and emancipatory, since the issue areas under scrutiny are related to major societal questions on how to manage borders, how to use sensitive biometric data of travellers in a sustainable manner and how to take vulnerable groups into consideration in border control.

1.1 The political debate on technologically reinforced border control in Europe

Since the devastation of the Second World War Europe has pursued and achieved unforeseen integration between states in the form the European Union. It has managed to create and gradually expand the Schengen area of virtually no internal borders since the Schengen Agreement of 1985. Today 22 out of 28 EU Member States (MSs) fully implement the Schengen Borders Code and four more candidate states intend joining. The agreement dispenses with the necessity for internal border controls within the area and fosters co-operation on external borders and visa policies. While free mobility of persons and goods continues within the Schengen area, stricter control of its external borders has become a salient policy issue in recent years. Europe's economic power compared to that of its adjacent regions and the increased arrival of asylum seekers and 'irregular' migrants due to poverty and conflict have in the last few years increased interest in guarding the external borders (e.g. Jones and Johnson 2016). Threats related to terrorism, crime and overstays in the EU Member States have become an established topic of political debate at top and grassroots levels alike. Nationalist sentiment has been on the rise in many European Union Member States among them Italy, Hungary and Poland, accompanied by populist, anti-EU and anti-immigration movements (Sperling and Webber 2019). This has led to pressures to strengthen the control of external borders technologically (Broeders and Hampshire 2013).

Meanwhile, the volume of passengers crossing borders to and from the European Union is on the rise. The European Commission (2014, 311) estimates that by 2025, the number of border crossings in and out the Schengen area may reach 887 million, which would be an increase of 57% from 2014 to 2025. This increase implies more pressure for the authorities tasked with overseeing the mobility of persons. In this context, the growing passenger volumes are accompanied by the aforementioned threat perceptions of terror, crime and unauthorized immigration and also the availability of novel technological solutions. This situation of increasing mobility and potential threats and difficulties combined with the development of new technologies has led to the technologization and digitalization of border control. The European Commission (e.g. 2016) has pushed for policies modernizing border control and thus aspired to adopt technological solutions especially during the past decade, e.g. in the form of its Smart Borders proposal. This proposal aims to amend the existing border management systems with the Entry/Exit System (EES), which would electronically record non-EU travellers' stays in the Schengen area and thus combat irregular migration and overstays as well as pre-vet frequent non-EU travellers to facilitate their border crossing (European Commission 2019a).

The tendency to rely on (information) technological solutions for border control has shifted the practice of managing movement across borders from the traditional protection of the physical border to a complex set of high-technology, data-driven processes. These solutions include automated border control (ABC) systems, where technological devices operated by the passengers themselves, i.e. self-service devices and systems, perform the tasks traditionally performed by border control officers in person. The automated process enables holders of biometric passports to cross borders using electronic automated border control gates, i.e. 'e-gates'. The electronic passport reader of the e-gate compares the biometrics stored on the chip of the passport, such as fingerprints, iris scans and/or facial images to the physical attributes of the person inside the gate and makes the decision whether or not to allow passage, while border guards supervise the functioning of the e-gates. This is globally a relatively recent shift of responsibility from personnel to devices. In Europe many EU Member States started to commission this automated technology in the late 2000's, especially for airport borders, where passenger volumes are greatest. It has also been envisaged that the Smart Borders EES system would make e-gates available to Third Country Nationals. At the time of writing ABC is used mainly by Schengen nationals and some Third Country Nationals as an experimental phase in the systems' adoption.

As regards policy, the European Commission has aimed at harmonizing the automated border control processes in the EU Member States. The Commission supports the notion that technological systems will help the border control officers to concentrate on 'high-risk' passengers more thoroughly, while most passengers could use the automated processes, which are assumed to expedite the throughput of passengers. This would help to alleviate the pressures of increased passenger volumes while simultaneously addressing the threat perceptions with the help of increased use of passenger data and new technology. The efforts to harmonize the automated border control processes in the EU are intended to make using the systems as efficient as possible. If they worked in the same way throughout the EU, they would be easier for passengers to use, thus generating a more efficient flow of people across borders. However, the decisions to commission these automated systems are made on the Member State level, in national parliaments, which binds the harmonization to national decision-making.

The policy debate we research in the articles of this dissertation is at the intersection of the harmonized technologization of border security, which the European Commission promotes with the Member States' decision-making power regarding border control policies, especially those related to automation. Today's EU's shared and divided competences in border control range from national to international, and to an extent supranational responsibilities and power, which has led to ambiguities and difficulties in formulating common border control policies. The European border control debate shows properties of 'differentiated integration' (different levels of integration), where on the one hand the institutional push for EU level harmonization competes with diverse views at the level of Member States on the other (see Leruth 2015, 816). The Member States obviously have vastly different priorities when it comes to external border control, depending, for example, on what kinds of borders they share with non-Schengen states.

The Members of Parliament in each MS formulate national border control policies and decide whether to acquire ABC systems and if so, what kind of systems. While the political power is held by the parliamentarians – depending on the degree of parliamentarism in each Member State – a multitude of other authorities, institutions and stakeholders are involved in the processes leading to potentially automating and technologizing border control. These actors are usually ministries in the sectors of homeland security, civil liberties and transport, the border (police) forces and the like. They are often consulted in the decision-making and have an important role in implementing the policies in practice. The research articles of this dissertation aim to understand what kinds of social, political, ethical and legal

requirements the national parliamentarians and stakeholders involved impose on the forthcoming ABC systems. To this end, it is essential to research the views of members of national parliaments and other influential stakeholders. Those views are presumably operationalized in parliamentary decision-making on border control. Decision-makers are faced with difficult choices balancing e.g. security concerns, costs and privacy rights related to using sensitive biometric identifiers in border control as well as e.g. nationalist and/or populist pressures to curb the influx of immigrants in some cases.

It has indeed been difficult for the European Union Member States to negotiate a fair way of addressing migration and asylum claims within the Schengen area of free internal mobility. The 'basic trust and common identity' binding the Schengen area has been questioned widely 'encouraging states to abandon co-operative norms for unilateral defensive practices' (Alkopher and Blanc 2017, 511). According to Alkopher and Blanc (2017), this mistrust arises from framing immigration as a security threat endangering the receiving society in various ways for the past thirty years. In general terms, southern Member States have been accused of unreliable border control by the northern ones, while the northern Member States have been criticized for not sharing the burden of the migratory pressures of the south due to their geographical locations (Alkopher and Blanc 2017). States faced with high numbers of asylum seekers, such as Austria, Germany, Greece, Italy and Sweden have been under pressure from local public opinion to demand burden sharing from the rest, while public opinion in the eastern Member States has 'cringed at the notion of sharing the costs of western multicultural sentimentality' (Genschel and Jachtenfuchs 2017, 188).

This back and forth blame game has placed the Schengen area in a situation where Member States have resorted to the reinstatement of border controls within the area of free movement. Member States such as Austria, Belgium, Denmark, France, Germany, Hungary, Slovenia and Sweden re-established internal border controls in 2015 (Alkopher and Blanc 2017; Genschel and Jachtenfuchs 2017). While the Schengen Agreement allows for temporary reinstatement of internal borders, in reality these 'temporary' arrangements have persisted for longer periods since asylum seekers started to arrive in large numbers, now justified by the 'security situation in Europe and threats resulting from the continuous significant secondary movements' (European Commission 2019b, 5).

Reinstating or strengthening border control have not been the only means to address these issues – European states also implemented stricter measures to control the arrival of asylum seekers in 2015. For instance, Jones and Johnson (2016)

mention Hungary building a fence at the border with Serbia as well as Bulgaria erecting a razor wire fence along a section of its border with Turkey. These physical barriers have been reinforced with water cannon, tear gas and by the deployment of military personnel (Jones and Johnson 2016). According to Jones and Johnson (2016, 187–188), these practices at borders show a tendency towards militarization and ultimately towards the 'dehumanization' of migrants leading to 'increasing mortality in border spaces'. They criticize this tendency whereby EU Member States and EU institutions use 'border security as a venue to express territorial sovereignty in the face of unwanted migrants and political instability in neighbouring regions' highlighting that the International Organization for Migration has identified '20,000 deaths at the borders of the EU in the past decade' (Jones and Johnson 2016, 191, 195). The political debate seems, broadly speaking, to be a battle between two opposing camps (as well as the spectrum of political views between them) – the right-wing populist anti-immigration movements in the EU Member States and the left-wing opposition of increasing surveillance as well as the promotion of human rights in border control, where the latter is generally accompanied by critical scholarly discussion.

The next subsections introduce the policy landscape we are focused on in more detail and debate the research so far on EU border control and its technologization. First, I present the roles of EU institutions and Member States in border control decision-making. The second subsection briefly discusses the influence and interests of the security industry in automated border control. The following section debates the practices of EU's 'dataveillance' (data-oriented surveillance), which combines mobility control and law enforcement aims by collecting and using large amounts of personal information on international travellers and EU citizens. The fourth section reviews earlier (critical) research on border control and border security in the EU. In the fifth section I criticize the relatively scant empirically, especially experimentally obtained knowledge the research so far has been able to produce. The final two sections respectively present the precise research questions of the four articles included in the dissertation as well as its structure.

1.2 The competences of EU institutions and Member States in border control decision-making

The decisions taken on border control are traditionally seen to be at the core of national sovereignty but in the case of the EU, in addition to the numerous national

institutions involved in border control, there are multiple international institutions with power over border control policies. The European Parliament comprised of Members of the European Parliament and the Council of the European Union consisting of ministers from Member States together shape and decide upon border control policies. Moreover, the European Commission, which consists of one commissioner per Member State (each tasked with a policy area) initiates the border control policies prepared by the Council and the Parliament. The Parliament has been seen as the representative of the 'citizens' perspective [in] EU border policies', an upholder of the operation of the Schengen area and the free movement of citizens (Huber 2015, 421). While the Parliament defends the 'citizens' interest', the Council represents the national interests of Member States and the Commission is then viewed as the guardian of the 'general European interest' (Huber 2015, 422).

Some scholars have argued that the Commission has secured 'control over border control policymaking' with its 'closer association with large-scale IT [information technology] systems' (, 301). The main data driven technological border control enforcement tools, which I discuss in more detail in section 1.4, are indeed organized under the *Commission's* Directorate-General for Migration and Home Affairs (Jeandesboz 2016). Jeandesboz (2016, 301) explains that the officials of the Commission's units have been tasked with the 'translation of technical specifications into legislative proposals and vice versa, and the translation of the successes and failures of technological systems into policy prescriptions, and again vice versa'.

The European Commission has sought to be a key stakeholder in Union-wide border control, but this has caused controversy regarding the national interests of various Member States. According to Jeandesboz (2016, 302) there have been 'longstanding controversies over the respective competencies of the Union and the Member States in the field of border control, and of EU bodies with regard to national bodies in this area'. Jeandesboz (2016, 303) says 'these controversies have unfolded over different issues, for example the establishment and operation of Frontex [the European Border and Coast Guard Agency] as well as the development of the SIS II [Schengen Information System II] and VIS [Visa Information System]', and argues that Smart Borders (essentially the Entry/Exit System) is an effort to consolidate the external rather than national borders as the Union's borders. While Frontex has certain supranational powers, including co-ordinating Schengen border control operations between the Member States, the states also implement national policies (Boulanin and Bellais 2014, 235–236). Thus, the Commission's harmonization efforts and the transition to 'smarter' borders with technological

devices such as automated border control gates are dependent upon the decisions made in the Member States.

The Schengen area operates intergovernmentally despite the Commission's efforts to establish a Union-wide immigration policy as a supranational solution in the 1980s before the creation of the Schengen area (Hooghe and Marks 2001). While the national governments have co-operated on immigration and border control under the Schengen Agreement since 1985 and on asylum policy since the 1990 Dublin convention, according to Hooghe and Marks (2001), these efforts at agreeing on intergovernmental ways to organize border control in the EU have not been as successful as hoped. The co-operation has suffered from enforcement problems as national governments have not made binding commitments (Hooghe and Marks 2001). In this complex situation, the unilateral decisions to re-establish border control in the recent years may erode the trust and identity Schengen Members share and may even lead to the disbanding of the security community (Alkopher and Blanc 2017). The tensions between national, international and supranational levels of authority are ever present in European border control.

1.3 The security industry's profits and potential influence in automated border control

Considerable business interests are related to the technology for automated border control. Europe is globally the largest market for automated biometric facilitation at airports[1] both in terms of units sold and in revenue; it is estimated to generate 1.19 billion Euros in revenue between 2018 and 2022 with the compound annual growth rate at 20% (Acuity Market Intelligence 2018). Globally there are more than 5,500 automated airport facilitation devices and processes in use, including border control, bag drop and check-in in 80 countries and their number is expected to triple by 2022 (Acuity Market Intelligence 2018).

Automated border control devices are offered by a variety of companies. In the 18 EU and/or Schengen Member States using or planning to use ABC, the devices are supplied by 17 different suppliers (Frontex 2015; Leese 2018). On the one hand this situation creates competition between suppliers but on the other it is regrettable in light of the envisaged harmonization, since the Member States do not use same criteria for commissioning the devices. Despite the funding granted by the European

[1] Europe's market share is 35%, while Asia is expected to surpass Europe before long (Acuity Market Intelligence 2018).

Commission for large research and development projects for the harmonization of ABC – one of which, entitled FastPass, was actually the funder of our research in Articles I, II and III – harmonization seems more an unrealistic than an attainable policy outcome for the forthcoming years.

The entanglement of business and policy within the sphere of technologically enforced border control has been treated critically in recent research. Jeandesboz (2016, 303) argues that the growing business potential of technological border control has furthermore attracted industry players formerly engaged in the defence industry, who now call themselves the 'security industry' and tend to issue policy recommendations in favour of a 'technology-intensive approach to border control'. Moreover, Cetti (2014, 13–14) maintains that the 'representatives of the global security industry have become incorporated into the core of the European Union's border security and migration management systems' not only by providing technology, but by 'helping direct its policy and manage its activities, and shaping its ideology, discourse and rationale'. The 'policy of subcontracting and outsourcing' migration control also characterizes the agreements the EU and its Member States have made with their neighbours (Cetti 2014, 15). These agreements involve 'intergovernmental policy bargains' resulting in 'returns and readmission clauses', which act as a 'buffer zone filtering out unwanted migrants' (Cetti 2014, 15). Here one can observe how the technological border management systems are intertwined with migration issues from the business point of view and how the industries profiting from increased technology use in border management potentially influence both border control and migration policies.

1.4 European dataveillance: a mix of law enforcement and mobility control

The complex mechanisms through which EU border control is organized moreover include a collection of various electronic information gathering, storing and sharing systems, which I describe next. These computerized systems have been created 'for the collection, exchange and analysis of data related to persons crossing the external borders of the European Union' (Jeandesboz 2016, 292). These systems, identified by a number of acronyms, comprise social and technological elements systematically gathering massive quantities of border control related information on individuals (Jeandesboz 2016). Border control has thus come to be more about the control of personal information of the masses and their mobility rather than the control of

territory; the tendency to rely on large databases is on the rise and new systems to utilize the data are constantly being created.

The VIS, or the Visa Information System aims to help Member States issuing Schengen visas to share information on people's visa applications. This is to prevent applicants from potentially concealing their unsuccessful applications when applying to another issuing authority, to determine which MS will have to process a potential asylum claim (first country of entry) and to help border guards to rapidly authenticate Schengen visas electronically. Yet the VIS also provides national police forces and intelligence services as well as the Europol (the EU Agency for Law Enforcement Co-operation) with access to consult the data in the systems for purposes of preventing, detecting and investigating serious crimes and terrorism, thus 'knitting together' many tasks and creating 'associations that blur the lines between visa and asylum application processing, border security, law enforcement and counter-terrorism' (Glouftsios 2018, 190–191).

The SIS II, i.e. the second-generation Schengen Information System circulates alerts issued by national authorities and Europol on wanted or missing people, and consular authorities consult the database, for example, when issuing a Schengen visa (European Commission 2018a). SIS II 'allows information exchanges between national border control, customs and police authorities ensuring that the free movement of people within the EU can take place in a safe environment' (European Commission 2018a). SIS II is also used to identify bans possibly imposed on passengers from entering the Schengen area due to crimes they are convicted or suspected of (Glouftsios 2018). The process to replace the first-generation SIS was initiated in December 2001 in the aftermath of the 9/11 attacks and owing to disagreements about the goals of the new system: The lengthy preparation ended only in 2013, when SIS II became operational (Jeandesboz 2016).

Remarkably, the data of both VIS and SIS II is consulted in cases where crimes are *suspected* or the aim is to *prevent* crimes. Thus 'technology enables the creation of virtual identities that condition the mobility and life chances of their human counterparts, who are first divided into suspect populations, and then disaggregated into more or less risky subjects' (Glouftsios 2018, 194). The same rationale extends to another upcoming system more than a decade in the making, the EES, or the Entry/Exit System, which is the main content still retained in the European Commission's so-called Smart Borders proposal since the RTP, i.e. the Registered Traveller Programme was abandoned. According to Glouftsios (2018, 194), the EES will 'allow for the practical operationalization of a pre-emptive logic calling for the identification of yet unknown risky individuals'.

One of the objectives of the EES is to accelerate, facilitate and ameliorate the calculation of the time non-EU passengers have spent in the Schengen area by switching from traditional passport stamps to automation. Another goal is to issue alerts on people who overstay and record refusals of entry as well as to provide statistical data to determine which nationalities tend to overstay and should thus potentially be required to have a visa in the future. The EES will enable the use of 'automation of border checks on third-country nationals', i.e. automated border control (European Union 2017, 33). It also makes the personal information on people not requiring a visa to enter the Schengen area available to law enforcement authorities for counter-terrorism and crime investigation purposes; i.e. the EES creates a far wider database than the VIS, by targeting all third-country nationals, which has been argued to make mobility and travellers essentially suspicious (Glouftsios 2018; Jeandesboz 2016). Among other things, the EES has been criticized for being exorbitantly costly and considerably slower than the conventional border control process, at least during its pilot phase (Sontowski 2018). The slowness of the EES has been attributed to the time it takes to gather and register the biometrics of such a large number of people (Sontowski 2018). One may safely assume that it will take a lengthy period of time and quite a lot of resources in general to record all this data.

At least three more systems for electronic information exchange operating in the EU's complicated border regime should be mentioned: Eurodac, PNR and ETIAS. The first refers to an EU asylum fingerprint database, which records and shares asylum seekers' fingerprints in a centralized database. This is done to make sure that the 'Dublin Regulation' is followed, i.e. that the first MS of entry processes the asylum claim, yet it also grants access to national and European authorities for law enforcement purposes (European Union 2013). The conversion of Eurodac into a 'policing tool' with 'enhanced governmental surveillance' and 'racially motivated targeting' has been criticized in research (Marciano 2019, 131).

The PNR, i.e. the Passenger Name Record directive adopted in 2016 establishes how the European Union will use passenger data collected by airlines for the often stated aim of 'prevention, detection, investigation and prosecution of terrorist offences and serious crime' (European Union 2016, 132) with agreements to share this information with the respective authorities e.g. in the United States. This system uses 'matching and profiling techniques in order to pre-check and score travellers for risk' (Hall 2017, 188). Despite its title, the Passenger *Name* Record directive, the PNR data includes fairly extensive information. This refers e.g. to addresses (physical, email and IP addresses), phone numbers, credit card details, dietary

requirements (e.g. requests for kosher or halal meals), hotel and car reservations, information on disabilities etc. (Korff and Georges 2015). In their report, Korff and Georges (2015, 83, 109) claim that the PNR data sharing serves no legitimate aim, violates 'respect for human identity' and is ineffective in the identification of 'possible or probable terrorists' by datamining. Finally, the planned ETIAS, i.e. the European Travel Information and Authorization System is very similar, for example, to the United States' Electronic System for Travel Authorization (ESTA), both of which act as pre-checks for visa-exempt travellers. In the European case, ETIAS would 'automatically cross-check each application' against the SIS II, the VIS, the Eurodac, the EES as well as Europol and Interpol databases (European Commission 2018b).

The existence of large databases has in existing social scientific research been regarded as alarming since they offer ample potential for 'surveillance creeps' where personal data becomes available for a wider array of purposes and to more users than the purpose for which it was originally compiled. Broeders (2007) discerns this temptation of privacy disintegrating surveillance creeps in the case of VIS, Eurodac and (the first-generation) SIS, while Vukov and Sheller (2013) research the case of the second-generation SIS. Hendow, Cibea and Kraler (2015, 43) also highlight the potentially detrimental consequences of the interconnectedness of European databases for 'rights to data protection and privacy'. Furthermore, Salter (2013, 14) argues that the logic of 'pre-emption and precaution' and 'surveillance creeps where information is available or can be connected' is alarming. Salter (2013, 14) points out that the PNR data is 'increasingly mined for potential intelligence simply because the data is there', emphasizing the temptations of extensive data use. This is part of a wider trend whereby large amounts of personal data are gathered supposedly primarily for purposes of terrorism prevention, but these information sharing systems (also) lead to the mass surveillance of populations.

One especially vulnerable group in this infrastructure of data sharing are people seeking international protection. Asylum seekers may face devastating consequences if e.g. Eurodac data is transferred to third countries (Hendow, Cibea and Kraler 2015). All in all, the biometrically reinforced and digitalized border control systems have been criticized for decreasing the options of safe channels to apply for asylum (Cetti 2014; Palm 2013; Spijkerboer 2007). The use of biometrics has led to asylum seekers destroying their fingerprints in an attempt to avoid identification (Hendow, Cibea and Kraler 2015; Muller 2004). This discussion is supported by those who argue that freedom of movement in actuality 'has become a birth-right for Western

citizens, whereas people from the Global South in particular are subjected to an increasingly repressive border regime' (Könönen 2019).

1.5 Existing research on automated border control

The main body of International Relations research relevant to the topic of this dissertation consists of critical security studies literature. It has developed from the questioning of the 'core assumptions of security and its politics and practices' (Leese and Wittendrop 2018, 173). Accumulating literature and establishing its place as a field aiming to 'transcend the disciplinary boundaries of IR' over the past two decades, critical security studies emphasizes 'the multiple discursive, practical, and material entanglements through which security is produced and reproduced' (Leese and Wittendrop 2018, 173). This characterization of security as a multifaceted phenomenon with interrelated mental and material properties, as well as the desire to integrate multiple research traditions is also adopted in this dissertation.

Securitization is one of the pertinent research themes of critical security studies. As Leese and Wittendrop (2018, 179) aptly put it, securitization in the context of border control refers to a situation where

> 'within political discourse, reference to security and the urgency to deploy measures against a threat would enable politicians to side-track [bypass] the usual mechanisms of deliberation and parliamentary control, and would instead put an override on those democratic principles – eventually leading to the implementation of technologies and policies that might otherwise not have gained political traction'.

Sperling and Webber (2019, 232) conclude that the EU has become an actor 'harnessing collective securitization to security governance' and note how the EU has 'securitized particular issues' such as 'terrorism, cyberspace [and] migration'. Jeandesboz (2016, 294) also considers the 'smartening of EU borders' in the framework of securitization, although not in the most orthodox sense if viewed against the original securitization theory presented by Buzan, Wæver and de Wilde (1998). Jeandesboz (2016, 294) argues that EU's Smart Borders relies less on an existential threat and the logic of emergency (contrary to the original securitization theory) and more on a justification of this 'smartening' as 'strengthening the existing security measures'. Security as a concept gives leeway to try to achieve many kinds of goals since it is difficult to argue against but also since it is often purposefully not defined in concrete terms.

The securitization research draws attention to the 9/11 attacks in the United States and the subsequent 'War on Terror' as the main impetus for technologically strengthened border control and the ensuing collection of large databases for identity control and intelligence (Korff and Georges 2015; Lodge 2004; Muller 2011). Many criticize the way security and migration policies have become intertwined (Alkopher and Blanc 2017; Dijstelbloem, Meijer and Besters 2011; Epstein 2007; Jones and Johnson 2016; Muller 2004). This research also sees risk management technologies as integral parts of contemporary states (Ceyhan 2008). Furthermore, the 'dramatic increase in number and intensity' of 'surveillance practices and policies' is presented as perhaps 'one of the most far-reaching social changes of the past 50 years' affecting especially the 'post-9/11 Western world' (Marciano 2019, 127). Accordingly, the 'doctrine of risk management, precaution and pre-emption' is seen as a sign of 'a global expansion of surveillance' where mobility is construed as risky and data collection aims at the 'conversion of data into intelligence' operating on an 'axis of normality/danger' (Salter 2013, 10).

Research has criticized the way technology use in border control accentuates inequalities between passengers. According to Salter (2013, 11) free mobility is transforming from a right to 'a reward for group and individual success'. Epstein (2007) argues that biometric border control entails a vision of human beings not as holders of rights but instead as bodies, as measurable objects. Indeed, the political, ethical, social and legal implications of technology use in border control have been studied for some time (e.g. Petermann, Sauter and Schertz 2006; van der Ploeg 2003). One key area of such research discerns how the collection of biometrics affects the right to privacy (e.g. Friedewald et al. 2010; Harel 2009; Loh 2018; Mordini and Rebera 2012; Tomova 2009; van der Ploeg 2009). Another inspiration for critical research has been the erosion of bodily integrity and potential discrimination against vulnerable groups in the context of biometric systems (Marciano 2019; Pirelli 2009; van der Ploeg 2012).

The use of biometric systems for implementing governmental policies implies that the technologies convey an 'official', normative position on what kind of people are accepted as their users (Amicelle, Aradau and Jeandesboz 2015; Valkenburg and van der Ploeg 2015). Ignoring the normative side of biometrically reinforced border control has been criticized widely for the 'technocratization of citizenship', a context where technologies define identities leading to 'bodily social sorting' and 'symbolic ineligibility', which refer to the categorization of people into groups expressing normality or deviation from it where 'transgender, disabled, racialized and overweight people' receive a status of requiring special attention (Marciano 2019,

129–131). It has been argued that security systems based on measuring bodily traits carry with them norms of bodily normality, which burdens those who unintentionally differ from such norms since they are somehow grouped together with the individuals deemed riskier (Maddern and Stewart 2010; Valkenburg and van der Ploeg 2015).

In this context of technologically facilitated risk management people with disabilities as one example have been left outside the group of potential users of automated border control. The justification for this exclusion comes implicitly from the decision-makers of the EU and the Member States, who have distanced themselves from the normative power the technologies hold, essentially enabling the biometric engineers to steer technology development with underlying able-bodied assumptions. The access for persons with disabilities to automated border control has not been researched before and it is the topic of Article III in this dissertation. While the accessibility requirement has not previously been researched in the case of automated border control, standardization and border management organizations have started to cater for people with disabilities in their best practice guidelines. E.g. Frontex (2015, 50–51) 'recommends' ABC to be designed considering 'all categories of persons with disabilities' and has included specific guidelines by the European Disability Forum, which is the umbrella organization for European disability organizations.

Authors in the field of Science and Technology Studies have argued for an understanding of technology as essentially political instead of neutral (Brey 2018; Coeckelbergh 2018; Dotson 2012) much like authors in critical security studies. Technologies are now increasingly viewed in terms of their social and societal impacts, which is also the view adopted in this dissertation. By contrast, research on automated border control has typically been conducted in the fields of engineering and computer sciences, often exploring and comparing the benefits and drawbacks of biometric solutions in ABC (e.g. Labati et al. 2016; Robertson et al. 2017; Sanchez del Rio et al. 2016), comparing human and machine performance e.g. in detecting fraudulent identity documents (Gariup and Piskorski 2019) or discerning traveller risk assessment in ABC (Yanushkevich et al. 2018).

While relevant to the themes of this dissertation, the technological (mostly engineering) research does not address the potential societal issues and/or benefits resulting from the use of automated border control. The technological research has, however, increasingly been paralleled with e.g. the critical security studies research presented above focusing on the political and social facets of automated border control. Other similar critical research programmes have been developed recently:

In surveillance studies, biometric surveillance 'has emerged as a sub-field that attracts particular interest' (Marciano 2019, 127). It is no longer in 'the exclusive realm of computer scientists, mathematicians and engineers' and critical examinations concentrating on 'political, cultural and ethical questions' have increased (Marciano 2019, 127). Authors in Science and Technology Studies have furthermore recommended measures such as 'the anticipatory technology ethics checklist' (Brey 2012, 12) and a 'value declaration' for technology development projects (Heger, Niehaves and Kampling 2018, 1) to ensure that new technologies do not exclude segments of the population, especially those who are already in a disadvantaged position. Critical IR security studies research has had a similar aim but has concentrated more widely on means of governing populations with border security technology.

1.6 Addressing the research gap

While I agree with the majority of the critical insights presented in the previous section, I find that the existing IR research on the technologization of EU border control often concentrates extensively on developing theoretical arguments at the expense of empirics. Contemporary research often draws on Actor-Network Theory (Andersson 2016; Bourne, Johnson and Lisle 2015; Dijstelbloem and Broeders 2015; Glouftsios 2018; Jeandesboz 2016; Pollozek and Passoth 2019; Valkenburg and van der Ploeg 2015) and assemblage thinking (Amoore and Raley 2017; Bourne, Johnson and Lisle 2015; Pötzsch 2015; Salter 2013; Vukov and Sheller 2013). Often it is heavily inspired by critical theory and post-structuralism, especially the works of Michel Foucault, Jacques Derrida, Giorgio Agamben, Gilles Deleuze and Pierre Bourdieu (Hall 2017; Hälterlein and Ostermeier 2018; Jones and Johnson 2016; Leese 2018; Pötzsch 2015).

Another body of research views border security as practice, which is a research agenda coined by Côté-Boucher, Infantino and Salter (2014) focusing e.g. on the entanglement of human activity with technology and the power algorithms exercise (Hall 2017). This work is linked to the 'practice turn' in IR and practice-oriented social theories in general. Border security as practice has also become mainstreamed on the theoretical level in the contemporary literature (Baird 2017; Glouftsios 2018; Hall 2017; Hälterlein and Ostermeier 2018; Jeandesboz 2016; Loh 2018). The focus of this research has thus shifted from the '*concept of the border* to the *notion of bordering practice*' (Parker and Vaughan-Williams 2012, 729, emphases original). In addition to

the IR literature concentrating on critical theory and security as practice, there are also strains of European studies focusing on the EU migration debate and utilizing integration theories: e.g. Niemann and Speyer (2018) apply neofunctionalism, Schimmelfennig (2018) uses liberal intergovernmentalism and Hinterberger (2018) applies multi-level governance. All the aforementioned strains in the literature are theoretically driven.

Besides developing the theoretical discussion, existing research typically analyses institutional documents (Alkopher and Blanc 2017; Sperling and Webber 2019; Ulbricht 2018) and utilizes methodologies such as ethnography (Baird 2017; Bourne, Johnson and Lisle 2015; Sontowski 2018) and interviews (Glouftsios 2018; Hall 2017; Leese 2018). However, theoretically inspired criticism is typically at the forefront, while new empirical, especially experimental findings are relegated to a supporting role (e.g. Hendow Cibea and Kraler 2015; Valkenburg and van der Ploeg 2015) if they exist at all (e.g. Jones and Johnson 2016; Pötzsch 2015). It is somewhat disappointing that, for instance, scholars who have collected more than 30 interviews only cite three (Sontowski 2018) or less than half of 25 interviews (Hall 2017), but more problematic is the fact that the interview based research in this area usually only relies on less than ten interviews not advertised to be particularly extensive (e.g. Glouftsios 2018; Hendow, Cibea and Kraler 2015; Leese 2018; Valkenburg and van der Ploeg 2015).

The existing research makes elegant and ethically important points on the technologization of European border control, but the trend seems to be to rely on 'extensive desk research' (Hendow, Cibea and Kraler 2015, 41) and to remove 'methodological scaffolding' from the work (Jeandesboz 2016, 294). It is thus difficult to judge the value of the empirics involved and suspicions arise as to whether the typically long quotes from a handful of interviewees have been included in the final publication to support the researchers' arguments or preconceived notions. While there is a push to contribute to the research agenda of border security as practice, the rather scanty empirics do not seem adequate, especially when viewed against Côté-Boucher, Infantino and Salter's (2014, 197) wish to 'ensure that there is a balance between abstract theoretical work and empirical field-driven analysis' on the border security as practice research agenda. This same apprehension is expressed by Hills (2006, 67), whose call to research the 'empirical and practical – rather than theoretical – dimensions of border security' to 'rebalance the debate' has not yet been adequately answered.

The research presented in this dissertation addresses this gap in the empirical and experimental research in the literature so far by designing experiments and analysing

experimental data. The contributions in Articles I and II draw on altogether 63 Q methodological experiments, while Article III is based on 139 survey responses along with 14 interviews. The input from the participants is presented including the 'methodological scaffolding', which aims at transparency in the evaluation of our results. Our approach is to give priority to the voices of actors who formulate border control policies and decide on the technologization of border control at the level of national parliaments, as well as to empower a disadvantaged group (not) using border control technology, namely passengers with disabilities. This emancipatory aim also is enshrined in the argumentation of Article IV for studying subjective agency with a broader view than is usually done in IR.

When it comes to the content we analyse, our approach is new compared to the research so far in that it addresses the Member State level in Articles I and II. The EU level has been analysed previously e.g. in the case of Smart Borders in the European Parliament (Sontowski 2018), in viewing Schengen area as a security community (Alkopher and Blanc 2017) and in studying Frontex as a securitizing actor (Léonard 2010). Member States are understudied compared to the EU level, even though they have an active role in policy formulation and implementation, in the practicalities of border control as well as in promoting their national interests, since the competences are shared and divided between EU and its Members in this policy area. Our enquiry in Article III also scrutinizes novel content matter not previously researched, i.e. the organization of automated border control for travellers with disabilities.

While Articles I and II in this dissertation study subjective political agency empirically using Q methodology, the contribution of Article IV is in arguing for the importance of such research in the field of IR in more general terms. This argument takes us quite far from automated border control, to a wholly different body of recent IR work, namely Alexander Wendt's (2015) postulations about a quantum mechanically based view of social sciences and the following discussion. IR scholars have been widely interested in debating Wendt's book, which is evident in *Millennium* (2018), the *Journal for the Theory of Social Behaviour* (2018) and *Critical Review* (2017) having dedicated special issues to this discussion. Wendt has received a mixed and quite sceptic response, with many critics pointing out that his way of choosing interpretations of quantum mechanics that fit his agenda and argumentation is less than ideal (e.g. Albert 2015; Crasnow 2016; Donald 2018; DeCanio 2017; Jackson 2016; Waldner 2017). Some suggest that adopting the quantum view might only be a trendy approach (Smith 2016), a view that is questionable or with no added value for IR (Allan 2018).

The research so far in this area is uniform in that it focuses on debating the theoretical arguments Wendt makes (e.g. Arfi 2018; Burgess 2018; Fuller 2018; Kirby 2018; Little 2018; Michel 2018; Popora 2018). However, Wendt (2015, 36, emphasis added) states that 'a quantum perspective offers at least a fruitful heuristic for thinking about long-standing controversies in social theories, and *ultimately for doing empirical social science*'. There have been no contributions to this end, i.e. no efforts to link the social scientific quantum onto-epistemology with empirics or a methodology. The novelty value of my work in Article IV is that it shows the built-in alliance of Wendt's ontology with Q methodology, especially with regard to a common interest in studying self-referential subjectivity. The developer of Q methodology, William Stephenson, elaborated on the connections of the methodology to quantum mechanics in his late works in the 1980s (e.g. Stephenson 1981; 1982; 1983; 1985; 1986a; 1986b; 1986c; 1987), but there has not been a link to the underused methodology and Wendt's recent writing. I draw on both Wendt and Stephenson in establishing that link.

1.7 Research questions

The more general research questions raised in this dissertation concern the anticipated societal impacts of border control technologies in the EU. Automated border control is a relatively new and not yet institutionalized technological development, with ABC systems either under development, undergoing testing or in their first years of use in many EU Member States. Our research sets out to examine what kind of societal aspects should be taken into account to potentially develop and possibly harmonize ABC as sustainably as possible. Furthermore, the research of political subjective agency as a topic of study is an issue to which I want to draw attention on the scale of IR as a field. The subjective views of the decision-making elites inform our inquiry, yet we also consider the preferences of vulnerable populations affected by their decisions, as well as humans as subjective decision-makers more generally. The overarching questions are thus:

What kind of automated border control practices are politically acceptable to the politicians and stakeholders involved debating and deciding upon border control?

How should we take account of groups with special needs when designing ABC systems?

How could the study of subjective agency be revitalized within IR?

More specifically, Article I seeks answers to the question *'What kind of socio-ethical, legal, political and privacy requirements do Finnish Members of Parliament and the political stakeholders advising them have on ABC systems?'* This implies assessing the demands Finnish political stakeholders impose on ABC. We start our Q methodological enquiry with a single Member State, aiming to first test and develop our research setting for a subsequent comparative study of several EU countries. The importance of Member State level political debates stems from the fact that even though border control in the EU is an area of shared competence between the Members and the Union, the decisions on what kind of ABC devices Member States wish to commission and use (if any) are made by national parliamentarians.

Our second Q methodological iteration in Article II aims to answer the question '*How do political stakeholders in four EU Member States (Finland, Spain, Romania and the United Kingdom) view the complex nexus of ABC technologies with regard to privacy, rights and legal issues, as well as further institutional choices?'* This study, like Article I, seeks to elicit subjective political view types but is distinct since it compares those in four EU Member States, the selection criteria of which are explained in section 3.2.2 of this dissertation. While this study does not purport to represent all EU Member States, the four cases outline the variety of potential views found in EU countries with different characteristics and border control priorities at the Schengen area's external borders. This comparative aspect affords an opportunity to examine, for example, whether the political views depend on the participants' nationalities or political affiliations and what kind of potential commonalities can be found among the various view types. The commonalities will potentially work as future building blocks for European, harmonized ABC systems, the benefits of which the European Commission has argued for.

The research questions in Article III arise from the results of Article II. Political stakeholders from all our case nations and with all types of political affiliations demand accessibility to ABC for passengers with disabilities, which motivates us to explore what this would mean in practice. Article III thus asks: *'Would European travellers with disabilities wish to use ABC instead of the special assistance services provided at EU airports? Do key stakeholders including passengers with disabilities consider the accessibility of ABC to be ethically imperative, operationally and technologically feasible, cost-effective and recommendable?'* This research works as an exploratory journey into the opinions of people with disabilities who as a user group have not previously been taken into account in the design of ABC as well as a brief probe into the minds of some key

experts to find out whether or not the requirements of different groups of people with disabilities could and should be included in ABC design in the immediate future.

The political subjectivity of the decision-makers is studied directly in Articles I and II, whereas Article IV makes a more philosophically and methodologically driven contribution to the field of IR. In the spirit of practice-oriented IR (discussed in the next chapter), it aims at creating more empirical work on subjective agency in the future. Article IV thus aims to ascertain *'How could Alexander Wendt's quantum social ontology be brought into the sphere of empirical social scientific (*IR*) research? Could Q methodology build a bridge between Wendt's ideas and empirical research?'* The interest in this article is to elucidate the main points Wendt makes but does not yet link to empirical social scientific research and to try to show how Q methodology could be useful in bringing the quantum concepts closer to international political practices in future research. I use the earlier Q methodological empirical contributions, especially Article II, in this dissertation to illustrate the quantum principles of the methodology in practice.

1.8 Structure of the dissertation

The remainder of this dissertation is divided into four main chapters. In the first one, I present the practice-oriented principles guiding the knowledge generation of the research articles. These combine pragmatism and practice theory: My approach relies heuristically on certain core commitments to studying practices empirically. The next chapter presents the main research methodology used in the articles, namely Q methodology. I present its principles and discuss its practical application. The third chapter outlines the findings of each of the four articles in a concise form. Finally, I discuss these findings. This includes debating the theoretical, methodological and practical significance of the presented research as well as outlining necessary and potential topics for further research.

