Switch on the Big Brother! Investigating the educational gradients in acceptance of online and public areas surveillance among European citizens

Maineri, Angelica M.; Achterberg, P.; Luijkx, R.

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:
Maineri, A. M., Achterberg, P., & Luijkx, R. (2022). Switch on the Big Brother! Investigating the educational gradients in acceptance of online and public areas surveillance among European citizens. *European Societies*, *24*(5), 628-656. https://doi.org/10.1080/14616696.2022.2043412

European Societies

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/reus20

Switch on the Big Brother! Investigating the educational gradients in acceptance of online and public areas surveillance among European citizens

Angelica M. Maineri, P. Achterberg & R. Luijkx

To cite this article: Angelica M. Maineri, P. Achterberg & R. Luijkx (2022) Switch on the Big Brother! Investigating the educational gradients in acceptance of online and public areas surveillance among European citizens, European Societies, 24:5, 628-656, DOI: 10.1080/14616696.2022.2043412

To link to this article: https://doi.org/10.1080/14616696.2022.2043412

EUROPEAN SOCIETIES
2022, VOL. 24, NO. 5, 628–656
https://doi.org/10.1080/14616696.2022.2043412

Switch on the Big Brother! Investigating the educational gradients in acceptance of online and public areas surveillance among European citizens

Angelica M. Maineri [a,b], P. Achterberg [a] and R. Luijkx [a,c]

[a]Department of Sociology, Tilburg University, Tilburg, Netherlands; [b]Erasmus School of Social and Behavioral Sciences (ESSB), Erasmus University Rotterdam, Rotterdam, Netherlands; [c]Department of Sociology and Social Research, University of Trento, Trento, Italy

ABSTRACT

In this study, we investigate whether, and why, individuals express different levels of acceptance of surveillance depending on their educational level, and whether this relationship varies with the level of digitalization and globalization expansion of their country. Additionally, we ask whether the type of surveillance (online surveillance vs cameras in public areas) conditions these differences. We build on two theoretical frameworks, one concerned with the resurgence of authoritarian values via the cultural backlash, and the other one explaining how different people analyse manufactured risks differently due to processes of reflexive modernization. In order to test the hypotheses, we employ data from the latest wave of the European Values Study (EVS) and implement multilevel multivariate regression models. Findings indicate that the lower educated individuals are more prone to accept online surveillance, due to their stronger authoritarianism and weaker reflexive mindset; however, there is no educational gradient in acceptance of video surveillance in public areas. Additionally, the countries' levels of digitalization and globalization expansion do not condition the educational gradient in acceptance of surveillance.

ARTICLE HISTORY Received 1 October 2021; Accepted 29 January 2022

EDITED BY Türkay Nefes

KEYWORDS Surveillance; privacy; security; risks; reflexive modernization; cultural backlash

Introduction

Alongside the development of sophisticated surveillance technologies, questions about the opportunity of their adoption emerge. The deployment of surveillance is presented by the monitoring institutions as a

CONTACT Angelica M. Maineri maineri@essb.eur.nl Erasmus School of Social and Behavioral Sciences (ESSB), Erasmus University Rotterdam, Burgemeester Oudlaan 50, Rotterdam 3062 PA, Netherlands

shield from physical risks, deemed to increase safety and the perception thereof (Trüdinger and Steckermeier 2017; van Heek *et al.* 2017). The technological component is justified by the increase in efficiency and accountability, and by the reduction of bias (Brayne 2017). However, surveillance generates risks for the monitored subjects (Wester and Giesecke 2019) and is privacy-intrusive (van Heek *et al.* 2017: 80), as individuals may lose control over what is known about them and by whom, or feel the need to self-censor themselves to comply with the monitoring activities (Degli Esposti and Santiago Gómez 2015). Moreover, technology-driven surveillance tools are not unbiased: the collection, processing, and recombination of data reinforce existing inequalities by disproportionately targeting already-vulnerable social groups, e.g. people with a low SES, or minorities (Lutz 2019; Brayne 2017; Mann and Matzner 2019).

Nowadays, lower educated individuals can be considered vulnerable. Not only a high level of education is more rewarded in the de-industralized labor markets of advanced economies (Bonoli 2007), but also in daily lives education enables people to navigate the complexity of the digital word more efficiently, as research on the digital divide has showed (for extensive reviews, see Lutz 2019; Scheerder *et al.* 2017). Lower educated individuals are also more exposed to cybercrime and social sorting by lagging behind with online privacy protection (Park and Chung 2017; Maineri *et al.* 2021).

A paradox emerges, since – despite their stronger exposure to harmful digital surveillance processes – lower educated individuals have been found to accept surveillance to a larger extent (Trüdinger and Steckermeier 2017; van den Broek *et al.* 2017). In these studies, education was only used as a control variable, underscoring the importance of exploring the mechanisms underlying this relationship. We propose two distinct explanations. While both theories predict higher acceptance of surveillance among lower educated individuals, they stress different sides of the tension between security and privacy risks unfolding within surveillance. The first explanation emphasizes the security side and draws on the cultural backlash thesis (Norris and Inglehart 2018), according to which lower educated individuals demand more surveillance because of their stronger authoritarian attitudes, ignited by the expansion of leftist-progressive policies and globalization. The second explanation focuses on privacy risks and, drawing on the reflexive modernization theory (Beck 1992), sees the larger tolerance of surveillance among the lower educated individuals as rooted in a lack of critical mindset, which hinders their

ability to recognize the risks entailed by a modern institution, i.e. government surveillance. Albeit the two theories are not completely alternative to each other when it comes to differences between individuals, the derived expectations are conditional on the type of surveillance under scrutiny and on the national context.