2 THEORY

2.1 Practice-oriented IR guiding knowledge creation

As argued in the Introduction, the existing border security research tends to be quite theoretical and despite generating ethically and theoretically important knowledge, it often falls short in the empirical sense, particularly lacking in experimental research design and the accompanying analyses. By contrast, my approach is characterized by an experimental emphasis in which I concentrate on border control policies as practices. This includes the political practices of decision-making, which materialize as the technological devices EU Member States adopt as well as the ensuing practices of technologically enforced border control at the EU's external borders. I rely on pragmatism and practice theoretical IR thinking in this endeavour. However, even these practice-oriented strains of IR have often produced *theories of practices* instead of empirical work. To achieve my goal of empirically practice-driven work, I will first briefly present pragmatism and practice theory in IR, criticizing them to an extent for creating quite a lot of 'armchair research' despite their desire to focus on practices. I will then move on to present the concrete commitments to practice-oriented IR in this dissertation.

The inflated role of philosophical debates and theoretical disputes within IR has caused concerns of the discipline being driven by theory rather than issues on the international political agenda (Côté-Boucher, Infantino and Salter 2014; Owen 2002; Sil and Katzenstein 2010). The theoretical controversies of IR have been entitled e.g. 'contemporary IR theory wars' (Owen 2002, 655) or 'belligerent rhetoric' (Franke and Weber 2011, 686). Owen (2002, 655) is apprehensive of a 'philosophical turn', i.e. the 'reflection on the philosophical commitments of different theoretical approaches' dominating the disciplinary agenda. While these debates are important in transparent theory building and in differentiating theoretical positions, giving them priority implies that interpreting problems or phenomena tends to be overlooked (Owen 2002).

The alternative I support is a call for pluralism in IR research. Put simply, theories are usable for different purposes and arguing for or against a theory for its own sake is probably not the best use of our resources. Franke and Weber (2011, 686)

encourage 'viewing different theories as different tools and instruments for dealing with the social world', which enables a plurality of research agendas where argumentation is centred on whether or not the approach in question is suitable to address the situation at hand. IR scholars in favour of pragmatist and practice theory standpoints have argued for pluralism and agonism between theoretical positions in IR (Bauer and Brighi 2009; Owen 2002). Instead of monologues and 'theoretical feuds', the scholarly IR discussion should 'provide a forum for honest and fair intellectual exchange' (Bauer and Brighi 2009, 165). Respect for research traditions in the pluralist sense means that I do not claim that my choices are the only possible way to create knowledge in the context of automated border control or subjective political agency.

A somewhat similar orientation to pluralism is Sil and Katzenstein's (2010, 10) analytic eclecticism, which aims to integrate analytic tools from theories that 'have been developed within separate paradigms but that address related aspects of substantive problems that have scholarly and practical significance'. This approach has been influenced by pragmatist thought, and both analytic eclecticism and pragmatist IR avoid 'excessively rigid metatheoretical postulates in favour of open-ended efforts to frame and address socially important problems' and aim to create knowledge interesting to both scholars and practitioners (Sil and Katzenstein 2010, 47). However, analytic eclecticism is 'focused on the theoretical constructs that we deploy to capture the complexity of important social problems' (Sil and Katzenstein 2010, 18). Although I support both pluralism and analytic eclecticism, I find that an experimental emphasis on practices rather than trying to explicitly mediate between theoretical research traditions will make a more important empirical contribution in this case.

The discussion about the different IR traditions, paradigms and schools and whether or not to adhere to one is related to the wider conversation on knowledge-constitutive interests à la Habermas (1987)[2], where the technical, practical and emancipatory cognitive interests guide different kinds of enquiries in a pluralistic spirit. The technical cognitive interest found in positivistic accounts is characterized by desires for prediction, showing causality and establishing generalizability; goals not at issue in any of the four articles. The practical knowledge-constitutive interest refers to aiming at pragmatically usable knowledge, interpreting societal phenomena and increasing understanding(s) among humans. Finally, the emancipatory cognitive interest implies a critical, self-reflective role for the researcher and critically

[2] Habermas (1987) presents these ideas; for an introduction, see also Seidman (2013).

examining social phenomena with the aim of changing potentially harmful practices to achieve emancipation and empowerment.

This dissertation concentrates on the practical and emancipatory knowledge-constitutive interests. Articles I and II share the practical cognitive interest in exploring the political views on the technologization of border control in the EU, while Articles III and IV are more emancipatory in their approach. The emancipatory aim in Article III is to empower people with disabilities to voice their opinions on an aspect of European border control policy that directly affects their travelling, i.e. the accessibility of ABC for people with disabilities. Furthermore, the emancipatory aim in Article IV is to critically examine the scope of IR scholarship and bring one of the topical onto-epistemological debates receiving quite a lot of attention onto the level of empirical work on agency in IR. While Articles I and II study political subjective agency in practice, Article IV argues for the study of subjectivity in IR on a wider scale in general. Article IV thus takes part in the metaphysical debate in IR but does so with a view to promoting the (empirical) study of subjectivity in the future.

The vision of theories as coping tools in the social world has been advocated by pragmatism, which focuses our analyses towards practices, away from abstract theoretical constructs. For Rytövuori-Apunen (2009, 642) pragmatism offers a 'profound critique of the theory-centred mainstream' in IR in connecting (the) 'de-contextualized (theory-centred) knowledge with life-practices'. A similar perspective is voiced by Friedrichs and Kratochwil (2009, 725), who maintain that the 'periodical discussions among IR scholars on what matters more, structure or agency' exemplify a total alienation from the 'social environment' of the field. Pragmatism distances itself from such debates and commits to studying practices 'as *human* (and hence social, historical, linguistic) constructs' (Bauer and Brighi 2009, 165, emphasis original). This is to say, that the aim of practice-oriented IR scholars is to develop 'socially grounded understandings of the international' (Gadinger 2016, 187) while overcoming the 'familiar, yet often merely scholastic dichotomies: material versus ideational, objective versus subjective, structure versus agency, etc.' (Bauer and Brighi 2009, 165). Practice theorists intend to 'bypass essentialist and static notions of the international and side-line distinctions that emphasize these, such as the one between agency and structure' by emphasizing 'process over stasis' (Bueger and Gadinger 2015, 453).

Even though practice-oriented IR scholars obviously agree that international practices are to be researched more, they seem to have put their nucleus in empirical work on hold in order to establish a secure position in the field. It is paradoxical that

practice-oriented approaches have suffered from remaining on the theoretical level, which is the exact opposite of their professed aim. Pragmatists should be held accountable for this tendency to attempt to 'engage the IR field in the same abstract language they use to formulate positions in opposition to analytic philosophy' (Sil 2009, 648). Sil (2009, 648) argues that 'pragmatists themselves' are involved in 'nuanced debates over such issues as the relationship between ontology and epistemology, the relative significance of specific pragmatist tenets, and the complicated history of pragmatism as an intellectual movement'. Franke and Weber (2011, 669, emphasis original) suggest some strains of pragmatism seem to actually 'emphasize *the theorizing of practice*'.[3]

Thus, while pragmatism 'grew into an explicit item on the disciplinary agenda of IR' in the 1990s (Friedrichs and Kratochwil 2009, 707)[4] and the 'study of international practices has gained significant momentum recently' (Adler and Pouliot 2011, 2), the empirical weight of practice-oriented IR remains questionable. In essence, IR scholars still hesitate to use pragmatism in empirical research (Gadinger 2016). Furthermore, Bauer and Brighi (2009, 166) criticize IR pragmatists for not engaging in enough empirical work and thus sustaining 'embarrassing gaps of knowledge that frequently characterize the writings of "armchair scholars"'. In their opinion, there is a danger that 'engaging with practices might remain only a verbal commitment' (Bauer and Brighi 2009, 166). This concern is shared by Sil (2009, 648), who argues that 'ironically, pragmatist discourse appears either too abstract or too convoluted to be of any practical significance to IR scholars coping with the challenges and requirements of research'. Likewise, in the sphere of practice-theoretical work in general, empirical considerations have not been as prominent as one might hope. When it comes to methodology, 'reflexivity is arguably weak' while 'many practice theorists have primarily come up with negative methodological

[3] Franke and Weber (2011, 682) criticize the tendency of e.g. William James, one of the earliest developers of pragmatist thought to create 'elaborate bodies of theories […] while hammering down his message about practice as the criterion of truth'. I aim to avoid embroiling this dissertation in the internal (theoretical) disagreements on variants of pragmatism and practice theory since they are not of importance to my work: pragmatism and practice theory are used as a heuristic. Therefore, the discussion on the work of the (contested) 'root scholars' such as James, Peirce and Dewey for pragmatism and Bourdieu and Foucault for practice theory does not appear in this overview of practice-oriented IR.

[4] Friedrichs and Kratochwil (2009, 707) conclude that since being featured in the special issue of Millennium in 2002, pragmatism has achieved a position in the 'methodological and epistemological debate' of IR; a position that can also be noted from pragmatism having been the topic of a symposium in the *Journal of International Relations and Development* (2007) as well as the *International Studies Review* (2009).

guidelines that argue against "objectivist" accounts and suggest how not to conduct research' (Bueger and Gadinger 2015, 457).

Another possibility for a theoretical framework in the context of automated border control would have been assemblage thinking, which has been used in critical security studies e.g. for studying the non-human agency of 'security technologies at border sites' (Lisle 2014, 69). However, some actually see assemblage thinking as a form of practice theory (see Bueger 2014). What is more, practice-oriented IR and assemblage thinking seem to suffer from the same problem of paradoxically theorizing practice: both at their weakest tend to forget that the premise is an 'an invitation for empirical work, not for contemplating ontological concepts' (Bueger 2014, 65). Furthermore, the strains of assemblage thinking that draw on poststructuralist thought emphasize deconstruction (Acuto and Curtis 2014), which is too concentrated on structures at the expense of agency for the purposes of this dissertation. Similarly, an approach utilizing the Foucauldian, poststructuralist framework of biopolitics and biopower would have been possible in the context of border security technologies, but, again, with a structural orientation (e.g. Dillon and Reid 2001).

Absurd as it may sound, advocating for an emphasis on practices in IR research seems to entail a commitment to perspectives that produce a significant amount of theorizing on practices and are articulated in the same way as more mainstream IR theories but deny that they are a theory or an '-ism'. Despite featuring '-ism' in its name, pragmatism does not constitute a unified theoretical construct or a school of thought (Adler and Pouliot 2011; Bauer and Brighi 2009; Hellmann 2009). Furthermore, practice theory, despite its somewhat misleading title, is not considered a theory as such, but rather a 'heuristic device' or a 'sensitizing "framework" for empirical research in the social sciences' (Reckwitz 2002, 257). Practice theory remains purposefully 'thin' when it comes to its 'conceptual requirements' as well as ontological and epistemological ventures (Bueger and Gadinger 2015, 458). Since the aim of using pragmatist and practice theoretical heuristics is precisely not to get stuck on the theoretical level, I prefer to use the term 'practice-oriented IR' and refer to a wider group of (non-)theories.

I thus consider practice theory here as a part of the pragmatist tradition, which admittedly is not the most common way of viewing things in IR. Practice theory originates from two main traditions, critical theory and pragmatism (Bueger and Gadinger 2015). Nevertheless, contemporary pragmatist theorists are 'rarely recognized for their role within practice theory and the interest in pragmatism is often understood as a separate project' (Bueger and Gadinger 2015, 455). IR scholars

have mainly developed 'classical pragmatism' (Hellmann 2009) as well as the critical theory inspired strain of practice theory drawing on the work of Pierre Bourdieu and Michel Foucault (Adler and Pouliot 2011; Bueger and Gadinger 2015; Lechner and Frost 2018). The critical tradition of practice theory concentrates on 'concerns over power, domination and resistance' and aims to clarify 'larger historical trends and forces' (Bueger and Gadinger 2015, 454). In contrast, the strain of practice theoretical work rooted in pragmatism criticizes 'explicit focus on domination, power, and hierarchies' of Bourdieusian scholarship, which gives the 'impression that practice is always embedded in power struggles', while ignoring the myriad of 'other sociocultural practices' (Bueger and Gadinger 2015, 455). Instead, enquiry should start from distinct practices, emphasizing 'situations, contingency, creativity and change' (Bueger and Gadinger 2015, 455). In this dissertation IR pragmatism and the strain of practice theory stemming from pragmatism are together considered to be practice-oriented IR, which implies a broad view of social practices understood not only through power or hierarchical structures.

Controversy prevails among IR scholars as to what actually can be considered practice-oriented IR research. For instance, Adler and Pouliot's (2011, 28) perspective is highly inclusive; they argue for the use of practices as the 'conceptual focal point' for almost any kind of IR theoretical strain from realism to poststructuralism, while maintaining the individual characteristics of each perspective. They hope for an emphasis on practices to yield 'innovative ways of engaging with the world of research and policy that are contextually progressive, both analytically and normatively' (Adler and Pouliot 2011, 31). By contrast, not everyone working with practices sees this perhaps inadvertent intellectual clustering around practices as the way to proceed. Bueger and Gadinger (2015, 450) argue that Adler and Pouliot's overly inclusive view 'obscures key wagers of practice-turn theories while minimizing its potential contributions to understanding international affairs', since not all IR theories share the implied ontological and epistemological commitments of practice theories.

Be that as it may, my goal is to avoid a theoretically captious approach by adopting an orientation towards practices in this dissertation as a heuristic. The practice orientation works thus as a general guiding framework, not in the sense of trying to 'apply' a theoretical construct or develop practice-oriented IR theoretically. This approach is in keeping with the 'practice turn' in security studies, which advocates the practical salience of security studies (see Côté-Boucher, Infantino and Salter 2014). In the context of my dissertation, this entails drawing attention to border control policy as an international practice while selecting societally meaningful topics

for empirical work (Articles I–III) and also choosing to develop the connection of a recently proposed 'social ontology' with a suitable methodology to enable it to contribute to empirical work on practices in the future (Article IV).

2.2 Commitments to practice-oriented research

Even though the spectrum of practice-oriented IR research is contested and wide, there are certain general commitments one may expect. Bauer and Brighi (2009, 164) present a 'pragmatist manifesto for IR' in the form of the "'ten commandments" of an IR pragmatist', while Bueger and Gadinger (2015, 453) define international practice theory in which they loosely include 'different variations of pragmatist theorizing' with the help of some 'core commitments'. Since I make use of a practice-oriented heuristic in this dissertation, I will next outline six key commitments that guide practice-oriented enquiry. The interrelated commitments discussed here are not an exhaustive list implying consensus, but rather my adaptation from the aforementioned two sets of commitments for a practice-oriented approach.

First, the core idea of an orientation in practices is obviously to focus the analysis primarily on international practices. To that end, I begin by defining what is understood as an international practice, agency and practitioner. The definition of practices in the IR context tends to rely on the distinction between behaviour, action and practice (Adler and Pouliot 2011; Bueger and Gadinger 2007; Cook and Brown 1999). While behaviour refers to 'a deed performed in or on the world' (Adler and Pouliot 2011, 5), the term action is usually seen as 'behaviour imbued with meaning' (Cook and Brown 1999, 387). Finally, practice refers to *patterns of action informed by meaning in socially organized group contex*ts (Adler and Pouliot 2011; Cook and Brown 1999). International practices are thus defined as 'socially organized activities that pertain to world politics, broadly construed' (Adler and Pouliot 2011, 6).

Cook and Brown (1999) illustrate the difference between behaviour, action and practice in simple terms: behaviour is when one's knee jerks, whereas action with meaning is when one uses a medical tool to check reflexes; furthermore, if a physician raps one's knee in a medical examination, this constitutes a practice in the field of medicine. In the context of this dissertation, I view decision-making on border control policies as a practice in the field of national and international policymaking, where the European Union and its Member States share competences. Border control policies have politically negotiated goals and they drive concrete patterns of action when implemented in socially organized group settings, i.e. in

today's society, where territories and populations are organized into states. These policies further materialize as practices of border control, which are enacted at the EU's external borders. Furthermore, researching these international practices in the field of IR is a social scientific practice intended to acquire practically and ethically relevant knowledge on border control.

Agency is seen as a creative process. It is important to note that the focus on practices entails a view that they evolve continuously and that actors and practitioners have opportunities to act creatively within the sphere of practices. The open-ended process or the 'endless stream of practice' is seen as both 'performing an act' and thus '*closing*' a 'scope of possibilities for action that has been opened before and *opening* a new one' (Franke and Weber 2011, 678, emphases original). Practice is perceived as a 'sequentially structured' succession of choices, where 'the practitioners (actors) involved have, consciously or not, realized one possibility for action among many' (Franke and Weber 2011, 676). Practices are thus loci of agency with potential for agential creativity. While both the 'rationalist *homo oeconomicus* and the constructivist *homo sociologicus*' emphasize the constraints on human action, pragmatism focuses on 'potentially creative social action', which means 'much more than being exclusively either forced into rationality by one's environment or trained by norms' (Franke and Weber 2011, 677, emphases original). This understanding of the pluripotentiality of human action is similar to the view taken by Alexander Wendt's (2015) quantum social ontology and by Q methodology on the study of human subjective orientation and political agency, which I discuss in Article IV. This view of creative and pluripotential agency thus ties together the main methodology of the dissertation and the heuristic background in practice-oriented research as well as the wider discussion of agency in the IR context presented in Article IV.

Practitioners (or actors) in the context of this dissertation are the participants of our Q methodological experiments and interviewees, i.e. politicians and experts, whose potentially creative subjective agency we research through the decisions they make in our experiments. It is assumed that the decision-makers and policy negotiators hold the same convictions in their professional capacity and in the experiments. Likewise, the survey respondents in Article III are viewed as actors with an emancipatory emphasis in mind – they are people with disabilities who make choices in order to inform us on their preferences, which have previously not been considered in the development of automated border control. Furthermore, IR scholars are also seen as a group of practitioners having the creative potential make choices on what topics to research and how. All the above-mentioned actors are thus understood to guide this dissertation's knowledge creation with their choices.

A second key commitment in practice-oriented IR is that knowledge should serve the practical purposes of 'navigating' in the world; not representing a world 'out there' (Bauer and Brighi 2009, 164). Practice-oriented scholars commit to generating knowledge in a different way from 'hypothesis-testing prized and advocated by contemporary neopositivists', since testing hypotheses 'presumes a mind-independent world to which a speculative hypothesis might be compared, and a notion of truth as the correspondence between a claim and a state of affairs in the world' (Jackson 2009, 658). Indeed, social and natural scientific 'facts' differ in nature. Friedrichs and Kratochwil (2009, 704) claim that ontological realism is 'in trouble' in social sciences since the social world does not exist independently of observing (human) subjects. As an alternative to the aimless search for law-like and epistemologically secure knowledge, they propose 'the recognition of knowledge generation as a social and discursive activity, and the orientation of research toward the generation of useful knowledge' (Friedrichs and Kratochwil 2009, 701–702). The notion of useful knowledge encourages scholars to be 'geared towards the idea of emancipation and betterment of the community to which they belong' (Bauer and Brighi 2009, 164). The practical orientation is guided by a sense of responsibility where academia as a part society and the global community has an obligation towards 'human betterment' (Bauer and Brighi 2009, 163). This refers to pragmatism having an 'ethos' of striving towards a 'good life' (Bauer and Brighi 2009, 165). The commitment to create knowledge in the pursuit of 'human betterment' can be noted in the decision to use emancipatory motives in the research for the service of international travellers (and their civil rights in the context of data-driven surveillance), passengers with disabilities and in advancing the understanding(s) of human agency.

The aspiration to create practically useful knowledge carries with it the third commitment to eclecticism in research and methodology. Positivistic accounts of IR have been criticized for seeking 'to establish social scientific credibility and rigor despite its practical non-applicability' (Friedrichs and Kratochwil 2009, 709), while postmodernist and critical accounts have been accused of 'aloof criticism without a sufficiently strong grounding in everyday real-life problems' (Hellmann 2009, 239). Practice-oriented IR aims to avoid these problems by the eclectic use of methodologies and analytical strategies and with the ultimate goal of generating practically relevant knowledge. However, the emphasis is not on searching for practically applicable, yet 'less than perfect solutions because they somehow work', but rather on 'pluralism and analytical and methodological eclecticism' (Kratochwil 2009, 12). The idea of 'analytic eclecticism' lies in combining 'existing research

traditions in a pragmatic fashion', which allows for 'the formulation and exploration of novel and more complex sets of problems' (Friedrichs and Kratochwil 2009, 708).

My objective is to present systematic, yet methodologically and analytically eclectic empirical work in the spirit of practice-oriented IR research. The eclectic orientation in this dissertation is implemented in the methodological sense by selecting different methods, i.e. Q methodology in the case of political views on automated border control (Articles I and II), survey research to explore the views of passengers with disabilities and interviews to elicit expert opinions (Article III) as well as reviewing the literature to shed light on a potential compatibility between a methodology and an ontology through intertextual communication (Article IV). This implies that, instead of selecting one methodology, it is deemed more important to start from a practice, which in the case of Articles I and II refers to the political decision-making on automated border control, in Article III to the non-inclusive design of automated border control apparatuses and in Article IV the study of IR with an exclusively philosophical or theoretical focus, which I claim to be less than ideal. Furthermore, the analytic eclecticism and the recognition of the usefulness of many research traditions is practised by drawing on multiple traditions such as the 'practice turn' in critical security studies (Articles I and II), International Political Sociology, Science and Technology Studies and disability studies (Article III) as well as social scientific philosophies of science and even philosophical accounts of quantum mechanics (Article IV). This reflects the nature of analytic eclecticism, which refers to 'making intellectually and practically useful connections among clusters of analyses that are substantively related but normally formulated in separate paradigms' in order to concentrate on 'concrete dilemmas' (Sil and Katzenstein 2010, 2). The goal is to provide 'richer explanations' closer to the 'practical knowledge required by policymakers' than the typical academic accounts strictly divided into research traditions (Sil and Katzenstein 2010, 3).[5]

Moving on with the commitments to practice-oriented research, a fourth commitment is to recognize that knowledge of practices is created socially, in a social context. 'All knowledge of the world' should be considered 'as a human creation, and hence language-mediated, socially based and historically grounded', implying that knowledge 'does not exist outside experience and judgement' (Bauer and Brighi

[5] Sil and Katzenstein's (2010, 19) account of analytic eclecticism also includes also the notion of creating a 'causal account' drawing on several paradigms. This I do not attempt, but concentrate instead on the two other 'makers of eclectic scholarship', which refer to 'open-ended problem formulation encompassing complexity of phenomena' and engaging in both 'academic debates and the practical dilemmas of policymakers/practitioners' (Sil and Katzenstein 2010, 19). All in all, in many of its principles, analytic eclecticism resembles pragmatism in IR (see Sil and Katzenstein 2010, 47).

2009, 164). I agree with Franke and Weber (2011, 674) in that 'whoever interprets a text (or, more generally, whoever copes with the world in some way) draws on experiences made before in a continued process of inquiry'. That is to say that 'pragmatist methodologies do not pretend to approach social reality without pre-established concepts since all reasoning rests on such categories' (Franke and Weber 2011, 674). This commitment can in essence be found implicitly (in the present dissertation and other practice-oriented work) in the sense that practice-oriented scholars do not claim to be neutral analysers of the social world and thus recognize the effects of their own societal and historical ties as well as the weight and sometimes burden carried by the previous work they refer to.

In addition, the recognition of contextuality in knowledge creation is tied to the 'social relevance' of knowledge, which in the IR field refers to the relations of IR to its 'environment', i.e. 'actors, their institutions, and discourses', for instance 'politicians, journalists, citizens, funding agencies' etc. (Bueger and Gadinger 2007, 91). These connections with our surroundings are important in practice-oriented research as it aims at practically relevant knowledge. It is considered a serious problem if, for example, political decision-makers 'are not interested in our theoretical ruminations because they either do not understand them or do not see their utility' (Friedrichs and Kratochwil 2009, 726). Even though the communication with our environment is undoubtedly difficult, not least because the scientific language differs greatly from the texts laypersons and policymakers are used to, it is nonetheless something to be striven towards when choosing the topics of research and disseminating results. Article IV concentrates on the 'meta' level of creating favourable conditions *for* empirical research to be conducted so that it could eventually benefit the IR environment.

In this dissertation the IR 'environment' of policymakers is considered by placing their viewpoints centre stage in knowledge creation (Articles I and II) and in Article III the interest group of people with disabilities affected by the political decisions is brought to the knowledge-generating focus. However, the dissemination of the results in an understandable format to stakeholders and decision-makers still leaves ample room for improvement.[6] Moreover, in order to remain true to the practice-oriented commitment to the environment of this research, it is appropriate to

[6] The published articles were shared with the people who participated in the research, but this is quite a modest attempt at dissemination, since it only reaches the people willing and able to read academic journal articles who already took part in the research. I assume that in their present form the results of Articles I–IV are mainly of interest to an academic audience, which, however, goes for the majority of scientific research in general, but in my view should be an area of improvement, especially in the case of practice-oriented social scientific work.

mention that Articles I–III received funding from the European Commission and that the findings of those articles were duly reported back to the Commission. This also means that the interests in knowledge creation have been to an extent affected by the Commission's desire to harmonize automated border control in the European Union and its decisions to fund research on those issues.[7] This is not to say that the enquiries are biased towards harmonization, but rather to acknowledge that the initial impetus to initiate research on politically sustainable automated border control and whatever its features might be – or if indeed it would be at all possible – came from the agency funding the research and the FastPass consortium (of which the authors were a part), which decided to respond to this call.

The social contextuality of knowledge leads us to the fifth commitment, i.e. recognizing the plurality and evolution of 'truths'. Knowledge in practice-oriented IR is seen as potentially fallible, an admission that should not, however lead to 'radical scepticism' (Bauer and Brighi 2009, 164). Scholars should 'believe in the open-endedness of the social world, in the possibility of creative action, and in the emergence of new practices' to which they themselves will contribute (Bauer and Brighi 2009, 164). The open-endedness is a positive feature in that researchers by their choices can to an extent steer the emergence, continuation and abandonment of practices. This implies that as researchers we can define and re-define what important practices to research are at any given time and reflect upon how our assumptions and choices may reinforce tendencies such as perceiving migration as a security issue (see Bueger and Gadinger 2007; Owen 2002). In this dissertation the knowledge created in the articles is seen as a view of what exists at the moment of conducting research. This implies that the different viewpoints found using Q methodology (Articles I and II) and the notions collected by the interviews and the questionnaire (Article III), or 'truths' for the participants, may, at least to an extent, change over longer periods of time as the participants potentially learn about different aspects of the issues researched and the international political practices of technology use in border control change. In a similar vein, Friedrichs and Kratochwil (2009, 705) argue that a 'consensus theory of knowledge' should prevail in this context rather than 'the correspondence theory of truth'. All in all, an orientation in practices does not search for 'neat and final answers' (Franke and Weber 2011, 680).

[7] In addition to us social scientific researchers, the FastPass consortium of 27 partners included, among others, border control and police officials, ABC technology manufacturers, airport management officials and technology researchers. Our role as social scientists was to act as the 'political and societal conscience' of the project in order to avoid ABC solutions being proposed that would potentially create ethically and legally undesirable outcomes for societies even though they would be e.g. 'efficient' from the engineering standpoint.

The sixth and final commitment to practices concerns recognizing their materiality in addition to their mentality. Practice-oriented scholars view bodies, technologies and 'material artefacts' as 'carriers of practices' – an aspect that 'tends to be marginalized in other social and culturalist theorizing' (Bueger and Gadinger 2015, 453). As Adler and Pouliot (2011, 7) put it 'practice weaves together the discursive and material worlds' and can 'change the physical environment as well as the ideas that people individually and collectively hold about the world'. In the context of this research this means that automated border control is recognized both as a socio-political construct in the form of border control policies and a material manifestation of those policies in the form of concrete apparatuses, i.e. automated border control gates, which people use when they travel. The recognition of materiality here relates to the quest for a just society promoted by practice-oriented research. The societal impacts of technological apparatuses are by no means neutral (see Brey 2018), and the societally fair and inclusive development of these material technologies rests on the political decisions that sanction their use. This idea also relates to the theoretical and methodological discussion in Article IV in that the 'quantum onto-epistemology' and Q methodology also consider researching both mental and material 'realities' important.

3 METHODOLOGY

3.1 Q methodology as the main research methodology

The principal research methodology used in this dissertation is Q methodology, which studies human subjectivity in a systematic manner relying on the factor theory of psychology (e.g. Brown 1986; McKeown and Thomas 1988; Watts and Stenner 2012). Q methodology combines qualitative and quantitative approaches to study subjectivity. It compares the (qualitative) views expressed by the participants with the help of (quantitative) factor analysis, and moreover makes use of (qualitative) interviews and analyses.

In a nutshell, a Q methodological experiment is a simulation of a succession of interconnected decision-making situations. The participants consider their views regarding short statements drawn from the whole debate on the topic of research. They observe their own states of mind related to the subject of study while rank-ordering or sorting the statements. The sorting is followed by factor analysis, where the researcher compares participants' rank-orderings aiming to find distinguishable factors which can be viewed as clusters of likeminded persons. The analyst then interprets these factors or views qualitatively and presents them in a narrative form.

Q methodology was developed by William Stephenson, a physicist and psychologist who began this work in the 1930s, arriving at the first comprehensive publication in 1953 (Stephenson 1953). Initially used in psychology, Q methodology has since been applied within a variety of other fields including political science (Brown 1980) and IR. The methodology has often been utilized in e.g. studying types of national and supranational identities (Aalto 2003; Davis 1999; Haesly 2001; 2005; Robyn et al. 2005; Wong and Sun 1988). It has also been employed in IR questions related to development studies, such as assessing the legitimacy and quality of development co-operation (Hilhorst, Weijers and van Wessel 2012) as well as analysing perspectives of marginalized populations with emancipatory goals in mind (Brown 2006). Ascher and Brown (1986) also argue for the use of Q methodology as a tool in international conflict mediation. Scholars researching perhaps more typical IR themes such as terrorism (Callahan, Dubnick and Olshfski 2006; Koçak 2012) and nuclear non-proliferation (Willoughby 1986) have likewise made use of

the methodology. International resource issues (Dryzek, Clark and McKenzie 1989) and public diplomacy (Seo and Kinsey 2013) have also been analysed with it. What these applications have in common is that they concentrate on the subjective views of a relevant, yet often previously neglected or underrepresented group of participants with a potential to open new avenues of examination and possibly develop a political practice. They all prefer knowledge generation through an experimental process to relying solely on e.g. textual sources of data to be analysed.

Q methodology has in general proven useful for studying policies. Several recent applications have been reported in policy research, mostly in environmental policy issues (Albizua and Zografos 2014; Curry, Barry and McClenaghan 2013; Ligtvoet et al. 2016; Sprujit et al. 2016; Toivanen et al. 2017). Furthermore, other policy issues such as global science and technology policies (Savaget and Acero 2018) and non-profit organizations' policy advocacy (Gen and Wright 2018) have also been analysed with the methodology. The suitability of Q methodology to research policies comes from its ability to distinguish and assemble preferences (Lynn 1999). The methodology concentrates on the claims and expectations present in the decision-making processes (Ascher 1987).

Q methodology can identify consensus and disagreement among the participants in the context of policy analysis (Steelman and Maguire 1999). Durning (1999) lists ways in which Q methodology could be useful in various stages of understanding policy processes. These include understanding how stakeholders define the problems in a policy process, how they outline their interests and what preferences they express, as well as how they define 'non-efficiency criteria' such as fairness in the context of the policy issue (Durning 1999, 405–406). Q methodological results thus reflect which aspects or issues the participants find most important and which directions policies should take in their view. This practical utility of modelling preferences is especially useful in this study when attempting to comprehend the landscape of political argumentation and preferred political solutions regarding the development and deployment of ABC systems, including the 'non-efficiency criteria' of ethical, legal and normative choices involved.

Despite the advantages mentioned above, Q methodology is far from being the most widely used research methodology in IR and in policy analysis. More conventional and common methodological alternatives include e.g. analysing textual(ized) data such as public speeches and policy documents, i.e. researching 'elite, media and advocacy rhetoric, practices and utterances' by employing (critical) discourse analysis (Stanley and Jackson 2016, 224). A discourse analytical approach would, however, have been less useful in the context of this research for two reasons.

First, not much directly relevant textual material in this precise emerging field of policy existed at the time of conducting our research and indeed to focus on analysing only existing documents would have taken us in quite a different direction than the experimental emphasis we argue for. Second, a Q methodological strategy offers the added benefit of first mapping out the debate in question – which (in most cases) is found from the same textual sources that could have been used in discourse analysis as primary sources – and then making the whole debate available in a condensed form to enable the participants to react to it. The participants thus make their own interpretations of the debate or discourses, which enriches the analysis with empirical data of the participants' subjective opinions. Furthermore, speaking from the standpoint of practice-oriented IR, analysing texts does not offer 'direct access to practices', but rather 'representations of practices' (Bueger and Gadinger 2015, 457). Q methodology is more direct in the sense that the political practice is researched in a simulation of decision-making.

As an alternative to publicly available textual sources and Q methodology, the data to be analysed could have been produced through various types of interviews, such as in-depth, structured or semi-structured interviews (e.g. Arksey and Knight 1999).[8] However, these methods are inherently not as systematic and transparent as Q methodology when it comes to the interpretational work of the analyst. The interviewing researcher has the power of deciding how to formulate questions, frame the interviews and interpret the results (Dryzek 2005). Q methodology is not completely free from these problems, but it democratizes the research process by empowering the interpretations of the participants, which constrains the analyst's interpretation. What is more, Q methodologists usually employ post-sorting interviews as a way to gain more detailed knowledge, guide interpretation and ascertain the validity of the Q sorts. In this dissertation, Article I makes use of personally conducted interviews while Article II employs a web-based questionnaire to support Q methodological work. Moreover, Article III utilizes semi-structured

[8] In an ideal situation, focus groups with political stakeholders could have been employed, but in practice this would have been impossible to arrange with these elite-level individuals (see O'Connor 2013). Observational methods such as ethnography would have presented another alternative, but this would have required targeting e.g. a specific committee, which would have eliminated the comparative aspect between the different actors and nationalities we were after as well as eliminating the aim of researching the subjective viewpoints of the participants, i.e. giving them a voice. Committee observation is often also only possible when the researcher 'has managed to become embedded within the committee under investigation' (O'Connor 2013, 1077), which is not the case here. Moreover, participant observation would have been an acceptable methodology from the practice-oriented heuristic standpoint (Bueger and Gadinger 2015), but it would have been susceptible to the same problems as ethnography.

interviews as primary research data in its examination, which draws on the Q methodological results of Article II.

Another alternative to Q methodology could have been a questionnaire (a survey) to a larger population of European politicians and experts, which would have yielded more demographically generalizable results. Yet, compared to Q methodology, questionnaires have many substantial drawbacks to be considered in this research setting. While questionnaires are based on a measuring system created item by item by the researcher, Q methodology allows the participants to react to the various stimuli presented and thus models the whole subjective orientation of a person with respect to the research domain (Dryzek 2005). This means that in surveys a response is to a specific item only, while in Q methodology the rank-ordering of each statement is dependent on how the participant has ranked the other statements (O'Connor 2013). Q methodology thus adds the benefit of requiring (stricter) interconnected prioritizations compared to surveys and interviews. This feature has clear benefits in the case of politicians, who are not able to claim equal importance for all or many issues. Furthermore, Q methodological knowledge may be used to inform the design of questionnaires by 'establishing the range of perspectives on a topic' (O'Connor 2013, 1084), which enables creating items with empirically found significance (Dryzek 2005). Questionnaires created using Q methodological data can test how widely Q methodologically found views are held in a larger population of interest (Mason et al. 2016; O'Connor 2013), or examine a Q methodologically found consensus item prevailing among a certain group of participants with another population of interest, as was done in Article III.

Q methodology is applied in Articles I–II and discussed in Article IV. Other research methods used in this dissertation include a survey and semi-structured interviews (Article III) and a literature commentary (Article IV). These methods play a supporting role to Q methodology and are thus not discussed here in detail. The research setting of Article III draws on the Q methodological findings of Article II, i.e. the apparent political consensus on requiring accessibility for people with disabilities to use future ABC systems in the EU. It explores the preferences of this group of people directly affected by the political decisions. Along with the survey, which resulted in a sample of 139 participants, Article III analyses thematically the 14 semi-structured expert interviews which we conducted with disability organization representatives and disability activists, airport management staff, e-gate developers and politicians involved in committees debating border control (for the complete list of interviewees, see Article III, p. 63). Moreover, the literature review or commentary in Article IV focuses on the similarities (and differences) found in

Wendt's (2015) book on quantum social ontology and the work of Stephenson, the founder of Q methodology, from the 1980s on the quantum mechanical 'roots' of the methodology as well as the existing work by mainly IR scholars on the interface of social scientific accounts of philosophy of science with quantum concepts.

3.2 Applying Q methodology

This section outlines how the Q methodological research process was carried out in practice. Our Q methodological work includes two iterations. The first one, reported in Article I, served as a pilot study to develop the research setting for the experiments described in Article II.

3.2.1 Modelling the debate on ABC

A Q methodological enquiry starts by compiling the debate or 'concourse', which refers to collecting as many pertinent and distinct viewpoints on the domain of the study as comprehensively as possible. We examined an extensive amount of literature to model the debate on ABC on the European level when collecting the concourse for our experiments. The technological approaches within the ABC debate were found e.g. in organizational guideline documents,[9] research project reports[10] as well as academic publications, the majority of which debated biometric authentication (e.g. Jain and Kumar 2012; Kwon and Moon 2008). To cover policy preferences, we drew upon publications by the EU and other relevant actors[11]. For the public political debate, we made use of evaluations on Smart Borders (Bigo et al. 2012; Hayes and Vermeulen 2012) and consulted newspaper articles and press releases[12]. Moreover, we surveyed academic publications for the political scientific points of view, which often appeared fairly critical towards ABC. The criticism emanates e.g.

[9] Published e.g. by Frontex and the International Civil Aviation Organization.

[10] Published e.g. by European Commission funded projects such as 'FastPass', which we were a part of as well as 'PRESCIENT', i.e. 'Privacy and emerging fields of science and technology'.

[11] E.g. European Data Protection Supervisor, European Commission, Biometrical European Stakeholders Network, Biometrics Institute and European Organisation for Security.

[12] The sources included national newspapers as well as the EU Government Gazette and the EU Observer and dissemination by various European Parliament parliamentary groups such as the European Conservatives and Reformists Group and The Greens/European Free Alliance along with advocacy groups, such as Privacy International.

from the perceived tendency of contemporary states to make excessive use of risk management technologies (Ceyhan 2008; Muller 2008). These technologies are in the political scientific publications associated with securitization, i.e. processes by which issues are brought under a specific security logic calling for emergency measures instead of a public debate (Lodge 2004; Muller 2011).[13] Many scholars also criticize the entanglement of security and immigration policies (Dijstelbloem, Meijer and Besters 2011; Epstein 2007; Muller 2004), as well as the erosion of privacy associated with biometric identification (Friedewald et al. 2010; Harel 2009; Mordini and Rebera 2012; van der Ploeg 2009).

After collecting the contents of the debate on ABC on the EU-wide scale, we formatted the views discovered into altogether 230 short statements[14]. Upon closer examination of the contents of the debates, three main themes emerged from the concourse. They served as the basis for forming a heuristic model of the debate. The model was formulated to enable us to reduce the number of statements for the experimental design (see de Graaf and van Exel 2008). We named the themes *technological possibilities* (A), *privacy, rights and legal issues* (B) and *institutional processes* (C). Each theme contained three types of statements: *representative statements* (a),[15] *normative statements* (b) and *policy recommendations* (c). We cross-tabulated the themes and types of statements using a Fisherian design (see Aalto 2003). All statements were first placed in the cells of the model to map the volume of the debate, after which a balanced number of statements, in this case three or four, was selected from each cell (Aa, Ab, etc.) (see Table 1). The heuristic model helped us to reduce the initial sample of 230 statements into 34 statements[16] in a balanced way, i.e. to find a relevant, equalized sample, which would serve in answering the research question (see Brown 1986).

[13] For an introduction to securitization, see Buzan, Wæver and de Wilde (1998).

[14] According to Brown (1986), the concourse should consist of at least a threefold number of statements the researcher will finally use as the study's Q sample. This would have meant 129 statements for our first iteration, which we used to collect the concourse initially.

[15] The representative statements are seen here as 'declarative', describing the (debatable) current state of affairs. Even though the representative statements and policy recommendations may also be normative, the normative statements take an explicit normative position.

[16] After piloting a sample of 43 statements (Article I), we further reduced it to the 34 most salient ones (Article II) based on the feedback received.

Table 1. The heuristic model of the concourse i.e. the policy debate on automated border control in the EU.

	Technological possibilities (A)	Privacy, rights and legal issues (B)	Institutional processes (C)
Representative (a)	Aa	Ba	Ca
Normative (b)	Ab	Bb	Cb
Policy recommendation (c)	Ac	Bc	Cc

3.2.2 Case selection

Finland was selected as the case study EU Member State for the pilot iteration of the study (Article I) because it has striven to be a 'forerunner in the utilization of technology' for border control (Finnish Border Guard 2018) and was one of the first Member States to introduce the use of ABC in 2008. Helsinki airport in Finland is also northern Europe's leading entry point for transit flights between Europe and Asia, which requires efficient processing since the external border controls in the Schengen border convention Member States are performed at the first point of entry or exit. Finland as a case study Member State is described in more detail in the remainder of this section.

For our second iteration (Article II), we selected four EU Member States as cases since the aim was to compare political views in different Member States.[17] The selected Member States, Finland, Spain, Romania and the United Kingdom, were chosen with the criteria of maximising the variance among the cases with respect to (1) the status of the ABC debate and system institutionalization, (2) the geographical location and types of border challenges at external EU borders, (3) Schengen

[17] Four was a suitable number bearing in mind that we wanted the political spectrum in each Member State to be represented by the participants and that Q methodology is a small-N methodology where some 40 participants is quite a large sample.

membership and (4) position on Smart Borders[18].[19] As for the first criterion, the institutionalization of ABC can be regarded as very weak in Romania, strong in Finland and Spain and very strong in the UK. So far, the ABC activity Romania has shown is to briefly test a land border ABC solution for cars crossing the border with Serbia in Moraviţa as part of the European Commission funded FastPass project in late 2016 (Romanian Border Police 2016). This weak institutionalization is mostly due to Romania linking ABC with its potential upcoming Schengen membership and not being so interested to act before that membership is secured.

Contrastingly, Finland has shown fairly strong ABC institutionalization, as witnessed in ABC use at Helsinki airport and the Port of Helsinki. The airport gates, which have served for over a decade, have also since 2012–2013 been utilized with certain Third Country Nationals[20] exiting Schengen (Finnish Border Guard 2016). Even though the Finnish Border Guard has been active in the use and development of automated gates, the volumes of passengers and thus also numbers of gates are significantly lower than e.g. in Spain and the UK. While Helsinki airport uses 30 gates and the seaport five gates, Spain has expanded the use of ABC to more than 120 gates, which now cover the most important airports, along with one land border and one seaport (Spanish Ministry of the Interior 2017). Furthermore, the UK has exhibited perhaps the strongest institutionalization of ABC in the EU as there are over 250 ABC gates at 22 air and rail ports in the country (United Kingdom Border Force 2018). The UK represents an interesting case despite its ongoing negotiations to leave the European Union at the time of writing.

Our second case selection criterion was Member State location since we wanted to account for different types of EU external borders in our examination. We chose case Member States from the four corners of the EU with diverse challenges at the Union's external borders. Our cases were not chosen to model the number of incoming asylum seekers, which increased dramatically and decreased again in recent years.[21] Rather, we chose case Member States dealing with different types of

[18] The political debate on ABC is closely tied to views on the European Commission's Smart Borders package envisioned to make use of ABC, which is why we treat views on ABC as part of the wider debate on Smart Borders whenever relevant.

[19] We first made a table of all the EU MSs and the criteria and then selected the four cases displaying the widest variation.

[20] This includes nationals of the United States, South Korea, Canada, New Zealand and Australia. Japanese passengers can use the ABC on departure and arrival.

[21] The annual number of asylum seekers registered in the EU has fluctuated from around 200,000 to 300,000 in 2009–2012, to the peak year of 2015 with 1.23 million and then decreased to 730,000 in 2017 (European Asylum Support Office 2018). According to Frontex's (2018, 18) 'Risk Analysis' the number of detected 'illegal border crossings' at EU's external borders has decreased significantly from

challenges at the borders owing to their geographical and geopolitical situations. Even though ABC is nowadays mostly used at airports, plans are in place to expand its use to land borders and ports. The EU's external land borders are challenging for Finland at the much traversed and long border with Russia as well as for Romania at its land borders with Moldova, Ukraine and Serbia (Frontex 2017). For Spain, the land borders are also a challenge, since the country faces the second heaviest inward land border passenger traffic in the EU (after Croatia) through the Spanish autonomous communities of Ceuta and Melilla in North Africa (Frontex 2017). While Spain's problems of migrants forcibly entering from Morocco to Ceuta through fences seem to have abated along with its problems of monitoring the Canary Islands, the sea route from Morocco and Algeria continues to attract irregular migrants on perilous boat journeys to Spain (Frontex 2017). Document fraud cases have also been a significant challenge at the Spanish-Moroccan land and sea borders (Frontex 2017; 2018). The UK's most difficult border control tasks were not on the coasts of the islands but at the air borders, which were among the most active sites in denying entry to the EU (Frontex 2018). Furthermore, the Romanian authorities denied entries significantly at their land border and the Spanish at air, land and sea borders (Frontex 2018). These denials reflect that the volumes of passengers entering the Schengen area through Romania, Spain and the UK were significant[22] – and less so in the case of Finland.

Our third case selection criterion was to include Schengen members and non-members. Finland and Spain are members while the UK has decided to opt out and Romania is a candidate for membership. Furthermore, the fourth and final criterion of diverse positions regarding the European Commission's Smart Borders proposal was included to ensure that we would include Member States with different policies and priorities regarding border control.[23] The UK will not participate in Smart Borders since the policy is built on the Schengen Agreement, which it is not a part of, and since at the time of writing the UK is also actively negotiating its terms for

more than 500,000 in 2016 to roughly 200,000 in 2017; the most important entry route with more than half of the illegal crossings is the Central Mediterranean sea route from North Africa to Italy.

[22] The denials may also reflect that there were more travellers who did not meet the EU entry criteria attempting to enter through these Member States.

[23] The official national positions on Smart Borders as of March 2017 were obtained by the author from the following sources: Finnish Ministry of the Interior (2016), Finnish Ministry of the Interior and the Government of Finland (2016), correspondence with the Head of the International Affairs Unit of the Finnish Border Guard; Romanian Parliament (2016), correspondence with an official from the EU Division of Chamber of Deputies; Spanish Permanent Representation to the EU (2016) and correspondence with an official of the Mixed Commission on EU Affairs of the Congress; United Kingdom House of Commons (2016) and correspondence with an official from the Parliament's European Scrutiny Committee.

leaving the EU altogether. The UK has its own Registered Traveller Programme in place. Spain views the technological modernization of border control as essential and supports the Entry/Exit System for the benefit of detecting irregular stays. Romania also supports the EES because it considers the automated calculation of stays useful. Spain furthermore supports access of law enforcement to EES data to help prevent and combat terrorism and serious crime along with the majority of other EU Member States, including Finland. Finland views Smart Borders as potentially helpful in a situation where the Union's large neighbouring countries such as Russia may attain visa exemptions, which would presumably increase travel from these states. Finland wants ABC use to increase and expects all Third Country Nationals with a biometric passport to be able to use ABC in the near future. However, Finland wants to explicitly forbid handing over passenger data to third countries in the context of Smart Borders even in cases of combatting terrorism and serious crime or repatriating Third Country Nationals. Romania on the other hand wishes for fewer legal impediments to information sharing and proposes a single European search interface (for the SIS II, VIS, Eurodac, Interpol Stolen and Lost Travel Documents database, EES and ETIAS), which seems rather dangerous from the point of view of data protection. Romania also appears especially interested in the extent to which EU finance will cover the costs of implementing Smart Borders.

3.2.3 Participant selection and subjective self-measurement experiments

As participants for our experiments we targeted primarily Members of Parliament (MPs) who discuss and decide on border control policies. We aimed at selecting well-informed participants based on their parliamentary committee membership, political affiliation and backgrounds. To complement our participant sample, we also targeted relevant high-level experts such as ministry officials and political staff such as special advisors to political parties. These individuals had been consulted on related proposals, e.g. on the EU's Smart Borders in the governmental committee work and they generally enjoy a more permanent status than MPs.

Even though the process of selecting appropriate participants and convincing them to take part in Q methodological experiments is often an arduous undertaking, it is essential for the quality of Q methodological research and relevance of the results (see O'Connor 2013). After numerous calls and emails to potential participants, 19 individuals took part in the experiments of Article I and 44 in the experiments of

Article II. These quantities are methodologically ideal, since Q methodology is designed for a small number of participants, some 10 to 40 (see Dryzek 2005). That is to say, it is essential to represent all pertinent categories of perspectives and individuals but not to aim at a quantitatively representative sample of persons (Dryzek, Clark and McKenzie 1989). In this case the relevant categories of participants refer to covering the political spectrum and nationalities in a balanced manner.[24] In addition, we considered current trends such as the rise of right-wing populist immigration and EU-critical parties in our cases of the UK and Finland (see Auel and Raunio 2014; Leruth 2015) in our participant selection.[25]

The first 19 individual Q methodological experiments were carried out in Helsinki in September 2013 in a manner typical for administering experiments using this methodology, i.e. printing out the statements onto cards and having the participants 'physically' sort them. In the following 44 individual Q sorting experiments performed between February and November 2014 we utilized an online Q sorting platform entitled FlashQ (Hackert and Braehler 2007) to model the face-to-face sorting experiments.[26] The idea underlying Q sorting is that participants 'converse' with each other, as they react to the same statements, even though they are conducting the experiment individually. Furthermore, the participants engage with the broader debate on the subject since the statements are drawn from that discussion. This 'conversational' aspect makes the Q sorts intercomparable and relevant in relation to the wider conversation on the research topic.

During the experiments, participants were first instructed to carry out a 'pre-sort', which means glancing through the statements and sorting them roughly into three piles, 'agree', 'neutral' and 'disagree' (Figure 1) in order to facilitate the following thorough rank-ordering. The sorting criterion was the participant's subjective view, which is assumed to be operant and manifest as agency in their advisory or decision-making role. Following the pre-sorts, the participants were requested to arrange the statements again, on a scale from most agree (+4) to least agree (-4) (Figure 2). This is the moment when participants determine the importance they want to assign to each statement (O'Connor 2013). In practice, there is an equal number of statements and slots in the quasi-normal distribution grid (Figure 2). Participants were reminded

[24] The participants and their nationalities, party affiliation and expertise are listed comprehensively in Article I, pp. 11–12 and in Article II, p. 213.

[25] Spain has not manifested Euroscepticism, while support for the Romanian Eurosceptic Greater Romania Party is marginal (Halikiopoulou and Vasilopoulou 2014).

[26] We sent a link and a password to participants, prior to which we had configured FlashQ to give the necessary instructions, to save the data on each experiment on a server and send the experiment data to us via email.

that placing statements in the extreme right or left columns would emphasize the importance they attached to the statements, while the statements in the middle columns would receive less weight. After the sorting participants were advised to go through the entire sort and were able to make any adjustments they felt necessary.

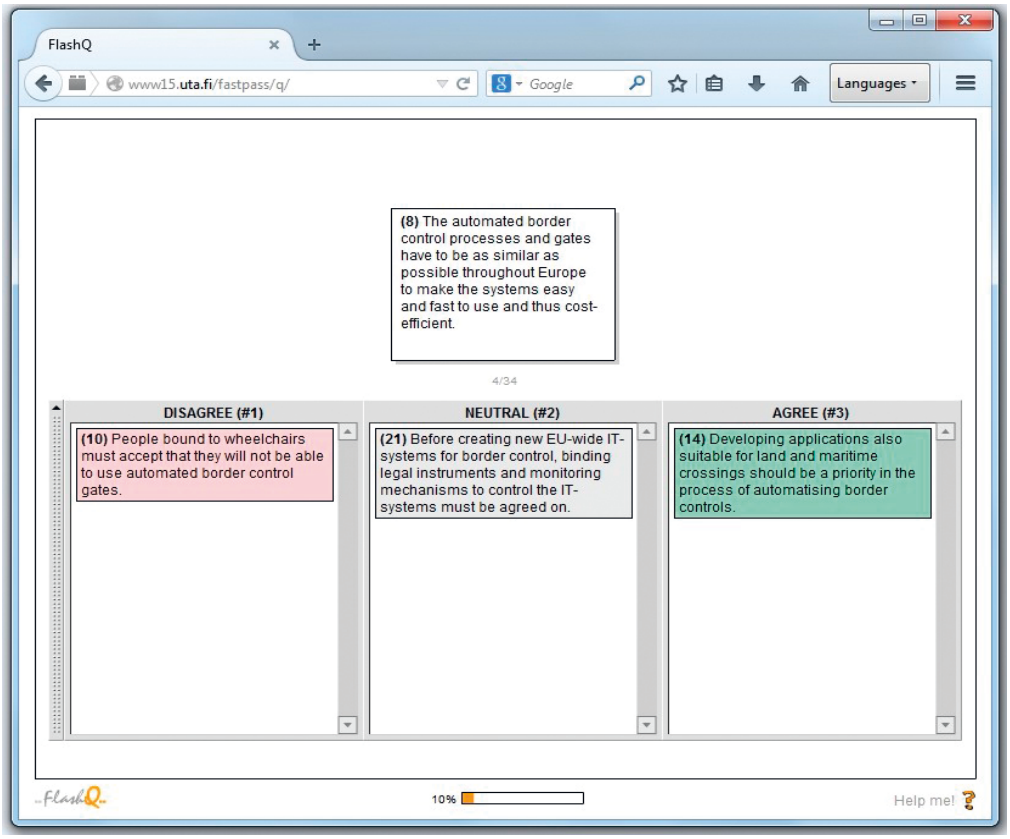

Figure 1. The online pre-sorting on FlashQ.

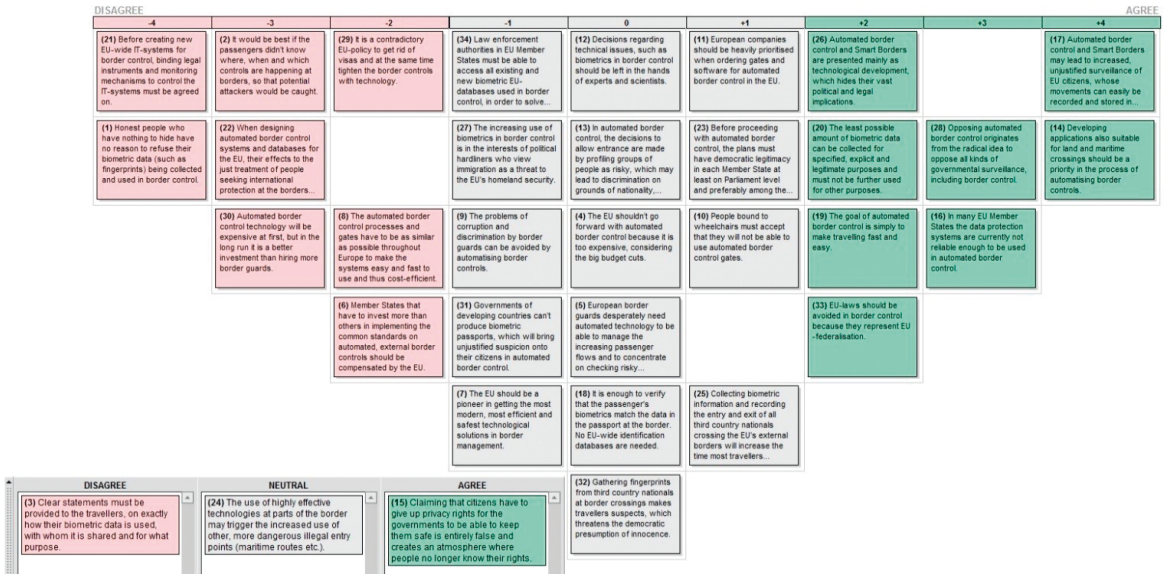

Figure 2. The online Q sorting platform.

After the Q sorting experiment, participants were interviewed to ensure that the sorting data was reliable and to gain a more detailed understanding of their views to support the following analysis. The interviews were more comprehensive in the pilot study (Article I) since the goal was to develop the research setting, while in the online version (Article II) we provided a web-based questionnaire. To control the validity of the rank-orderings in both iterations, the participants were asked whether they got to express their views completely, i.e. that they were not forced to place statements into slots that did not reflect their actual views. In addition, for the sake of reliability, we asked participants in both iterations to explain why they had placed certain statements in the extreme columns in order to verify the statements were understood similarly enough by the participants so that the sorts would be intercomparable.

3.2.4 Data analysis

Once the numerical Q sort data was obtained, we entered it into the PQ Method programme (Schmolck 2002) for analysis. Centroid analysis and Principal Component Analysis (PCA) were used to extract unrotated factors from the data. These 'raw' factors were then tested and rotated with Varimax and 'manual' i.e. judgemental rotation.[27] We generated and reviewed dozens of different factor solutions with the aforementioned methods of factor extraction and rotation in order to test which of them would generate the most distinguishable and analytically interpretable factors expressing clear views vis-à-vis ABC.

The finally chosen factor solution in the first iteration included three factors and explained 62% of the variation among the Q sorts. It was achieved by combining PCA, Varimax and judgemental rotation. For the second iteration, we chose a factor solution at which we arrived with a combination of PCA and judgemental rotation, which explained 50% of the variation with its three factors.[28] At this point it is worth noting that even though the factor analytical phase may sound quite technical and perhaps out of place in a mostly qualitative social scientific setting, its procedures are the means to the end of creating qualitative narratives of the factors. The results obtained with factor analysis are restricted by the contents of the participants' Q sorts, which means that the analyst can only make interpretations that are supported by the numerical Q sort data. However, there is no underlying 'right' factor solution and each generated factor solution is an interpretation based on the Q sort data (Dryzek 2005).

Moving on to the contents of the factors or the types of views expressed still in quantitative form, each participant's loading on the factors indicates how similarly to or differently from the factor's imaginary 'ideal sort' or 'ideal representative' the participant in question performed their Q sort. The factor loading thus indicates how

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[27] As Watts and Stenner (2012, 99) explain, Centroid analysis and PCA 'ordinarily produce very similar results'. Centroid analysis is the traditional Q methodological factor extraction method, which existed prior to computers, whereas PCA produces the mathematically-statistically 'best' solution (Watts and Stenner 2012). In factor rotation, judgmental, i.e. 'by-hand' rotation is the traditional solution concentrating on the subject matter of the factors, while Varimax rotation is an automatic procedure, which rotates the factors so that, taken together, they account for the greatest variance possible (Watts and Stenner 2012). These factor extraction and rotation techniques are all used in Q methodological research, although certain analysts prefer some over others. For a detailed discussion on the preferences, see Brown (1980). The fundamental premise I find, is that factor extraction and rotation is a process of balancing between the substantial and mathematical contents of the factors and finding the optimal solution through trial and error.

[28] Both 50% and 62% are methodologically satisfactory results compared to the Q methodological literature in general.

comprehensively the participant shares the opinion of the factor or disagrees with it. The loading is expressed numerically from 1.00 to -1.00, where the former would indicate complete agreement and the latter would signify total disagreement. The minimum value of a statistically significant loading at the $p<.01$ level was set with Brown's (1986, 64) formula in both Q methodological iterations, which in the pilot study meant a value of 0.39 and in the following study 0.44. Significantly loading persons on a factor define its contents and their interview comments support the qualitative analysis of the factors.[29] To keep the factors and the views they express as distinct as possible[30], participants loading significantly on multiple factors were not regarded as defining sorts of any factor (see Akhtar-Danesh, Baumann and Cordingley 2008).

After looking into the loadings of participants on the factors, the next step is to explore the so-called factor 'Q scores' provided by the PQ Method programme. The Q scores represent the 'ideal values' of an imaginary respondent completely in agreement with the factor. They are calculated from the significantly loading participants' Q sorts and expressed with the range according to which the participants rank-ordered the statements, which in this case refers to values from -4 to 4. These scores play an important role in the subsequent qualitative analysis, since they indicate the differences and similarities between factors. They guide the creation of a narrative of the content of each factor and are often referred to when reporting results.[31]

Attention is paid especially to the high and low scores as well as the divergence and correspondence of scores between factors. To clarify, let us say that a statement reads 'risk profiling is recommendable' and the factor Q scores are +3 for factor A, 0 for factor B and -4 for factor C. This would indicate the factor A quite strongly recommends risk profiling, factor B does not have an opinion and/or does not think this is an important topic of discussion while factor C thinks risk profiling is not at all recommendable. If the factor Q scores for a statement are the same or similar on all factors, we may interpret that there is consensus on that statement across factors, which is an interesting result, especially in policy research, since it may serve as the starting point for policy negotiations. All in all, the factor scores, along with the interview transcripts help the analyst to construct and present the 'factor views',

[29] The factor loadings of each participant on each factor are listed in Appendix 1 of Article I, pp. 11–12 and in Table 2 of Article II, p. 213.

[30] The factors in both iterations do not correlate significantly with each other, which also indicates their distinctiveness.

[31] Factor Q scores for each statement on each factor are listed in Article I, pp. 12–14 and in Article II, pp. 224–225.

which are the main Q methodological research results. The next section presents the findings of the Q methodological research of Articles I and II, i.e. the qualitative narratives in condensed form along with the findings of Articles III and IV.

4 FINDINGS

4.1 Findings of Article I

As mentioned above, Article I seeks to answer the question '*What kind of socio-ethical, legal, political and privacy requirements do Finnish Members of Parliament and the political stakeholders advising them have on ABC systems?*' The findings in this Q methodological inquiry are as per usual for the methodology presented in the form of factors, i.e. view types groups of participants share along with the so-called potential consensus statements, which convey agreement across the view types. The views are presented here in a summarized form and more thoroughly in Article I.

In this case, three different view types of requirements for ABC systems were found.[32] The first view was supported by politicians representing different parties and experts working in the Finnish Ministry of the Interior. This view's supporters saw ABC and the biometric data collection involved as necessary and trusted it would make border control safer. Their argumentation was quite similar to the European Commission's stated position: both pushed for the harmonization of ABC across Europe to make it faster to use and adopting a risk profiling based approach, which involves the border control staff concentrating on 'risky travellers' while the majority of 'trusted passengers' would use the automated systems. The potential erosion of privacy linked to biometrics use was not seen as a problem and participants sharing this view stated they believed today's society is already permeated by surveillance e.g. in the form of smartphone use with little data protection. Thus, ABC was not considered an overly invasive practice with its large biometric databases, as long as the data collection is transparent and access to data is clearly prescribed.

The second view supported by human rights and law experts and a left-wing political participant conveys a rather different position. Participants sharing this view defended the right to privacy and opposed perceiving technological 'advancement' as an intrinsically positive value. The highly sensitive nature of biometric data such as fingerprints was emphasized and accordingly participants believed that the

[32] In the cases of Article I and II, the views found are presented according to the amount of variation among the Q sorts they explain, the first view explaining the most etc. The specific percentages of variation explained are listed in Articles I and II.

amount of data collected should be kept to a minimum since it may potentially end up in the wrong hands. Logically, granting law enforcement agencies access to biometric databases used in border control was also opposed. The status and treatment of asylum seekers in a technologically enforced border control environment worried participants sharing this view. They were disturbed by the idea that passenger data could be shared with non-EU officials putting the asylum seekers at risk in their countries of origin. All in all, the supporters of this second view resented the EU striving to be a pioneer in technological border control, which could mean that the risk profiling approach leads to discrimination and exclusion masked as technological improvement. The stated worries echo the apprehensions of critical IR scholarship on the technologization of border control and increased governmental surveillance in general.

Participants supporting the third view represented a moderate position between the two former extremes. It was shared by politicians from the centre and centre-left parties. While this view is analytically not as clear as the two first views, it essentially welcomes ABC but shares some of the privacy concerns stated by those subscribing to view two. Those subscribing to this view wished to proceed with the use of ABC somewhat more slowly than those subscribing to view one. View three supporters argued that the technology needs first to be perfected and public discussion on its use needs to be had in order to attain public approval. The participants subscribing to the third view encouraged data minimization and opposed hidden surveillance as well as law enforcement access to border control databases. Yet participants sharing this view also stated that people are too concerned with their privacy and that it is useless to object to personal data collection in general, since that battle was lost long ago.

Altogether the position conveyed by the supporters of the third view is somewhat inconsistent, which possibly implies that at the time of the experiments in 2013 it was not yet easy to form a coherent judgement. At that time information on ABC was scarce and the debate e.g. on Smart Borders on the committee level in the Finnish Parliament was underway; a point to which a potential interviewee, an MP, referred to when declining to participate. On the other hand, according to the feedback from those who did participate, the experiment helped many of them to form and articulate their views on how technologically operated border control could be developed into an ethically sustainable practice.

Finally, participants supporting any of the three views agreed on two items of the Q sample. They deemed the regulation of the EU-wide systems and data use crucial. More specifically, participants sharing any of the views firmly agreed with the

statement 'before using biometric technologies and storing biometric data, there should be a clear definition of who will get access to the data' as well as the statement 'the EU must not produce any union-wide IT systems without binding legal instruments'. This implies that transparent biometric data use was a concern for supporters of all the views and that information technology systems need legal regulation as well as monitoring. This consensus is quite interesting in hindsight as it is contradictory to the Finnish government's disputed legal preparation for granting law enforcement authorities access to the biometric passport database in Finland for solving serious crimes (e.g. Teittinen 2019).

While participants supporting views one and three argued that people today have already had to acquiesce to extensive surveillance in many forms, there is a point to be made about the differences in the entities handling personal data. It is true that technology users are to an extent compelled to entrust corporate handlers with data such as location if they wish to use devices like smartphones. Even biometric applications using fingerprints and facial recognition are becoming more widely employed in these quotidian contexts. Yet governments are the only entities that can in the final instance oblige citizens to give up their most sensitive biometric markers – nowadays one cannot e.g. obtain a passport in the EU without being fingerprinted. Thus, governments are the only entity with access to systematically harvested large information registers on citizens and the power to change the conditions of access to these, which is why they should be held to the highest possible standards in personal data use to account for the security and privacy of those registered. The overarching trend seems to be that an increasing amount of personal data is held by various governmental and non-governmental entities and it is reasonable to be concerned about how and when the data in question will be used and by whom. Ranging from commercial use to totalitarian regimes and their potential desires to persecute political opponents, this is not something to be taken lightly. Civil rights are at issue e.g. when collecting fingerprints of individuals not accused or suspected of crimes and envisaging the use of this data by law enforcement in the near future.

4.2 Findings of Article II

The main question posed in Article II is '*How do political stakeholders in four EU Member States (Finland, Spain, Romania and the United Kingdom) view the complex nexus of ABC technologies with regard to privacy, rights and legal issues, as well as further institutional choices?*' Our findings are presented next in the form of a summary of the three types of views

and so-called 'consensus statements', i.e. opinions shared by the supporters of any of them.

The first view resembles the second view in Article I since participants supporting both firmly advocated for privacy rights and were concerned about encroachment upon them in the context of automated border control. Participants from all case nationalities subscribed to this view, and supporters were mostly people with a left wing or liberal party-political background or expertise in law and data protection. Subscribers to this view labelled decisions on ABC political due to their effects on fundamental rights making them unsuitable to be made by experts and technology developers. The risk profiling approach used in ABC and advocated by the European Commission is an object of criticism as it may lead to discrimination. Participants sharing this view called for unified EU legislation and border control policies that take into consideration the just treatment of asylum seekers since the Union has a common external border. Furthermore, the proposed fingerprint collection from third-country nationals in the context of Smart Borders alarmed supporters of this view due to its implications for their safety and due to jeopardizing the presumption of innocence.

Participants espousing the first view emphasized how risky it is to collect personal information from citizens overall. The goals of large European databases were seen in a more sinister light than streamlining travel experiences. Those espousing the view felt that citizens should not be required to let governmental authorities record their biometric data. This reluctance to share intimate information stemmed from the relatively recent memories especially of the Spanish and Romanian participants of dictatorial regimes using personal information as an instrument against their own population. Data misuse in the future was deemed inevitable, hence participants subscribing to this view emphasized that only the absolutely necessary data for a specific purpose, in this case border control, should be collected. They noted the dangers of 'surveillance creeps', which occur when data collected for border control purposes comes to be used later for other purposes than initially intended. Thus, law enforcement access to border control databases was seen as unnecessary and dangerous even in the case of attempting to prevent acts of terrorism. This opinion is in contradiction to the Smart Borders proposal of 2016 about granting the mentioned access (European Commission 2016). In addition to considering it tempting for EU Member States to employ border control databases for more than just border control, participants subscribing to this view also criticized the differences in legislative systems and legal cultures among Member States. This refers to the inability to guarantee that the data would be employed only for legitimate ends:

lack of accountability, and the possibility of corruption and discrimination worried the participants. This perception was justified by the notion that ambiguous data use in just one state or border authority could endanger the biometrics of an enormous group of people.

Supporters of the second view took a position similar to the first view in Article I in declaring that ABC would improve security. This view was supported chiefly by right and centre right-wing politicians, with all case nationalities represented. Their main argument was that security is the most important aspect to consider and that the EU should invest in automated, state-of-the-art technological devices to achieve efficacy and safety. Automated risk profiling of passengers was supported and it was argued that an equally thorough border clearance with every traveller would be counterproductive as opposed to focusing more intensively on the 'riskiest' travellers. For participants sharing the second view, using passengers' biometric information was justified and necessary, also in the context of solving serious crimes and battling terrorism, i.e. providing law enforcement authorities with access to border control databases. Even though the participants were not concerned about potential baseless passenger surveillance, they wanted to achieve clarity on what is acceptable data use and prohibit concealed surveillance of travellers. Furthermore, subscribers to this view pointed out that immigrants were not a security threat in the EU and that the goal of security measures is not to prevent immigration.

Participants sharing the second view were in favour of the harmonization of automated border control apparatuses and procedures since they deemed it beneficial for European integration. They argued that the EU should have joint legislation in border control and that the Union must act together to improve its external border control to be able to maintain the unregulated internal travel of EU citizens. Furthermore, they were not concerned by the costs of the new ABC technology, deeming it an investment in security and efficiency in the context of increasing passenger volumes and as such a viable alternative to hiring more personnel at the borders.

Contrastingly, participants subscribing to the third and final view called for increasingly rigorous border control since they perceived immigration as a security threat to the EU. The view was supported by far-right Eurosceptic party politicians and political staff from Finland, the UK and the Netherlands[33]. Participants sharing this view argued based on the alleged will of the 'people', which is a central strategy

[33] Spain and Romania did not have significant Eurosceptic far right movements and the participant from the Netherlands was included as a control case to represent a sufficient number of Eurosceptic parties.

of populist movements; they maintained that citizens were justifiably anxious about increasing immigration due to its socioeconomic consequences and crimes committed by non-nationals. This view contradicts existing research in its position on the relationship between migration and security: if 'human insecurity of the people facing persecution in the country of origin or discrimination in their new country or even dying in transit' is ignored, i.e. 'human security is excluded from national security concerns', one may expect 'new and more intense risks and threats' to national security to arise (Estevens 2018, 19).

Essentially, the supporters of the third view saw EU citizens as holders of a wider variety of rights than third-country nationals: this notion of 'different' civil rights for different (minority) parts of the population is also central to right-wing populism. It implies that non-EU nationals can and should be subjected to strict security measures such as fingerprinting as part of Smart Borders. Accordingly, possible discrimination against ethnic groups or nationalities in a risk profiling approach did not worry those supporting the third view.

While participants defining the third view generally condemned the monitoring of EU citizens, in contradiction to the previous two views, they supported hidden surveillance of travellers at border zones to capture potential aggressors and criminals on the logic that if one is not trying to get away with criminal activities, monitoring should cause no fears. The participants supporting this view expressed altogether controversial opinions regarding governmental and EU level surveillance. They stated that data protection systems in several EU Member States were not trustworthy enough and they did not trust governments to keep passenger biometrics safe. This suspicion was apparently related to a reluctance to subject citizens to surveillance more rigorous than the national level, although EU-wide surveillance databases such as SIS II already check Schengen nationals. Furthermore, the supporters of view three saw technological systems in general as having harmful potential due to an inherently immoral 'human nature'. They were reluctant to proceed with ABC especially when the systems would be EU-wide or harmonized and defended national sovereignty in organising border control. ABC and other technological solutions appeared somewhat interesting to the participants supporting this third view especially if used at the Union's southern land and maritime borders to register asylum seekers thoroughly.

Our results indicate both support for the technologization of border control as envisaged by the European Commission as well as opposition for it, stemming from the (centre) left's privacy concerns as well as the far right's desire to decide on border control exclusively on the national level as opposed to the current situation of shared

competences. While the (centre) right politicians supporting view two would gladly receive ABC as an augmentation in border security and a stimulator of further EU integration, the (centre) left politicians subscribing to the first view connected ABC use with civil rights questions drawing attention to the potential misuse of passenger data (see Figure 3). Participants espousing the third view used a far-right populist Eurosceptic argumentation opposed to further EU integration and harmonization of border control policies pleading to threats they associate with immigration. Concerning European integration in the case of the Schengen security community, existing research warns that divergence from the path of integration and co-operation would lead to unfortunate regression into power politics and mistrust (Alkopher and Blanc 2016). Despite representing a minority, the third view is noteworthy since Eurosceptic right-wing populists have gained increasing support in many Member States in recent years.

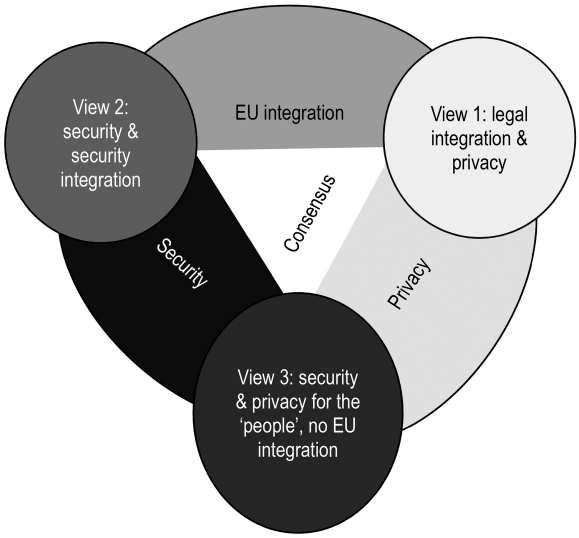

Figure 3. The Views and their positions at the nexus of security – privacy – EU integration according to Article III.

Participants sharing the three views furthermore shared similar ideas on five items of the Q methodological statement sample. As they represent EU Member States with different border control challenges and a wide variety of political ideologies, these items may be useful as a start for negotiations on ABC on the EU level. First,

participants subscribing to any of the views supported data minimization, which refers to collecting the minimum amount of personal information necessary for performing ABC. They deemed it vital to use this data only in border control and to be wary of the temptations of governments to use it for other ends. Second, transparency in personal information use was deemed important when it comes to legitimating ABC use for citizens. Third, participants supporting all views also required democratic legitimacy for upcoming ABC systems, which at minimum entails their acceptance in national parliaments but by preference also on the level of civil society. Fourth, participants demanded binding legislation and monitoring to be established for any upcoming EU IT systems in border control. Finally, participants subscribing to any of the views agreed that ABC must be made accessible to people with disabilities since they deemed accessibility a matter of fundamental rights.

Deciding on EU level solutions on any issue requires compromises achieved through lengthy negotiations. Border control and its technologization are no exception, bearing in mind that there are ambiguities in the responsibilities of Member States and the Union's institutions. Border control is an area of shared competence between the Union and Member States, which implies a mix of national and EU level debates. The European Commission has acted to technologize border control in a harmonized manner, while the European Parliament has had a say in the development of the Schengen Borders Code and upheld free movement of citizens according to it. Moreover, Member States implement border control in practice and have their own interests and challenges that may differ significantly from one MS to another. The interests of different Member States do not, however, seem to be key in the attitudes towards ABC we found in our experiments and analysis, but participants' support for the views was rather tied to their political affiliation.

4.3 Findings of Article III

Inspired by the findings of Article II, where accessibility for passengers with disabilities was deemed important by participants representing different nationalities and political affiliations, Article III explores the necessities of developing and providing accessible ABC systems for people with disabilities at European airport borders. It asks '*Would European travellers with disabilities wish to use ABC instead of the special assistance services provided at EU airports? Do key stakeholders including travellers with disabilities consider the accessibility of ABC to be ethically imperative, operationally and technologically feasible, cost-effective and recommendable*?' The responses to these questions

are analysed and presented with the help of a thematic review, which is concentrated on four debates found in the responses to the survey as well as stakeholder interviews. We named these debates as the equality debate, the operational debate, the technological debate and the economic debate. They are presented here in condensed form based on the findings of our survey of European travellers with disabilities and expert interviews.

The equality debate shows that the freedom to choose to use ABC, which entails that the systems would be accessible for people with disabilities, was considered a fundamental rights issue by political stakeholders, survey respondents and disability organizations. The political will to design accessible ABC systems was found to be one of the consensus items of our Q methodological study in Article II. Of the people with disabilities who took part in our survey (N = 139), 51% strongly agreed and 32% agreed with the notion that access should be considered a fundamental rights issue. Aviation organizations such as the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) have also gradually become more mindful of the needs of passengers with disabilities when it comes to airport practices in their publications (ICAO 2013; IATA 2015).

The need for universal design received strong support from disability organizations such as the European Disability Forum, which pushes for designing only accessible ABC gates. The idea of universal design principles is that as many people as possible with different abilities and bodily as well as cognitive traits would be able to use the systems independently. This would guarantee equal treatment, i.e. the materialization of fundamental rights for able-bodied and disabled passengers, which our interviewees also demanded. The respondents to the questionnaire supported the view that all the e-gates need to be accessible for people with disabilities with 56% strongly agreeing and 29% agreeing. Our interviewees with disabilities who travel often by air believed the freedom to choose between using the assistance services and ABC was paramount; the survey respondents also regarded the freedom to choose very important with 68% strongly agreeing and 26% agreeing that it was needed. Travellers with disabilities form a diverse group with varying desires and capabilities for independent travel, making the provision of choice important in creating border zones that are societal spaces with just practices.

The operational debate discussed the practicalities of potential upcoming accessible ABC systems at airports. Here we discovered that the majority of respondents in our survey, 71%, would use e-gates if accessible. For those people with disabilities who would not like to use ABC, the main motivation was that they expected the assisted process offered to be speedier. Since 2008, airports in the EU

and EU-based airlines have been legally required to offer an assistance service free of charge for people with disabilities or impaired mobility. According to our findings, people with disabilities were generally satisfied with this service: 52% of the survey respondents reported being satisfied and 10% highly satisfied. Yet there were facets of that practice that caused feelings of embarrassment and of being abandoned according to our passenger interviewees, perhaps mostly due to lack of staff instruction. Isolated waiting rooms sometimes felt like spaces of social segregation. The airport management employees among the interviewees seemed to think that the assisted service was of good quality with potential to improve if necessary and faster than possible self-service ABC solutions. Yet, as technology in this case delimits the practices of border control for people with disabilities, e.g. the European Disability Forum representative interviewed commented that the potentially increased waiting times would exemplify equal treatment and that access to ABC is more important than achieving the fastest solution. Lastly, the point needs to be made about the accessibility of other parts of the travel process at airports. Indeed, it would not seem sustainable if only border control were to be made accessible and other parts such as security clearance would leave people with disabilities in need of assistance. Yet, as our technical and airport management interviewees pointed out, improvements might very well begin from ABC with the goal of extending universal access to other processes as well.

The third debate concentrates on the technological possibilities and obstacles of accessible ABC systems. Organizations standardizing aviation practices (e.g. IATA 2015; ICAO 2013) and guiding border management (e.g. Frontex 2015) have gradually started to include people with disabilities and restricted mobility in their guideline publications recommending best practices. These recommendations, however, have not yet noted the different requirements that diverse groups of people with disabilities imply for the systems. Different and at times contradictory requirements are expected to arise. Thus, any accessible ABC system will require compromises and it seems unlikely that it would serve strictly all categories of passengers. A technology provider we interviewed stated that from the technological viewpoint there is no problem at all to produce e-gates that would be able to serve both very tall people and people in wheelchairs, for instance. Another technologically possible adjustment would be to let two people access the e-gate simultaneously so that passengers with disabilities could be helped by their travel companions and thus allowed to take the same route as other passengers, which would include them in the same spaces and practices as able-bodied travellers.