The research problem is therefore addressed at three levels. First, we look at differences among individuals. Lower educated individuals tend to hold authoritarian values (Stubager 2008; Van De Werfhorst and De Graaf 2004), and lack awareness over the functioning of institutions, essential to recognize 'modern' risks (Makarovs and Achterberg 2017): both mechanisms could explain their stronger support for surveillance. Second, individual-level mechanisms may be conditional upon the national context: while the cultural backlash hypothesis emphasizes how rapid social changes trigger a security demand among vulnerable social groups, reflexive modernization illustrates the knowledge gaps created by the diffusion of the ICTs. Third, the type of surveillance matters for its acceptance among citizens (van den Broek *et al.* 2017), with surveillance technologies in public areas more widely accepted than in private areas (Degli Esposti and Santiago Gómez 2015; van Heek *et al.* 2017). A privacy intrusion caused by surveillance is perceived as more problematic in online settings than in the public space; yet, the authoritarian appeal is likely to apply to both types of surveillance. In this study we gradually address the following questions:

RQ1: *To what extent and why is there an educational gradient in acceptance of surveillance?*

RQ2: *Is the educational gradient in acceptance of surveillance stronger in online settings compared to public areas?*

RQ3: *To what extent is the educational gradient in acceptance of surveillance conditioned by the degree of digitalization and globalization expansion in a country?*

Whereas previous studies on the acceptance of surveillance adopted a qualitative approach (Degli Esposti and Santiago Gómez 2015), focused on one country (Wester and Giesecke 2019; Trüdinger and Steckermeier 2017) or relied on convenience samples (van Heek *et al.* 2017), we add to the literature by using data from the European Values Study (EVS) 2017, which has been collected among representative samples of individuals from over 30 European countries.

Explaining acceptance of surveillance

Types of surveillance

Contemporary surveillance systems (or 'dataveillance', cf. Van Dijck 2014) often rely not only on the collection of information about individuals and their activities, but they also gather contextual information carrying great disclosure potential when re-combined. Facial recognition technologies, for instance, allow to follow single individuals moving across different places. Despite the high level of privacy-intrusiveness, surveillance, whether it is a monitoring of public areas or of internet communications, can be promoted by the institutions a security measure, as seen with the justification provided for the collection of internet data within the PRISM program unveiled by Edward Snowden (Lyon 2014).

However, the type of surveillance has implications for its acceptance among citizens (van den Broek *et al.* 2017; Degli Esposti and Santiago Gómez 2015; Wester and Giesecke 2019); for instance, people are more inclined to accept cameras in public locations than in private areas (Degli Esposti and Santiago Gómez 2015). In public spaces, it is implied that one's behavior is already visible to others, and there is a large consensus over what constitutes appropriate behavior, in compliance with the law but also with social norms (Hatuka and Toch 2017). Surveillance in public areas shields from risks which are socially acknowledged as such: deviance is possible, but it can be punished. Surveillance of communications exchanged online, instead, makes monitored subjects feel personally targeted, since the definition of what constitutes a risk online is less clearcut (Degli Esposti and Santiago Gómez 2015). Whilst it is relatively clear what behavior, if monitored in a public area, would produce a reaction from authorities, this is not straightforward when it comes to online behavior. Therefore, online surveillance may be perceived as more privacy-intrusive than surveillance in public areas.

The educational gradient

Security demand and cultural backlash

Surveillance as a way of protecting security is instrumental to the desire for 'law and order', which has been resurging in recent decades. The cultural revolution of the 1960s–1970s, which led to a more progressive political and cultural climate, created the space for the revival of conservative values starting from the 1980s (de Koster *et al.* 2008). The post-materialist value shift proposed by Inglehart (1977, 1981), has emphasized the

libertarian side of this new cultural climate: accordingly, due to the increased economic security after the second world war, people's priorities shifted from material issues (e.g. physical safety) to immaterial, or post-material, issues (e.g. self-expression). However, this perspective has failed to grasp the emergence of the neo-conservatist cultural climate which, combined with other factors, explains the success of extreme right-wing parties in Europe in the last decades (Ignazi 1992). According to Flanagan (1987), the loss of salience of economic issues has led to a non-materialist value change, in two different directions: libertarian (overlapping with Inglehart's understanding of post-materialism), and authoritarian. The authoritarian value pattern prioritizes non-economic issues, among which 'law and order' (Flanagan 1987).

Education stands out among the individual characteristics affecting the authoritarian/libertarian value dimension (Flanagan 1987). Education is thought to affect political attitudes via socialization (Van De Werfhorst and De Graaf 2004; Stubager 2008): students internalize values during their school years, and when in higher education 'a view is promoted that social reality is an ongoing human product in which individual action can make a difference' (Van De Werfhorst and De Graaf 2004: 215). As a result, higher educated individuals are generally more tolerant and libertarian compared to lower educated ones, who instead display authoritarian traits (Stubager 2008; Van De Werfhorst and De Graaf 2004).

After dismissing authoritarian values as a matter of old politics, Inglehart has revised his position, and proposed the concept of the cultural backlash (Norris and Inglehart 2018) to indicate the resurgence of authoritarian values among the vulnerable strata of the population (e.g. elderly, less educated individuals), as a reaction to the progressive-leftist policies threatening family values, and to the rapid growth of social diversity brought along by globalization (Norris and Inglehart 2018). Accordingly, the cultural backlash explains the support for populist authoritarian movements witnessed in recent decades in Europe and the US (Norris and Inglehart 2018). Hence, the relationship between education and acceptance of surveillance as an authoritarian reflex should be stronger in countries which underwent rapid social changes.

Reflexive modernization and knowledge gaps

Surveillance creates uncertainty for the monitored subjects, as their increased safety may come at the expenses of individual privacy (Trüdinger and Steckermeier 2017; Degli Esposti and Santiago Gómez 2015).

Arguably, this aligns with the idea of manufactured uncertainties (Price and Peterson 2016), key to Beck's risk society thesis (Beck 1992): in contemporary societies, individuals must co-exist with the threats posed by modern technological advances (Beck 1992).

Central to risk societies is reflexivity (Beck 1992), i.e. a critical questioning of modernity itself and of its achievements (Knight and Warland 2005) coupled with a progressive distancing from a dogmatic interpretation of knowledge (De Keere 2010). As a process of constant revision of modernity, reflexivity enables skepticism towards 'the notion that secular understandings of the world lead to a safer and more rewarding existence for humans' (Knight and Warland 2005: 257). In reflexive modern societies, technological and scientific advances are questioned (Price and Peterson 2016). For instance, individuals in countries with a higher rate of tertiary education enrollments and internet access displayed higher distrust in science (Price and Peterson 2016). This critical attitude towards progress enables awareness over the manufactured risks of modernity.

The inclusion in this process of revision of modernity is, however, stratified, as manifest in the 'new social divisions between the "information rich" and "information poor"' (Elliott 2002: 304), with the latter lacking resources to acknowledge the existence of modern risks. Empirical evidence on the role of education in this is mixed. When taking the lack of confidence in science as an expression of a critical attitude over modern institutions at the individual level, higher educated individuals were found to be *more* trusting of science rather than less (Price and Peterson 2016; De Keere 2010; Achterberg *et al.* 2017). Others found, however, that higher educated individuals in reflexively modern societies developed a heightened knowledge and awareness about the functioning of modern institutions rather than a generalized skeptical stance towards them. For instance, a high level of education in reflexively modern societies is negatively associated with the likelihood of getting the seasonal flu shot (Makarovs and Achterberg 2017), explained by the authors as a critical reaction to scientific progress. A study found that higher educated individuals in the US were not generally more skeptical about science, but that those who were also tended to translate their negative views into a lack of support for embryonic stem cell research to a larger extent than lower educated individuals (Nisbet and Markowitz 2014). Hakhverdian and Mayne (2012) found that the level of corruption of a country has detrimental effects on institutional trust only among the

higher educated individuals, suggesting that they are better able to critically evaluate the functioning of institutions.

The pre-requisite for the in-depth knowledge of modern institutions is the availability of information, fueled by the diffusion of ICTs. Albeit vast amount of information is available at little cost to a broader swath of individuals, it has become increasingly difficult to navigate the multiplicity of (often contradictory) sources. Therefore, rather than equalizing knowledge evenly, the diffusion of ICTs has created knowledge gaps, i.e. the differential growth in knowledge between the higher and lower social strata due to the easier and faster uptake of information of the former (Bonfadelli 2002). This mechanism has been extensively found in the literature (for a review, see Lind and Boomgaarden 2019). Therefore, the spread of ICTs in a country may facilitate the concentration of awareness about surveillance technology-related risks among the higher educated individuals.

Summary and hypotheses

The outlined theoretical framework, conceptually summarized in Figure 1, underscores the importance of education to understand attitudes towards surveillance, and provides some tentative explanations over the negative educational gradient in acceptance of surveillance (AoS) which was found in previous studies yet left unexplained (Trüdinger and Steckermeier 2017; van den Broek *et al.* 2017). In this section, we formalize the mechanisms and formulate hypotheses derived from the two theoretical strands (i.e. cultural backlash and reflexive modernization).

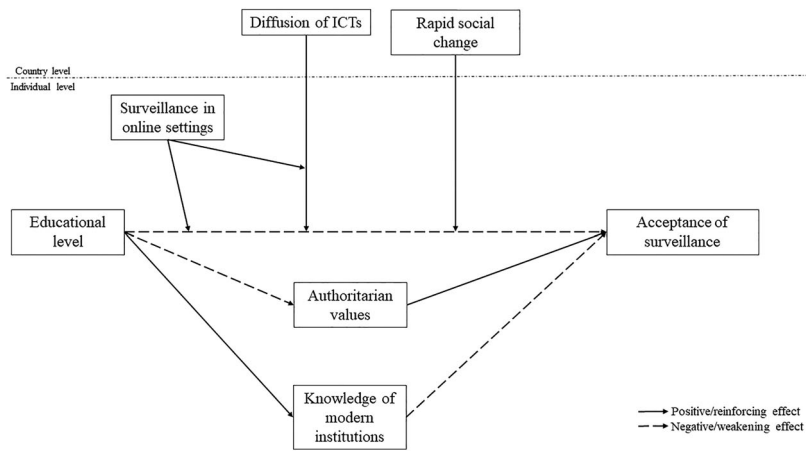

Figure 1. Conceptual model.

Authoritarian values feed AoS in the name of increased safety (de Koster *et al.* 2008). Since the lower educated respondents are more sensitive to the safety appeal of surveillance due to socialization processes (Stubager 2008; Van De Werfhorst and De Graaf 2004), we argue that they are more likely to accept surveillance regardless of the potential level of privacy intrusiveness. Hence, we expect that

HP1 *The negative association between education and AoS is equally strong for online surveillance and for public areas surveillance.*

HP2 *Acceptance of both public areas and online surveillance is higher among the lower educated individuals because of their stronger authoritarian attitudes.*

Additionally, according to the cultural backlash hypothesis (Norris and Inglehart 2018), the authoritarian reflex among the lower educated individuals is accelerated by social change, hence we expect that:

HP3 *The educational gradient in AoS is stronger, irrespective of the type of surveillance, in countries which recently underwent rapid globalization expansion.*

In contrast, the reflexive modernization perspective (Beck 1992) suggests that higher educated individuals, because of their knowledge of the functioning of modern institutions, would be better able to analyse the risks, as in gains and drawbacks associated with surveillance (Elliott 2002; Price and Peterson 2016, Hakhverdian and Mayne 2012; Nisbet and Markowitz 2014), leading to lower acceptance overall but also to a clearer differentiation between the types of surveillance. Due to the sensitivity of the information exchanged and to the differences in exposure and visibility associated with the two types of surveillance (cf. Hatuka and Toch 2017), we suspect that privacy risks are perceived more distinctly for online surveillance than for surveillance in public areas. Hence, we expect the heightened knowledge over modern institutions to reduce the strength of the relationship between education and AoS, only in online settings. The following hypotheses are formulated:

HP4 *The negative association between education and AoS is stronger for online surveillance than for public areas surveillance.*

HP5 *AoS online is higher among lower educated individuals because of their lower knowledge of modern institutions.*

In countries where digitalization processes are more widespread, the larger accessibility to information fosters awareness over the functioning of institutions. However, following the knowledge gap hypothesis

(Bonfadelli 2002), this occurs to a larger extent among higher educated individuals. Accordingly, we expect a steeper educational gradient in the acknowledgment of privacy risks in online surveillance where there is a larger availability of ICTs, flowing into the following hypothesis:

HP6 *The negative association between education and AoS in online settings is stronger in more digitalized countries.*

Data and methods

To study the impact of education on AoS at the individual level, we use data from the Integrated Dataset of the EVS, which collected data from representative samples of over 55,000 individuals in 34 countries[1] between 2017 and 2020 (EVS 2020). The main mode of data collection is face-to-face, but six countries implemented a mixed-mode design (see Luijkx *et al.* 2021).