Our findings also indicate some key difficulties in the technological design of accessible ABC. Namely, people with visual impairments pose the most difficult requirements for accessible e-gates technologically, since locating the gates and knowing how to act while using them is challenging and noisy airports are not ideal for audio guidance. Another important feature of the technological design is the tolerance for user mistakes, which is inherently tied to the security aspects of ABC. Passengers who are disabled or elderly will likely make more mistakes, which an accessible e-gate would need to tolerate. This is problematic in the sense that the tolerance for erroneous use cannot be too high since the system needs to be safe in case someone tries e.g. to test if the system lets them enter with a forged passport.

Perhaps the most important aspect of the technological debate is the need to involve different user groups in the design of the technology, which concurs with the earlier literature (e.g. Brey 2018; Dotson 2012). Involving user groups with different abilities in the (universal) design process for practical and equality reasons is key. The earlier literature (e.g. Bennett 2002; Newell, Gregor and Morgan 2011) as well as our interviews with technological experts, people with disabilities and a fundamental rights expert all support increasing the involvement of people with disabilities in the design and development of new technological systems. The reason why technology developers do not involve these groups now is that it is not the users who buy the systems; the national border forces or other government entities commission the ABC systems and have so far not required accessibility for special groups.

The fourth and final thematic debate covers the economic aspects, i.e. the potential costs and savings involved in the design, adjustment and operation of accessible ABC systems. The technology providers stated that the main reason for not developing accessible systems was that there was no demand for them from the buyer organizations. In practice, governments and their institutions decide which requirements to include in their tenders seeking ABC technology provision. In the current situation, where accessibility has not been required in the tenders, the technology developers compete with each other and any extra features catering to passengers with disabilities will not increase their chances of winning a contract. Notwithstanding this lack of accessibility requirements is contrary to the EU Public Procurement Directive (European Commission 2004).

Our findings indicate that the most efficient way to motivate companies to design accessible ABC systems is to include the requirements involved in the tendering processes, something in which our survey respondents hoped the European Commission would lead the way (53% strongly agreed and 33% agreed). According

to our findings as well as earlier research (e.g. Brey 2012; Fleischer 2007), the overall costs of designing and building e-gates which would cater for people with a more varied range of abilities would be relatively small, i.e. less than 3% according to our interviewee engaged in developing ABC technology. This would be the case if a universal design approach were applied from the start as opposed to having to update existing e-gates, which is more expensive. While the economic debate also included concerns about accessible e-gates taking up more expensive airport floorspace than the currently used ABC systems, there are also potential savings and revenue to be considered. If more people were able to travel independently, assistance services would need less staff and people with disabilities would be able to e.g. shop at the airports instead of waiting in designated rooms. As also highlighted in the literature, people with disabilities form an underserved market in the tourism industry (Darcy, Cameron and Pegg 2010; Blume, Gadis and Valderrama Pineda 2014).

All in all, our inquiry into the needs to design automated border control systems accessible to people with disabilities or impaired mobility at European airports shows that such needs do indeed exist. This is especially true from an equal rights perspective in building infrastructure and IT systems for an ethically sustainable society with freedom to choose which system to use available to as many people as possible. The most salient arguments to oppose such systems are the lack of need due to the assistance service in place as well as the costs of technology and floorspace at airports. Some user groups with disabilities will probably require the assistance service anyway, yet a significant majority expressed their wish to travel independently using accessible e-gates. Thus, we propose two main actions for future ABC design. These are to involve people with different disabilities and mobility restrictions in the design processes of accessible e-gates and to require a universal design approach in the tenders for new ABC technology. In the case of state commissioned technological devices used for enforcing public policies, the EU and its Member States have the power and the responsibility to require accessible e-gates and thus make these border spaces more equitable in their practices. Funding inaccessible ABC reflects badly on the EU; wherever policies are enforced with technology, a normative power is also used to determine which parts of the population are taken into account as potential users. For positive societal impacts such as ensuring human dignity and equal opportunities, European and Member State authorities should incentivize universal design approaches to cater for a variety of capabilities in their populations.

Viewed as a larger societal question, publicly funded technology that is used for official purposes such as border control has a political dimension, where questions arise of truly serving the common good for the most people possible and not discriminating against segments of the population. Our claim is that technology is not neutral or only positive in essence, but also political and thus it should be a part of the public debate, which is contrary to the 'technocratic' view of separating societal and political from technological and material practices. In the technocratic approach, decisions on technology use should be left to technology experts and developers, but we recommend a participatory approach in order to serve European societies in a more equitable manner. This is in line with the so-called social model of disability, where it is the obligation of the environment to serve everybody, whereas the previously prevalent medical model saw it as the individual's responsibility to cope with the impairment (e.g. Freund 2001; Hughes and Paterson 1997; Samaha 2007). Unfortunately – and coinciding with Epstein's (2007) work – the exclusion of people from modern border control practices based on bodily traits and considering the human body more as a measurable object than a holder of fundamental rights is upheld at ABC gates at European airports at the time of writing.

4.4 Findings of Article IV

Article IV explores the questions '*How could Alexander Wendt's quantum social ontology be brought into the sphere of empirical social scientific (IR) research? Could Q methodology build a bridge between Wendt's ideas and empirical research?*' The character of the findings of this article differs significantly from the results of the three other articles since, instead of empirical experiments, Article IV draws on the literature and is essentially a commentary essay. This article explores how to combine recent claims of the philosophy of science by one of IR's most known contemporary scholars with a relatively uncommon methodology. Adhering to the practice-oriented commitments of the dissertation, this article ultimately aims at establishing avenues for the meta-theoretical claims Wendt makes to contribute to practical empirical work in IR with the help of Q methodology.

My commentary concentrates on comparing Alexander Wendt's (2015) book on quantum social ontology and the Q methodological literature. More specifically, the Q methodological literature reviewed consists chiefly of the work of its creator, William Stephenson, on the built-in alliance of the methodology with quantum

physics. My analysis shows that Wendt's 'quantum ontology' and Q methodology are based on a similar view on the characteristics of the human experience and what that means for the research of purposeful subjective agency. Both are based on the premise that separating mind and body, or mental and material, is an unfortunate course of scientific inquiry, since the bifurcation has led to concentrating on the latter as it suits the classical or (neo-)Newtonian physics-based understanding of how the world should be researched. The ensuing concentration on observable data, generalizations and causal patterns is regrettable, especially in the case of social sciences. The 'mind' in this bifurcation refers to the subjective orientation of individuals, which is the base of social life, yet idiosyncratic and difficult as an area of inquiry. Both Wendt and Stephenson believe that the positivist view of humans as rational utility maximisers is inaccurate and too narrow.

Wendt (2015, 115–116) distinguishes between Cognition, Experience and Will as 'features of psyche or subjectivity' in order to explain what should be understood in quantum mechanical terms and studied in social sciences from the point of view of quantum social ontology. Cognition and Experience refer to observable and passive action, reducible to matter, i.e. Cognition to thinking without necessarily being self-aware and Experience to feeling basic things such as pain. Will, then, is the feature of subjective agency to focus on here, because it is the active force with intent, mental states experienced subjectively, and thus an internal experience impossible to fully observe from the outside. However, this is when Q methodology becomes useful: it uses self-measuring subjects as knowledge creators and opens up a 'window' into the subjective experience. According to Stephenson (1987, 538), the experience of free will does not lend itself to causal analysis and is not deterministic (with predetermined causes), but rather needs to be measured as in quantum theory as a 'state-of-feeling'. To Wendt, the lack of free will or ability to act intentionally would mean we are dead or resemble machines, whereas the quantum ontology considers humans as material and mental, more subjects than objects, evolving (or 'Becoming' rather than being) with their conscious agency. This view is supported by Q methodology: a person is regarded not as a predictable utility maximiser but as a holder of creative potential and many rationales.

The stance against rational choice or pre-existing, latent preferences becomes evident in how both Wendt and Q methodology look at 'measurement' or the acquisition of scientific knowledge. The roots of Q methodology as an 'ally' of quantum theory are evident in the way it considers states of mind as complex phenomena, which are not readily observable as such and thus not a fruitful object of hypothesis testing or demographic generalizations but rather for discoveries. In

quantum physics, light and electrons behave as a wave when they are not observed, and the measurement collapses them into particle form. That is to say, they are in superposition: a wave function has potential for all outcomes or locations of particle hits. A quantum system that has not been measured is thus in an indeterminate state of superposition (this differs from a determined but unknowable state). The same holds true for Q methodological statements. They have no meaning as such, at least no normative meaning, before they have been sorted by the participant in the experiment. The Q methodological concourse which has not been organized by a participant can be seen as a superposition of options for mental states, with virtually infinite possibilities to be arranged in the measurement or Q sorting experiment, which collapses the mental state from superposition into observable information. The observer and the observed are considered 'entangled' in the quantum view, and in Q methodology they are actually the 'same' since the subject is self-observing, and the researcher acts as a facilitator creating a space for the subjective views to appear.

A similar view is expressed about language, which in the quantum social ontology is seen as a wave function in superposition before collapsing into the intended meaning in a specific context. This refers to the many potential meanings for e.g. a word before its use. In Q methodology, the Q statements are regarded in a similar way. They receive meaning at the time of sorting, i.e. when participants assign the statement to a slot according to their perception. When it comes to intentional subjectivity, Wendt (2015, 236) claims we can only take 'unmediated measurements' of our own intentions. In Q methodology the self-observing subjects take the measurements while the researcher's role is to compare the self-measurements with each other with factor analysis and subsequently interpret them.

The quantum cognitive models and quantum decision theory that Wendt presents share some important features with Q methodology but are considerably more difficult for the social scientist to use than Q methodology due to the mathematical-statistical knowledge required. These models tackle the empirically widely proven issue that humans do not act according to expected utility maximization, whether it is due to their idiosyncrasies or simply because politics and society hardly ever present decision-makers with standard or even similar decision-making situations, where strictly rational behaviour would be easy. The quantum cognitive models may have applications in quantitative social scientific work in the future (see, e.g. Khrennikova 2016; Khrennikova, Haven and Khrennikov 2014), but for qualitative IR and social scientific work Q methodology presents a more fitting and more easily applicable methodological option due to the subject matter it studies.

In terms of power, Wendt also talks about the differences in the influence different individuals and their states of mind or subjective orientations are able to exert. This refers to the existence of so-called dominant individuals having the authority to act on behalf of e.g. a state. The dominant actors can collapse a state's wave function by making a decision on how the state should act, which will affect masses restricting and permitting their agency. In relation to Q methodology, this is relevant in the sense that the participants of a Q methodological study should be influential in the area of interest so that the results would be pertinent. In the case of automated border control (Articles I and II), the pertinent individuals were interpreted to be the politicians and officials who were members of the relevant committees making decisions on border control in their national parliaments.

In sum, I believe there is noteworthy compatibility between Wendt's quantum social ontology and Q methodology in the study of subjective agency in IR. The ontology and methodology share a profound interest in intentional subjectivity, which is something that the ontologies and methodologies based on classical physics and materialism cannot or will not account for in research. This uniting interest in states of mind has not been a promising topic of study since we humans act in unpredictable ways, but it is nonetheless important in IR since the majority of IR study topics relate to human constructs which contain more than only material aspects. Viewing human agency in terms of rational utility maximizing yields at best inaccurate knowledge. The same goes for the customary IR views of a fixed human nature as well as the alternative of ignoring agency and concentrating on structure. Furthermore, the focus on the juxtaposition of advantaged and disadvantaged agency is also too narrow a way to study subjectivity. Instead, the view that Q methodology and a quantum worldview of sorts – be that in the form an ontology, analogy or a heuristic device – share on human agency is encouraging in the sense that there are multiple if not virtually unlimited potential rationales for action.

This combination of Q methodology and a quantum view in social sciences is not intended as an attack against the usefulness or 'correctness' of other approaches. In the spirit of practice-oriented IR and pluralism, I support the notion that multiple and even contradictory research agendas, methodologies and ontologies may very well serve different purposes. The point I aim to make in comparing the methodology and Wendt's view is to preliminarily show that they share compatibilities in the empirical research of political subjectivity in IR. Here the agenda is to add tools and motivation to cover subjectivity more broadly and to an extent to show that Wendt's quantum ontology should not remain merely a theoretical endeavour. Moreover, there are also potential ethically beneficial avenues

to explore in IR with the quantum view of everything and everyone being an entangled part of the same system. A unity view of sorts might encourage ethical action in general and viewing human agency as something that has more potentialities than restrictions might instigate creative behaviour instead of a pessimistic outlook.

5 DISCUSSION

5.1 Theoretical and methodological significance of the thesis

As this dissertation utilizes a practice-oriented heuristic as its background and focuses on border control as practices with an empirical, experimental emphasis, the theoretical significance for the field of IR is subservient to the empirical findings and methodological insights. Our empirical enquiries differ from those of earlier research, which has typically been more interested in theoretical and ethical argumentation. Practice-oriented IR supports pluralism in research and the main theoretical contribution is also an emancipatory one related to methodology: the coupling of Q methodology with Alexander Wendt's (2015) quantum social ontology. The idea of combining these two and using them together to promote the study of subjective agency in IR is perhaps the most important conceptual innovation in this body of work.

Even though the developer of Q methodology, William Stephenson, argued for the built-in alliance between quantum mechanics and the methodology in the 1980s (e.g. Stephenson 1981; 1982; 1983; 1985; 1986a; 1986b; 1986c; 1987) and in spite of efforts to use quantum mechanics as an onto-epistemology in the social sciences by others than Wendt (e.g. Barad 2007 discusses this in more general terms while Wendt tries to do it with more relevance to IR), the angle to study pluripotential and creative agency in IR presented in Article IV is a novel one. There have been no previous efforts to 'translate' Wendt's claims into empirical IR work, either by Wendt or others, so in a sense this effort has been pluralistic as outlined by Patrick Jackson (2011). The goal of establishing the connection between the quantum social ontology and Q methodology essentially is to do – and encourage others to do – more empirical work in the future. This future work, as argued in Article IV, has the added benefit of viewing people as decision-makers with potentials for a variety of complex motivations behind their actions as opposed to the current restrictive manner in which agency is often still tied e.g. to rational choice in IR research. Some have argued that the study of subjectivity as well as quantum ontology fall outside the scope of IR (see e.g. Jackson 2016; although the 'psychological school of IR' would not agree, see e.g. Goldgeier and Tetlock 2001), but I claim that we cannot afford to

lose this analytic path that leads us to aspects of social life that have been neglected or at least under-researched in the past.

Within the practice-oriented strains of IR, Bueger and Gadinger (2015, 457) argue that critical practice theorists 'risk providing overly "clean" narratives of practice' while pragmatists potentially create 'incomprehensible cacophonies of voices'. This is something that this dissertation tries to overcome by using Q methodology and thereby creating quite nuanced types of views and by applying a systematic approach in collecting these. When it comes to creating academically and practically pertinent knowledge, which is something that practice-oriented IR promotes, analysing the subjective orientations of political stakeholders and decision-makers with Q methodology (Articles I and II) creates knowledge that is useful, since the views uncovered represent tendencies, which will presumably manifest in practical decision-making situations. Thus, 'measuring' the subjective inclinations of participants regarding the societal, political, ethical and legal aspects of automated border control in the EU serves to ascertain what is and is not accepted by the political stakeholders, what they agree and disagree on. The methodological choice also forces political stakeholders to ponder and formulate their views carefully during the Q methodological process without the possibility of making contradictory promises to please as many as possible. Earlier research has found that compared, e.g. to questionnaires, participants in Q methodological experiments have reported the Q sorting to reflect their views more precisely since they are able to see the statements in a larger context (O'Connor 2013).

There are some caveats to be visited as regards the power to predict policy outcomes and the demographic generalizability of results obtained by Q methodology. The methodology does not claim to produce generalizable results across populations, which is a drawback associated with it and other small-N research methods as well as most qualitative research. Also, the people who participated in our experiments may no longer be in office when more decisions on automated border control are made. However, the aim of this dissertation is not to predict the specific forthcoming outcomes of political decisions but rather to model what kind of opinion groups there are in the Parliaments of the case states, and this was done successfully. The findings of Q methodological Articles I and II are not intended to be demographically generalizable; they are rather discursively representative (see Dryzek 2005, 206). Thus, if and when the people in power change, the types of opinions are likely to remain.

Even though Q methodology has a central role in this dissertation and is an appropriate method for the research setting, it is not my intention to claim some

kind methodological supremacy. Actually, on my almost decade long journey with the methodology I have realized that there is nearly an 'apotheosis' or at least a persistent and actively promoted glorification of the developer of the methodology. This includes believing that the users of Q methodology are unfairly criticized, misunderstood and in a manner of speaking the 'chosen few', who understand this way of conducting research. I do not subscribe to these beliefs or the 'Church of Q' as Tamás and Kampen (2015, 539) call it. Analysing Stephenson's writing on quantum mechanics from the 1980s (Article IV) may seem like a favourable move for the Church of Q, but the intention is not to somehow elevate the inventor of the methodology. Rather, the purpose is to make the connection of Q methodology and quantum social ontology, which together may be used to study agency within IR with fewer restrictions than usual.

As is evident from the use of other research methods besides Q methodology – interviews, survey and literature review – I am in favour of methodological pluralism in IR. As Jackson (2011, 230) argues, methodology best serves as a 'prosthetic'; not as permanent as skin but not as light as a sweater. As a matter of principle, all rigorously justified methodological choices should be welcomed in IR, which is not a particularly methodologically rich field at the moment, and which has emphasized theory development and theoretical controversy. Different theoretical and methodological choices create complementary knowledge, which will ultimately be beneficial to IR, (social) sciences and humanity.

Q methodological work actually benefits from further and/or earlier research conducted with other research methods. In an ideal situation with greater resources, focus groups could have been used for formulating the Q statements (see O'Connor 2013), but this was quite impossible in the case of politicians residing in different countries. Article I was in a sense used as a 'pilot iteration' for testing the Q methodological statements on Finnish politicians before widening the scope of the research to Spain, the UK and Romania. Moreover, questionnaires, which clash with the principles of Q methodology in many senses, e.g. when requiring generalizability, representativeness in large populations, the application of observables, cause and effect beliefs, as well as belief in behaviourism and positivism, make good candidates for testing the results of Q methodological work on larger populations. A survey was used in Article III to expand the issue area of research to another stakeholder population, i.e. passengers with disabilities. Also, the interviews in Article III introduced the stakeholders from technology development, airport management and disability organizations. This is to say that methodological puritanism is perhaps even

more absurd than theoretical from the point of view of creating useful and ethically important knowledge in societal research.

This methodological pluralism was applied in deriving the research questions for Article III from the results of Article II. It does not take the most common route of using Q methodological results further by 'testing' how generally certain views are held by a larger population by means of a questionnaire (see Baker et al. 2010; Mason et al. 2016), but instead explores a stakeholder section different from politicians – passengers with disabilities – and how they conceive of the issues themselves. Since the design of European automated border control systems has not included their requirements in the design of the systems and since the overall requirements were still unclear due to lack of research, this task was more important than asking the political elite what precisely they would require for people with disabilities. The task of exploring what exactly would be the most important needs vis-à-vis the new and perhaps harmonized ABC systems in the EU was a practically motivated one, also providing direct feedback to the FastPass project developing the technological solutions and to the European Commission intending to harmonize these.

Assessing the scientific quality of work in the case of Articles I to IV by comparing them to earlier research ends up being rather difficult in that they were all quite exploratory and thus there is no directly similar work against which to compare them. However, they succeed in their practice-oriented objective of creating novel empirical insights into societal questions. They stay loyal to the practice-oriented agenda of knowledge creation in serving practical purposes, recognising the contextuality and evolution of truths in the plural and in also taking into account of material realities instead of arguing only abstractly, as ethically important as that is. These commitments are notable in the way the analyses in Articles I–III aim at developing societally and politically fair technological border control practices that recognize e.g. vulnerable or disadvantaged user groups of these socio-material, policy enforcing apparatuses. Article IV enacts these commitments by establishing a new (meta)theoretical and methodological pairing, which can be fruitful as a basis for future empirical work on societal questions. Combining quantum social ontology and Q methodology paves the way for analyses accounting for the material and mental properties of practices as well as creative agency in IR.

On the other hand, there are of course also some limitations to the scientific quality of the articles. While Article I represents the political parties in Finland equally and has a variety of relevant as well as informed participants whose subjective opinions are of interest and operant in policy formation and decision-making, Finland as the only case in that research is far less than ideal when the ultimate

objective is to research European border control. Obviously, this research was only the first phase and served to develop the research setting, but in an ideal case the comparative aspect between Member States could have been included in the first iteration as well. A limitation of Article II was mainly the underrepresentation of participants from the Conservative and Unionist Party in the UK. This party's politicians were simply unwilling to participate despite repeated efforts to engage them, which is regrettable, since the party has been governing the country consecutively since 2010. However, this shortcoming was compensated for by including conservative think tank personnel from the UK as participants. All in all, the case Member States and participants within them were selected with clear criteria justified in detail in Article II and represent cases with the different profiles of border control challenges EU Member States face as well as covering the range of political standpoints. The number of participants was ideal from the viewpoint of the methodology.

As for other limitations, we found coherent views with Q methodology in both Articles I and II, but as is common in Q methodological research, some parts of the data were fragmented and/or idiosyncratic, so not all of the data is included in the viewpoints. However, this is virtually the case in all Q methodological work since the possibilities to make different kinds of Q sorts for nuanced views are in practice endless. Again, due to the nature of Q methodology and the scope of our research, it is not known how widely the views we found are shared by political stakeholders on the national level in each case Member State and/or in other EU Member States. A further potential reliability issue in the case of Article II is the possibility of participants giving their personal passwords to someone else and having them perform the online Q sort instead. However, there was no evidence to suggest any kind of doubtful practices.

In the case of Article III, the survey and the interviews are also not representative of a large population. The fourteen interviews with expert stakeholders provide important insights into an issue which has been neglected in policymaking, legislation and product development. The knowledge gained through these does not cover the issues in depth, as is also the case for the questionnaire that received 139 responses. Nevertheless, this emancipatory, exploratory and practical work sheds light on an important issue. Compared to previous surveys of people with disabilities on the European level, the number of responses was satisfactory, since most earlier scholarship has used existing large survey data sets of not only this segment of the population or interviews with less than fifty participants (see, e.g. Freeman and Selmi 2010). Obtaining this number of survey responses was quite laborious in itself, yet a

potential way to improve the response rate would have been to provide the survey in languages other than English.

Article IV relies methodologically on a literature review focusing mainly on Wendt's (2015) book and Stephenson's aforementioned articles from the 1980s, which debate the interface of social scientific accounts of philosophy of science with quantum concepts and the quantum 'roots' of Q methodology. Many limitations become apparent and they are mostly due to my own (and perhaps Wendt's) potentially contestable social scientists' readings of the quantum mechanical concepts. The literature in this odd niche is quite scarce: in addition to Wendt and Stephenson's work, the bulk of the material for Article IV consists of reviews and discussions prompted by Wendt's book and to an extent the past applications of Q methodology. This makes it difficult to judge e.g. whether Wendt or I have simplified concepts for the sake of argumentation and whether this risky endeavour will pay off in the future by widening the scope research on agency in IR. The article is risky in the sense that it does not conform to IR's better-known ontologies and methodologies and in a manner shakes up IR by combining a new idea and an underused methodology for the study of subjectivity in IR, which may prove less than popular. Within IR, there are many who regard humans as operating under general rules of e.g. rational utility maximizing logic and/or deem it impossible or not important to study human subjective agency. The risks accumulate since the quantum ontology literature is difficult and time consuming to analyse. Nonetheless, IR has experienced 'a quantum turn' of sorts of its own (see, e.g., Barad 2007; Der Derian 2013) and my effort to take this philosophical conversation to the level of potential empirical applications in the future will hopefully advance that conversation, whether or not the debate in itself will prove salient in the long run.

Perhaps one of the main weaknesses and simultaneously strengths of this dissertation is the aim of generating knowledge with a societal impact. Since the practice orientation leads to regarding the main aim of scientific knowledge to be useful in practice, we may then ask how the results of Articles I to IV actually translate into practices, since communication between academia and practitioners as well as politicians is tenuous. There are many banal explanations as to why the communication is tenuous, such as different ways of using language and the differences in the urgency of finding solutions to problems. Academics use abstract language and develop theories and/or scientifically rigorous analyses, which are slow to produce, while practitioners must deal with imminent decisions to be made with less knowledge to inform their choices and often use less complex language. This is to say that I believe it is a strength of the work presented here to *try* to produce

practically relevant knowledge on automated border control and subjective agency but when one tries to do that in the context of academic research, the results of the analyses will probably arrive somewhat late and in a somewhat inaccessible form for the practitioners to make use of them.

Haukkala (2013, 230) discusses these themes, especially the timing of scientific research and its relation to political decision-making, and states that the 'real difference' is often not made by a scholar but rather that the scholar needs to 'turn into a civil servant, bureaucrat or perhaps even a politician' to make a difference, yet even then there are no guaranteed results. Furthermore, there are considerable dangers of 'losing intellectual integrity' if scholars come very close to powerful decision-makers, so this communication between the policymakers and scholars is quite complex to organize without the risk of bias (Haukkala 2013, 231).

IR scholars should be more interested in disseminating the results of analyses in an understandable format, but there are significant obstacles to such work. For instance, a doctoral dissertation and contributions to scientific journals hardly constitute such formats. However, these are the required formats for distinguishing oneself as a part of the academic community. The problem of not having the funding, interest and/or time to disseminate academic research results in more approachable formats and in a timely manner is indeed a wider societal question that relates to the funding and structuring of academic work. If the funders do not require such work on societal engagement to be done, it is unlikely to appear. The situation is much like the design of automated border control for people with disabilities – it needs some impetus from the funding institutions, which, fortunately, is something certain funding institutions have begun to understand.

However, as this dissertation has argued for the practical salience of the results, a brief discussion of who will potentially benefit from its results and how is in order. First, the results of Articles I and II will potentially benefit everyone who travels to or from the EU, if the ABC systems are designed in such a way as to be respectful of people's privacy and rights. These articles potentially help the European Commission (through FastPass) to gain insight into what is and is not politically acceptable in the harmonization process, which will not happen if the Member State politicians decide against it.

Second, the findings of Article III will potentially benefit people with disabilities who wish to travel independently using ABC in the EU. From the usability of technology perspective all users of ABC will potentially benefit if universal design is adopted at an early stage because these systems will be easier for everyone to use and because no-one is exempt from potential disability. Societies, and especially people

with disabilities, will benefit if universal, participatory design processes become a mainstreamed practice in other fields of technological infrastructure design as well. The benefits of participatory design are clear for other groups with special needs, e.g. elderly people, the share of whom is increasing in the European population. The technology developed with a participatory approach is not only ethically more sustainable but will likely be more easily accepted by many kinds of users and thus more efficient. Ignoring user groups or assuming able-bodiedness is quite decidedly myopic: should fundamental rights questions arise later and create the need for adjustments, the costs will accumulate.

Third, the findings of Article IV will potentially benefit the field of IR (and other social scientific fields) in the sense that the article opens up prospects for an underresearched topic: the study of the (political) subjectivity of individuals without previous restrictive understandings of individual agency in IR. Using the quantum ontology/analogy/heuristic with Q methodology can be the start of a new strain of IR empirical research and contribute to the 'quantum turn' in IR and especially security studies (see Der Derian 2013), but with a rigorous methodology rather than staying on the theoretical or intellectual level. Article IV contributes to the advancement of the philosophy of science debate in IR, moreover joining it to the empirical level. This in turn can later contribute to more societally impactful work.

A further point related to IR creating societally important knowledge needs to be made here: even though I present work that aims to be practically relevant for societies, the articles of this dissertation potentially fall into the trap of not imagining alternative ways of arranging our societies. In essence, this means that while we seek answers on how to improve the current or envisioned systems of border control, we do not question e.g. the territorial divide into sovereign states or how that affects the welfare of people overall. For instance, Vaughan-Williams (2009, 8) discusses these 'alternative border imaginaries'. Our research thus presupposes e.g. that the current political organization of border control by sovereign states with the added complexities the EU and its efforts bring will not change any time soon. For instance, Owen (2002, 669, emphasis added) addresses this by saying that 'IR is oriented to addressing the problem posed by refugees in terms of how this problem is governed and how *existing ways of governing it may be improved*'. The fact that we as scholars do not question e.g. the existing ways of governing the mobilities of populations as such has an impact through our assumptions and language use in scientific research. In security studies researchers have been 'concerned about how their research reinforces the definition of issues as security issues (securitization processes), and thus produces the possibility that these issues will be tackled by extraordinary

measures (such as the use of the military instrument)' (Bueger and Gadinger 2007, 94). Challenging our reproduction of world orders would a fruitful area for further work.

5.2 Recommendations for further research

Further research on the topic of Articles I and II could in a methodological sense assess how widely the political views on automated border control are held in larger populations of decision-makers. This would require larger-N methodologies capable of demographic generalizations, such as questionnaires. Another possibility would be to use, for instance, the narratives of the factors or viewpoints in Article II as a basis for interview research on more cases on the EU level and assess whether the viewpoints they convey are indeed supported by politicians and stakeholders with similar backgrounds and party affiliations. Perhaps there would be also an opportunity to conduct comprehensive discourse analyses of national preferences in the context of EU border control and its automation in the near future as the amount of readily available material accumulates.

If further Q methodological research on the topic is indeed done, it would be important to reassess which of the statements we used in our work in 2013–2014 continue to be pertinent and include some of the more recent developments and opinions on ABC in the statement sample. When it comes to the types of views found in Article II, there was potential for a centre-right view – but this did not manifest in the results as centre-right party supporters were underrepresented as significant loaders on the views identified. This could be further researched in potential future Q methodological research on the topic. The most important topic for further research, based on Articles I and II, is how the debate on ABC and border control in the EU has evolved since our experiments, how it will continue to unfold and whether there is potential for more political consensus between EU Member States than we discovered in Article II.

The findings of Article III could be taken further by exploring how to ensure that people with different kinds of (dis)abilities can be included in the design processes for publicly funded technological apparatuses for border control (and for other purposes). It would be important to comprehensively evaluate the specific requirements of various groups of disabled passengers for border control apparatuses, although this would probably not be the task of an IR researcher. A related undertaking would be to explore how to negotiate and decide upon these

sometimes-conflicting user requirements imposed by different groups with disabilities on the emerging technological infrastructure used to enforce policies. Furthermore, it would be important to research *how* the requirement of accessibility should be integrated into the national and EU level tenders for (ABC) technology in practice – what kind of influence, lobbying or decisions would it require? On a more general level, an important area of future research would be how to replace ethically unsustainable technology design practices with participatory, universal design in order to ensure a better society for the greatest possible number of people.

Related to the findings of Article IV, future research should consist of empirical applications of the quantum ontology, analogy or heuristic in IR. The ethics of quantum entanglement and the possibilities to utilize the quantum ontology as a motivator for ethically informed IR research provide considerable inspiration for further research (see Fierke 2017). In my view, taking political subjectivity as something full of potential for creativity as opposed to a pessimistic view due to the limitations posed by societal structures, for example, would be inspiring for future research. This would imply studying human subjectivity in IR not as restricted by rational choice, by a fixed human nature, by the belief in determinism or by the position of power or powerlessness.

In more general terms, the tendency to govern the mobility of masses with increasing amounts personal data in an increasing number of electronic registers merits more attention in future research. The presumption of innocence has been somewhat compromised when information registers are comprised of data on passengers who are not suspected of crimes. In particular, the logic and efficiency of crime *prevention* through information collecting and sharing as opposed to the potential erosion of civil liberties and privacy rights require more research. There has been evidence of police authorities repeatedly pushing for access to passport databases (e.g. Teittinen 2019) and it is indeed a source of concern what relaxing the conditions of use of existing databases or allowing authorities to merge the data of different systems would mean from the perspective of privacy protection and due process. This does not mean that fighting e.g. organized crime would not be important – of course it is – but rather the point here is to draw attention to the proportionality of the measures in so doing. The logic and rhetoric of technological systems relieving human capacity and human resources for more creative and difficult tasks also require more research, especially from the ethical standpoint: how extensively do we want to rely on automated decisions and the power of algorithms, and how much do we know about how the electronic systems are configured and by whom?

Registers holding personal data are inherently problematic, since the information they consist of is not anonymous but rather highly personal (e.g. fingerprints) and there is ample potential for misuse of that data. The temptations of the misuse of personal data require more research, considering, for instance, the technological totalitarianism that has been exhibited in China with the facial recognition and the social scoring of citizen behaviour (e.g. Pajari 2018). There are obvious drawbacks when it comes to truly absolute surveillance of citizens and their mobilities. One might ask how justified it would be to judge a person on the basis of a decades-old school grade or a criminal record from long ago. The holders of any kind of register may also become corrupt or in a slightly less sinister scenario just decide to widen the use of personal data to target certain groups of the population. The big question to tackle with future research would thus be whether a safe register is an illusion and whether governing (mobility) with personal data will ever be entirely sustainable from an ethical point of view.

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PUBLICATIONS

PUBLICATION I

Policy Requirements for Automated Border Control Systems: A Q Methodological Study of Finland in the Context of a Large European Research Project

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Policy Requirements for Automated Border Control Systems: A Q Methodological Study of Finland in the Context of a Large European Research Project

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Abstract: With growing passenger volumes and pressures for secure identity control at the European Union's borders, interest is growing in automating and harmonising border control processes. A large research project entitled FastPass and funded by the European Commission is developing solutions for this purpose. Ultimately, however, the funding decisions for the acquisition of automated border control devices and software are taken by national parliaments, making politicians key stakeholders in the process. We examine their subjective views on the socio-ethical, legal, political, and privacy requirements for these systems with the help of Q methodology. In this way we account for the concerns, risks, and opportunities they identify in these systems. This initial case study reports the policy preferences and requirements for automated border control as found in the views of political stakeholders in Finland. The findings indicate some apprehensions, for example, on privacy, but also hope of finding common ground. We discuss the implications of the findings for future, politically sustainable solutions in automated border control in the European Union, and the needs for further Q methodological analyses in this type of research context.

Keywords: automated border control, border security, European Union, harmonisation, privacy rights, Smart Borders

Introduction

This article reports a Q methodological study on how political stakeholders view automated border control (ABC) systems in one Member State of the European Union (EU), Finland. The study is part of the ongoing European Commission funded research project FastPass, which aims at the harmonisation of ABC systems within the EU. FastPass recognises the multitude of stakeholder views in this rapidly evolving field where technology developers, border guards, politicians, and security authorities, airport operators, civil rights NGOs as well as travellers have interests. The political stakeholders are of particular interest to us. They reflect the spectrum of opinion and lead policy development in this field characterised by issues such as the changing nature of border security, new flows of migration, methods of surveillance, and

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nationalist pressures in many EU Member States. Among them, especially crucial are the views of Members of Parliament (MPs) because they will ultimately decide on public funds for developing and commissioning ABC systems. Governments which in the future may initiate different border policies are also formed from their ranks.

This article examines the socio-ethical, legal, political, and privacy requirements Finnish MPs and political stakeholders advising them have for ABC systems. In addition we comment on the application of Q methodology in the context of the large, diverse and interdisciplinary FastPass consortium carrying out the project. As the study is the first in a series of Q methodological studies within the consortium, we will also discuss how to develop the research design further.

Literature Review

Although several countries on many continents are currently piloting or operating ABC systems, they are relatively new in the EU context. ABC systems rely on electronic gates processing passengers with the help of biometric identification technologies, checking the information against databases, utilising advanced technologies and software. They still require further scientific research and R&D to improve their usability. Regulation also needs enhancement for ABC systems to become more widely deployed, harmonised and eventually accepted by the various stakeholders.

The existing research reflects this dynamic state of the field. While one key area in the technological research ponders, for example, the benefits and drawbacks of different biometric applications (see e.g., Kwon & Moon, 2008), the first wave of studies in the social sciences in particular called for more attention to be paid to the political, social, ethical and legal implications of their deployment and use (see Petermann, Sauter, & Scherz, 2006; van der Ploeg, 2003). These concerns prompted several legal and ethical studies on the privacy implications of the personal data collected by means of biometrics (see e.g. Friedewald, Wright, & Gutwirth, 2010; Harel, 2009; Mordini & Rebera, 2012; Tomova, 2009; van der Ploeg, 2009), and the effects on the bodily integrity of the users of biometric systems (Pirelli, 2009; van der Ploeg, 2012).

The use of new technologies has also evoked wider debate on the social, political and security implications of ABC, the related technologies and solutions. For example, some studies scrutinise the possible risks of 'function creep', whereby the EU-wide biometric databases developed for and used in border control might be used for other than their original goals (Broeders, 2007). Others examine the potential effects of technologically reinforced border control and protection on the rights of asylum seekers (Palm, 2013; Spijkerbroer, 2007). Some see modern states as being pervaded with technologies of risk management (Ceyhan, 2008), while others associate the technologies within the post-9/11 War on Terror (Lodge, 2004; Muller, 2011). The alleged entanglement of security and immigration policies has sparked criticism (Dijstelbloem, Meijer, & Besters, 2011; Epstein, 2007; Feldman, 2011; Muller, 2004). Some note how governments in multi-party systems face significant, sometimes populist, pressure to use the latest technologies to enhance border control over travellers and migrants (Broeders & Hampshire, 2013).

Nevertheless, today many critical studies acknowledge the strong support among airport operators, passenger carriers and immigration authorities for ABC systems owing to their efficiency (see e.g., Broeders & Hampshire, 2013). The more technologically oriented regulatory publications by influential actors such as the EU's border management agency Frontex (2012) also advocate these systems. Budgetary constraints in an increasingly financially strained EU speak in favour of automation of

border control as well. This contrast between advocacy and practical needs on the one hand and criticism on the other affords our research a useful point of departure to identify the requirements for politically acceptable ABC systems in the case of Finland. In other words, by means of Q methodology we can test empirically the extent to which this apparent contrast between criticism and advocacy is actually operant among the political stakeholders. At issue is the first application of Q methodology in this new field of policy.

We will next discuss the research design, and then the three different viewpoints as revealed in our factor analysis, alongside the located consensus, including the preliminary implications for the development, deployment and harmonisation of ABC systems in the case of Finland. Finally, we assess the further development of Q methodological work in the context of this large consortium and draw some conclusions.

Research Design

Q methodology is eminently suited to examine solutions and policies in their early stages of formulation such as ABC systems in Finland because of the methodology's communicative, operational and subject-centred properties. With this method, policy-relevant stakeholders participate in a communicative process where they prioritise certain policy preferences over others and can reflect thoroughly on their subjective views. Modelling policy preferences based on those views is of practical utility, as we attempt to comprehend the landscape of political debate and preferred policy solutions regarding ABC systems. The subjective views revealed are assumed to become operational in the ABC-related decision-making processes. The Q methodological analysis may also lead to identifying unpredicted grounds for compromise or consensus (see Ascher, 1987; Steelman & Maguire, 1999), which could prove useful in formulating accountable and stable policies on ABC and future border control regimes. Recent examples of applying the methodology for similar purposes focus on US foreign policy formation among elites (Aleprete & Rhoads, 2011) and the design and evaluation of stakeholder dialogue in policymaking (Cuppen, 2013).

In the context of the FastPass consortium which consists of 27 partners from several EU Member States and ranges from universities to technology and software developers, system integrators and consultancies, Q methodology is used to probe the political acceptability and feasibility of the solutions for the harmonisation of ABC systems which the consortium develops. In this way, the consortium gains knowledge of the possible constraints and requirements that the political processes in Member States may set for technology development and the related border policies. Q methodology offers the consortium a tool with which to monitor the degree and nature of political acceptability. As such, it complements the consortium's work on the ethical and legal requirements for ABC, and studies of the views of travellers, border guards and other stakeholders conducted by means of surveys, interviews and workshops.