To measure globalization expansion at the country-level, the study employs the KOF Globalization Index (Dreher 2006; Gygli *et al.* 2019), published by the KOF Swiss Economic Institute. This index has been designed to cover economic, political, social and cultural factors related to globalization (Dreher 2006). The revised dataset comprising data from 1970 until 2020 in all the countries included in EVS is used (for more details, see Gygli *et al.* 2019).[2]

Data on the level of digitalization of the country was collected by the World Economic Forum in the form of the Network Readiness Index (NRI).[3] The NRI data from 2016 contain information for all the countries in the EVS, except Belarus, which is excluded from the study.

Variables

To measure AoS, respondents expressed opinions on whether the government should have the right to:

- Keep people under video surveillance in public areas;
- Monitor all e-mails and any other information exchanged on the Internet.

[1]See the list of countries in the Appendix.
[2]The dataset is available at http://www.kof.ethz.ch/globalisation/.
[3]The dataset is available at https://reports.weforum.org/global-information-technology-report-2016/downloads/?doing_wp_cron=1637161624.8069250583648681640625. NRI now collected and published by the Portulans Institute; see https://networkreadinessindex.org.

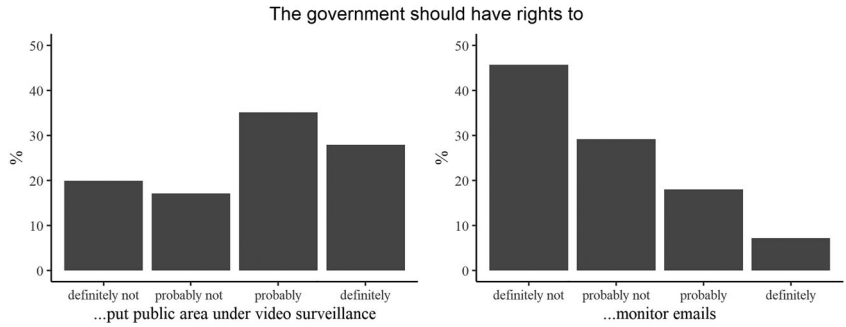

Figure 2. Distribution of the dependent variables ($N = 48{,}047$). Source: EVS (2020), own calculations.

Answer categories ranged from 1 (Definitely should have the right) to 4 (Definitely should not have the right); the coding has been reversed so that high values indicate high acceptance. Figure 2 reports the relative distribution of the two variables, which have a sizeable correlation (Pearson's $\rho = 0.45$, $p < 0.001$).

The main independent variable is the *educational attainment* of the respondent, measured by the European Survey ISCED (ES-ISCED) classification, an adaptation of the ISCED official classification designed by Schneider (2009). The ES-ISCED scale, devised as a metric variable, ranges from 0 (No formal or less than primary education) to 7 (Master's and higher level), excluding 84 cases with 'other' educational level (see Appendix for the distribution of educational attainment across countries).

Political authoritarianism is measured by an item from the democracy-autocracy preference scale, asking whether 'Having a strong leader who does not have to bother with parliament and elections' is a very good, fairly good, fairly bad or very bad way of governing this country; after reversing the scale, higher scores indicate stronger preference for a strong leader. The average scores vary across countries, with the lowest support for a strong leader found in Norway, the highest in Georgia (see Appendix).

The *awareness over the functioning of institutions* is measured by institutional knowledge (cf. Achterberg *et al.* 2017). Following Wegscheider and Stark (2020), we use a battery measuring the essential characteristics of democracy. The response categories range from 1 (Not at all an essential characteristic of democracy) to 10 (An essential characteristic of democracy).[4]

[4]In the self-administered version in Denmark and the Netherlands, category 0 (It is against democracy) was visible for respondents, instead of only coded if spontaneous. For the purposes of this analysis, the 10- or 11-categories versions are not differentiated.

A good knowledge of institutions is indicated by recognizing the following as essential characteristics of democracy:

- People choose their leaders in free elections;
- Civil rights protect people from state oppression;
- Women have the same rights as men;

and by recognizing the following as *non*-essential characteristics of democracy:

- The army takes over when government is incompetent;
- Religious authorities ultimately interpret the laws;
- People obey their rulers.

Respondents who answered 'Don't know' were also recoded into the low-knowledge category due to the nature of the questions.[5] After ascertaining the clustering of the items with a factor analysis (see Appendix), we added scores related to knowledge of democracy and the *reversed* scores related to the knowledge of authoritarian regimes, normalized them in a 0–1 range and subsequently multiplied them.[6] The resulting scores range between 0.00 and 1.00 (see Appendix the distribution of the average scores by countries).

Control variables include age, sex (recoded as female) and the mode of data collection to rule out potential mode effects. Table A2 (see Appendix) reports the descriptive statistics of the individual-level variables.

The KOF-GI is used to measure *globalization expansion*. To capture the *change* in globalization rather than its absolute value and better represent the theoretical mechanism, we subtracted the KOF-GI of 2017 from the one of 2007, and labeled it ΔKOF-GI: the higher the score, the more globalization has expanded in that country in the 10-year span. The distribution of ΔKOF-GI scores across countries is presented in Figure 3(a), ranging from −2.02 (Iceland) to 12.03 (Georgia), with a mean of 3.44 and a standard deviation of 3.43. Due to its skewness, the distribution was normalized using a Box Cox transformation (after

[5]Their answers were recoded to 0 in the three items indicating knowledge of democratic principle, and to 10 in the three items characterizing authoritarian regimes.

[6]Wegscheider and Stark (2020) justified the choice of multiplying by explaining that 'low knowledge of authoritarian regime principles as non-essential characteristics of democracy cannot be compensated by high knowledge about democratic ones' (Wegscheider and Stark 2020: footnote 4) and that robustness checks displayed similar results with an additive index.