Here we apply Q methodology to explore the views of political stakeholders on the development and deployment of ABC systems in the case of Finland. Finland's Helsinki-Vantaa airport is northern Europe's leading entry point for transit traffic between Europe and Asia. The country also has the longest EU border with Russia. Alongside these country-specific features, Finland is currently operating ABC systems, like many other EU Member States, and is an active participant in the EU's Schengen border convention (where internal border controls are lifted and cooperation increased on governing external borders). In this first Q methodological case study in the consortium,

we seek to assess the balance between political support and policy demand for ABC systems, and any possible obstacles, tensions and suspicions regarding ABC as found in the views of Finnish MPs and other political stakeholders advising them.

Preparation of the Q sample

We first consulted a variety of material to represent the debate on ABC, that is, the concourse in the form of 230 statements. We covered the technological approaches by accessing technical and operational guideline documents by, for example, Frontex and the International Civil Aviation Organization, as well as previous reports by FastPass and other related research projects; and the critical political scientific accounts by a selection of scientific articles and books (see Literature Review above). Policy preferences were also drawn, for example, from policy evaluations, agency publications, newspaper articles and press releases, as well as dissemination by political parties and advocacy groups.

Three main lines of debate or themes emerged from these sources. These were technological options (A), privacy, rights and legal issues (B), and institutional processes (C). Within each theme, we discerned three different types of statements: representative ones (a), normative ones (b), and policy recommendations (c). By cross-tabulating these themes and types of statements we formed a heuristic model of the concourse (see Table 1).

The final Q sample of 43 statements was selected with the help of the model. First, all compiled statements were placed in the cells of the model to map the volume of debate. Four or five statements from each cell (Aa, Ab, etc.) were selected for the final Q sample to arrive at a relevant, balanced sample (see Appendix 2). To fine-tune the sample we received expert comments from a Member of the European Parliament.

Table 1. The heuristic model of the concourse.

	Technological options (A)	**Privacy, rights and legal issues (B)**	**Institutional processes (C)**
Representative (a)	Aa	Ba	Ca
Normative (b)	Ab	Bb	Cb
Policy recommendation (c)	Ac	Bc	Cc

Participants

The political stakeholders whose views we wanted to examine regarding the Q sample were chosen on the basis of their involvement in the political decision-making processes on ABC. In Finland, committees consisting of MPs prepare decision proposals for the Parliament after having consulted experts, ministries and other stakeholders, such as civil society actors. Nineteen individuals involved in these processes took part in assessing and sorting the statements of the Q sample (see Appendix 1). Four of them were MPs, four advisors or assistants to MPs, and two policy experts. They were elected or hired representatives of six different political parties. Furthermore, nine experts working in ministries and offices accountable to them, in relevant NGOs and universities as professors took part, having expertise in public law, data protection, refugee and immigration questions among other fields.

Q sorting

The participants sorted the statements individually with the condition of instruction of relying on their current, subjective opinions – as in how strongly they agreed or disagreed with the statements – because we assumed their subjective opinions to be operant in their advisory and decision-making tasks. After pre-sorting the statements in three piles of *agree*, *neutral* and *disagree*, the participants conducted their Q sorting, placing each statement in one slot in the quasi-normal distribution grid ranging from -4 (least agree) to +4 (most agree). Following each Q sorting we interviewed the participants face-to-face, and asked them to comment on their motivations for placing statements in the extreme columns; furthermore we asked for feedback on the representativeness of the Q sample for the purposes of further research.

Data analysis

The Q sort data was analysed with PQ Method. We experimented with various factor solutions combining Centroid analysis or Principal Component Analysis (PCA) for factor extraction with Varimax and/or judgmental factor rotation methods for factor rotation. We aimed at a solution uncovering factors that would be analytically most distinguishable and empirically useful. In particular, we were interested in examining the possibilities for a solution which would include more than two factors, or in empirical terms, include more policy options than for example simple pro-ABC technology and ABC-critical factors. Of the various possibilities, we chose a PCA and Varimax solution, followed by judgmental factor rotations in order to improve the definition and reliability of the factors by seeking to maximise the number of participants defining each factor and increase their loadings if possible. In this way, we obtained three factors, explaining altogether 62% of the Q sort variations. Four or more participants loaded significantly on each factor (see Appendix 1). In the following section, we present the three factors and the two statements conveying consensus, referring throughout to the factors' Q sort values for individual statements, and discussing the correlations between factors in the context of the third factor. Appendix 2 lists the factor Q sort values for all statements and factors.

Results

Factor 1: ABC and collecting biometric data are the necessary, secure way forward

Factor 1 is the largest, explaining 25% of the variation among the Q sorts. Its seven significant loaders are four politicians across party lines and three ministry experts, including the Border Guard representative. This factor communicates a strong need for ABC systems and for biometric data to be collected to ensure security in border control.

Participants supporting Factor 1 appear to agree with the plans of the European Commission and the goals of the FastPass project. They point out that automation is needed to free border personnel, whom they believe to be under heavy pressure, to check risky passengers manually (statement 1, +4; statement 29, +3). They also want to harmonise the automated border control procedures throughout Europe, so that border crossing would flow as fast as possible (statement 8, +3). Altogether participants loading significantly on Factor 1 see much potential in the cost-effective development of ABC systems (statement 9, +4). They recommend that the EU go forward with ABC regardless of budget cuts and austerity measures (statement 4, -3), with several of them expecting savings from ABC especially in Finland, where employment costs are high.

Factor 1 reflects a firm belief in biometric data collection for security reasons. The gathering of citizens' fingerprints is not considered to be problematic (statement 32, -4;

statement 38, -3), as long as clear criteria prevail as to who shall have access to the data. The passengers should thus be explicitly informed about how their data is to be used and with whom it is to be shared (statement 43, +3). Stakeholders adhering to Factor 1 think that EU-wide databases must be created for the biometric identification data; they do not believe that verifying that a person's biometrics match the data on the passport at the border would be sufficiently safe in future systems (statement 33, -2). Somewhat radically, two individuals sharing this view, participants 2 and 11, state that today's society is already a surveillance society, which is fine by them, as they value security over privacy.

Factor 2: Privacy is crucial while technological advancement should not be an intrinsic value

Factor 2 explains 20% of the variation in the Q sorts and has four significant loaders: two human rights-oriented experts from NGOs, a professor of law and a political participant representing the Left Alliance. The second factor's main views accentuate the importance of privacy and civil liberties and convey scepticism towards ABC.

Adherents of Factor 2 acknowledge the privacy concerns relating to ABC as valid (statement 20, -4; statement 16, -3) and accordingly believe in the data minimization principle, which implies collecting the least possible amount of data (statement 42, +3). In this case it would mean strict regulation of biometrics in border control owing to the highly sensitive nature of biometric data. Contrary to the subscribers to Factor 1, those associated with this factor are wary of granting law enforcement officials access to the data used or obtained in border control (statement 38, +4). They also have apprehensions about the implications of ABC for international protection of asylum seekers and their rights, fearing that increased surveillance at airports could result in asylum seekers trying to enter the Schengen area through more dangerous irregular routes, such as by precarious boats across the Mediterranean Sea (statement 24, +3). Furthermore, legal expert 13 remarks that strict restrictions should apply on giving Third Countries information about attempts to cross a Schengen border for purposes of seeking asylum, as an automated system sending out information could compromise the asylum seekers' safety.

Factor 2 participants wish to evaluate carefully the needs and implications of ABC systems before ABC is implemented throughout Europe (statement 40, -3; statement 28, -4). ABC technology acquisition should be based on clear policies and needs (statement 3, +4), not on the EU striving to be a pioneer (statement 7, -2), or "the world champion of border control" for the mere sake of it, as expert 14 puts it. Factor 2 stakeholders also treat security differently than their counterparts on Factor 1. For instance, for participant 3, security does not necessarily improve by increasing surveillance or coercive action in general; it stems from trust. In sum, affirming the concerns of the critical social scientific literature discussed above, participants sharing the view of Factor 2 argue that ABC systems could become discriminatory and exclusionary apparatuses hiding behind an expert discourse of technological advancement if the criticism is not taken into account during their development (statement 27, +3; statement 19, -3).

Factor 3: The middle ground

While Factor 3 explains 17% of the variation in the Q sorts, its independent status is unclear. Participants supporting Factor 3 side with those adhering to Factor 2 in some privacy matters but the view Factor 3 conveys is closer to Factor 1's standpoint as a whole due to the ample potential it considers ABC to have. Factor 3 correlates with Factor 1 (0.40) and with Factor 2 (0.35), while Factors 1 and 2 do not correlate

positively (-0.06). Nevertheless, Factor 3 may have political relevance regarding future analyses. Five participants have significant loadings on Factor 3, which is also a reason to believe in its explanatory potential. The participants are a professor of law, two representatives from the Finnish Centre Party and one from the Social Democrats, and an expert from the Ministry of the Interior who is also involved in party politics.

Participants supporting Factor 3 set certain preconditions for the use of ABC systems. They emphasise that the general population should approve of ABC before making a decision to proceed with it (statement 39, +3), and thus express a need to promote public discussion on the subject. They feel the ABC technology needs to be further developed and perfected to avoid deploying it before it is completely trustworthy (statement 5, +4). However, the reservations leave room for optimism and ABC is observed to be "a great possibility" by politician 8, and "very useful as long as it is designed and regulated well" by politician 15. Overall, those associated with Factor 3 wish to proceed with ABC despite budget cuts (statement 4, -3) and see it as a probably profitable investment in the same way as Factor 1 participants.

Factor 3 further reflects a belief that biometric identification is valuable in border control, but should be subjected to privacy considerations (statement 18, -4). Hidden surveillance of passengers is vehemently opposed (statement 2, -4) and the data minimisation principle is supported (statement 42, +4). Agreeing with Factor 2, the participants associated with this factor think that biometric data is highly sensitive and hence not something that should be provided to law enforcement officials (statement 38, +3). However, the concerns for privacy rights are by far not as extensive as those described by participants on Factor 2; the individuals sharing the third factor's view make remarks that contrast the strict privacy measures the participants supporting the second factor call for. For instance, politician 8 says that people are nowadays often too concerned with safeguarding privacy. For politician 15, so much private data already exists in registers, that data collection in automated border control would hardly constitute a drastic increase.

Consensus statements across the factors: Regulation before action

Participants on all three factors strongly support two statements. Firstly, participants believe that biometric technologies and the storing of biometric data for border control should build on a clear definition of who shall be granted access to such data (statement 37, +4 on all factors). Secondly, they demand that binding regulation for the future EU-wide IT-systems for ABC needs to be created before they can be introduced (statement 35, +3 on each factor); a professor of law, participant 4 observes that this regulation will have to include *monitoring mechanisms*. In addition, during our interviews, participants on all factors also stressed that ABC systems should be developed duly mindful of their cost-effectiveness.

Discussion

This first Q methodological study within the FastPass consortium has pointed at several areas in which the FastPass consortium should pursue further research on the subjective views of stakeholders in order to be able to develop politically more sustainable ABC systems.

First, it will be useful to study in more detail the common ground expressed by the consensus statements and Factor 3, which mediates the pro-technologisation Factor 1 and the more cautious and sceptical Factor 2. This will help in finding legitimate, politically acceptable and feasible solutions that would be less susceptible to policy shifts resulting from changes of government or populist pressures. In other words, the

harmonisation of ABC systems and related border policies should build on issues on which we can expect potentially opposing groups to agree. Overall, we need to enquire more profoundly into the above-mentioned political concerns regarding ABC systems to foresee their policy implications in both the short and long term.

Second, the FastPass consortium is on the right track in recognising the limitations of the technological options theme supported by Factor 1 participants in this study, and consequently exploring stakeholder views broadly. Our Q methodological work corroborates how the concerns expressed by Factor 2 participants – regarding privacy, increasing surveillance, and the lack of trust in fellow human beings that it symbolises for many, as well as new risks to asylum seekers and the possible infringement of their rights – need to be addressed seriously and convincingly. Here the industry, consultancies and policy developers at EU and national levels hold great responsibilities. The harmonisation process of ABC systems in the EU may also encounter some of the apprehensions conveyed by those associated with Factor 2. In response to these worries, EU-linked actors, in particular, should avoid excessive reliance on technocracy, or seek to critically assess the role of functional expert knowledge in decision-making which instinctively plays a major part in the EU over and above ABC matters (see e.g., Eriksen, 2011).

Third, further Q methodological work should try to foresee how the rise of populist, anti-immigration parties throughout the EU may affect the future prospects and functions of ABC systems. Indeed, border and immigration control policies are becoming more politicised (see Broeders & Hampshire, 2013). We need to know more about the political pressures regarding ABC systems in Member States and how they could affect the work of projects like FastPass, the EU Joint Research Centre, and ultimately the Commission's border policies including the currently discussed 'Smart Borders' package through which ABC systems are likely eventually to be viewed on the wider political level (see European Commission, 2013a; 2013b; 2013c).

What complicates the assessment of the findings most is, perhaps, the not yet well-established nature of the research topic. For instance, one MP declined to participate in the research because the working committee of which (s)he is a member was processing the European Commission's Smart Borders initiative at the time of conducting this first round of Q methodological inquiry, in anticipation that his/her standpoint could still change upon the committee receiving further expert opinions. Indeed, many MPs may not yet have well-formed political views on ABC systems. The uncertain status of Factor 3 could also be a result of political indecision, given that all but one of the participants loading significantly on this factor are involved in party politics.

At the same time, the process of sorting the statements of the Q sample helped many participants to develop their views on the topic as they started to ponder how to develop ABC into an ethically sustainable process. For example, in relation to statement 13, expert 17 and politician 5 raised the issue of whether electronic gates would be less prejudiced than the border guards are. Another notion concerning the ABC users' hesitations was voiced by expert 16, who argued that familiarity with technology cuts back on scepticism and fears about it; people are comfortable using smartphones with little data protection but may dislike being fingerprinted for a biometric passport. This would suggest a need for more information to be provided to the general public and voluntary pilot testing of any new electronic gates – something that the FastPass consortium plans to work on – so that people would become acquainted with the

technology and not see it as something imposed by their government or the EU; a view supported by Factor 3 participants in this study.

As the FastPass consortium seeks to promote the harmonisation of ABC systems, the Q methodological enquiries need to be expanded into more cases to ascertain the political preferences and restrictions concerning ABC in different EU Member States. Member States face different border control challenges in the South (with migration pressures), East and North (land borders with Russia, Belarus and Ukraine, accompanied by diverse local trade and traffic patterns), and West (the UK not being a member of the common Schengen border regime). Populist pressures also vary from case to case, as do the ethical and privacy reservations regarding adopting ABC on a larger scale.

Within large, diverse consortia such as FastPass the use of Q methodology also encounters the challenges of interdisciplinary communication. In the case we report, the political constraints that were located and the positive features of ABC systems that were identified need to be converted into the technical requirements the consortium generates for technology, system and software developers. Methodological triangulation poses its own challenges as in this consortium, the views of border guards, travellers and NGOs are assessed by means of interviews and surveys, while only those of political stakeholders in some Member States are established by means of Q methodology. The comparison of the Q methodological material with other material can hence only be qualitative and indirect. At the same time, in the best possible case the use of Q methodology can serve as the political conscience of the consortium by producing information on what ultimately is politically feasible and what is not, helping other consortium members to avoid potentially risky and costly choices in the proposed harmonisation and related R&D.

Conclusion

The main findings of this first Q methodological study in the FastPass consortium concern how a focus on subjectivity can help to elucidate the political acceptability of ABC systems in the case of Finland, as witnessed in the three distinct viewpoints expressed by the factors. Factor 1 is the most security and technology oriented, and most pro-ABC, while Factor 2 is the most critical towards ABC and emphasises the importance of preserving privacy. Factor 3 conveys a moderate stance on proceeding with ABC, but see it as a viable option. The participants on all three factors agree on asking for data protection in the sense of wanting legal instruments to regulate the EU-wide IT-systems for border control, and demanding a clear definition of who would be granted access to the information in them.

While we found a limited amount of common ground among Finnish political stakeholders, the concomitant existence of different factors makes it clear that the stakeholder dialogue that FastPass has initiated needs to continue in the form of further Q methodological case studies and related research on other EU Member States. To succeed in its objectives, the consortium needs to develop a harmonisation solution to ABC that would take sufficient account of the different viewpoints expressed by the factors. EU-level solutions such as the one pursued by FastPass are usually compromises sought over a long period. Q methodology can help to clarify the prospects of such a compromise.

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Appendix 1: Participant Sample and Factor Loadings

	Organisation or Sector	***Political Party Affiliation***	***F1***	***F2***	***F3***
1	Office of the Data Protection Ombudsman	-	0.07	0.51	0.66
2	Finnish Border Guard	-	(0.82)	0.04	0.19
3	Parliament of Finland	Left Alliance	-0.26	(0.84)	0.24
4	University	-	-0.08	(0.84)	0.24
5	Parliament of Finland	Social Democratic Party	(0.79)	0.14	0.28
6	Parliament of Finland	Centre Party	0.09	0.01	(0.76)

	Organisation or Sector	***Political Party Affiliation***	***F1***	***F2***	***F3***
7	Parliament of Finland	Finns Party	0.30	-0.23	0.17
8	Parliament of Finland	Centre Party	0.38	-0.27	(0.56)
9	Ministry of the Interior	-	(0.82)	-0.12	0.18
10	Ministry of the Interior	-	(0.82)	-0.13	0.00
11	Parliament of Finland	National Coalition Party	(0.73)	-0.39	0.17
12	Ministry of the Interior	(involved in a party)	0.25	0.15	(0.68)
13	Non-governmental organisation	-	-0.08	(0.89)	0.19
14	Non-governmental organisation	-	0.13	(0.82)	0.18
15	Parliament of Finland	Social Democratic Party	0.16	0.33	(0.73)
16	Ministry of Transport and Communications	-	(0.74)	0.05	0.34
17	University	-	0.10	0.23	(0.66)
18	Parliament of Finland	Left Alliance	(0.70)	0.37	-0.19
19	Parliament of Finland	National Coalition Party	0.07	-0.01	-0.01
		Explained Variance	25 %	20 %	17 %

Key: Parentheses indicate a significant loading on the factor. The significance level was set to 0.39, using Brown's formula (1986, p. 64). Participant 1 loads significantly on Factors 2 and 3 and has not been regarded as a defining sort in order to keep the factors as distinctive as possible.

Appendix 2: Q Sample and Factor Scores

		Factor		
No.	***Statement***	***1***	***2***	***3***
1	Automating border check procedures allows a better use of personnel by allocating more resources to check risky travellers.	+4	0	+2
2	It would be best if the passengers wouldn't know where, when and which controls are occurring so that potential attackers wouldn't be able to outwit them.	–1	–2	-4
3	Border control technology should only be acquired after a careful assessment of needs and according to a clear policy.	+2	+4	+2
4	The EU shouldn't go forward with ABC because it's too expensive, especially against the background of pervasive budget cuts and austerity measures.	-3	0	-3
5	The technology of the ABC should be perfected and made more trustworthy before taking it into use.	0	+2	+4
6	Member States carrying a bigger financial burden than others in implementing the common standards on external border controls should be compensated by the EU.	+2	-1	-3
7	The EU should be a pioneer in moving towards more modern and more efficient border management by using state-of-the-art technology.	+2	-2	+2

		Factor		
No.	***Statement***	***1***	***2***	***3***
8	The ABC process should work as similarly as possible throughout Europe to cause less confusion to the travellers and thus to speed up crossing.	+3	+1	+3
9	The costs of the ABC gates should be lower and the processing times faster than performing the same functions with manpower.	+4	-1	0
10	ABC is needed, because more and more countries are becoming visa-exempted, which will add to the masses of travellers wanting to cross the EU's borders.	+2	-3	+1
11	The plan to align the information systems of numerous EU agencies with national and international surveillance, immigration and border control systems is not technically viable.	-2	0	-1
12	Facilitating the entry to the EU by using new technologies will boost the European economy.	+1	-1	0
13	The ABC does not discriminate, because the decision to allow entrance is automatic if the data matches.	+1	-2	+1
14	Developing applications suitable for land and maritime crossings should be a priority in the ABC-process.	0	-2	-1
15	No computer systems can currently detect nervousness and suspicion as well as experienced border officers.	0	-1	-2
16	The relation between security and privacy is a zero-sum game where an increase in security automatically means a reduction in privacy.	-1	-3	0
17	A key challenge in ABC is for the Member States to agree on which biometric identifier (e.g. facial, iris, fingerprints) they all wish to use, so that the systems would be inter-operable.	-1	-2	+2
18	The safe storage of one's biometrics is no more concerning than providing one's billing information to businesses.	-1	-4	-4
19	The goal of ABC is simply to make travelling easier and more comfortable.	+1	-3	0
20	The security and other benefits the current biometric deployments offer far outweigh the social concerns relating to personal privacy.	0	-4	0
21	Biometric identification produces symbolic violence in the forms of inequality, exclusion, and humiliation.	-4	+1	-4
22	Biometric identification paves the road to totalitarian regime.	-4	0	-3
23	Biometric systems are risky because it is difficult to build them so that they fit only their designated purpose.	-2	+2	+1
24	The use of highly effective technologies at parts of the border may trigger the increased use of other, more dangerous illegal entry points (maritime routes, deserts, etc.).	+1	+3	-3
25	Biometric identification will not hinder terrorists as they probably have legitimate biometric documents.	-1	+1	0
26	The accelerating spread of biometrics represents a convergence of business interests and the aims of political hardliners who view migration as a threat to the EU's homeland security.	-2	+1	-2

		Factor		
No.	***Statement***	***1***	***2***	***3***
27	Biometric technologies mask their often discriminatory, exclusionary character behind a technological, and scientific discourse.	-3	+3	-2
28	Opposing ABC often stems from the radical desire to oppose all kinds of governmental surveillance, including border control	0	-4	-2
29	The border control personnel is under heavy pressure and desperately needs the benefits of improved technology and modern resources.	+3	-1	-2
30	The long queues at border crossings represent a poor image of the European Union to visitors.	0	-1	-1
31	The digital divide between developed and developing countries will be reinforced by placing suspicion on travellers, whose passports lack the latest technological security requirements.	-1	+1	-1
32	Gathering fingerprints at border crossings essentially makes travellers suspects, which threatens the general, democratic presumption of innocence.	-4	+2	+1
33	It is always better for passenger privacy, if personal data is stored in a passport or other user-held document instead of a database.	-2	0	+1
34	It is shameful that the ones who profit the most from ABC are the big European defence contractors.	-3	0	-1
35	The EU must not produce any union-wide IT-systems without binding legal instruments.	+3	+3	+3
36	ABC systems should not lead to a situation where those who do not wish to use the automated gates are treated with suspect and subjected to more intrusive searching and inconvenient delays.	+2	0	+2
37	Before using biometric technologies and storing biometric data, there should be a clear definition of who will get access to the data.	+4	+4	+4
38	It is a dangerous trend to give law enforcement authorities access to data of individuals, who are not suspected of committing any crime.	-3	+4	+3
39	Before proceeding with ABC, there should be an informed acceptance among the general population.	-2	+1	+3
40	ABC should be taken into use as fast as possible throughout Europe.	+1	-3	0
41	It is unacceptable that ABC systems do not provide full access for all travellers with disabilities, such as wheelchair users.	0	+2	-1
42	The principle of data minimization (collecting the least amount of data possible) should be the cornerstone of any biometric policy.	+1	+3	+4
43	Clear statements should be provided to the travellers, as to exactly how biometric data is used, with whom it is shared and for what purpose.	+3	+2	+1

PUBLICATION II

Smart and Secure Borders through Automated Border Control Systems in the EU? The Views of Political Stakeholders in the Member States

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Smart and secure borders through automated border control systems in the EU? The views of political stakeholders in the Member States

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ABSTRACT

The European Commission launched the "Smart Borders" policy process in 2011 to enhance border security in the European Union (EU) using technologisation and harmonisation. This includes the use of automated border control (ABC) systems. The Member States crucially shape the process, weighing security technologies and costs, privacy and rights, and further institutional choices. We examine the views of political stakeholders in four Member States by conducting a systematic empirical and comparative study unprecedented in the existing, political-theory-inspired research. In our Q methodological experiments, political stakeholders in Finland, Romania, Spain and the UK rank-ordered a sample of statements on Smart Borders, ABC and harmonisation. The factor analysis of the results yielded three main views: the first criticising ABC as a security technology, the second welcoming the security gains of automation and the third opposing harmonised border control. While impeding harmonisation, the results offer a consensus facilitating common policy.

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Introduction

Border security has become a salient policy issue across Europe. The unexpected influx of "irregular" migrants into several European Union (EU) Member States from the neighbouring regions since 2015 adds to the security concerns related to unauthorised overstays, cross-border terrorism and crime. At the same time, border-crossings in and out of the EU are increasing and may reach 887 million by 2025 (European Commission 2016a, p. 2), while the border control resources cannot keep pace. These trends drive the technologisation and digitalisation of border security. In addition to GPS and satellite-assisted surveillance of "pre-frontier" areas, at the border technologisation includes the use of passport readers, biometrics for identity verification, automated processes and monitoring of flows of people through automated border control (ABC). This shift underpins the ongoing debate on new border control policies, border-crossing practices and more widely the

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role of the security industry in Europe (Vaughan-Williams 2015, pp. 21–28). As a result, border control has evolved from "narrow" protection of territory by the border guard to a complex high-technology process, leading to a wider concept of border security including large-scale data management in cyberspace (Heiskanen 2014, pp. 69–70).

Meanwhile, the policy debate on border control in Europe features the effects of differentiated integration, whereby EU-level harmonisation efforts coexist with different views among the Member States (see Leruth 2015). Twenty-two out of 28 EU Member States belong to the Schengen area. They follow the Schengen Borders Code, which has abolished internal border controls and introduced co-operation on external borders and visas. While the Schengen Members have granted the Frontex agency certain supranational powers to co-ordinate the technical standards of border control, these states continue to have national policies (Boulanin and Bellais 2014, pp. 235–236). At the beginning of 2016, several Schengen Members started to re-establish border controls in response to immigration-related threat perceptions. By eroding trust and common identity, these unilateral decisions may eventually dissolve the security community upon which the Schengen area stands (Alkopher and Blanc 2016).

Harmonisation, therefore, hinges on the decisions of Member States. A key process in this is the "Smart Borders" policy the European Commission introduced in 2011. It seeks to better secure the Union's external borders and streamline border-crossing by relying increasingly on automated information sharing and self-service. This includes the legislative proposal of April 2016 on a common entry/exit system (EES) for third-country nationals and corresponding amendments to the Schengen Borders Code, and concomitant suggestions for further technologisation (European Commission 2016a, 2016b). The November 2016 proposal for a European Travel Information and Authorisation System (ETIAS) externalises border control towards "policing at a distance" (Skleparis 2016, p. 107), by subjecting visa-free passengers to digitalised advance checks for security and irregular migration. Further proposals include a Passenger Name Record Directive, enhanced security features in travel documents, more systematic checks on EU external borders and enhancement of the Schengen Information System (European Commission 2016c). At issue is a contentious mixture of policy issues involving security, costs, mobility, fundamental rights and privacy (e.g. Bigo et al. 2012).

Here we address the complex nexus of ABC technologies; the privacy, rights and legal issues involved; and further institutional choices as subjectively perceived by Member States' political stakeholders. This is a novel line of enquiry in three major respects. First, it responds to Hills' (2006, p. 67) call a decade ago for more empirical evidence: "Border security is an empirical manifestation of a state's adaptation into its political environment", while "functional security" is "neglected by the academy", and thus research on the empirical dimensions of border security is needed to "rebalance the debate". Second, while many studies concentrate on EU-level policies, we consider the Member States, as yet little addressed in the literature. They share the competence with the Union in border control, participate in the Smart Borders policy process, and develop and implement policies at the national level. Member States also produce competing political imperatives on actual EU-level policies. For example, a recent single-case study highlights how national-level securitisation of border-crossing risks illiberal practices at the EU borders (Skleparis 2016).

Third, while critical border studies often evince a political theory-informed critique of policies (see next section), we empower some of the actors "in the field", examining

and comparing the subjective views of political stakeholders vis-à-vis ABC in four EU Member States: Finland, Romania, Spain and the UK. We focus mostly on Members of Parliament, because national parliaments debate the EU initiatives, report back to the EU institutions and make the respective national budget allocations. Our effort is broadly informed by the "practice turn" in critical security and border studies in concentrating on a group of actors steering the development and deployment of security technologies. This helps us to focus on the meaning of policies "as understood by the actors in these fields", and to study these security practices through their "shared understandings and disagreements" which "make up border security" (Côté-Boucher et al. 2014, pp. 197–198).

To gain an empirical insight into the shared views and contentions of Member States' political stakeholders, we apply Q methodology, thereby enabling participants to *question* the security technologies from their own subjective standpoints. Importantly this affords an empirically grounded idea of the political concerns and incentives regarding the technologisation and harmonisation of border security to complement political theory-informed critique. We understand the security technologies scrutinised as results of interaction among actors with different views. Because the technologies function on behalf of the user governments, the Member States' stakeholders can assign normative and political considerations to them that in turn deserve systematic empirical research (see Amicelle et al. 2015, p. 297, Valkenburg and van der Ploeg 2015, pp. 327–329). Hence our contribution is driven less by theory and more by methodology (see Côté-Boucher et al. 2014), prioritising the empirical evidence in the subjective views of political stakeholders.

We therefore ask the following: (1) What views do political stakeholders in Finland, Romania, Spain and the UK have on the development of ABC systems? (2) Can we identify any common ground among these views on which to build European border control policies? We first introduce our methodological choices and then outline our results featuring three different views on ABC and the common ground among them, along with policy recommendations based on the consensus and the wider implications for European border control policies.

Research design: the Q methodological approach to views of political stakeholders

Case study countries

Our case study countries Finland, Romania, Spain and the UK display a wide variation of border challenges and policies in terms of membership of the Schengen agreement, institutionalisation of ABC and positions on the Smart Borders process. While a four-country comparison is not representative of all EU Member States, it illustrates the potential range of views.

Regarding border challenges, all our cases have significant external entry points to the EU (Frontex 2013). Finland and Romania have much traversed land borders. There is occasional congestion on the Finnish–Russian border, likewise on the border between Romania and Moldavia, and also on that with Ukraine. In the UK and Spain, the major external entry points to the EU are the airports, namely London Heathrow, London Gatwick, Manchester and Madrid Barajas. The Spanish autonomous communities of Ceuta and Melilla in North Africa are also major gateways to the EU. The southern

borders of the EU, alongside the borders with the Middle East, manifest a complex intersection of border security issues ranging from immigration and terrorism to fundamental rights (Del Sarto and Steindler 2015).

Regarding policy, these countries were not chosen to model the number of incoming asylum seekers, which rose dramatically in 2015 (Frontex 2015), but rather the variation in the development of border control policies including ABC. The UK has a Schengen opt-out, and will not participate in the Smart Borders policies. In June 2016, it also voted to exit the EU. The country is nevertheless interesting, being perhaps the most institutionalised case of European ABC use, with automated systems at most airports and plans to acquire electronic gates for seaports and railway stations. Finland, a Schengen member, considers Smart Borders to enable more extensive ABC use, which could expedite the Fenno-Russian border traffic, which since 2014 has suffered from the sanctions imposed by the EU and Russia. Finland utilises ABC systems at the main traffic hubs at air borders, and some land and sea borders. Spain and Romania have endorsed the Smart Borders EES, which would help them to detect possible overstays. Spain, a Schengen member, has recently expanded ABC to cover the most important airports, along with one land border and one seaport. Romania is only pursuing Schengen membership and plans to pilot ABC systems at the land border with Serbia and at Bucharest Airport.

Modelling the ABC debate

We modelled the ABC debate on the all-European level by first exhaustively reviewing the existing literature and policy documents. We then formatted the emerging views into 230 short statements. To discern the crucial technological approaches in the ABC debate, we drew on guideline documents (e.g. those produced by Frontex and the International Civil Aviation Organisation) and academic articles mostly discussing biometric authentication (e.g. Kwon and Moon 2008, Jain and Kumar 2012). We extracted EU-level policy preferences from publications by the European Commission, the European Data Protection Supervisor and the Biometric European Stakeholders Network, among others. To comprehend the public political debate, we used Smart Borders evaluations (e.g. Bigo et al. 2012, Hayes and Vermeulen 2012) and consulted national and EU newspaper articles along with press releases by various European Parliament groups and independent advocacy groups.

For the wider expert debate on border policy, we reviewed the existing research, which often draws upon political theory and is quite critical of ABC and related technologies. For example, some authors were alarmed by modern states' proactive use of risk management technologies (Ceyhan 2008, Skleparis 2016). These observers associate such technologies with securitisation, that is, processes in which issues are brought under the security logic of emergency measures, delimiting public debate and involvement (Lodge 2004, Muller 2011). Scholars criticise the securitisation of migration, especially in the post-9/11 context (Alkopher and Blanc 2016), and the ensuing entanglement of security and immigration policies (Muller 2004, Dijstelbloem et al. 2011), potentially undermining, for example, asylum seekers' rights (Palm 2013). The research also identifies threats to users' privacy due to biometric identification and European databases (Broeders 2007, Harel 2009, van der Ploeg 2009, Friedewald et al. 2010, Mordini and Rebera 2012).

We divided this debate into three themes. The first, "technological options" (A), includes statements on ABC technology, including its costs. The second theme,

Table 1. The heuristic model of the policy debate.

	Technological possibilities (A)	Privacy, rights and legal issues (B)	Institutional processes (C)
Representative (a)	Aa	Ba	Ca
Normative (b)	Ab	Bb	Cb
Policy recommendation (c)	Ac	Bc	Cc

"privacy, rights and legal issues" (B), includes statements on protecting privacy, human rights and the lawful use of ABC. The third theme, "institutional processes" (C), concerns the wider institutional choices involved and some political economy issues. Each of the themes contained three types of statements: representative (as in declarative, describing the *status quo*) (a), explicitly normative (b) and a policy recommendation (c). We cross-tabulated the debate themes and statement types to create a heuristic model of the policy debate (Table 1). The purpose of the model is practical: to help locate as diverse statements as possible and select from these a balanced, relevant sample (see Brown 1986). We placed the 230 statements into the cells of the model (Aa, Ab, etc.) and then selected an equal number of statements from each cell. To establish which statements were of the greatest practical relevance, we tested a sample of 43 statements empirically with 19 Finnish political stakeholders, who rank-ordered the statements and commented on them in interviews (Lehtonen and Aalto 2015). We then fine-tuned the statements and reduced their number to 34 in order to "lighten the cognitive burden" of the participants (see Dryzek et al. 1989, p. 484). The complete Q sample is listed in the Appendix, with indications as to which cell of the model each statement belongs.

Participants

The importance of the views of political stakeholders on ABC stems from the increasing salience of border security. While the EU level features policy co-ordination efforts, decisions to commission and introduce ABC systems are taken by national governments and their agencies. National parliaments discuss both EU-level and national policies and allocate the funds; decisions regarding ABC and Smart Borders are most often deliberated in committees on justice and home affairs. We selected the participants, primarily Members of Parliament, according to their committee memberships, political affiliations and backgrounds. The aim was to include well-informed participants able to react to our statements and representing the most important political parties in the case countries. We included 44 participants, which suits the small-N Q methodology well: it is essential to include representatives of all pertinent categories of perspectives, instead of a quantitatively representative sample of individuals (Dryzek et al. 1989). Typically Q studies feature 20–40 carefully selected participants. Our study covered the political spectrum and current trends such as the rise of the right-wing and populist, immigration and EU-critical parties in the UK and Finland[1] (Auel and Raunio 2014, Leruth 2015).

Twenty of the 44 participants were members of national parliaments (MPs), one senator and three Members of the European Parliament (MEPs). Twelve were senior officials of their respective political parties and involved in committee work on issues relevant to the study. The remaining eight were non-partisan, high-level experts in border control, data protection, technology policy and public as well as immigration law contributing

to the debate. In the case of the UK, we included three experts working for think tanks considered to be Conservative and Unionist Party-inclined, although officially non-partisan, because the Conservative MPs and political staff declined to participate.

Altogether 18 political parties were represented through their elected and employed agents, covering the major parties in each case country. Regarding nationality, there were 16 participants from Finland, 10 from the UK, 8 from Romania and 7 from Spain. As control cases vis-à-vis the conservative, Eurosceptic parties and correspondingly the European Parliament group the Greens/the European Free Alliance to monitor standpoints against data collection and Smart Borders, we further included one Dutch, one Danish and one Latvian participant (Table 2).

The Q sorting experiments

All participating political stakeholders conducted individual, online Q sorting experiments, where they ranked the final 34 statements of the Q sample. The experiments took place between February and November 2014, when the Member States debated the Commission's 2011 Smart Borders proposal, as an input into the Commission's second Smart Borders package in 2016 and before the vote in the UK on leaving the Union. With this timeline, the results of the experiments also address some of the problems and delays in the Smart Borders process.

The participants accessed the password-protected Q sorting platform and received instructions through the FlashQ programme, which then saved the experiment data on a server. The participants sorted the statements visualised as cards according to their agreement or disagreement, relying on their current, subjective views, which would presumably be implemented in their advisory and/or decision-making roles. They made a primary sort into three categories, "agree", "neutral" and "disagree", then a detailed sort, placing each statement in an empty slot on the forced "normal distribution" grid ranging from −4 through 0 to 4. In this way, we modelled the prioritisations they would normally choose in the relevant policy issues. We verified the validity of the data by requesting participants to explain in writing why they had placed statements in the extreme columns. This ensured that the participants understood the statements similarly and sorted them according to their opinions, which guarantees the inter-comparability and reliability of the Q sorts.

Analysis of the data

We analysed the Q sort data with the PQ Method programme to identify the most distinguishable and interpretable factors or views on ABC. Having experimented with various combinations of factor extraction and rotation methods, we chose a three-factor solution produced with principal component analysis and judgemental rotation. The factors account altogether for a satisfactory 50% of the variation among the Q sorts. The remaining Q sort data were too fragmented, with views which were too idiosyncratic to yield factors amenable to reliable interpretation.

Two indicators are decisive in Q methodological data: the loading of a participant on each factor and the factor Q scores. The participants' loadings indicate the extent to which they agree with a factor: a loading of 1.00 would signify total agreement and

Table 2. Participants and their factor loadings, significant loadings flagged with an X.