Figure 3. (a) Distribution of the change in KOF Globalization Index between 2007 and 2017. Source: KOF Globalization Index (1970–2020), own elaboration (b) Distribution of the NRI across countries. Source: World Economic Forum 2016.

shifting the values above 0, and selecting 0.5 as the optimal λ value) and standardized. The resulting score varies between −2.9 and 2.2.

For the country's *level of digitalization*, we use the Network Readiness Index (NRI) (Baller *et al.* 2016). The NRI, based on 53 indicators, is designed to evaluate how countries leverage digital transformations, and ranges between 3.6 and 5.9 (mean = 4.8, sd = 0.68; see Figure 3(b)). Unsurprisingly, Northern European countries display higher levels of digitalization compared to Southern and Eastern European countries.

Analytical strategy

To test the hypotheses, we employ multivariate multilevel multiple linear regression models. Multiple regression models allow to control for several independent variables simultaneously. The multilevel feature enables to disentangle the variation within and between countries, and to test the interactions between individual- and contextual-level factors. Finally, the models are multivariate because the equations are estimated simultaneously on two highly correlated dependent variables. Through multivariate models, it is possible to directly test the equality of certain coefficients or variance components (Hox 2002). The multivariate multilevel set-up requires the specification of three levels (Snijders and Bosker 1999): (a) the dependent variables, here specified by two dummy variables, *public* and *online*, (b) individuals and (c) countries. All independent variables, and the constant, are multiplied by the DV dummy variables (Snijders and Bosker 1999), resulting in the estimation of two constants and two sets of fixed effects, one for each dependent variable. The interpretation of the coefficients resembles that of univariate models. In comparison to a classic multilevel model, there are additional

variance components, e.g. the correlation between the random effects of the two dependent variables.[7]

We built the models incrementally: after estimating an empty model to assess the variance allocated to each level, models testing the effect of the independent variables were estimated, adding mediators step-wise to better control their impact on the direct effect of education. Subsequently, the random slopes for education were added, to assess changes in the correlation between education and AoS across countries; finally, country-level predictors, interacted with individual educational attainment, were added. For the purposes of the analyses, all independent variables but dichotomous variables have been centered around the grand mean. Analyses are performed on R (R Core Team 2020) using several packages; the multilevel multivariate models are obtained with the package *nlme* (Pinheiro *et al.* 2020). The analytic sample includes 48,047 individuals nested in 33 countries, after deleting 12.5% of cases due to missing values (see Table A1 in Appendix). For preference for a strong leader and institutional knowledge, descriptive analyses showed that cases with missing values (respectively, 6.4% and 2.4%) tend to display lower AoS. However, alternative models (see Online Supplementary Materials[8]) showed that retaining these cases in the analytical sample by imputing values (either via mean imputation or FIML) does not lead to a substantial change in the results compared to the models with listwise deletion, which are hence presented in the manuscript.

Results

At a descriptive level (see Figure 4), surveillance in public areas is consistently more accepted than online. This is confirmed by the intercepts of the two variables in the regression models (see Table 1, M0), showing an average AoS of 2.66 ($p < 0.001$) for video surveillance in public areas, and 1.84 ($p < 0.001$) in online settings. There is variation across countries, with 11% of the variance of AoS in public areas, and 6% of the variance of AoS online, attributed to the country-level.

As concerns individual-level models, results are displayed in M1 to M4 in Table 1. In M1, a negative association between education and AoS is displayed only in online settings. The coefficient is small: at each

[7]The estimation of the correlations follows the procedure of Snijders and Bosker (1999) and documented via R syntax at https://www.stats.ox.ac.uk/~snijders/ch16.r (Accessed on 23 February 2022).
[8]See https://doi.org/10.17605/OSF.IO/M82KW (accessed on 23 February 2022) for supplementary materials and scripts.

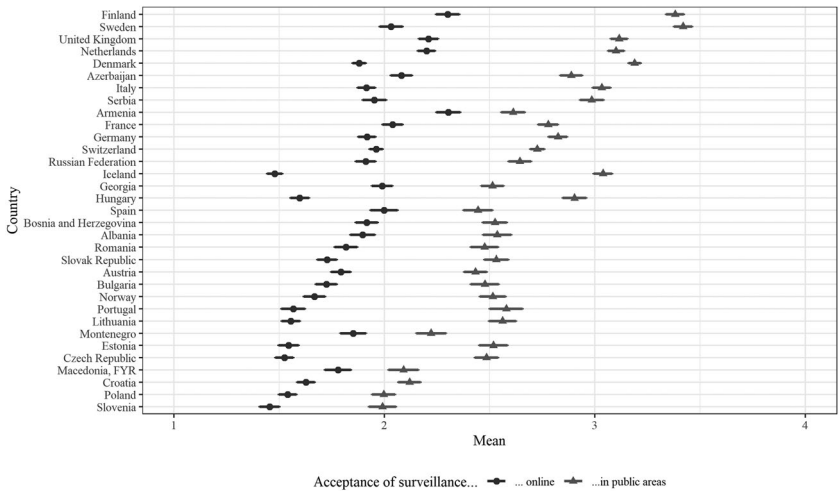

Figure 4. Average acceptance of surveillance by country with 95% confidence intervals. Source: EVS (2020). Own calculations.

additional attained level of education, acceptance of online surveillance drops by 0.04 ($p < 0.001$), i.e. the relative difference in AoS online between the lowest and the highest educated individuals is 0.28 on a 4-point scale (see Figure A4 in the Appendix for the predicted values of AoS by education). Regarding AoS in public areas, the association with education is not statistically significant. The coefficients of education on the two types of AoS are statistically different (Wald $chi^2 = 163.6$, $\Delta df = 1$, $p < 0.001$). These findings lead to reject the expectation of equal strength in the educational gradient regardless of the type of surveillance formalized in HP1, and to accept HP4, predicting the educational gradient to be stronger for online surveillance.

Both preference for a strong leader and institutional knowledge have significant and, respectively, positive and negative, associations with AoS. The magnitude of the effects is stronger for acceptance of online surveillance compared to acceptance of video surveillance in public areas: taking M4, when comparing the most knowledgeable individuals to the least knowledgeable ones, AoS drops by 0.14 when in public areas and by 0.53 when in online settings.[9] Interestingly, refusing to answer questions is significantly associated with lower AoS.

[9]Concerning control variables, AoS is positively associated with age, whereas the association with sex is not significant. Respondent in the self-administered mode show slightly higher AoS than respondents interviewed face-to-face.

Table 1. Multivariate multilevel linear regression model of AoS on individual and country characteristics ($N = 48{,}047$ nested in 33 countries).

	M0		M1		M2		M3		M4		M5		M6		M7	
Predictor	b	Sig.	b	Sig.	b	Sig.	b	Sig.	b	Sig.	b	Sig.	b	Sig.	b	Sig.
Fixed effects																
Type surveillance: public ×	2.66	***	2.65	***	2.65	***	2.65	***	2.65	***	2.65	***	2.64	***	2.65	***
Education			0.001		0.004		0.01	*	0.01	*	0.01		0.01		0.00	
Preference for strong leader					0.03	***			0.02	***						
Inst. Knowledge							−0.17	***	−0.14	***						
Age			0.003	***	0.003	***	0.003	***	0.004	***	0.003	***	0.003	***	0.003	***
Female			−0.01		−0.01		−0.01		−0.01		−0.01		−0.01		−0.01	
Mode: CAWI			0.09	***	0.09	***	0.09	***	0.09	***	0.09	***	0.09	***	0.09	***
Mode: Mail			0.07	*	0.07	*	0.06	*	0.06	*	0.06		0.06		0.06	
ΔKOF-GI													−0.11			
Education × ΔKOF-GI													0.01			
NRI															0.25	*
Education × NRI															−0.001	
Type surveillance: online ×	1.84	***	1.83	***	1.83	***	1.83	***	1.83	***	1.83	***	1.84	***	1.83	***
Education			−0.04	***	−0.03	***	−0.02	***	−0.02	***	−0.04	***	−0.04	***	−0.04	***
Preference for strong leader					0.09	***			0.05	***						
Inst. Knowledge							−0.59	***	−0.53	***						
Age			0.01	***	0.01	***	0.01	***	0.01	***	0.01	***	0.01	***	0.01	***
Female			−0.001		0.001		−0.01		−0.01		0.000		0.000		0.000	
Mode: CAWI			0.06	*	0.06	*	0.08	***	0.08	***	0.06	*	0.06	*	0.06	*
Mode: Mail			0.11	***	0.11	***	0.10	***	0.10	***	0.11	***	0.12	***	0.11	***
ΔKOF-GI													0.08			
Education × ΔKOF-GI													0.002			
NRI															0.04	
Education × NRI															0.01	
Random effects																
Var(Country | public)	0.14		0.13		0.13		0.13		0.13		0.13		0.12		0.10	

Var(Country | online)	0.06	0.06	0.05	0.05	0.05	0.06	0.05	0.06
Cor(Country | public, Country | online)	0.54	0.52	0.57	0.56	0.59	0.51	0.67	0.52
Var(Education | public)						0.001	0.001	0.001
Var(Education | online)						0.00	0.00	0.00
Cor(Education | public, Education | online)						0.71	0.72	0.72
Cor(Country | public, Education | public)						−0.41	−0.38	−0.46
Cor(Country | public, Education | online)						−0.26	−0.33	−0.26
Cor(Country | online, Education | public)						−0.16	−0.15	−0.26
Cor(Country | online, Education | online)						0.04	0.03	0.02
Var(Individual | public)	1.04	1.04	1.04	1.04	1.04	1.03	1.03	1.03
Var(Individual | online)	0.86	0.84	0.84	0.83	0.82	0.84	0.84	0.84
Cor(Individual | public, Individual | online)	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

Notes: b = coefficient; sig = Significance; Var = Variance; Cor = Correlation. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

Turning to the mediating effects, preference for a strong leader and low institutional knowledge among lower educated individuals[10] partially explain the educational gradient in AoS online. The coefficient indicating the educational gradient in AoS (b = −0.04, $p < 0.001$, cf. M1) shrinks in size when adding the mediators. Institutional knowledge accounts for a stronger reduction in the direct association between education and AoS in online settings (b = −0.02, $p < 0.001$, cf. M3) compared to the preference for a strong leader (b = −0.03, $p < 0.001$, cf. M2). For surveillance in public areas, the coefficient for education remains small in size, but turns positive and significant (b = 0.01, $p < 0.05$, cf. M4). This leads to a partial support of HP2, since authoritarian attitudes mediate the association between education and AoS when online but not when in public areas. However HP5, predicting the educational gradient in AoS online – and not that in AoS in public areas – to be explained by institutional knowledge, is supported.

The explanatory power of the models is weak. When including all individual-level independent variables (M4), only 5% of the variance of AoS in online settings and <1% of the variance of AoS in public areas is explained.[11] The last row of Table 1 reports the residual correlation between the two types of surveillance, which remains stable, indicating that the individual-level characteristics hereby considered do not account for the correlation between the two types of AoS.

As for country-level models, the results are reported in M5 to M7 in Table 1. The random slopes for education, Var(Education | public/online), are negligible in size (0.001, cf. M5). However, a conditional likelihood ratio test (LR chi2 = 144.8, Δdf = 7, $p < .0001$) indicates an improvement in the random slope model (M5) compared to the random intercept model including the same fixed effects (M1), indicating variation across countries in the educational gradient in AoS (see Figure A5 in Appendix).

For both types of surveillance, the association between education and AoS does not vary with ΔKOF-GI (see Figure 5), as the coefficients of the interactions are not significant (respectively, b = 0.01, $p > 0.05$, and b = 0.002, $p > 0.05$; cf. M6), and little additional variance is explained at the country-level. Given that the educational gradient in AoS is not larger in countries that underwent rapid globalization expansion, HP3 is rejected.