Participant			Loading on factors			
Natl.	Position	Party/organisation	Party definition	F1	F2	F3
1 UK	Political staff	Liberal Democrats	R	0.58X	0.21	0.24
2 ES	MP	Socialist Workers' Party	L	0.65X	0.35	0.26
3 ES	MP	United Left	L	0.50X	0.06	0.28
4 ES	MP	People's Party	R	0.29	0.63X	0.37
5 UK	Political staff	Labour	L	0.79X	−0.12	0.22
6 RO	MP	Dem. All. of Hungarians	Min.	0.31	0.46X	0.26
7 ES	MP	People's Party	R	0.11	0.69X	0.14
8 UK	MP	Labour	L	−0.06	0.20	−0.22
9 UK	Expert	National Audit Office	–	0.19	0.51X	0.15
10 RO	Political staff	Social Democratic Party	L	0.12	0.69X	0.32
11 ES	MP	People's Party	R	0.26	0.59X	0.19
12 ES	MP	Socialist Workers' Party	L	0.67X	0.34	−0.02
13 FI	Expert	University	–	0.29	0.74X	0.19
14 FI	Expert	Non-Governmental Org.	–	0.62X	−0.09	0.21
15 FI	Expert	Government Agency	–	0.68X	0.23	0.10
16 FI	Political staff	Social Democratic Party	L	0.66X	0.42	−0.02
17 FI	MP	Left Alliance	L	0.77X	−0.23	−0.15
18 FI	Expert	University	–	0.88X	−0.15	−0.01
19 FI	Political staff	Centre Party	C	0.21	0.58	0.51
20 FI	MP	Centre Party	C	0.08	0.61X	−0.14
21 FI	MP	Social Democratic Party	L	0.76X	−0.08	0.05
22 FI	Political staff	National Coalition Party	R	−0.04	0.48X	0.33
23 FI	MP	Left Alliance	L	0.64X	0.32	0.01
24 FI	MP	National Coalition Party	R	−0.24	0.10	0.40
25 FI	Political staff	The Finns Party	RR/Anti-EU	0.08	0.05	0.44X
26 FI	MP	The Greens	Env./C	0.77X	−0.12	0.01
27 RO	MP	Social Democratic Party	L	−0.04	0.76X	0.17
28 RO	MEP	National Liberal Party	R	0.31	0.45X	0.26
29 RO	MP	Social Democratic Party	L	0.23	0.68X	0.16
30 FI	MP	The Finns Party	RR/Anti-EU	0.12	0.16	0.79X
31 RO	MP	Social Democratic Party	L	0.59X	0.03	0.21
32 UK	MEP	UK Independence Party	RR/Anti-EU	0.11	0.65X	0.25
33 NL	Political staff	Reformed Political Party	R	0.22	0.39	0.45X
34 FI	MP	The Finns Party	RR/Anti-EU	−0.44	0.53	−0.09
35 UK	MEP	UK Independence Party	RR/Anti-EU	0.00	−0.38	0.60X
36 RO	Political staff	New Republic Party	R	−0.27	0.57	0.56
37 RO	Senator	National Liberal Party	R	0.43	0.49X	0.16
38 UK	Expert	Think tank	(R)	0.55X	−0.08	0.41
39 LV	Political staff	Greens/EFA	Env.	0.88X	−0.19	−0.06
40 ES	Political staff	Socialist Workers' Party	L	0.70X	−0.03	0.00
41 UK	MP	Liberal Democrats	R	0.50X	0.14	0.40
42 UK	Expert	Think tank	(R)	0.25	0.40	0.15
43 DK	Political staff	Greens/EFA	Env.	0.76X	0.00	0.08
44 UK	Expert	Think tank	(R)	0.44	0.27	0.65
Explains the variance among Q sorts at				24%	17%	9%

Notes: Party definitions: centre (C), environmental (Env.), Eurosceptic (Anti-EU), left (L), minority rights (Min.), radical right (RR), right (R). Sources of the definitions: Brack and Startin (2015), Halikiopoulou and Vasilopoulou (2014), Hloušek and Kopeček (2010), Rovny (2014), Stan (2013). The abbreviated nationalities: British, UK; Danish, DK; Dutch, NL; Finnish, FI; Latvian, LV; Romanian, RO; Spanish, ES.

−1.00 absolute disagreement. The minimum value of a statistically significant loading at the $p < .01$ level was set at 0.44 using Brown's (1986, p. 64) formula. Participants' factor loadings are listed in Table 2, with the significant ones marked X. To keep the views the factors expressed as distinct as possible, participants loading significantly on multiple factors (participants 19, 34, 36 and 44) were excluded from the definition of the factors, along with participants 8, 24 and 42 loading less than 0.44 on all factors.

The factor Q scores represent the "ideal values" of an imaginary respondent totally agreeing with the factor, calculated from the defining, significantly loading Q sorts. They range here from −4 to 4, the equivalent spectrum along which the participants sorted the statements. The Q scores indicate (dis)similarities between factors and help to create a narrative of the content of each factor, a "factor view" shared by the defining participants. Extremely high and low scores, along with the difference or similarity of scores between factors, merit attention (see Appendix). In addition to the Q scores, we used participants' written comments in the narrative creation.

Results: three views on ABC

The results of our Q methodological analysis revealed three distinctive factor views, illustrated in terms of the factor scores and participants' comments (P1–P44, see Table 2).

First view: privacy rights must be safeguarded

The first view explains 24% of the variation among Q sorts, gaining the support of 19 participants. View 1 was subscribed to by all the case nationalities and defined by social democrat, left-wing, environmental and liberal politicians and party staff, likewise by law and data protection-oriented experts.

Participants sharing View 1 deemed the decisions regarding ABC political in nature, as they have implications for fundamental rights. This view was opposed to letting experts and scientists steer the automation of border control. It called for the harmonisation of EU legislation and clear, unified policies on ABC based on the notion of the Union having one external border. EU refugee policy was criticised (P12), with a call to incorporate the just treatment of asylum seekers into the design of the forthcoming ABC systems and databases; this referred to the risk profiling used in ABC, which, according to View 1, might lead to discrimination.

The goal of ABC for the first view is "to increase the knowledge that states have about people travelling" (P5), that is, the "intellectual expansion of the central state" (P1), not merely to facilitate travel. The view asserts that ensuring security is compatible with the individual's right to privacy (P1, P37 and P39). It calls for the personal right not to disclose intimate, biometric data even to the authorities. Participants strongly opposed Statement 1, claiming that honest people should have no reason to object to their biometrics being collected and used in border control (P2, P12 and P31). The statement reminded Spanish Participant 2 of the dictatorial and authoritarian argumentation of the Franco administration, while Romanian Participant 31 was wary of biometric data becoming "a tool for the Government against its citizens". Fingerprinting third-country nationals at border-crossings for Smart Borders also appeared alarming to those subscribing to View 1; it compromises the presumption of innocence. Supporters of this view stressed that there was more than enough proof of data misuse from the past. Participant 41 made a case for everyone having the right to "disappear and reboot":

> Even the most secure and compartmentalised data *will* be shared eventually, because of natural curiosity or greed or paranoia […] it should therefore as a matter of principle be as skeletal as is compatible with achieving the published primary aims of its collection.

Strict data usage limitations should apply, allowing data collected by border control to be used for that purpose only; the first view is very wary of "surveillance creeps", that is, the wider use of a technology or a system beyond its original scope potentially encroaching on privacy.[2] Law enforcement authorities in the EU should accordingly not have access to border control databases, not even to combat terrorism. This goes against the April 2016 Smart Borders proposal, which would allow the access even in the case of third-country nationals (European Commission 2016a, p. 11). The "different" legal systems of EU Member States would not guarantee the exclusive legitimate use of the data (P31), as "corruption, low or no accountability for wrongdoing and discrimination prevail among the authorities of many Member States" (P14). For View 1, this gives reason to be critical of an EU-wide biometric data system. Further, ABC and Smart Borders represent a danger of increased, unjustified surveillance of EU citizens. The participants considered it very tempting for Member States to use the border control data for other purposes (P26, P39 and P41). A loophole in the supervisory arrangements of only one state or border agency in the EU could have dire consequences (P41). View 1 moreover involved proportionality: "since we don't fingerprint everyone for fighting crime, the principle of proportionality should also be applied to border controls" (P39). Accordingly, hidden controls to catch potential aggressors were rejected. Participant 41 pointed out the volatility of the concept of terrorism:

> European ideas on what terrorism is have changed: the Hitler bomb plot and the French resistance being heroic, and the tube suicide bombers being cowardly. Some EU countries give sanctuary to those that other states seek to extradite for terrorism. Fashions in these things change, but the data remains on record.

Second view: ABC will enhance security and advance European integration

The second most explanatory view, at 17% and with 13 participants loading significantly on it, was supported mainly by right-wing and centre-right political parties in all our case countries, although the Romanian participants supported the view more widely.

For the second view, border security was paramount and could be enhanced by automating border control. The EU should thus strive to be at the forefront in acquiring the most modern, efficient and safest technological solutions in border control. The security attributes of ABC systems were believed to override other considerations, such as the speeding up of border-crossing, as the EU was seen to "attract illegal cross border threats and other sources of instability from outside the Union" (P10). This is why View 2 demands a risk-based approach in border control, referring to "directing border guards at those deemed the riskiest […] not spending time checking the passports of very low-risk passengers" (P9). Automated risk profiling was considered an advantage of ABC, especially given the "sheer volumes of people travelling, and projections of greater numbers in the future" (P9).

The second view accepted the use of travellers' biometrics far more extensively than the first view. Advocating EU-wide identification databases in ABC and deeming the verification of passengers' identity insufficient, View 2 was also in favour of using these databases in solving serious crimes and combatting terrorism by sharing their information with law enforcement authorities. The use of biometrics in ABC and Smart Borders was encouraged: this view included no notion of potentially unjustified surveillance of EU citizens or

surveillance creeps. Nevertheless, it calls for a "detailed study on which data should be used and for what purposes" (P11), along with demanding transparency by condemning hidden control of travellers even if it might help to catch potential aggressors. View 2 moreover postulates that while the increased use of biometrics is undertaken in the interests of public safety, immigrants do not constitute an internal security threat to the EU: "immigrants are not criminals and the system does not try to forbid immigration" (P4).

Those subscribing to View 2 support the harmonisation of ABC processes and gates in the EU not only for cost efficiency and security, but also due to their usefulness in the European integration process. They articulated a need to harmonise processes in the EU whenever possible "in order to build a real European Union" (P11), which "needs more federative elements" (P13). The second view welcomed EU legislation on border control as a "logical evolution of further integration in policies, including those referring to common security […] the EU must assume responsibility for further integrated external border control if free movement of EU citizens is to be maintained" (P7). View 2 furthermore deemed ABC a worthwhile investment despite the current difficult European economic situation. The technology might initially be costly, but would offer a safety-enhancing, cost-effective alternative to hiring more border guards to process growing traveller volumes, as Participant 7 explained:

> New investments related to new technologies are always at first considered an unnecessary expense […] it is exactly the opposite. In the long run automated border control technology will allow states not to employ so many personnel at their borders, and be able to specialise in fighting against specific crimes along borders.

One participant furthermore perceived ABC as an opportunity to combat corruption: "It has been demonstrated many times that the border police is corrupt and an automated border would eliminate this risk" (P27).

Third view: Eurosceptics against immigration

Four participants shared View 3, explaining 9% of the variation among Q sorts. They represented the British, Dutch and Finnish far right, Eurosceptic parties, which belonged to the Europe of Freedom and Democracy Group in the European Parliament until its 2014 reform. The third view argues for stricter border control by reason of deeming "constant concerns about increasing immigration" legitimate due to the "social and economic consequences for European society" (P33). Immigration is framed as a soft security threat: "The people of the UK think illegal immigration is the biggest problem in our country, next to open borders, the numbers of people entering the UK and the rising crime directly attributable to non-UK nationals" (P35).

It seems inherent in View 3 that "EU citizens have different rights compared to third-country nationals" (P30), and thus fingerprinting the latter for Smart Borders, for example, is justified for security reasons. Risk profiling in ABC and any consequent potential to discriminate against certain nationalities or ethnicities were not a concern for those subscribing to View 3, nor was the inability of developing countries to produce biometric passports, which might raise suspicion regarding their citizens in the context of ABC. Opposing the surveillance of EU citizens in general, View 3 remarkably, and contrary to the two other views, advocates covert surveillance of passengers at borders to catch potential aggressors. Those who are not "bad guys" should have nothing to fear from

monitoring (P25). In contrast, View 3 also urged transparency on the part of the states in providing travellers with explicit statements on the use of their biometrics (P25).

The current data protection systems in many EU Member States invoked scepticism in View 3 participants; they are not reliable enough for ABC. Biometric identification data are considered inherently unsafe (P35) and the participants mistrust the governments' ability to keep them safe. This view stressed the political and legal implications of ABC and Smart Borders; it wanted to avoid labelling them as technological development. Rather, View 3 wanted to bring privacy questions centre-stage in the ABC debate. "Big Brother is watching", commented Participant 35, continuing: "Where data can be kept, compiled and lost, citizens' right to privacy will be invaded and not properly safeguarded. […] We are free because we are born free, we do not need EU surveillance."

The third view on the whole articulated a reluctance to proceed with ABC. It recognised not only the need to "investigate and use technical solutions where possible", but also the "constant anxiety of many citizens regarding the expanding possibilities of governments to control their lives"; technical systems can be used in the service of humankind, but "as long as human nature doesn't improve, the risks grow with the possibilities" (P33). The supporters of the view considered acquiring ABC technology a worse investment than recruiting more border guards. Harmonising ABC processes and gates was not supported because "top-down approaches do not work very often […] the EU is welcomed to offer a best practice approach" (P30). Instead, each Member State should act at its own sovereign discretion on border control practices. If the EU decided to proceed nonetheless with harmonised ABC, the third view insisted on the Union compensating Member States forced to invest more than others to comply with the standards. Finally, View 3 did favour ABC at land and maritime borders, given the benefits likely to accrue in processing asylum claims at EU's southern borders: "Failing registration of refugees by Southern Member States mainly concerns land and maritime crossings. This puts EU-wide solidarity under high pressure. It would be very helpful that the EU takes its responsibility in developing applications" (P33).

Agreement across the three views

The views converged on five issues represented in the statements in our Q sample. This consensus may serve as a prospective starting point for a politically sustainable automation of border control in the EU, given that participants from different Member States and representing the extreme ends of the political spectrum share it. First, all three views endorsed data minimisation, that is, limiting the collection of personal information to "what is directly relevant and necessary to accomplish a specific purpose" and retaining it "only for as long as it is necessary to fulfil that purpose" (European Data Protection Supervisor 2015). Harvesting, using and storing personal data "presents both a security risk and an erosion of civil liberties" (P1). Our participants stressed assuring travellers, citizens, that their data would only be used for purposes of border control (P3, P9, P29, P31 and P44): people do not automatically consent to the state using their data for other purposes (P38), while "further use of those data would violate civil rights" (P21). Extensive data use was opposed as "collecting more data than is needed will only cloud the picture" (P9); also, "there is little if any proof that more biometrics reduces false negative and positive identification" (P43). Therefore, our three views rejected the use of

multiple biometrics (such as fingerprints, facial images and iris scans) in ABC, even though the security industry is currently developing such solutions. Furthermore, a potential surveillance creep in biometric data use worried the participants; Participant 41 articulated these apprehensions:

> Data leakage and recycling is a constant temptation for any data holder, especially a multifunction body such as a state or the EU. Systems should be designed to minimise the opportunities for temptations to arise. There is no sign that any state has as yet sufficiently built into its constitution, institutions or culture resistance to such "mission creep". There is, however, plenty of evidence that parts of them would actively welcome such a data hoard to mine, and might quite readily connive with third party states to pass data on.

Broeders (2007, p. 87) shares this concern, in particular with an eye to the "unprecedented scale" of data in the European border control databases, which may tempt authorities to extend their use beyond the original purposes.

Second, participants subscribing to all views called for transparent data use: they wanted to inform travellers clearly on how, by whom and why their data would be used. This would guarantee the travellers the means to take action if their data were misused (P31), which would help in achieving citizen support and legitimacy for the ABC systems (P38 and P44). Third, on grounds of legal transparency, the participants supporting the three views called for binding legal instruments and monitoring mechanisms to be set up before creating new EU-wide information technology systems for border control. On this point, Del Sarto and Steindler (2015, pp. 369–370) direct attention to how the EU's increasing competences in security management generate legal and procedural uncertainties and "lack of transparency in terms of competences and accountability".

Fourth, the views require democratic legitimacy from ABC systems, at least at the parliamentary level in each EU Member State, and preferably in civil society. Participants subscribing to View 1 in particular drew attention to parliaments having to approve changes affecting fundamental rights (P3 and P12). "The data should never be used for additional purposes without a democratic political decision" (P43): parliamentary decisions would thus render citizens less vulnerable to potential surveillance creeps associated with ABC. Participants subscribing to View 2 also demanded political decisions and large-scale debate within the civil society on ABC matters (P29), "to find a social agreement or at least a wide understanding among the European population" (P4). Participants sharing View 3 stress the power of decision of each nation state. They reached the same conclusion that ABC requires parliamentary approval.

The final issue agreed upon concerns the accessibility of ABC for disabled people, which is considered a fundamental rights issue: "people with whichever disability have exactly the same rights as the rest of the citizens" (P3). Creating accessible ABC systems was deemed crucial (P2, P11, P25 and P29). "If such a sophisticated system can be created, finding solutions for people with disabilities should be a part of the plan and the goals. The solutions must be found at any cost", commented Participant 2.

Conclusions

The technologisation of security is alongside digitalisation pivotal for the evolving border control policies of the European Commission. Our results reiterate such a policy demand

for ABC in the form of the (centre) right-wing View 2, welcoming ABC as an enhancement in border security as well as a catalyst of European integration. This view conveys a "political and institutional counter-move" to the setbacks witnessed in the Schengen borders policy since 2015–2016 (see Alkopher and Blanc 2016, p. 23) and to the slow progress of the Commission's Smart Borders initiative since its inception in 2011. View 2 agrees with the main thrust of the Commission's border control policies. Supporters of this view would most likely welcome the EES and ETIAS proposals of the Commission (see above). As such, this view builds on the "deep-seated security dynamics" of the Schengen security community and could ultimately help to sustain this community (Alkopher and Blanc 2016, p. 23).

However, our empirical results imply two major challenges for the technology-intensive integration of border control envisaged by the Commission. The critical border studies literature can help to discern these challenges. First, this literature warns against taking technology as an "absolute security provider" (Ceyhan 2008, p. 102). One reason for caution is that emerging technologies may cause uncertainty in society, which "results in a growing gap between citizens, technology and politics", especially with regard to the balance between individual privacy and the "notion of common good" (Friedewald et al. 2010, p. 63). Our results show that some political stakeholders worry about this potentially precarious balance given an opportunity to express their subjective views. View 1 challenged ABC as a security technology, emphasising the political aspects involved in technology development (see, e.g. Amicelle et al. 2015, Valkenburg and van der Ploeg 2015). View 1 moreover reiterated the calls for exercising strict control over access to passengers' biometric data (see, e.g. Harel 2009) and any use of border control data contrary to the rights of asylum seekers (e.g. Muller 2004) or anyone in the name of terrorism prevention (e.g. Lodge 2004).

Second, we found the Eurosceptic and populist far right View 3 critical of harmonisation of European ABC policies, preferring to develop border control on a national basis and appealing to immigration-related threat perceptions. Here some strands in critical border studies help to analyse the potential consequences of such views, warning how any divergence on the part of the Schengen security community from the path of regional integration and solidarity could send Europe back to the traditional power politics of national interests, self-reliance and mistrust (Alkopher and Blanc 2016). Such a return is possible since right-wing Eurosceptic populism has become mainstreamed (Brack and Startin 2015), especially in our cases of the UK (Auel and Raunio 2014) and Finland (Leruth 2015). In this situation, voices such as our third view portray the "people" being justifiably concerned about increasing immigration and surveillance. Indeed, referring to the will of the people is the core strategy of populism (Mény and Surel 2002). It is essential to note our third view trusted neither governments, ABC technologies nor all travellers. Simultaneously it lacked internal coherence. This is typical of populism, characterised by opportunism, which is "more flexible than the value-laden dominant ideologies" (Mény and Surel 2002, p. 18). Hence the third view called for transparency in data use, but encouraged the covert surveillance of passengers.

Although our results confirm the divisions among political stakeholders in the contemporary EU, they simultaneously highlight a potentially significant policy convergence on privacy protection and inclusion. We suggest that the so far tedious European ABC and the Smart Borders policy process could be revitalised and gain wider acceptance among stakeholders and Member States if it were it to build on this convergence. The

convergence emerged in the form of the consensus statements to which our participants reacted consistently and strongly across the views.

First, the political stakeholders we approached agreed on the principle of data minimisation when compiling biometric information from passengers, and on restricting the use of data for other purposes. This urges caution regarding the Commission's April 2016 proposals on using multiple biometrics including both fingerprint and facial image recognition, and for establishing a common biometric matching service open to various authorities including law enforcement (see European Commission 2016b, pp. 8–9, 15). Second, our participants required passengers to be informed transparently and efficiently of the use made of their personal data. This suggests a need to design the passengers' user interface accordingly.

Third, our participants stressed how European-wide ABC requires a legal basis produced through transparent political processes and democratic accountability, also involving discussions and decisions in national parliaments. This conveys a strong message to keep security technology under democratic and public political control to ensure its acceptability to the users. Currently Member States differ significantly on how they nationally debate and respond to the Commission's border control proposals. Euroscepticism may further complicate such political processes across Europe. This support for democratic processes is important: since the conclusion of our experiments in late 2014, many Member States have experienced new waves of immigration and witnessed rampant populism among some political parties questioning the human rights of new border-crossers and the extension of the democratic responsibilities of society towards them.

Fourth, the insistence of our stakeholders for accessibility for disabled passengers as a fundamental right leads us to recommend following universal design principles. Overall, this suggested consensus presupposes that political stakeholders are informed on the development of harmonisation solutions to help them formulate their positions for forthcoming political debates. We expect significant numbers of undecided political stakeholders; informing them would most likely improve the prospects of EU-wide harmonisation.

Regarding wider implications, although our results primarily concern ABC systems and only to some extent the debate on Smart Borders, the degree of dissent we found reminds us of the concerns that emerged in late 2015 regarding the future of the Schengen agreement, when some Member States temporarily re-established border controls to curb uncontrolled immigration. In other words, while Member States disagree on how much EU-level policies can help to solve the "immigration crisis", they also continue to disagree on how much European integration can address the policy dilemmas concerning border security. This may mean that the debates on EU-level border control policies will prove long-lasting.

A further aspect of EU's technologising border control is the ambiguity of the division of labour between institutions and Member States. The EU's "asymmetrical integration" has gradually "shifted responsibility for border management to the European level", thus creating a "mix of policy regimes that combine different institutional configurations" which have both intergovernmental and supranational features (Del Sarto and Steindler 2015, p. 371). Whereas the Commission proposes further technologisation of border control, the European Parliament acts a guardian of the free movement of people and the Schengen principles. The Member States possess the practical expertise in border control, while

the Parliament has influenced the formulation of the Schengen Borders Code, for example, regarding fundamental rights, transparency, non-discrimination and the training of border guards (Huber 2015). Simultaneously, doubts persist on the extent to which the Schengen *acquis* actually affects the practices of border policing at the peripheries of the EU (Hills 2006, p. 85).

Alongside the suggested consensus and wider implications, we must stress the limitations of our research. They arise from the difficulty of reporting coherent further views because our data contained idiosyncratic views not amenable to factor interpretation. This partly fragmented nature of the data may imply that opinions on ABC are still evolving, or the participants were torn between the interests of several groups. Moreover, while trusting that the factors identified and interpreted reflect more general patterns, with our methodology, we cannot establish how widely they are supported in individual Member States or across the EU as a whole. That is the task of survey studies, other large-N studies or comprehensive discourse analyses of national debates. There is also potential for a fourth view, which could well include centre-right or conservative participants: eight of the participants were not included in the definition of any of the views and all but one of them represented such parties. To enquire into this in more detail, future studies should consider how the debate on ABC and border control more widely evolves in the Member States and on the EU level. While we expect the views identified in this study also to emerge in further studies involving other Members States, such studies should also further analyse the potential for border security consensus on the European level, which is only tentatively probed here.

Notes

1. Spain has experienced some left-wing Euroscepticism amidst its economic hardships, while support for the Romanian Eurosceptic Greater Romania Party is marginal (Halikiopoulou and Vasilopoulou 2014, Brack and Startin 2015).
2. We use the wider term "surveillance creep" to account for the expressions "mission creep" and "function creep" when referring to systems, technologies or actors expanding the use of (biometrical) data beyond the original purpose of their collection, potentially eroding privacy rights (see Broeders 2007, Vukov and Sheller 2013).

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Appendix. Statement sample with Q sort values for each factor/view. The position of each statement in the model appears in parentheses. Statements associated with a factor in the analysis appear in bold face. Consensus statements appear in both bold face and italics.

	Statement	F1	F2	F3
1.	Honest people who have nothing to hide have no reason to refuse their biometric data (such as fingerprints) being collected and used in border control (Aa)	**−4**	1	1
2.	It would be best if the passengers did not know where, when and which controls are happening at borders, so that potential attackers would be caught (Ab)	**−2**	**−2**	**3**
3.	Clear statements must be provided to the travellers, on exactly how their biometric data are used, with whom they are shared and for what purpose (Bb)	***3***	***2***	***3***
4.	The EU should not go forward with ABC because it is too expensive, considering the big budget cuts (Cc)	−1	**−3**	0
5.	European border guards desperately need automated technology to be able to manage the increasing passenger flows and to concentrate on checking risky travellers (Aa)	−2	1	−1
6.	Member States that have to invest more than others in implementing the common standards on automated, external border controls should be compensated by the EU (Cc)	0	−1	**2**
7.	The EU should be a pioneer in getting the most modern, most efficient and safest technological solutions in border management (Ac)	0	**2**	1
8.	The ABC processes and gates have to be as similar as possible throughout Europe to make the systems easy and fast to use, and thus cost-efficient (Aa)	1	**2**	**−2**
9.	The problems of corruption and discrimination by border guards can be avoided by automatising border controls (Ab)	−1	**1**	0
10.	People bound to wheelchairs must accept that they will not be able to use ABC gates (Ab)	***−4***	***−4***	***−2***
11.	European companies should be heavily prioritised when ordering gates and software for ABC in the EU (Ac)	−1	0	0
12.	Decisions regarding technical issues, such as biometrics in border control, should be left in the hands of experts and scientists (Ab)	**−3**	−1	−1
13.	In ABC, the decisions to allow entrance are made by profiling groups of people as risky, which may lead to discrimination on grounds of nationality, ethnic origin, skin colour, etc. (Ba)	**3**	0	**−2**
14.	Developing applications also suitable for land and maritime crossings should be a priority in the process of automatising border controls (Ac)	−1	1	**2**
15.	Claiming that citizens have to give up privacy rights for the governments to be able to keep them safe is entirely false and creates an atmosphere where people no longer know their rights (Ba)	1	0	0
16.	In many EU Member States, the data protection systems are currently not reliable enough to be used in ABC (Ca)	1	0	**2**
17.	ABC and Smart Borders may lead to increased, unjustified surveillance of EU citizens, whose movements can easily be recorded and stored in the future (Bb)	**3**	**−3**	1

(*Continued*)

Appendix. Continued.

	Statement	F1	F2	F3
18.	It is enough to verify that the passenger's biometrics match the data in the passport at the border. No EU-wide identification databases are needed (Bb)	1	**−3**	−1
19.	The goal of ABC is simply to make travelling fast and easy (Cb)	**−2**	1	−1
20.	The least possible amount of biometric data can be collected for specified, explicit and legitimate purposes and must not be further used for other purposes (Bc)	***4***	***4***	***2***
21.	Before creating new EU-wide IT systems for border control, binding legal instruments and monitoring mechanisms to control the IT systems must be agreed on (Bc)	***2***	***3***	***3***
22.	When designing ABC systems and databases for the EU, their effects to the just treatment of people seeking international protection at the borders must be considered thoroughly (Bc)	**2**	2	0
23.	Before proceeding with ABC, the plans must have democratic legitimacy in each Member State at least on the Parliament level and preferably among civil society (Bc)	***4***	***3***	***4***
24.	The use of highly effective technologies at parts of the border may trigger the increased use of other, more dangerous illegal entry points (e.g. maritime routes) (Ba)	0	0	1
25.	Collecting biometric information and recording the entry and exit of all third-country nationals crossing the EU's external borders will increase the time most travellers spend at border controls, no matter how much new technologies are able to speed up the process (Ca)	0	−1	−1
26.	ABC and Smart Borders are presented mainly as technological developments, which hides their vast political and legal implications (Ca)	**2**	−1	**4**
27.	The increasing use of biometrics in border control is in the interests of political hardliners who view immigration as a threat to the EU's homeland security (Ca)	1	**−2**	**−3**
28.	Opposing ABC originates from the radical idea to oppose all kinds of governmental surveillance, including border control (Cb)	**−2**	−1	**−3**
29.	It is a contradictory EU policy to get rid of visas and at the same time tighten the border controls with technology (Cb)	0	−2	**−3**
30.	ABC technology will be expensive at first, but in the long run it is a better investment than hiring more border guards (Aa)	−1	**4**	**−2**
31.	Governments of developing countries cannot produce biometric passports, which will bring unjustified suspicion onto their citizens in ABC (Cb)	0	0	**−4**
32.	Gathering fingerprints from third-country nationals at border-crossings makes travellers suspects, which threatens the democratic presumption of innocence (Bb)	**2**	−2	**−4**
33.	EU laws should be avoided in border control because they represent EU federalisation (Cc)	**−3**	**−4**	0
34.	Law enforcement authorities in EU Member States must be able to access all existing and new biometric EU databases used in border control, in order to solve serious crimes and combat terrorism (Cc)	**−3**	**3**	**1**

PUBLICATION III

The Requirement of Accessibility: European Automated Border Control Systems for Persons with Disabilities

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The requirement of accessibility: European automated border control systems for persons with disabilities

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ABSTRACT

This exploratory study investigates whether automated border control systems should be provided for persons with disabilities at European airports. While the special assistance provided to disabled passengers has improved in the last decade, some may want to travel independently using automated gates. This is currently not possible, nor is there an explicit plan to include the accessibility requirement in future technology development. We reflect this questionable situation against the notion of the good society and consider airports as normatively laden socio-physical zones contributing to experiences of exclusion. Our research stresses the need to consider human abilities as a spectrum, which should be addressed with the use of universal design principles to benefit as many travelers as possible. Interviews and a survey of disabled passengers help us explore the views of stakeholders; to find out whether persons with disabilities wish to use automated systems instead of assistance services, and whether stakeholders consider accessible systems technologically possible, cost-effective, and recommendable.

1. Introduction

In this article we scrutinize the accessibility of automated border control (ABC) gates for persons with disabilities at European airports by interviewing and surveying various stakeholders. ABC gates are publically funded biometric-technological apparatuses[1] used for immigration control, which makes them innately normative shapers of "the good society". Full and effective participation and inclusion in society represent core rights of good societies and people with disabilities should enjoy these rights. International law explicitly guarantees freedom of movement and choice, independence of all people, as well as the elimination of discrimination.[2]

Aviation, like other transport modes, needs to recognize and accommodate disabled travelers. Airports in the European Union (EU) Member States, currently host hundreds of electronic border control gates, or "e-gates," but only a few are accessible for people with disabilities. These e-gates are automated self-service barriers, enabled by biometric passports and operated by border forces. They have been introduced to allow passengers faster and more convenient border crossing while ensuring maximum security. Passengers are identified and authenticated by biometric features such as facial scans or fingerprints. From a usability perspective, e-gates will need to accommodate a population with different characteristics, e.g. height, ages, and impairments [33].

Persons with a disability[3] constitute 15% of the global population and are often labeled the world's largest minority, whose number increases through population growth and the ageing process [41]. In Europe alone there are currently 80 million people with disabilities [17]. Nonetheless, in reality the whole population risks becoming chronically ill or disabled at some point in their lives. This gives reason to "demystify" disability's specialness and acknowledge its "near universality" (Zola [42]; 420).

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[1] Biometric technology refers to methods for the "measurement and recognition of physical and behavioural traits of humans for identification and authentication purposes" (Brey [5]; 7).

[2] See e.g. the *United Nations Convention on the Rights of Persons with Disabilities*, which includes the right of access to tourism (UN General Assembly [39]; articles 3, 18 and 30).

[3] We use the United Nations' definition of disability: a disabled person has a long-term "physical, mental, intellectual or sensory impairment, which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (UN General Assembly [39]; article 1). This refers to blind or partially sighted, hearing impaired or severely deaf, and wheelchair bound people, among others.

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Authors in Science and Technology Studies have recently come to argue that technology should be scrutinized as something inherently political and requiring public debate, certainly not neutral in its essence (e.g. Refs. [6,7,10]. This contrasts the western tradition of separating the societal and political from the technological-material. In this tradition, the good life pertains to the private sphere and the individual is made responsible for pursuing it on her own, while societal practices and consequences of technology use are viewed only as the aggregation of their individual effects [7,10]. We depart from this tradition and interpret the good life in a communitarian manner: to us it means the well-being of communities, which stems (in part) from egalitarian societal practices related to technologies. As Philip Brey [6] argues, technological devices are used in fixed social contexts, which generate social impacts that cannot be viewed as neutral. Rather, technologies "support only some conceptions of human flourishing," rendering them influential in relation to human aspirations toward the good life (Dotson [10]; 335).

The question of private versus public realm has also been central to another field relevant to our inquiry, namely disability studies. Up until the 1970s disability was seen as an individual's medical issue rather than a social or political one, and people with impairments were perceived incapable of participating in the everyday life of the community, instead requiring care [2]. Societal attitudes towards disability started to change with the emergence of the disabled people's movement in the 1960s, gradually leading to the adoption of the "social model of disability" in societal decision-making. This model has advocated viewing disability as socially produced: instead of perceiving the physical or mental impairments as disabling, it places responsibility on the individual's architectural, social, and economic environment [20,37]. We apply the social model of disability in this research[4] as a "heuristic device," an aid in understanding the "disabling tendencies of modern society" while aiming to create policies and practices that help extinguish those tendencies (Barnes [2]; 18). Following Galis [22]; 825–828), we think Science and Technology Studies should link "the disability experience with socio-material considerations" and consider the "practices between the impaired body, the built environment, and policy-making." We thus understand people's abilities as a spectrum that changes while they age and therefore "more universal policies" on disability are needed (Zola [42]; 401).

Regardless of anti-discrimination legislation and the influence the social model has had on policy development, buildings and technological systems often contribute to the experiences of disability (see Sherman and Sherman [38]; Easton [11]. Those experiences could be reduced or avoided by following universal design principles, whose aim is to make products and built environments easy for everybody to use, at little or no extra cost [8]. Universal design refers to creating products and environments that are usable to everyone to the "greatest extent possible, without the need for adaptation or specialized design," enabling people with disabilities to "function as natural members of society" (Aarhaug and Elvebakk [1]; 144). This without question applies also to the development of automated border control systems allowing *all* passengers to use e-gates when traveling by air. Nevertheless, universal access is often an afterthought in these sorts of publicly funded endeavors, even though "engagement with issues of accessibility throughout the entire design process" would "enable better access not just for disabled people, but for all" (Easton [11]; 107–108).

Disability for us is thus both a social and a bodily concept, which includes the *disabling* societal environments or practices and the biological impairments. In the case of automated border control, we consider that the technological devices and related practices shape our thinking about bodily normality and contribute to creating the normalized exclusion of disabled travelers. This potential of technology to shape our thinking has been highlighted by philosophers of technology [7]. While justice is considered perhaps the most important element of the good society, an "unjust scenario" would then be that "new technologies provide systematic support for some groups in society," excluding others, in particular if the excluded are already worse off (Brey [6]; 6).

Mobility and access to transportation have increasingly become important preconditions of full participation in the activities of society, and mobility restrictions cause social exclusion [1]. We consider airports to be normatively laden socio-physical spaces, where certain socio-political practices are enabled and sustained (see Howarth [23]. In these spaces, able-bodied values and practices "constitute vast tracts of space as no-go-areas" and "systematic patterns of exclusion" are literally built (Hughes and Paterson [24]; 325–328). The legitimacy of these practices stems from authoritative decisions, in the case of our research from political decisions on which kind of ABC systems European states commission, and whether they are accessible for everybody.

We draw from International Political Sociology in considering airport borders as 'zones of practices' rather than linear constructs (see Huysmans and Pontes Nogueira [25]. This implies focusing on disabled passengers' experiences of these practices in the event of border crossing. In addition to being inherently normative due to their capability to include or exclude travelers, the emerging technological practices at border zones *automatically* create socially demarcated spaces [30]. We want to contest the tendency of distancing moral responsibility from the governmental authorities by relying on the implicitly normalizing power of technology. European Union Member States in the context of ABC enable the biometric engineers who design and configure the systems to hold the normative power *behind the scenes*, thus allowing the assumptions of able-bodiedness by the biometrics industry to steer these systems (see Maddern and Stewart [30].

Although European states may not consciously intend to create discriminatory spaces, their ABC technologies (re)enact a powerful symbolism of who is considered "normal" and allowed to use these systems. As Valkenburg and van der Ploeg [40] argue, security systems focusing on human bodies always contain norms of bodily (ab)normality, which is especially problematic in the context of global civil aviation, considering the enormous ranges of bodily difference. They continue to explain that these systems place an unreasonable burden on people whose bodies do not comply with bodily norms, such as persons with disabilities. Deviations from the norm demarcate uncertainty and risk, placing those bodies in the context of a "biology of culpability" (Maddern and Stewart [30]; 239–240).

The aim of ABC is to facilitate the flow of "normal" bodies, while also identifying the "abnormal" and "risky" travelers. This risk management classification results in a situation, where the masses of able-bodied Europeans enjoy faster mobility, while the e-gates almost never accommodate the needs of people with disabilities, thus excluding them from these socio-political spaces and placing them in the same normative category as undesirable "persons of interest." These new biometric barriers to access are especially relevant due to the historical and contemporary role that constraint of movement has had in the oppression of people with disabilities

[4] However, we take the criticism of the social model seriously. The critics claim that the model unnecessarily separates the body from culture, concentrating on the latter [35]. This Cartesian divide focuses on the "barriers imposed by social structures and inadequate public policies", thus neglecting the "embodied nature of experience" (Blume, Galis, and Valderrama Pineda [4]; 102).

(see Maddern and Stewart [30]. Moreover, biometric border control labels the human body more obviously as a measurable object than a holder of rights [14]. This renewed tendency to categorize human beings based on their biological attributes seems to take a step back from the social to the medical model of disability. While the social model has achieved to bring disability into the public realm, the biometric technologies of risk management used in border control are based precisely on the (medical) logic of separating the qualified citizens' bodies from the unqualified ones, positioning the "abnormal" bodies outside the zones of border practices occupied by the general public.

Boundary making involves ethical questions requiring self-critical decision-making that is aware of competing values, commitments to rights, and that recognizes different capabilities [23]. Europe may be lacking such self-criticism in the arrangements of automated border control, as accessibility is not required in the public tenders. We argue that even though the special assistance services for people with disabilities at European airports are rather advanced and regulated, there is a normative case for catering to the needs of those disabled people who wish to use the ABC gates independently. While the freedom of choice of this traveler group may at first appear as an issue of marginal importance, the exclusion from ABC is a very concrete reality for the passenger unable to meet today's artificial definition of bodily normalcy.

There is a difference of opinion among stakeholders on whether or not the provision of accessible e-gates for persons with disabilities is a necessity at airport borders. The European Commission has funded large research and development projects with the aim of automating and harmonizing border control processes in the EU, but has not included universal accessibility in their requirements. Travelers with disabilities are thus currently, and presumably in the future, excluded from using ABC.

Adding to the normative argument we are making, we aim to explore whether people with disabilities wish to use the automated systems instead of the provided special assistance services in the EU; and whether key stakeholders consider accessibility as ethically imperative, operationally and technologically possible, cost-effective, and recommendable. We use interviews and survey data to uncover and discuss the arguments of actors with a vested interest: societal, political, operational, and technological stakeholders, and most importantly, persons with disabilities themselves. While the present study is only a relatively small-scale undertaking with obvious limitations, we believe that it demonstrates an argument for universal design processes that would serve the needs of people with a variation of abilities and equalize the practices at border zones. Our analysis is exploratory, as there is no previous research on this particular technology and accessibility issue. We will next describe the methods we have used to collect and analyze data, then present our findings in the form of four debates and conclude with recommendations for an automated border control technology design, which would foster the values of the good society.

2. Methodology: survey of disabled passengers and stakeholder interviews

To explore the views of involved actors, we conducted a survey and stakeholder interviews. We gathered quantitative information on the preferences of European travelers with disabilities with an online questionnaire. Representatives of the European Disability Forum[5] (EDF) with a wealth of experience surveying disabled persons provided feedback on the phrasing of the questions and also encouraged us to offer a Word document of the same survey to those who were unable to fill out the online form (e.g. people with a visual impairment). We distributed the link to the questionnaire (and the Word version) via 81 European-wide, national and regional organizations and 50 online platforms that represent and/or are run by persons with disabilities. The survey results discussed in this article are based on the responses of 139 participants, the total sample of gained responses. Of our respondents, 58% identify as having a mobility impairment, while 37% identify as blind/partially sighted. A further 9% has manual dexterity difficulties, is deaf (7%), or has a cognitive disability, or communication disorder (both 3%). Sometimes people indicated to having more than one disability (e.g. deafblindness). The severity of the disabilities ranges from minor (9%), moderate (27%), to severe (64%) levels.[6] Due to restrictions in both time and budget, we were unable to provide the questionnaire in any other language than English. This will clearly have impacted negatively on the response rate. Nevertheless, the quantity of responses is consistent with, or greater than in other surveys directed to people with disabilities in Europe (e.g. EDF [16]; 4).[7]

Applying a mixed methodology, we also interviewed 14 stakeholders (listed in Table 1). We used a non-probability sampling approach for our expert interviews where the aim is not to draw a representative sample of a larger population of e.g. political or technical actors to make generalizations about the full population, but to draw a sample that includes important stakeholders who have in-depth knowledge of the issues being studied. This suits exploratory research well. The stakeholders were chosen based on their expertise in the field of air travel: they are representatives of disability organizations, persons with different impairments, developers of e-gates, politicians involved in committees discussing Justice and Home Affairs (encompassing border control), and airport management. Some of the interviewees (Political1–3) had been involved in our previous work on ABC systems (see Lehtonen and Aalto [29] for the full analysis with European political stakeholders; we do not claim that our current interview sample of three European Members of Parliament would in any way be representative of the full political discussion). The interviews, conducted between February 2014 and October 2015, consisted of open-ended questions posed in a semi-structured manner. The interviewees were asked to provide background information to verify their expertise (see Table 1). Our analysis aimed at acquiring an (admittedly preliminary and non-exhaustive) overall picture of the views of different stakeholders. We analyzed the survey and interview data thematically, by the themes "equality," "operational," "technological," and "economic" issues, and will next discuss these four debates on the necessity and feasibility of accessible e-gates for people with disabilities.