[10]Preference for a strong leader has a negative correlation with education (rho = –0.15, $p < 0.001$) whereas institutional knowledge has a positive correlation with education (rho = 0.21, $p < 0.001$), in line with the theoretical expectations.

[11]Due to composition effects, the model accounts for 4% of the country-level variance of AoS in public and 7% for AoS online.

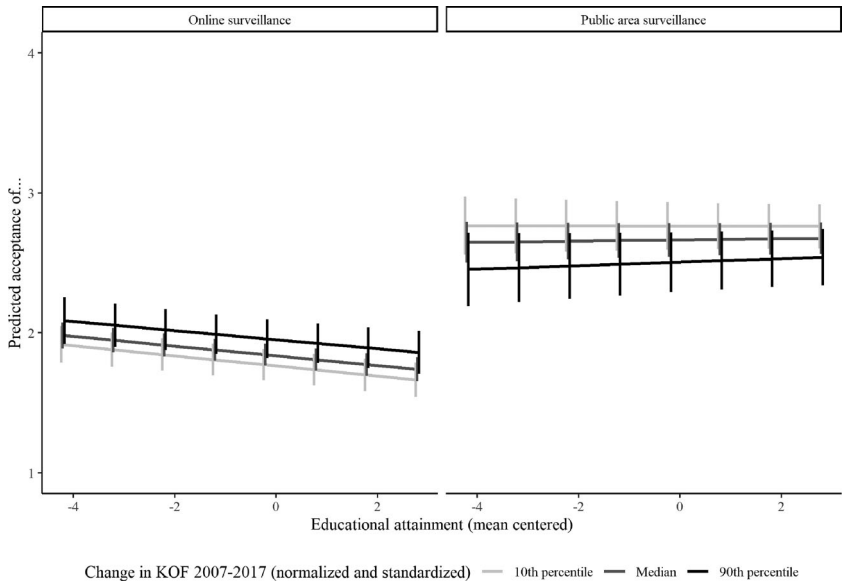

Figure 5. Predicted acceptance of surveillance by education and change in KOF Globalization Index (based on M6 in Table 1). Source: EVS (2020). Own calculations.

The cross-level interaction between the level of digitalization and education on AoS in online settings is also not significant (b = 0.01, $p > 0.05$; cf. M7 and Figure 6). Since the negative educational gradient in AoS online is not steeper in more digitalized countries, HP6 is rejected. Interestingly, AoS in public areas is higher in more digitalized countries and explains 20 percentage point of country-level variance in addition to M5. As for AoS in online settings, however, there is no variation by levels of NRI, and little additional variance is explained.

Discussion

The definition of the governments' rights to monitor citizens using digital surveillance tools constitutes a key challenge for policymaking nowadays. Despite the safety narrative promoted by monitoring institutions, surveillance generates risks for the monitored subjects, especially in terms of privacy invasion. Inspired by earlier studies suggesting a stronger acceptance of surveillance among lower educated individuals (Trüdinger and Steckermeier 2017; van den Broek *et al.* 2017), we investigated the underlying mechanisms of this relationship, as well as their conditionality upon national contexts and types of surveillance. We aimed at understanding whether, and why, social groups potentially more exposed to the negative

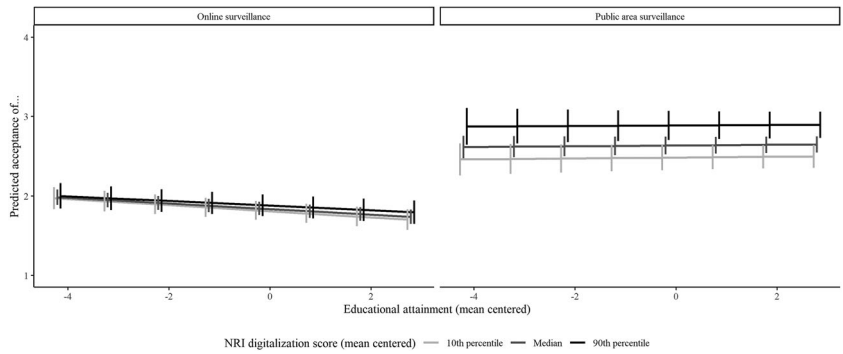

Figure 6. Predicted acceptance of surveillance by education and NRI (based on M7 in Table 1). Source: EVS (2020). Own calculations.

consequences of extensive surveillance may also be more willing to grant the government surveillance rights.

We found that the type of surveillance affects its acceptance. Online surveillance encounters more resistance than surveillance in public areas, confirming that citizens are more wary of government scrutiny when it violates the private sphere, aligning with previous findings (cf. van den Broek *et al.* 2017; Degli Esposti and Santiago Gómez 2015; Wester and Giesecke 2019). However, not only do people differentiate among types of surveillance, but also the explanatory mechanisms differ. Most notably, the negative educational gradient in AoS was only found in online settings, with lower educated individuals more willing to allow government surveillance on the communications exchanged on the internet compared to higher educated individuals. Yet, no sizeable educational gradient was found for the acceptance of video surveillance in public areas. Hence, despite the strong correlation between the two types of acceptance, it is advised to examine them separately.

Higher educated individuals appear more wary of potentially invasive governmental online surveillance due to their greater awareness of the workings of modern institutions, confirming the relevance of the reflexive modernization perspective to explain risk stratification at the individual-level. Against the expectations flowing from reflexive modernization, however, the larger availability of information does not deepen the cleavage between the higher and lower educated strata in society. Nevertheless, the higher AoS in public areas in more digitalized countries, combined with a stable level of AoS online, suggests a sharper differentiation among the types of surveillance in more digitalized countries, which may be explored in future studies.

Results regarding the authoritarian reflex are puzzling. Overall, the preference for a strong leader is positively associated with both types of surveillance, showing the power of the institutional 'safety' narrative. However, this fails to fully explain the educational gradient in AoS, which is mediated when in the online sphere but not in public areas. The rapid expansion of globalization which supposedly drove a security demand among the lower educates individuals is mostly unrelated to AoS. Taken together, these findings lead to discard the expectations derived from the cultural backlash theory. There are, however, some limitations. Regarding measurement, the change in the KOF-GI might not be able to adequately capture the social change that Norris and Inglehart (2018) identified as the spark of the backlash. Future studies may investigate different signals of social change. Second, the cultural backlash might not apply to AoS because of the general securitarian political climate associated with surveillance nowadays. The political landscape of the whole continent, also in countries involved for longer time in globalization processes, has seen an increment in right-wing authoritarian movements who leverage societal threats, e.g. terror attacks occurred in Europe, to promote a securitarian narrative which justifies governmental surveillance efforts, with little room for opposition.