[5] The European Disability Forum is an umbrella organization of the EU's national disability organizations, representing directly the opinion of people with all kinds of impairments.

[6] However, it is important to note that classifying the severity of a disability is not directly indicative of the person's needs and abilities (see Freeman and Selmi [19]; 472).

[7] Our interviewee (User3) commented it is highly unlikely to ever attain a sample of 200 responses in a survey that is European-wide and directed at people with disabilities. User3 spoke based on experience they gained from being involved in disability rights organizations actively since the 1970s. It is indeed difficult to find previous survey based research on disability issues that would not make use of already existing large data sets such as the Survey of Health, Ageing and Retirement in Europe, that is to say, the majority of the research either utilises existing large surveys (of not only disabled people) or interviews of less than fifty participants (see e.g. Ref. [19]).

Table 1
List of interview participants.

	Stakeholder	Position/accessibility requirement	Expertise/political party
1	NGO1	European Disability Forum officer	Transport, mobility, accessibility
2	NGO2	Finnish Federation for the Visually Impaired officer	Traveling as visually impaired; disability rights
3	User1	Manual wheelchair user	Traveling; universal design; disability rights
4	User2	Visually impaired user	Traveling with a guide dog
5	User3	Electric wheelchair and ventilator user	Traveling; universal design; disability rights
6	Airport1	Airport Programme Manager	All IT-systems used by airport security
7	Airport2	Passenger Operation Manager	Development and maintenance of passenger operations at an airport
8	Airport3	Customer Service Manager	Monitoring and coordinating outsourced assistance services for persons with reduced mobility at an airport
9	Tech1	ABC technology developer	Product management for border control solutions, including e-gates
10	Tech2	ABC technology developer	Development of e-gate cameras and implementation of the technology into e-gates; management of mechanical, electronic, and software specialists
11	Political1	Member of Parliament	JHA committee member; Spanish People's Party
12	Political2	Member of Parliament	JHA committee member; Spanish Socialist Workers' Party
13	Political3	Member of Parliament	JHA committee member; Romanian Social Democratic Party
14	Political4	EU Agency of Fundamental Rights officer	Providing EU institutions and Member States with independent, evidence-based advice on fundamental rights

3. Findings: four debates

3.1. Equality debate

The first debate touches directly upon the question of fostering certain values associated with the good society and technology use therein. In previous literature, nearly all scholars acknowledge that the good society is a just society, although not everybody agrees how to get there [6]. The debate focuses on how stakeholders understand the impact of ABC technology on the fundamental rights of people with disabilities and whether access issues are considered to undermine equal citizenship when alternatives, such as assistance services at airports are offered. This debate shows that freedom of choice to use ABC is overall seen as a fundamental rights question, and that demanding accessibility from at least some e-gates is considered important.

It has been argued that architectural barriers may impede access to physical spaces in a way "akin to an infringement of an individual's civil rights" (Easton [11]; 107) and the Members of Parliament we interviewed certainly regarded the accessibility of ABC as a fundamental rights issue. European politicians have been found to label universal accessibility as one of the few key requirements for ABC they could agree on irrespective of their nationality or political affiliation [29]. Our political interviewees did not support the deployment of new ABC systems that would not be accessible for all, because it would discriminate against people with disabilities (Political1–3): when putting together "such a sophisticated system," accommodating the needs of people with disabilities must be included in the plans and goals as "it cannot be that difficult … and if it is, solutions must be found, at any cost" (Political2). Also, our survey indicated that persons with disabilities view universal access of the e-gates as a fundamental rights question: 51% of the survey respondents *strongly agreed* and 32% *agreed* with that notion (Fig. 1).

Similarly, aviation organizations such as the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) have become increasingly aware of the need to adapt airport practices to the needs of persons with disabilities. This would facilitate the border clearance of persons with disabilities in a dignified manner and ensure that they receive services habitually available to the general public [28]. A recent IATA implementation guide for automated border control [26]; 51) states that ABC systems must take into account local regulations pertaining to people with disabilities and recommends that "if the standard system cannot be used by some passengers, a reasonable alternative should be provided." Disability organizations such as the European Disability Forum likewise argue strongly for universal access. Universal design is in this equality debate seen as a means of materializing the rights of disabled persons, with the United Nations also promoting it (UN General Assembly [39]; article 2).

The EDF argues that "all systems and equipment should be made accessible from the outset to avoid singling out and stigmatizing persons with disabilities" (EDF [15]; 7). According to the organization, it is not enough to provide assistance services at airports; disabled travelers should be able to choose which system to use [15]. This stems from persons with disabilities wanting to be treated "as anyone else," having "access to all services on an equal basis with others" and not having to use a "special queue, go to a special room, have a special check" (NGO1); a view reiterated by one of our disabled interviewees (User1). To avoid creating "otherness" of persons with a disability the EDF wants *all* e-gates to be accessible in the future instead of just having one dedicated e-gate (NGO1; EDF [15]; 7). The organization argues for universal design, as it would not be "much more of an effort" and because accessible e-gates would cater for a varied passenger group, including people who "have luggage, a child in a pram or a wheelchair" (NGO1). Universal design is indeed highlighted many times in good society literature because it promotes fairness and justice (e.g. Brey [6].

Our interviewees who fly regularly and have different impairments also wanted to ensure everybody gets to choose between

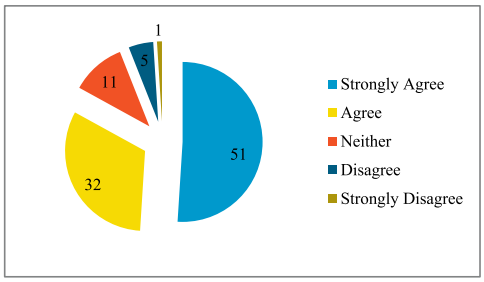

Fig. 1. Accessibility of e-gates is a fundamental rights issue (%, N = 139).

assistance and the automated process (User1–3). The survey respondents, of whom 68% strongly agreed and 26% agreed, support this opinion. In contrast to the position of the EDF, the disabled interviewees were of the opinion that not *all* e-gates have to be accessible. Dedicated accessible e-gates did not represent segregation or unequal treatment to them (User2); "it is not a human rights violation to have two different kinds of gates" (User3). Pointing out that the "official answer" of anybody working in a disabled people's organization would be to require accessibility from all gates, they said that in their personal opinion "it is fine if there are enough accessible gates" (User2), reminding that more than one is needed, as it could be out of order (User3). The survey respondents, however, were more inclined to demand accessibility from all of the e-gates: 56% *strongly agreed* and 29% *agreed*. In sum, passengers categorized as disabled are a heterogeneous group and while some wish to travel as independently as possible using the e-gates, others will require assistance. Thus, "both options have to be available and you need to have the right to choose" (User2); providing this choice would make these border zones less exclusionary and more egalitarian societal spaces.

3.2. Operational debate

The second debate explains the tensions of fitting the new ABC technology in with the existing logistics at an airport. As all European airports now provide assistance services for people with disabilities or reduced mobility, they see little need for investing in accessible e-gates; the provided help in moving through security, border control and boarding is considered sufficient. However, our results show that for disabled passengers there is a plethora of reasons (both practical and emotional) to prefer the independent use of ABC systems.

The majority of our survey respondents, 71% said they would want to use an e-gate if they were accessible. Thus, there are groups of passengers classified as disabled, who would prefer to use accessible e-gates instead of the assistance. The survey results furthermore illustrate the heterogeneity of people with impairments as a group; blind or visually impaired passengers for instance need more assistance and are less likely to use the accessible e-gates alone in the future (17%) than people with mobility issues, who are more willing to use the e-gates independently (33%) (see Fig. 2). Those who answered they would not like to use the accessible e-gates felt mainly that the assisted process would be quicker (16%). The intent of certain groups of disabled passengers to use ABC however speaks in favor of adapting the gates and contradicts the argument that assistance services make accessible e-gates unnecessary.

Despite the desire for independent travel, the *modus operandi* currently is the special assistance service. The majority of the survey participants indicated that they require assistance at the airport; 63% need help from airport staff, 26% need it from somebody traveling with them, while 11% of the respondents do not require any help. Since 2008, the assistance service for people with a disability or reduced mobility has been legally regulated at European airports. The aim of *EC Regulation 1107/2006* [13] is to offer those groups access to air travel comparable to that of any other travelers flying from airports in the EU or on a EU-based airline. All EU airports now provide services free of charge for those who need help to move through the airport from check-in, through security to the departure gate. Our disabled interviewees were quite satisfied with this "guaranteed service," which has followed the legislation (User2). Moreover, out of the 139 survey participants, the majority is *satisfied* (52%) to *very satisfied* (10%) with the provided assistance service at EU airports (Fig. 3).

Notwithstanding, some aspects of the service cause feelings of humiliation and neglect. In the current assisted process in the EU, disabled passengers are often placed in waiting rooms that isolate them from other passengers; these rooms exemplify the spaces of social exclusion of our conceptual departure point in a concrete manner. This has been criticized by disabled travelers: "It is uncomfortable, you are isolated and you cannot go and look at what is at the airport … when you are sitting in these centers you do not know if they remember when you are going" (User3). Once a person is placed in the waiting area, it is often impossible for them to go to the toilet, to a restaurant, or to do shopping. Observations made by Diamond [9] are in accordance with this, and describe how assisted travelers felt as though they were "passed around like a parcel" or "abandoned like a piece of luggage".

Treatment based on the medical model of disability was also reported as a problem of the assistance services in our interviews. These practices include "quarantining" people in the special waiting rooms, pushing them in a wheelchair against their will, or being generally insensitive. Disabled travelers are usually "forbidden to go with other passengers" (User3), which illustrates a border zone practice of isolation from the able-bodied passengers. Furthermore, sometimes staff members do not address the disabled person directly: "They seem to think that I cannot answer … So they ask someone else like my company, and that is always very unfortunate and humiliating" (User1). Our interviewees think it is a "really strange logic" connected to the mindset that disabled people are "somehow sick," to keep them in separate waiting rooms or transport them by ambulance at airports, as is sometimes done (User1). One of our interviewees was even locked in a "hospital room" at an airport for no other reason than being wheelchair bound (User3). One positive feature of the waiting rooms was however noted; they offer guaranteed seating (User2). There is evidence that better instruction of the assistance staff could attenuate these medicalizing practices (see McCarthy [31]. In many cases the staff are temporary workers with poor training, perhaps even only an instruction such as: "Just go and push them in a wheelchair" (User1). Yet, another solution to avoid causing humiliation and isolation would be to allow those disabled passengers who so wish to use the e-gates independently.

For some of our interviewees working in airport management, the assistance represents a good service, which they "may need to improve … so that people do not feel neglected or forgotten in the waiting rooms, but this has nothing to do with ABC systems" (Airport1). The accessible e-gates are thus seen as unnecessary, because airports have implemented "according to EU laws, lots of assistance services for impaired passengers, so that they simply do not need to use this kind of automation; " these services are "faster than any self-service" (Airport1). Our interviewee (Airport1) further stated:

> "I would like to underline that it is not that I reject the need of some people with reduced mobility to want to do it on their own. I do accept this, but I only say that the majority of these people with disabilities simply do not need to do it on their own because they can use this assistance service any time they need."

There is thus a difference of opinion on whether freedom of choice is necessary in border control. Some stakeholders point out that instead of limiting the choices and making decisions for persons with disabilities, those groups should be listened to in order to understand their needs and wishes: "If we do not give them the possibility, okay, then they need assistance … Nobody thinks about what the disabled people would wish … I think the disabled people have not been interviewed" (Tech2). Others claim disabled passengers might "have the satisfaction that they can use ABC on their own," but would "pay the price of being stressed because they have

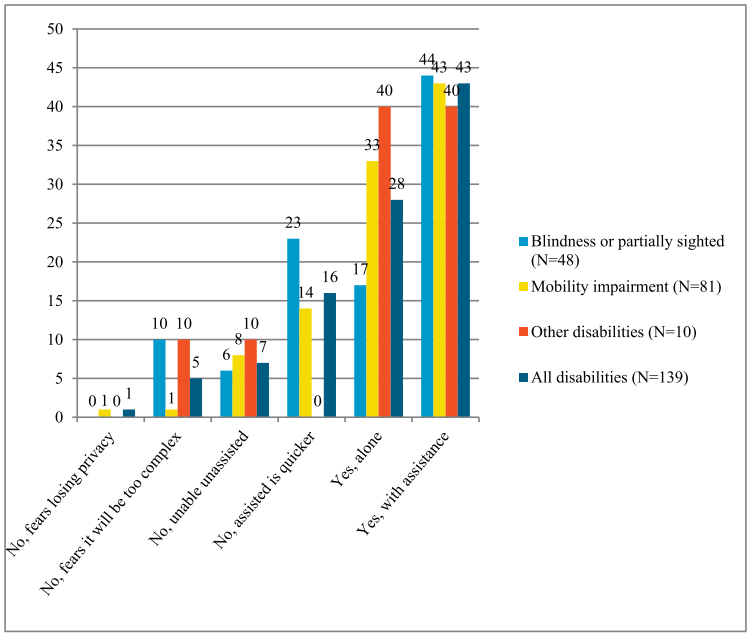

Fig. 2. Willingness to use accessible ABC gates in the future (%, N = 139).

to walk, they have to hurry, they have to come to the airport earlier" (Airport1). The European Disability Forum representative contests this point when referring to equal treatment: "Maybe you have to stand in the queue, well so be it, but it means that you have access, you can use the same services" (NGO1). Indeed, technology in this case shapes the roles people are forced to take.

A second operational reason to not invest in accessible e-gates is that they would not have enough users to justify their adaptation: "Last year we had about 54 million passengers, and only a fraction, about 650,000 people qualified as persons with reduced mobility, so this is not significant" (Airport1). Moreover, the few accessible e-gates currently in use have seen a low uptake. However, according to our previous research this does not automatically indicate a lack of need for accessible e-gates, as the standard e-gates have a similarly low uptake among passengers [34]. Hence, *disability* is not necessarily stopping people from using the few accessible ABC gates, more likely *unfamiliarity with the system* is: our European passenger interviews with able-bodied travelers showed that 76% (N = 117) had never used a self-service e-gate and were often unaware of their existence [34]. If new users, including disabled travelers, were guided through the system a first time, it might help them become frequent and confident users: "I am 100% sure that they would use it and when they have seen that it works for them, they will use it also in the future," whereas stating "we had a little sign there with a wheelchair but nobody came" seems unacceptable (Tech2).

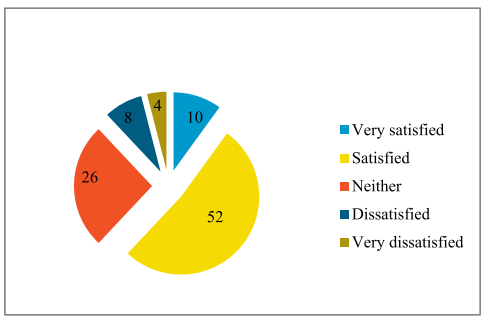

Fig. 3. Satisfaction with airport assistance (%, N = 139).

Finally, it has been argued that making only the ABC gate accessible would be of little use, as persons with a disability may need assistance during other parts of their journey, e.g. at the security clearance. On the other hand, progress needs to start somewhere: "If we always say … There has been done nothing so we also do not have to do anything, everything stays as it is" (Tech2). It does seem logical to adjust more than just border control, and previous research supports this notion, recognizing that separate technological fixes in parts of the transport system do not help [1] and that an accessible, "continuous path of travel" needs to be planned (Darcy, Cameron, and Pegg [8]; 520). Some airports have already started this by installing wheelchair accessible e-gates in security control: "There is no reason why we would not install those also at departing gates … The plan goes slowly, but finally it will cover the whole existing terminal" (Airport3).

3.3. Technological debate

The third debate captures the discussion of whether an overhaul in the design of ABC systems to make the gates more accessible is technologically possible. It deliberates the recommendations of standardization bodies and the different technological accessibility requirements of each group of disabled passengers. Our findings

show that universal design is possible from the technological standpoint, but it needs the involvement of user groups with different abilities. Previous literature supports this: it wants to "engage more stakeholders in technology development and design" (Brey [6]; 4), because participatory design is "laudable" and "desirable especially compared to contemporary technocracy", whereas the "practical agency of most citizens" has not yet caught up to its "theoretical potential" (Dotson [10]; 333).

The standardization and border management bodies have begun to recognize people with disabilities in their guidelines for ABC. While Frontex's 2011 *Best Practice Guidelines on the Design, Deployment and Operation of Automated Border Crossing Systems* for EU Member States does not mention persons with disabilities, their 2012 *Best Practice Operational Guidelines for Automated Border Control Systems* report covers this traveler segment. Noting that current ABC systems do not provide full access for disabled travelers, especially persons with limited mobility, it recommends they should be adapted to cater for this group by e.g. making e-gates wider or lower for wheelchair users [21]. This follows ICAO's [27]; 9) guidance, which encourages border control systems that allow use by young, elderly or disabled persons "without difficulty or prejudice". The importance of human factors is thus acknowledged, noting "obvious requirements, such as the need to cater for people with physical disabilities" and recognizing that "such matters become especially important where automated or semi-automated systems are envisaged" (ICAO [27]; 32).

The European Disability Forum has made formal recommendations in response to the 2012 Frontex guidelines. The organization is of the opinion that ABC systems should take into consideration the needs of *all* categories of persons with disabilities and elderly people both in their *design*, e.g. ergonomics, dimensions, location, lighting conditions, and in their *operation* [15]. Their idea is to guarantee the autonomous and safe use of the systems for everybody to the greatest possible extent. The EDF representative we interviewed however acknowledged that catering for all disabilities will be difficult: "In the end we always have to make a compromise in our position, because our position is also a mix of a lot of different opinions from very different disabilities that might also have sometimes conflicting requirements" (NGO1). However, "there are solutions that can really at least cover most of the requirements," serving many groups (NGO1). What is more, a universal design approach enabling access for the vast majority of people with different abilities is technologically not problematic: "From our point of view, our technology, for us it is really not different to have a person who is sitting in a wheelchair or a 2.2 m tall baseball player" (Tech2).

For some persons with a disability an e-gate, when designed properly, might be an easier option than going through the conventional system operated by border guards. For instance, the desk at the manual border control is too high for wheelchair users: "They have to climb over to look at you" (User3). Making the e-gates accessible for wheelchair users could actually benefit others as well. Reducing alerts caused by unwieldy luggage and trolleys could increase throughput: "The manufacturers say that they will not cause any alarms but they will … If we got a decreased amount of alarms in normal processes due to more advanced technology, why not make the adjustments?" (Airport2). Considering that not all disabled passengers require assistance from airport staff, but travel without help or with the guidance of their travel companions, it would actually be "easier if they could use the same routes as the other passengers" (Airport2), while also helping to remedy the experiences of social exclusion. In order to facilitate the help of a travel partner an important adjustment would be to allow two people to enter the e-gate at the same time, which is recommended by the EDF [15]; 5) and "technically no problem at all" (Tech2).

The most technologically challenging requirements come from blind and visually impaired passengers, as it is difficult for them to locate the gates and know how to position themselves once inside. The European Disability Forum suggests using standardized tactile floor guidance systems [15]; 4) and informing passengers in different formats such as audio and large print, with a possibility to approach the screen to read from a short distance [15]; 7–8). Our visually impaired interviewees however contest the helpfulness of tactile signage and audio signals. One interviewee feels tactile signage would not be helpful in locating the camera inside the e-gate, and notes that "it is difficult for a blind person to direct their face to the camera without the help of another person" (NGO2). At the e-gate, a blind or partially sighted passenger would also have to locate the passport reader, which takes time and possibly holds up the queue (NGO2). Audio guidance at the gate is furthermore deemed unhelpful at noisy airports, except if it consists of non-verbal signals: "You could have an unpleasant, short beep for the failure to act at the gate and a longer, more pleasant sound for the successful use of the gate" (NGO2). Another solution for the visually impaired to locate the e-gate itself would be to use GPS/navigation on mobile phones: "The indoor navigating system is just a question of time … I would be able to find the right gate with my mobile phone in the future and be able to use ABC"; "Until then I think that it is more secure to ask for assistance" (User2).

Another technological aspect to consider is that disabled and elderly passengers are more likely to make mistakes when using an e-gate. A universally accessible e-gate should allow for incorrect use caused by disability, weakness or misunderstanding; it should also be made sure that the doors do not close in on travelers who might move more slowly or have difficulties with orientation (EDF [15]; 8). However, having the system provide more tolerance for incorrect use is only possible up to a certain point. The developers try to use a security level that is low enough to be tolerant but high enough to be safe against counterfeit documents and attacks from criminals; the system is tested against certain security requirements that have to be fulfilled.

To become aware of the specific needs of different groups of disabled passengers, accessible ABC systems should be designed with the input from the target users; as the EDF motto urges, "nothing about us without us" [17]. This has been strongly recommended in previous research for both practical and equality reasons, noting that the interests of these groups have been underrepresented [30,40]. A link-up with user groups is needed (Political4) because without the participation of target user groups, we may easily develop technologies that do not meet their needs and preferences [3,32]. In order to create an efficient, inclusive design process, a rather large group of people needs to be reached: "You have interest groups – involve them in the design, listen to them" (Political4). Correspondingly, the technology developers argue that the design processes are not yet sufficiently influenced by people with disabilities: "The voice of the traveler is difficult to hear in the end, at least for the solution provider, because the traveler does not buy this solution" (Tech1). "With some minor changes, some minor additions, you can handle people in wheelchairs. You can even handle blind people, you must only think a little bit about it, you must speak with these people" (Tech2). Disabled persons themselves welcome such involvement in innovative technological projects: "I think it is very important that disabled people and accessibility experts would be involved in designing the product all along" (User1).

3.4. Economic debate

The final debate considers the costs and potential savings involved in operating and adjusting existing ABC systems to the

needs of people with disabilities and designing universally accessible new systems. The main reasons for commercial companies not to build and install accessible e-gates in Europe relate to the tendering processes and costs.

From a business perspective, not all technology developers and airport operators are convinced there is a real market for accessible ABC systems due to the assistance services provided at airports, although "from an equal rights viewpoint" the companies "should probably offer an accessible solution" (Tech1). The main economic issue for the airport operators seems to be that accessible e-gates take up more space at airports, which will result in fewer gates overall and lead to a reduction of capacity, throughput, and productivity, which is seen as problematic "especially if the fewer gates are used by people with reduced mobility who are slower and may need other processes in this gate" (Airport1). Airports are thus not keen to designate extra space to border control, as "space in airports is expensive, and they deal with you for every square meter" (Tech2).

For the technology providers, the most important factor affecting their decision to not supply accessible ABC systems is the lack of demand from the buyers' side (Tech1–2). The ultimate buyer of the ABC systems, which differs by country, will invite bids for these large projects. They will have to "judge whether they put more money in a service that is not needed or is required by only a very negligible percentage of people" (Airport1) and these decisions are reflected in the requirements of the tenders. The tenders issued by governments or other institutions describe what companies have to realize. If requirements for disabled people are not specified in them, companies will not offer that technology, given they will not want to invest in something that results in a product that is more costly than their competitors' option. Although extra features might be "very nice", buyers "will not pay one Euro more if you do more" (Tech2). The technology developers thus wonder "what is the incentive to invest the money, if the government does not want to invest" (Tech2). Yet, not including detailed accessibility requirements in the tendering processes runs against EU public procurement legislation (NGO1). The *EC Directive 2004/18* [12] (chapter IV, article 23) states: "Whenever possible, these technical specifications [relating to public procurement contracts] should be defined so as to take into account accessibility for people with disabilities or design for all users."

Clearly to get commercial companies on board in designing accessible e-gates there needs to be a top-down push in that direction. As long as this requirement is not mandatory, they will sell their current systems, as innovative development will be expensive and not rewarded. We find ourselves in a situation of "lock-in," where the few major companies with a proven track record of developing ABC systems are a safe bet for those buying new e-gates. Technological systems tend to generally follow "paths that are difficult and costly to escape" and "persist for extended periods, even in the face of competition from potentially superior substitutes" (Perkins [36]; 1). Including the accessibility requirement in the European tenders would thus be the most efficient way to enhance accessibility of future ABC; our survey respondents indicated the European Commission should lead the way in that effort; 53% *strongly agreed* and 33% *agreed*. Interestingly enough, the Commission claims to advocate making "research and innovation more responsive to society's needs and values" (Brey [6]; 4), but this action is yet to be seen in the case of ABC.

All in all, the costs involved in designing and building accessible e-gates as opposed to non-accessible ones would increase relatively little. "When you look at the final costs the percentage of making the gates accessible is very low" (User2). The e-gates will still cost around 100,000 Euros each, including software integration and installation, and making an accessible gate would account for an increase of "less than 3%" (Tech2). According to our disabled interviewees who have been involved in universal design planning, the costs of accessibility depend on the adopted design approach. Changing existing gates to allow usage by passengers with disabilities will be more expensive than designing inclusive border control systems from the start: "Changes afterwards … cost extra money, no doubt about it, but when you start from zero, then making the gates accessible does not cost any extra money" (User2). "I have been an accessibility ombudsman, so I know that if you design accessible right from the beginning, it does not cost more. It is not problematic, it is just a design issue so why not just do it right from the beginning?" (User1). This has been confirmed by many, e.g. Brey [5] and Fleischer [18]. The interviewees predict accessibility will eventually become a requirement in the tendering processes due to fundamental rights questions and an aging European population (User3), thus making it beneficial to act sooner rather than later and save future adaptation costs.

There are also potential savings for airports to consider. In the long run, "it is also cheaper for the service providers that people are as independent as possible … for all those extra services you need more people" having to work long hours (User3). Another monetary benefit for the airports could be extra retail spending by disabled people not confined to designated waiting rooms: "Shopkeepers lose money because people who have reduced mobility cannot do shopping there … Anyway they have lost my money" (User3). It would probably be more fruitful to consider people with disabilities as potential customers rather than as a problem [4,18]; NGO1); they constitute an underserved market within the global tourism industry despite significant growth potential [8,19].

4. Conclusion

Accessible automated border control for persons with disabilities or reduced mobility is a missing feature at EU airports, and the need for such technology has been questioned, given that passengers with a disability or reduced mobility are legally entitled to support at airports, commonly known as 'Special Assistance'. The costs, both for the technology itself as well as for the increased floor space the gates would occupy, have also worried some. The exploratory nature of our study, which employed a relatively small sample size, impedes our ability to draw definite conclusions about the findings. However, we believe that the tentative results indicate that there is a need for accessible e-gates among persons with a broad range of disabilities and reduced mobility who, although appreciative of the current special assistance services provided at airports, would prefer to cross borders unaided if possible. Our research suggests that universally accessible e-gates are needed in the good society striving for ethical sustainability. Granting the freedom of choice to use ABC for as many people as possible represents a fundamental rights question for political stakeholders, disabled passengers, and disability organizations. Border management and standardization bodies are also in favor of accessible e-gates and recommend this in guidelines.

There is indeed a strong normative case to provide equally accessible e-gates, and it appears possible from the operational, technological, and economic points of view as well. But even though many advocate a universal design approach for the development of e-gates, not much has been accomplished within the EU in this regard. It is important to remember that "technological innovation and utilization can be demanded, subsidized, discouraged, or outlawed by the state" (Samaha [37]; 1274) and thus creating EU legislation, instead of non-binding recommendations, would force the buyers to require accessibility in their tenders,

therefore making governmental actors more clearly accountable for the equality of border control practices.

Automated border control devices and the related practices are publically sanctioned and used to enforce public policies. That implies that they carry the weight of normative power; they send a message to the European population on who are considered *worthy* of using them. That is why the European Commission needs to incentivize the related technology development: we need to ensure the society gains positive outcomes (see Ref. [6]). This universal design would benefit all travelers and would not be proportionally much more expensive. European authorities regulating ABC should hence consider people with varied capabilities – some of whom now experience exclusion from these border control spaces – as a growing group with a desire and potential for independent travel.

Viewed against Brey's ([5]; 12) "anticipatory technology ethics checklist," ABC technology development needs to avoid psychological harm and harm to human capabilities, while ensuring human dignity. The absence of liberties and opportunities that the inaccessible ABC systems represent for people with disabilities is unacceptable. Moreover, the rights of people with disabilities are not fully realized in this context: the freedom of movement and choice remain incomplete. Perhaps most importantly, Brey's ethics checklist emphasizes the fostering of justice, which unquestionably includes non-discrimination and equal treatment of all technology users and citizens. Although our results are preliminary and exploratory by nature, our findings indicate agreement among stakeholders over the value and necessity of universally accessible e-gates. We can conclude that European authorities need to take action to tick the boxes of Brey's checklist (or any other checklist, for that matter) to guarantee an equally good society for all its citizens.

To make automatically controlled border spaces available for disabled passengers, we propose two measures for future European ABC development: involving people with a disability in the design as early as possible, and pushing for a universal design approach in the public tendering processes. Yet, our research provokes questions regarding the practicalities of how these measures could and should be carried out. Essential areas of future research include e.g. how to ensure that people with disabilities are included in the design of ABC systems (or other emerging, especially publically funded technological systems) and how to negotiate between the sometimes conflicting technical requirements different groups of disabled persons have for the ABC systems. Negotiating between requirements of course implies also first studying what these requirements exactly are e.g. for visually impaired people as opposed to persons with reduced mobility. Future research should also address the question of how to integrate these requirements into standardization and what kind of lobbying and/or influencing is needed to get the EU tenders to represent the values of the good society the European Commission claims to foster in its legislation. In our view, there is a need for larger-scale research in both academic and practitioner fields to remove technological barriers to participation for persons with disabilities. Allowing publically funded technology at normatively laden border zones to exclude a growing and already disadvantaged segment of the European population is not ethically sustainable.

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PUBLICATION IV

How Quantum Ontology and Q Methodology Can Revitalise Agency in IR

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How Quantum Ontology and Q Methodology Can Revitalise Agency in IR

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Abstract: This article brings Alexander Wendt's (2015) 'quantum social ontology' into the realm of empirical International Relations (IR) research by coupling it with Q methodology. It shows how Wendt's ontology and Q methodology share a central interest in complex agency and are inherently allied in terms of principles and purposes. The quantum view has catalysed conversation within IR and social sciences more broadly, but that debate has remained almost exclusively on a theoretical level. This article shows that there is potential for empirical research in this area regardless of whether one considers the quantum view to be an analogy or ontological reality. Q methodology's grounding ideas align with quantum physics and the quantum social ontology, e.g. in the fashion it conceives of subjective states of mind and their measurement. Practical examples of Q methodological work are presented to illustrate the quantum concepts in a social scientific setting. The article argues for a broader study of political subjectivity within IR through a notion of personhood, which opens up vast potentialities for agency as well as for breaking free of determinism, and fixed notions of human nature as well as ostensibly fixed understandings of advantaged or disadvantaged subject positions.

Keywords: Agency, Alexander Wendt, International Relations, Subjectivity, Q Methodology, Quantum Physics

INTRODUCTION: A QUANTUM OF AGENCY

This article proposes a means to operationalise the agency-related claims of Alexander Wendt's (2015) book *Quantum Mind and Social Science: Unifying Physical and Social Ontology* in empirical social scientific research. In his book, Wendt immerses himself in the reasons why social sciences (and social scientists) should consider a quantum mechanics-based ontology and, ultimately, why they should extend these principles into empirical research. He criticises the mainstream social scientific methodological toolkit but does not (yet) provide viable alternative methodologies for carrying out empirical work with the quantum ontology. Furthermore, those who have engaged with Wendt's ontology have not, thus far, pre-

sented methodologies suitable for empirical, quantum-inspired social science (e.g. Miller, 2016).

My claim is that there already exists a methodology able to bridge the gap between Wendt's ontological propositions and empirical social scientific research. The method of choice, Q methodology, shares parallel purposes and principles with quantum mechanics (Stephenson, 1983). It studies complex, subjective states of mind with experiments simulating interrelated decision-making situations and compares these states of mind with the aim of identifying view types.

Quantum ontology and Q methodology share an interest in subjective agency, which is a narrowly understood and understudied area in International Relations (IR). Wendt (2015) argues that this is because social sciences still perceive subjective experience as a taboo because the classical physics-based worldview, upon which they were founded – and remain grounded – cannot account for it. Subjectivity has been largely expulsed from contemporary scientific accounts in an effort to build objective interpretations of the world; this tendency is traceable to (neo-)Newtonian metaphysics (Stephenson, 1983; Montgomery, 2016). IR remains to an extent influenced by behaviourist, positivist principles, which regard humans in scientific inquiry as mere utility maximisers and favour research methods with observable data and recognisable causal patterns emanating from natural sciences (Kurki and Wight, 2007).

Individuals do appear to be a difficult, even counterintuitive topic of study. Their subjectivity in international life seems "the least promising, most idiosyncratic" area of inquiry (Dryzek et al., 1989: 480) as they are "too individualistic" and not fruitful for the "generalisations political scientists seek" (Byman and Pollack, 2001: 108). However, the subjective orientation of individuals creates the basis for social life as such, and the concepts *international* and *politics* would not exist without human individuals and their perceptions (Aalto, 2011). Moreover, reducing humans to rational utility maximisers and ignoring whatever else might be affecting their behaviour because it cannot be measured according to positivist principles may generate quite incomplete, if not biased knowledge (Kurki and Wight, 2007; Dryzek et al., 1989).

In the majority of IR research subjective agency has been reduced to a fixed understanding of human nature or the position of a subordinate, if not ignored. On the one hand, human nature, either combative or cooperative, is a given in IR theories preferring the individual as the level of analysis, such as traditional realism and some strains of liberalism, and on the other, many theorists deem the structure of the international system ontologically more important than the individual[1] (e.g. Mansbach and Taylor, 2012; Aalto, 2011). By contrast non-mainstream, postpositivist orientations have lent attention to the marginalised subjects in world politics. This work has often had a critical, emancipatory aim of bringing attention to disadvantaged groups, be they non-Western peoples, refugees, women, or anyone who actually seems more an object affected by decisions of the elites than a subject with agential pow-

ers (Aalto, 2011). Yet, as some scholars have pointed out, such critical work in IR can also succumb to weak or quasi-structural determinism or, conversely, to over-agential explanations that demonise from outside without trying to understand the complexity of agents' subjective experience (Kurowska and Tallis, 2013). Overall then, the scope of IR work on subjective agency could still be much wider than these threads imply.[2] Such work would benefit from a view of multiple potentials and continuous reconfigurations of subjective agencies, which could be achieved by combining Wendt's quantum social ontology with Q methodology.

I will begin by presenting some of the critical discussion on whether or not Wendt's quantum view, which involves quite a lot of speculation, adds value to IR's contemporary scholarship in a meaningful way. I will then move on to explain Q methodology's interest in complex agency, its practical application and its alliance to quantum mechanics. I will also compare Q to other, more widely applied social scientific research methods. In the following section, I will argue that Wendt's quantum social ontology and Q methodology share similar understandings of the nature of human agency and explain how they both understand the 'measurement' of mental states, distancing themselves from determinism. Subsequently, I will present key similarities of quantum cognitive models and Q methodology, arguing that the latter is better suited for IR. In the final section before concluding, I will debate the relation between the individual subject's agency and social structures, which are seen as shared mental states, lending attention to both elite political agency and the potential for ethical action stemming from the quantum world's 'entanglement'.

WHY IR SHOULD ENTERTAIN WENDT'S QUANTUM SOCIAL ONTOLOGY

Wendt's move towards quantum physics has catalysed discussion on whether the ontological view he proposes provides enough added value for IR[3] and ultimately whether debating philosophy of science extensively is relevant to social sciences. His critics have debated whether his admittedly speculative argumentation will end up developing the field of IR or whether it is focusing our attention too far away from the substance matter of IR research. While some IR scholars reviewing Wendt's work claim that exercises in "fundamental ontology" are not that essential for the field (Jackson, 2016: 1153), others remind us that while some of us may go on our merry way by, e.g., measuring voting patterns or collecting statistical data on warfare,[4] scholars who are disposed to question their own convictions of what social life is essentially based on will need to engage in more fundamental debates (Steinmo, 2017). In essence *all* sciences share the "context of justification", where researchers "reflect upon their priorities and assumptions about how to evaluate the quality of scientific knowledge" (Elman and Elman, 2003: 40–41). With the current fragmented or pluralistic state of IR theorising (see, e.g., Kristensen, 2016) and with the historical weight of the incon-

clusive 'great debates' involving significant controversies about philosophy of science, the fundamental debates do seem topical (see Kurki and Wight, 2007).

Another discussion prompted by the 'quantum turn' in IR[5] is whether it inescapably implies a paradigm shift. Presenting the quantum view as a grand theory is a common critique levelled at Wendt's work. According to Robert Jervis (2017: 187), Wendt does not prove the "virtues or the necessity of the quantum unification program". Jervis (2017) argues that trying to grasp the abundance of human behaviour in any single theory may be counterproductive, but adds that experimentation should be treasured, including the use of quantum concepts in IR at least as analogies. Another reviewer of Wendt, Karin Fierke (2017), is of the opinion that a perspective change from classical to quantum should not be seen as a Kuhnian paradigm shift, but instead as Wittgenstein's duck/rabbit picture: changing our perspective does not imply falsifying classical physics, but rather yields space for researching different phenomena. While "classical and quantum descriptions of physical phenomena" are "incompatible", they may both be "accepted as equally valid" in their own terms; that is to say, "both descriptions [can be] necessary for a valid account" (Stephenson, 1986b: 520). Perhaps Wendt's work thus brings more added value to IR as a motivator for us to re-examine our core assumptions on, e.g., agency rather than as an overarching grand theory. I am persuaded, in Wendt's (2015: 36, emphasis added) words, that "a quantum perspective offers *at least* a fruitful heuristic for thinking about long-standing controversies in social theories, and ultimately for doing empirical social science".

A key 'long-standing controversy' in this context is philosophy's controversial mind-body debate. According to Wendt (2015), conscious subjectivity has proved problematic for social theory because of the mind-body problem in philosophy, where none of the leading traditions have been able to account for both mind and matter in a scientific way. The bifurcation into mental and material has generally led to excluding subjectivity from the scope of scientific research, which represents science's failure to Q methodology's developer William Stephenson (Brown, 2002). Wendt's solution is panpsychism, a contested philosophical view claiming psyche is intrinsic to matter on all levels. In this sense, Wendt is more radical than Stephenson (1985: 43), who does not believe that matter would be "pervaded by mind".[6]

Wendt takes the argumentation for a wholly quantum reality of entangled mental and material properties to unexpected lengths, which results in a lot of speculation. Controversy among Wendt's readers has been unavoidable since quantum phenomena are not regarded as something possible to manifest in the macroscopic world according to the 'orthodox' and widespread interpretation of quantum mechanics. The common argument is that quantum mechanics studies particles on the subatomic level, and anything bigger than that operates according to the laws of Newtonian, classical physics (Ramlo, 2005).[7] The macro and micro domains are sep-

arated by a threshold entitled decoherence, a "feature of open macroscopic systems" which "filters out quantum effects" (Waldner, 2017: 202). This makes some think Wendt's "heterodox approach" is "based on a long series of low-probability wagers" (Waldner, 2017: 202).

Many scholars emphasise that "information processing by complex social systems can be described by the mathematical apparatus of quantum mechanics", but that the "quantum-like behaviour" humans display is not caused by quantum physical brain processes (Haven and Khrennikov, 2013: xviii). Quantum decision models, for instance, do not usually assume that the underlying brain processes would work quantum physically (Yearsley and Busemeyer, 2016). Contrastingly, others say there is no evidence of a separation of domains in the physical world with different physical laws, but that quantum physics supersedes Newtonian physics (Barad, 2007). There are also those who take the position that social sciences are more non-classical, or 'quantum' than quantum mechanics, rather than being only quantum-like (e.g. Wright, 2007). Be that as it may, I agree with Mathias Albert (2015), who says Wendt succeeds at least in revealing the problematic, taken for granted, classical materialist assumptions underlying social sciences.

Choosing suitable interpretations of quantum physics among a myriad of contentious understandings certainly seems like a reasonable critique against Wendt's undertakings (see Albert, 2017; Crasnow, 2016; DeCanio, 2017; Jackson, 2016; Waldner, 2017). The accumulated new-age connotations of anything 'quantum' do not help Wendt and might encourage us to disregard his propositions as part of a fad (Smith, 2016). However, some (e.g. DeCanio, 2017; Miller, 2016; Waldner, 2017) consider speculation inevitable due to the contested nature of quantum physical knowledge, yet helpful in consolidating social scientific argumentation when it comes to the non-material conceptualisations of human life, such as societal structures or conscious action.

To make things more complicated, no side of the argument is, for obvious reasons, able to produce compelling evidence. This is why some suggest that for social sciences quantum theory would be more useful as an analogy or a formalism than a claim related to ontological reality (e.g. DeCanio, 2017; Jervis, 2017). Robert Jervis (2017: 186) argues that "whether or not quantum theory can be successfully extended to the realm of human behaviour, at minimum it provides better analogies for reality than does classical mechanics". Jervis (2017) lists the connection between the observer and observed; the highly subjective, unstable estimates affecting human decisions; and the ability to alter the social world with our "measurements" of it as some of the reasons why the social world seems quite "quantum". It definitely appears simpler to 'only' make use of the quantum view as an analogy or a heuristic device in social sciences than to choose Wendt's path of argumentation, e.g., for panpsychism. Nonetheless, the contesting views of whether or not the quantum so-

cial ontology Wendt proposes is, or even could be 'true' on an ontological level are beside the point here: my aim is to show that the intentional, purposeful states of mind of the quantum view can be studied with Q methodology, and together they can help to revitalise research on agency in IR.

Q METHODOLOGY: STUDYING COMPLEX STATES OF MIND

Q methodology's principles and techniques were formulated in the 1930s[8] by William Stephenson, a psychologist and physicist. It is based on factor theory in psychology, which shares quantum theory's mathematical-statistical foundations and serves purposes comparable to those of quantum theory: one researches the states of matter and the other those of the human mind (Stephenson, 1981). Stephenson (1981: 121) wanted to create a methodology "allied to quantum theory" in its "mode of thought and pragmatics" to study human subjectivity systematically and make "self-reference central to all else". His interest was to study "mind, not minds in statistical bunches", aiming to make discoveries, not to test hypotheses (Stephenson, 1981: 124). These principles differ significantly, e.g., from those of survey methods, as Q methodology does not strive to observe, e.g., personality traits, or generalise findings in the way quantitative and statistical methods do. Both quantum mechanics and Q methodology probe into complex phenomena which cannot be directly observed. While physicists try to understand a related series of microscopic observables (objects), social scientists study a related series of macroscopic observers (humans as self-observing subjects) with Q methodology.

Q methodology combines qualitative methods with quantitative techniques in the study of subjective agency. It is systematic in comparing the views expressed by the participants with the help of factor analysis, but also makes use of qualitative interviews and analysis (Donner, 2001). Initially used in psychology, Q methodology has up to an extent spilled over to political science (Brown, 1980) and to IR. For example, it has been employed, e.g., to study types of national and supranational identities (Aalto, 2003; Davis, 1999; Haesly, 2001, 2005; Robyn, 2005; Wong and Sun, 1988). Another branch of IR's application of Q methodology, which draws on development studies, has concentrated on the legitimacy and quality of development cooperation (Hilhorst et al., 2012) as well as the perspectives of marginalised populations (Brown, 2006). Scholars researching IR themes such as terrorism (Callahan et al., 2006; Koçak, 2012), nuclear non-proliferation (Willoughby, 1986) and public diplomacy (Seo and Kinsey, 2013) have likewise made use of the methodology. Within IR, Q methodology is perhaps best suited for policy research[9] due to its utility in identifying and aggregating preferences (Lynn, 1999) by concentrating on the claims and expectations involved in processes of decision-making (Ascher, 1987).

In terms of practical procedures, the Q methodological research process begins with collecting the 'concourse', referring to as wide a range as possible of thoughts,

attitudes and opinions related to the research question at hand. These can be gathered by reviewing all pertinent documents, speeches, media sources, interviews, focus group discussions, etc. This gathering process should be carried out meticulously, since it is crucial for the validity of the results. Collecting the concourse is a means to a greater end than only mapping out the discussion revolving around an issue-area, i.e. the motivation is being able to later observe the subjective states of mind of the participants with regard to the concourse. The same disclaimer applies to the rest of the practical procedures with technical connotations to them: they *enable* the measurement of the subjective orientation of individuals. The quantitative steps provide an instrument to produce qualitative knowledge.

Once the concourse seems saturated and no further views can be found, a theoretical or heuristic model of it is generated. With the model, the concourse is reduced to roughly thirty to fifty short statements representing the spectrum of ideas in a balanced manner. Carefully selected participants then sort these statements. Approximately fifteen to thirty people participate in this small-n experiment one by one. They make the Q sort into a grid resembling a forced normal distribution, a down-pointing triangle if you will, according to their subjective view. The scale of the Q sort usually ranges from -5 (least agree) to 5 (most agree), with one slot per statement and more slots at the neutral centre to gain prioritisations at the extremes. The Q sort of each participant is compared to the corresponding sorts of other participants with factor analysis to find groups of likeminded people who have formed view types. The participants are interviewed to gain depth to the interpretation, and the researcher formulates narratives of the contents and prioritisations of each factor or view type, as well as of the potential consensus found among the views.[10]

In summary, the Q methodological experiment is a simulation of a sequence of interrelated decision-making situations. The participants consider their views regarding short statements drawn from the whole debate on the topic of research. They act as self-observing subjects and rank-order the statements according to their subjective view. This process is followed by factor analysis, in which the analyst compares the rank-orderings of participants, aiming to find distinguishable factors or clusters of likeminded persons. The researcher then interprets these factors or views qualitatively and presents them in a narrative form.

The aim of the experiments is not to study subjective views and communication as representation through "message systems", as these systems do not define the "realities and potentialities of the human condition" for the individual in question, but rather to study the way the participant "confronts" these systems (Stephenson, 1986a: 51). The reaction the participant shows regarding the concourse's statements during the Q methodological experiment is based on their personal experiences or "perspectives of existence", referring to "priorities, values and belief systems" which

will manifest as the factors or shared views found in the latter stages of Q methodological work (Stephenson, 1986a: 51).

As Q methodology is by far not the most widely used research methodology in IR, it seems fitting to compare its potential added benefits to the qualities of other more commonly employed research methods studying similar research questions, first in general terms and then in the quantum context. It is important to note that the 'rival' methodological alternatives are actually qualitative research methodologies and not quantitative ones, contrary to what one may suppose based on the quantitative phases Q methodology employs.[11] As methodological alternatives to similar research questions as those of Q studies, we should rather think of, e.g., (critical) discourse analysis, different types of interviews, ethnographic research methods and, in general, interpretive research methodology,[12] which advocates for combining many qualitative methodologies.

The added benefit to IR that Q methodology can bring compared to discourse analysis, interviews and ethnography is that it holds a balance of creating rigorously systematic, yet qualitatively nuanced knowledge on subjective agency. Compared to discourse analysis, the benefit of Q methodology is that it essentially uses similar sources, such as political speeches or media publications that would be analysed discourse analytically, but then makes those debates available to the participants of the study in a condensed form. This means that the analyst is not the one making direct interpretations of the debate, but instead the participants will react to the debate and express their subjective views on it. In the case of interviews, the researcher is awarded with the power of forming questions, framing the interviews and interpreting the results. Q methodology of course is not free of researcher influence, but it democratises the research process by empowering the interpretations of the participants in the form of Q sorts, which constrain the analyst's interpretation. The quantitative steps thus make the interpretative work of the researcher more transparent. What is more, Q methodologists usually employ post-sorting interviews as a way to gain more nuanced knowledge, guide interpretation and ascertain the validity of the Q sorts, which adds a subtlety that we are used to expecting from interviews and ethnographic research. The advantage of a systematic approach then comes from the analyst comparing the participants' subjective views with each other in the quantitative phase – something that is not done to the same extent in ethnography, interviews or qualitative discourse analysis.

The drawbacks of Q methodology are similar to those of other small-n research methods or qualitative research in general. Q does not aim to make predictions about the future or produce demographically generalisable results, which is the aim of most quantitative methods such as surveys. However, as John Dryzek (2005) notes, Q methodology yields *discursively generalisable* results, meaning that the shared view types expressed by participants are assumed to be typical in a larger

population. While surveys are based on a measuring system created item by item by the researcher, Q methodology allows the participants to choose how they react to the multiple presented stimuli and thus models the whole subjective orientation of a person with respect to the research domain (Dryzek, 2005). This means that in surveys each response is to the respective specific item only, while in Q methodology the rank-ordering of each statement is dependent on how the participant has ranked the other statements (O'Connor, 2013). Q methodology thus adds the benefit of requiring (stricter) prioritisations compared to surveys and interviews. Previous studies have found that compared to surveys, participants in Q methodological experiments have reported the Q sort to reflect their views more precisely since they saw the statements in a larger context (O'Connor, 2013).

When it comes to possible IR research methods to be used in the quantum social scientific context, it is worth noting that as such, Q methodology can be used for either quantum-inspired or other purposes. The difference of Q methodology as compared to, e.g., interviews and ethnography is that Q has a 'built-in' alliance to quantum mechanics with the mathematical-statistical foundations and the purpose of studying complex states of mind, whereas other methods *may be compatible* with Wendt's quantum ontology if, e.g., they do not hold strong assumptions on ontology in the first place.

In the quantum context, the main difference between the creation of empirical knowledge with Q methodology, and that with interviews and ethnography is Q's simulation of a complex decision-making situation. In interviews, as classically imagined and controlled, the interviewee responds to one question at a time and while it is possible to compare interview responses among interviewees, they are only the reactions to the respective specific stimulus or question. As mentioned, the same holds for surveys as they operate item by item. Q methodology's aim is to tease out more specific preferences in a simulation, where the participant needs to simultaneously react to the whole statement sample and make interrelated decisions. It is thus not possible to, e.g., deem all of the statements equally important. This is especially useful to IR in policy research and particularly with political stakeholders. If politicians are not 'forced' to prioritise, they may happily make contradicting promises to ostensibly please as many voters or stakeholders as possible.

Q methodology's access to subjective agency is furthermore direct in the sense that it relies on the self-measurement of subjectivity with the experimental procedure of the Q sorting, whereas interviews and ethnography rely on the researcher's interpretation of the participant's agency. All in all, there are not many alternative methodologies used in IR to choose from if we want to examine experiential subjectivity, where the self-referential subject would be privileged as the knowledge producer. Only certain phenomenological methods (see Odysseos, 2002) or strains of ethnography, such as subjective evidence-based ethnography (see Lahlou, 2001),

might offer alternatives to Q methodology in this sense. An auto-ethnography would moreover make direct access to subjectivity available, but it does not usually provide the possibility to compare the found subjective orientation with other subjectivities in the way that Q methodology does. It would also most probably be written by the researcher and not an outside informant, which changes the nature of the produced knowledge considerably, excluding the majority of interesting non-researcher informants. In short, the interrelated decisions made by self-observing individuals in Q methodology tie it to the quantum view and express complex, inter-comparable accounts of subjective agency.

'MEASURING' AGENCY AS STATES OF MIND

Perhaps the most important claim Wendt (2015: 149) makes on agency, is that "all intentional phenomena are quantum mechanical", including "private thoughts" as well as "public or collective intentions like norms, culture and language, which we might generically call institutions". The force behind these intentional phenomena is the individual's will. Wendt (2015: 115) proposes a trichotomy of the "features of psyche or subjectivity", which to him are "Cognition, Experience and Will". Cognition refers to computational 'thinking', e.g. information processing without the prerequisite of self-awareness, such as when computers 'think' without presumably being self-aware. For Wendt – and not uncontroversially – Experience points to an elemental way of feeling, e.g. pain, not emotions. In this view, both Experience and Cognition are somewhat passive, reducible to matter, and observable objectively from the outside as, e.g., brain activity while processing information – of course, Wendt's notion of Experience is highly contestable. Will is contrastingly "active and purposeful, a drive that imposes itself upon and thus changes the world" (Wendt, 2015: 116).

Wendt's focus is on this active side of the psyche, subjectively experienced mental states, which are obviously difficult if not impossible to 'measure'. However, Q methodology studies precisely these subjective mental states. The feeling of volition or the experience of free will is not compatible with causal analysis but rather "calls for quantum theory for its measurement" as a "state-of-feeling" (Stephenson, 1987: 538). Stephenson (1986b: 525) asserts there is "obvious indeterminacy of quantum action in every thought we have, in every experience of free will". The quantum ontology enables "genuine freedom of choice" and liberates social scientists from the "implausible basis" of determinism (DeCanio, 2017: 124, 129). The quantum view can thus be regarded as a stance against determinism, the doctrine of everything happening due to predetermined causes.

The existence of free will sounds intuitively compelling, or at least comforting, though some may be of the opinion that the hope is false. Wendt (2015) argues that if we conceive humans under the constraints of classical physics, they are in fact

dead (machines, zombies or the like). He proposes that if everything must be reducible to matter and predetermined, there is no space for consciousness or intentional action. In contrast, quantum ontology would imply that humans are

> "physical but not wholly material, conscious, in superposed rather than well-defined states, subject to and also source of non-local causation, free, purposeful, and very much alive"; "a subject rather than an object, and less an agent than agency, someone always in the state of Becoming" (Wendt, 2015: 207, emphasis original).

Q methodology is based on a similar "paradigm of personhood": rather than seeing a person as a "self-interested [utility] maximiser in possession of a well-behaved utility function", Q regards persons as "well organised, communicative, and potentially creative, with many possible rationales for action" (Dryzek et al., 1989: 502).

Breaking away from determinism and recognising wider potential for creative agency brings us to the quantum view of measurement, which distances itself from the standard ideal for objectivity in science. In developing quantum social ontology, Wendt (2015) explains that unobserved light and electrons behave in the manner of a wave; observed they collapse into a particle form. There is unavoidable "interaction between the measurement apparatus and the phenomenon" (Miller, 2016: 366). Measurement is thus inherently connected to how an electron can be described. Without measurement, there would be no collapse. The method and the mere act of measurement affect its outcome in quantum physics, which, broadly speaking, is something scientists of any field would like to avoid in the interest of reliable knowledge and replicable experiments, or objectivity. Unfortunately, that is not possible in the case of subatomic particles and, as some suggest, subjective states of mind. In the case of humans, a simple example of measurement affecting measured systems called the Hawthorne effect refers to how individuals modify their behaviour when aware of being observed (see Miller, 2016), which means, as some researchers (e.g., Kurowska and Tallis, 2013) have noted, we effectively co-create knowledge with our subjects of inquiry – rather than merely observing them objectively.

Measurement collapses the wave function to enable observation of a phenomenon, yet it results only in a "partial expression of its totality" (Miller, 2016: 366). In Q methodology, a person's mental state also collapses into an observable, partial manifestation of their pluripotential subjectivity when they measure it by sorting Q statements. With regard to social scientific mental states, it would be absurd and unnecessary to even try to capture everything that is going on inside a person's intentional psyche. It is more useful to seek "information about the state with respect to certain specific experiences", allowing a myriad of "actual states, the specifics of

which are unknowable and not of interest" (Wright, 2007: 2039–2040). In Q methodology, this implies one is interested in the partial state of mind related to the concourse, that is, the issues under scrutiny at the moment.

Niels Bohr titled the "wave-particle measurement curiosity" as the complementarity principle (Miller, 2016: 371). The complementarity principle holds that the properties of objects, e.g. wave and particle, cannot all be observed or measured simultaneously. The outcome of experiments with microparticles always involves information about the particle *and* something else, depending on how the experiment is carried out (Stephenson, 1983). The grounding idea is that information obtained with one set of conditions is complementary to information gained with other conditions (Stephenson, 1983). There is no intrinsic rank order between the different sets of information, but they manifest different sides of the 'reality', referring to the object of investigation. The factors or types of view emerging from a Q methodological experimentation process are also complementary to each other (Stephenson, 1986c). They reflect different 'sides' of the phenomenon, and each factor, just as any thought or feeling, is in principle equally acceptable. They are equally true, since the truth in this case could not be a more subjective issue.

Some of Wendt's critics claim that he is "beset by problems" such as "defining the 'observer' and how he/she/it is distinct from the system being observed" (DeCanio, 2017: 126). The quantum metaphysical view implies regarding the observer and observed as united, entangled. To Elina Penttinen (2013: 21), this means that "humans do not mediate knowledge of the world through representation, but are a material part of knowledge production", where the world communicates "between its parts". It is difficult to envision a methodology manifesting a clearer case of entanglement between the observer and observed than Q, where the participant acts as both of those, while the researcher operates as a facilitator of sorts to self-referent knowledge.

Prior to measurement, "a wave function represents the potential for all outcomes", as in locations of particle hits (Wendt, 2015: 47). A particle such as an electron, in the same way as a Q methodological statement, cannot be said to have a position before the experiment or measurement (Stephenson, 1983). The particles are in superposition and their positions are "developed as a result of experiments", which in Q methodology refer to factor analysis (Stephenson, 1983: 215). An "unmeasured quantum system" is in an "irreducibly indeterminate state of the superposition of all possible states", not by any means "a determinate but unknowable state" (Waldner, 2017: 208). Also the statements in Q methodology are considered "equipotential", having no "normative dimension" before the measurement (Stephenson, 1982: 239).

Q methodology's concourse and its reduced format, the statement sample, demonstrate the superposition of options for mental states. The statements partici-

pants sort according to their subjective view are to model the whole spectrum of opinions or views relevant to the subject of study. This means that all imaginable and/or previously stated claims about the research topic are included in the statements and that it is possible to organise the statements in any fashion the participants wish.[13] In practice, if there are, say, 40 slots and 40 statements there are Factorial 40 (40! – virtually endless[14]) possible ways of self-measuring one's subjective view regarding the area of research. The issues under scrutiny are not intended to be all-encompassing for the analysis to work, but rather specific. The topic could be, e.g., how automated border control in the European Union should be developed in the subjective views of the involved politicians (Lehtonen and Aalto, 2017) or what types of characteristics different terrorist organisations display according to counterterrorism professionals (Koçak, 2012). It is thus reasonable to assume there is enough room for the vast majority of interpretations and sufficiently nuanced views to appear.

In the event of Q sorting, the participant's mental state changes from superposition into a definite state, or an actual type. Similarly, in quantum mechanics the superposition state reduces to an "actual" state when a measurement is made and "a single type emerges in the wave function collapse" (Wendt, 2015: 163). It is imperative to note that this is antithetic to the "standard view"; decision-making is usually seen as an "expression of underlying pre-existing preferences" (Wendt, 2015: 163). The view of latent, original inclinations has been established in social sciences as rational choice (Wendt, 2015). For example, the so-called R mode of factor analysis used in statistical research employs "observables of statistical populations, for example with their intelligence, attitude, trait" (Stephenson, 1982: 237). The standard view considers that "observables are inherent structures of individuals, to be discovered and measured", which in turn are not a feature of quantum theory, and neither of Q methodology (Stephenson, 1982: 237). The difference is thus between the classical measurement of a static underlying reality and the quantum measurement of participating in a changing and entangled reality.

Some say the superposition of alternatives is not a part of our conscious, quotidian experience (Waldner, 2017). Others, however, view our actions, speech and thoughts as results of continuous "measurements" where we "enact a set of potentials rather than another" (Fierke, 2017: 152). Even though these measurements may go unnoticed to ourselves, it seems as though the Q methodological experiment process is able to simulate situations of superpositions before choosing among alternatives. In Q methodological research participants weigh statements and prioritise them. When they make their Q sort, they measure their state of mind related to how important an issue is in the context of the whole debate and make value-based decisions on how positive, neutral or negative an issue is to them on the provided scale.

In the border control example, this weighing would mean that participants ponder different aspects of automated border control, such as the costs of developing new technology, whether biometric data use and storage in border control represent an efficient and modern way of governing mobility or perhaps a danger for privacy and erosion of civil liberties for the citizens in the future, etc. (Lehtonen and Aalto, 2017). The idea is that these considerations have to be also reflected against other pertinent parts of the debate such as whether immigration is to be seen as a threat to homeland security and whether these automated border control systems take into account the protection of asylum seekers in a sufficient manner considering the dangers in sharing sensitive biometric identifiers such as fingerprints (Lehtonen and Aalto, 2017). In the terrorism example it would mean the experts weighing whether, e.g., the ideologies, attitudes, objectives, strategies, participants, allies, targets or techniques, etc. represent the most important characteristics of certain terrorist organisations (Koçak, 2012). While making these choices, participants take a measurement on themselves and, so to speak, collapse their wave function from the inside and provide quite nuanced and inter-comparable information on their subjective mental states. Their subjective view becomes observable in the order of statements, but before the Q sort, superposition defines their mind, in which all of the mentioned aspects of, e.g., terrorism or border control may be equally important; at least there probably has not been a need to prioritise as thoroughly before.

SHARED PRINCIPLES: QUANTUM COGNITIVE MODELS AND Q METHODOLOGY

Wendt considers quantum decision theory, or quantum cognitive models when discussing why we should not rely on expected utility in human decisions, but does not extend these considerations to the social scientific empirical level. There are similarities between Q methodology and quantum approaches to decision-making but the literature on the quantum models is of a highly technical nature for the social scientist while Q methodology is considerably more readily applicable in IR. Quantum models have very recently started spreading from mathematical psychology to social scientific research, but their use is by no means institutionalised or widely accepted even in psychology (Wendt, 2015). Almost exclusively published in the *Journal of Mathematical Psychology*, this research is based on numerical simulations and using, e.g., quantum master equations (see Khrennikova et al., 2014). Thus, the quantum models are at their core quantitative, while Q methodology has a quantitative phase but in essence is a qualitative methodology. It is nevertheless important to note some of the similarities these models share with Q methodology and potential future applications they might have in a social scientific research setting.

Quantum decision theory has gained footing since it addresses a largely documented empirical problem, namely that real-world decision-makers show system-

atic deviations from the expected rational utility maximisation, such as cognitive errors and bias (Waldner, 2017; Yearsley and Busemeyer, 2016).[15] David Waldner (2017: 231) sees quantum cognition as "the most promising approach to a non-classical understanding of humans and social life", with potentially "revolutionary consequences". Q methodology shares the view on deviations from rationality but it is much easier to understand and apply without prior knowledge of the mathematical-statistical processes involved than the quantum models.

Proponents of quantum decision models claim that the "mathematics of quantum mechanics formalise the uncertainty of cognitive processes" (Waldner, 2017: 228). Human behaviour is unpredictable, which suggests social scientific experiments to be probabilistic and potentially "mutually incompatible with one another", which are "characteristics attributed to quantum mechanics" as opposed to classical mechanics (Wright, 2007: 2026). We seem unable to predict how others will behave and how our own unconscious cognitive processes affect our decisions (Jervis, 2017). Nevertheless, ignoring those uncertainties would be harmful for our analyses, because a great deal of politics and social life in general involves non-standard situations, not referring to inadequate knowledge, but rather to numerous potentially realisable opportunities (Jervis, 2017). A superposition of alternatives, if you will, may be at issue.

Quantum cognitive models feature a "space of possible thoughts" or "judgement outcomes" and "subspaces corresponding to beliefs, opinions or choices" (Yearsley and Busemeyer, 2016: 101). In Q methodological terms those spaces would refer to the concourse, meaning all possible opinions or views on the issue-area at hand, and to the statement sample sorted on the grid. Quantum decision models also track the "decision-maker's current state of mind" (Yearsley and Busemeyer, 2016: 101), which, in Q methodology, is traced with the Q sorting process and the subsequent factor analysis. Quantum models furthermore follow the dynamics of how the state of mind evolves with time or presented stimuli (Yearsley and Busemeyer, 2016). The changing state of mind in Q methodology refers to the possibility to assign the participant to perform various Q sorts over time or with changing conditions of instruction (sort the statements as a conservative politician, or as an environmental activist would sort them, etc.) and the stimuli in Q methodology are the statements.

Quantum cognitive models usually employ observables, reflecting preferences of, e.g., "how confident a decision-maker feels about a particular choice" (Yearsley and Busemeyer, 2016: 102). This is exactly what Q methodology does, too, with the normal distribution-like grid, which requires the participants to weigh which choices they are the most assured about. However, Q methodology renounces observables as such. Even the roles of the researchers using Q methodology and quantum decision theory are similar: at one point "the maths ends" and "intuition has to take

over" (Yearsley and Busemeyer, 2016: 105). In Q methodology, the researcher utilises abductive reasoning to choose how to rotate and interpret the factors or view types arising from the data.

The aim of quantum decision models is to "compute probabilities for any relevant judgement outcome" (Yearsley and Busemeyer, 2016: 101). In Q methodology, the participant "projects probability distributions upon an otherwise undifferentiated concourse" (Stephenson, 1982: 238). However, it is important not to confuse these probabilities with predictions. Rather than predicting what will happen the method presents points of view that are likely to become operational in decision-making. As Stephenson (1987: 542) puts it, Q sorts are "in no way predictive; they are not hypotheses to be tested or falsified, but explorative probes". A well-structured Q methodological concourse models the options involved in a decision-making situation, but it is not likely that *all* relevant decision-makers would take part in the experiment process. Thus, predicting the future based on findings is not a strength to be associated with Q methodology. Nonetheless, the methodology offers an unusually systematic channel for the conscious and unconscious preferences of the participant to become operational in simulating decision-making situations in social scientific issues. Additionally, it allows for the comparison of these preferences with those of other participants. Instead of cause and effect explanations, it deals with "unpredictable, quantumised effects of factor theory", where the operant factors are "unknown to anyone beforehand" (Stephenson, 1982: 244).

Even though both Q methodology and the quantum models of decision-making use the formalism of quantum mechanics, the issue-areas they research are somewhat different. The interest of mathematical psychology is driven towards uncovering law-like mechanisms of behaviour by studying the relations of quantifiable stimuli and quantifiable behaviour outcomes. Q methodology is, in essence, more qualitative with an emphasis on the subject matter of the research, e.g. the social scientific issue at hand.

While the quantum models often measure behaviour with task performance, reaction times or the like, there are certain novel applications related to political science to take into account here. Polina Khrennikova (2016) lists the few pioneering applications to political scientific questions in detail. Their goal seems to be mathematically and statistically modelling voter preferences for the most part. Some of the studies take up the interesting task of modelling, e.g., why ideologically distant parties form coalitions in elections (Khrennikova, 2016). Another intriguing potential application for these quantum models is to research how voters without a clear political ideology – e.g. especially in the 'swing states' in the United States – make decisions on voting, since their decision-making rationale does not seem to follow the utility maximising logic but indeed seems to be more readily interpretable from 'quantum' formalism's point of view (Khrennikova et al., 2014; Khrennikova, 2016).

The quantum models might thus have future applications especially in quantitative social scientific research and not least in political science. However, there is no direct rivalry between Q methodology and the quantum models, since Q methodology does not aim to establish laws of behaviour or decision-making but focuses on the qualitative subject matter of social scientific research.

FROM INDIVIDUAL AGENCY TO COMPLEX ENTANGLEMENT

Viewed from the quantum social ontology perspective, agents and social structures are "mutually constitutive", and their relationship is not a "causal interaction over time, but a non-local synchronic state from which both are emergent" (Wendt, 2015: 260). Social structures, in Wendt's (2015: 259) view, are "superpositions of shared mental states". To elaborate, phenomena such as norms, culture and institutions require shared discourses for people to act according to them (Wendt, 2015). The "entanglement in a particular array of social norms and understandings increases the likelihood that some practices will manifest", precluding others (Miller, 2016: 377).

The participants in a Q methodological experiment, in a manner of 'quantum-speaking', interact with the society and with each other non-locally through the concourse and its statements. In Lehtonen and Aalto's (2017) border control study, the Q methodological statements have been drawn from the collective consciousness that re-enacts current societal norms, which is evident, e.g., in the assumption that states have the right to exercise border control in the first place. In the case of Koçak's (2012) terrorism study, the statements reflect the collective consciousness, e.g., in perceiving 'terrorism' as a problematic international phenomenon requiring global attention. Moreover, Albizua and Zografos' (2014) climate change research reflects the (almost) generally held idea that climate change is a salient policy issue with certain geographical areas more vulnerable to it than others.

The participants and the analyst in a Q methodological experiment are presumably entangled in a social context, a society. In the quantum view, there is rather intra-action among entangled people than interaction between fully separable agents (Wendt, 2015).[16] Wendt (2015: 172–173) argues, following Barad (2007), that we are continuously measured "on and by our environments", collapsing "our wave functions", which is how we constitute our independent agency. I would say that in Q methodology, intra-action is modelled in the concourse and its reduced format, the statement sample, which aim to represent the spectrum of views that manifests in the social context in question. The participants act as independent agents when they sort these statements, but they are also enacting, consciously or not, the societal values and understandings they have been subjected to. What is more, likeminded persons whose subjective Q sorts fall on the same factor (a similar view), form types of views but still exhibit a 'loading' of their own expressed on a scale from -1.00 to 1.00 on the factor. This loading represents their personal agency, i.e. how strongly they ad-

here to a certain view type. Their wave functions have thus collapsed in a similar way, but their specific loading expresses their unique view more precisely.[17]

In addition to social structures, the quantum view considers language as a similar superposition. According to Miller (2016: 366), "a shared language is like a quantum superposition (wave function) of possible meanings, which narrows down to one meaning when someone verbalises a particular meaning expressed in context" and thus excludes all other potentialities. Wendt agrees with this notion, which implies that words and concepts often lack strictly definite properties. How 'typical' a certain meaning is could be inferred via a survey, for instance, but in principle the meaning could be anything socially agreed upon (Wendt, 2015). Words, Q methodological statements and quantum physical particles are similar in this way: none of them have an intrinsic position (Wendt, 2015; Stephenson, 1983).

In practice, participants assign meanings to statements in a Q experiment when they sort them; meanings are not predetermined, similarly as in psychological inkblot tests (see Brown, 2002). E.g. in Albizua and Zografos' (2014) research, participants ponder whether water is to be considered as property, who should have the authority to make decisions on water use, and whether watering crops is to be accepted or not. In Koçak's (2012) study they weigh the ultimate goals and means of terrorist organisations, for instance, whether they intend to cause mass casualties. An example from Lehtonen and Aalto's (2017) research would be the way politicians conceive the collection of fingerprints in border control databases and the motivations behind it: is its aim to protect citizens, is it stricter government control that might prove discriminatory to certain groups of people or is it something else? How participants sort the statements in each of these cases thus expresses what kind of meaning participants assign to the statements or how their self-measured agency collapses into an actual manifestation from a superposed state.

This more 'direct' access to subjective agency that Q methodology has is a clear benefit when viewed against Wendt's idea of speech acts. According to Wendt (2015: 236), "speech acts interfere with trying to measure the true state of our interlocutors", which to him means that in social life, we can take "unmediated measurements" only of our own intentions, not those of others.[18] Precisely that is done in Q methodology, where self-observing subjects measure the states of their own minds, and the task of the researcher is to interpret how these measurements correlate with those of other self-observing subjects. However, as Q methodological statements are in the majority of cases verbal (textual), there is a danger that the participants interpret them dissimilarly. That is one of the potential pitfalls of Q methodological research. Then, even if two people sorted a statement in the same way (in the same slot), they still could have assigned different meanings to it. The goal for research design is to formulate the statements so that there is as little room as possible for interpretational differences, but understandably this cannot be fully

guaranteed. That is why the researcher interviews the participants after the sorting to verify that they have indeed understood the statements as similarly as possible and if they have not, the results cannot be regarded as valid.

The quantum view of social structures also takes a position on why everyone's subjective states of mind do not carry an equal weight or impact in the practical and political sense despite being entangled. Wendt (2015: 270) points out that there are people who have the "authority to speak for a state as a whole", dominant individuals who have a "first mover status" in collapsing a collective – e.g. a state's – wave function. Other individuals are restricted by the dominant actors' decisions. A state can be understood as a "quantum system of entangled particles" with a structure favouring its leaders (Wendt, 2015: 270). A state leader who makes the decision to detonate a nuclear weapon, for instance, will impact innumerable people, who cannot do anything about it but will have to live with the results. Of course one can also argue that in democracies this status of dominance is the result of a collective similar collapse in the minds of the constituents when they choose their leaders.

The categorisation into dominant and non-dominant subjectivities bears meaning when selecting the participants of Q methodological research. To gain results with impact and relevance, the participants of a Q study must be somehow influential in the area of interest. For example, if we inquire into how a policy should evolve, politicians and stakeholders involved in and presumably able to influence decision-making would be fitting candidates.[19] Of course, the spectrum of both Q methodological and social scientific research is wide, and populations of interest vary. Q methodological participants need to be relevant for the research topic, but not necessarily elite. In the case of policy research the aim is to find types of views that represent different desirable policy options to prioritise and, potentially, points of consensus that the view types share. The prerequisite is a well selected sample of participants, where, e.g., all political parties are represented proportionally, to give a simplistic example.

Even though this discussion of dominant subjectivities and the previous examples that concentrate on somewhat powerful individuals, i.e. the political elite, may sound ethically less than ideal since it is not possible or fruitful to examine the subjective truths of everyone on the planet, interestingly there is quite the potential for an ethical move stemming from the quantum ontology, where everything is connected. "In an entangled world, there are no externalities", as Laura Zanotti (2017: 16) puts it. According to Zanotti (2017), assuming the world works through linear causal relations or universal laws may suppress political imagination and instigate political choices based on abstract suppositions, which end up in inadvertent consequences. In Wendt's (2015) and Karen Barad's (e.g. 2007) work, the possibilities for ethical action open up from rejecting atomism's separability, which carries with it the "notions of individuality, rationality, and universal normativity" (Zanotti, 2017: 12). Zanotti (2017: 17) explains how the quantum view breaks away from the preceding

IR philosophies of science: in it, significant agency is not "stifled by the structuralist commitment to the stabilising effects of structures" (referring to Waltz's neorealism) or by "the inescapable features of an oppressive and alienating social order" (as in Agamben's post-structuralism). Quantum-based ethics is an "enterprise focused on potentialities" (Fierke, 2017: 153). That is to say, communitarian values stem from conceiving the world (and not only humans) as ultimately connected and able to engage in intentional agency for the common good.

CONCLUSION: FORKING PATHS CONVERGE

I set out to demonstrate how Wendt's quantum social ontology could be brought into the sphere of empirical research by pairing it with a methodology that shares parallel purposes and principles with quantum physics. The subjective, intentional agency of humans can be studied with Q methodology, whether it means perceiving the metaphysical views as an ontological reality, an analogy, a formalism or a heuristic device. My aim has not been to join any potential social scientific quantum revolution which would claim only this ontological view is pertinent. Rather, my goal has been to demonstrate the vast built-in compatibility that exists between Wendt's ontology and Q methodology. The principles of quantum physical scientific measurements are similar to Q methodology's experiment processes in, e.g., that the observer and the observed are perceived as inseparably entangled and the states of mind or energy cannot be observed in full, but rather any observations are complementary to others. When a measurement is made, the innumerable potential outcomes collapse into an actual one.

It remains to be seen whether the 'quantum turn' will finally become a genuinely new direction or even a U-turn for IR, but at least we can say there are empirical prospects to explore in the more practical applications of the quantum social ontology and Q methodology. This article has shown why the ontology and methodology are in principle well-suited to be used together and can be employed for studying complex subjective agency. When it comes to other research methodologies in the context of the quantum social ontology, there are possible future avenues for conversation and mutual learning between scholars using Q and those using other post-positivist methodologies to be considered. The potential for ethical action stemming from the quantum(-like) connectedness of the world merits more attention in IR research, as does the study of subjectivity where agency is not restricted by rational choice, 'human nature', or a fixed position of power or powerlessness.

ENDNOTES

[1] E.g. neorealists, neoliberals, constructivists, proponents of the English school and (neo-)Marxists.

[2] According to Wendt (2015: 19) experienced subjectivity within IR has not been taken seriously "outside phenomenology, psychoanalysis and feminist theory".

[3] See, e.g., the special issues of *Millennium* (2018), *Journal for the Theory of Social Behaviour* (2018) and *Critical Review* (2017).

[4] See Hensel and Mitchell (2015) for the Correlates of War project.

[5] I use the term "turn" quite lightly here. There are others besides Wendt within IR who are inspired by quantum mechanics – e.g. James Der Derian leads a research team (and a major research project: 'Project Q') concentrated on the study of peace and security making use of quantum concepts (see, e.g., Der Derian, 2013; projectqsydney.com). Furthermore, the attempt to use the 'quantic reality' in formulating worldviews is not Wendt's alone. E.g. Barad (2007) and Kallio-Tamminen (2006) have made similar efforts.

[6] For Stephenson (1982, 1983, 1985, 1986c), communicability, the sharing of knowledge, is more important in the study of subjectivity than consciousness and mind.

[7] In the common interpretation, quantum-like behaviour only occurs in closed or controlled environments with temperatures near absolute zero and the brain is far from those circumstances (Waldner, 2017).

[8] First published in Stephenson (1953).

[9] Recent applications of Q methodology in policy research consist mostly of environmental issues such as air pollution (Sprujit et al., 2016), sustainability policy development (Curry et al., 2013), climate change policy (Albizua and Zografos, 2014) and sustainable energy policy (Ligtvoet et al., 2016; Kilpeläinen et al., 2019).

[10] The Q methodological experimentation process in IR is described in detail, e.g., in Dryzek et al. (1989).

[11] The use of quantitative procedures may actually explain the reluctance of some qualitatively oriented social scientists to consider using Q methodology.

[12] Interpretive research methodology encompasses, e.g., ethnographical, phenomenological and action research methods and is similar to Q methodology in many senses. For example, both Q and interpretive research in general aim at knowledge generation as opposed to gathering information and try to understand how people make meanings in social contexts. They both combine different techniques to gain more complete (qualitative) understandings of subjective orientations. For an introduction to interpretive research design, see Schwartz-Shea and Yanow (2012).

[13] That is, in any manner on the provided grid. Sometimes a more 'free' distribution, e.g., in the shape of a square may be used, but that is likely to accentuate the tendency of people to agree with most things and eliminate the benefits of requiring participants to prioritise statements.

[14] 40! equals 815915283247897734345611269596115894272000000000. In an ideal situation, there would of course be an infinite number of statements and slots for highly subtle subjective states, but for research purposes practical limitations apply. Moreover, the aim is to compare subjective states of mind, which requires a certain uniformity of the sorting process.

[15] Quantum cognitive models have had particular success in the treatment of 'order effects', which refer to a phenomenon where the order of posed questions affects the subsequent answers (see Wright, 2007). If social interaction would operate in a classical manner, this should not be a problem: a computer would not let the previous answers affect the following ones. In Q methodology, the phenomenon is less of an issue of a shared bias among participants in the sense that the order of presenting the statements is randomised.

[16] Barad (2007) develops the concept of intra-action in depth.

[17] A Q methodological analysis usually also reveals the idiosyncrasies of an individual consciousness, but they are left outside the interpretable factors.

[18] Although others, e.g. Butler (2001), question our ability to self-measure as well.

[19] Public opinion as such is not a suitable research topic for the small-n Q methodology. The prominence of Q methodological factors in larger populations can be tested, e.g., with surveys.

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