Another methodological limitation in our study is item non-response. Though this problem is not uncommon in studies relying on survey data, it appears particularly problematic when dealing with attitudes towards surveillance, and warrants caution in future studies using these variables.

Generally, as concerns differences among individuals, the educational gradient in AoS online was found to be explained by a combination of factors, with a higher tolerance for online surveillance among lower educated individuals rooted in both a lack of awareness over the functioning of modern institutions and a stronger demand of authoritarianism. Additionally, institutional knowledge was found to be negatively associated with AoS in public areas, indicating that individuals more critical towards modern institutions also perceive manufactured risks stemming from video surveillance systems – which are highly relevant, thinking for instance of systems such as facial recognition technologies. These findings seem to challenge one of the assumptions of the security-privacy trade-off model (van Heek *et al.* 2017), according to which people are willing to renounce to privacy in exchange for more security. Our study provides some evidence that privacy risks, rather than being willingly accepted, are not fully acknowledged among vulnerable strata of the population. Questioning the accuracy of the assessment of

privacy-related risks is an important task for future studies (cf. Marwick and Hargittai 2018), as it directly challenges the legitimacy of policies regulating the use of new invasive surveillance systems. After all, vulnerable populations also tend to live in areas with higher crime rates, more likely to be surveyed, and feeding a recursive loop, with technology-generated risks made more likely among groups that need protection from safety risks.

Additionally, albeit our results showed differences across countries in the educational gradients in AoS, the two explanations hereby considered – the knowledge gaps enabled by uneven levels of digitalization and the cultural backlash sparked by the expansion of globalization processes – failed to explain them. Future studies should investigate the role of different national characteristics, such as the legacy of authoritarian surveillance (cf. Samatas 2005) which may have left long-lasting effects on the way citizens assess the government's rights to surveillance.

Our study showed a negative educational gradient in accepting government surveillance of online communications, due to the lack of a reflexive mindset, and – to a lesser extent – stronger securitarian demand among lower educated individuals. The higher tolerance for online government surveillance among lower educated individuals and the risks it entails such as social sorting (Mann and Matzner 2019; Lyon 2005), becomes alarming when coupled with previous findings showing how lower educated individuals are less prone to manage their privacy online (Park and Chung 2017; Maineri *et al.* 2021). Future studies should extend the investigations to other dimensions of social vulnerability such as ethnicity, age and social class, so as to remain vigilant of potential vicious circles, whereby vulnerable strata support invasive surveillance policies yet also lack the resources to shield themselves from potential harms, reinforcing inequalities. Our findings underscore the importance of raising awareness about the potential benefits and dangers of online surveillance.

Acknowledgements

We thank the editor and anonymous reviewers for the constructive comments, and G. Cassani and E. Costantini for their suggestions on the analytical approach.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Angelica M. Maineri is a PhD student at the Department of Sociology, at Tilburg University. After five years spent as the assistant of the Methodology Group of the European Values Study, she is now Data Manager at the Open Data Infrastructure for Social Science and Economic Innovation (ODISSEI) hosted at the Erasmus University Rotterdam. Her substantive research mostly focuses on privacy and surveillance in the digital era, but she also works on (Web) survey methodology.

Prof. Dr. *Peter Achterberg* is a professor of Sociology at the Department of Sociology, at Tilburg University. He is a cultural sociologist with a general interest in studying cultural, political, and religious change in the West.

Dr. *Ruud Luijkx* is an Associate Professor at Tilburg University and Visiting Professor at the University of Trento. He is the Chair of the Executive Committee and Chair of the Methodology Group of the European Values Study. His research interests revolve mostly around social stratification and mobility.

ORCID

Angelica M. Maineri http://orcid.org/0000-0002-6978-5278
P. Achterberg http://orcid.org/0000-0002-2365-6382
R. Luijkx http://orcid.org/0000-0002-9698-2891

References

Achterberg, P., de Koster, W. and van der Waal, J. (2017) 'A science confidence gap: education, trust in scientific methods, and trust in scientific institutions in the United States, 2014', *Public Understanding of Science* 26(6). doi:10.1177/0963662515617367.

Baller, S., Dutta, S. and Lanvin, B. (2016) *The Global Information Technology Report 2016 Innovating in the Digital Economy*. Tech. rep.: 1–48. https://www.weforum.org/reports/theglobal-information-technology-report-2016.

Beck, U. (1992) *Risk Society: Towards a New Modernity*, London: Sage, pp. 260. doi:10.2307/2579937.

Bonfadelli, H. (2002) 'The internet and knowledge gaps: a theoretical and empirical investigation', *European Journal of Communication* 17(1): 65–84. doi:10.1177/0267323102017001607.

Bonoli, G. (2007) 'Time matters. Postindustrialization, new social risks, and welfare state adaptation in advanced industrial democracies', *Comparative Political Studies* 40(5): 495–520. doi:10.1177/0010414005285755.

Brayne, S. (2017) 'Big data surveillance: the case of policing', *American Sociological Review* 82(5): 977–1008. doi:10.1177/0003122417725865.

De Keere, K. (2010) 'Wantrouwen in wetenschap: een kwestie van reflexiviteit of maatschappelijk onbehagen?', *Sociologie* 6(1): 26–45. https://www.aup.nl/journal-downloads/sociologie/ts2010006001002.pdf.

de Koster, W., van der Waal, J., Achterberg, P. and Houtman, D. (2008) 'The rise of the penal state. NeoLiberalization or new political culture?', *British Journal of Sociology* 48: 720–34. doi:10.1093/bjc/azn057.

Degli Esposti, S. and Santiago Gómez, E. (2015) 'Acceptable surveillance-orientated security technologies: insights from the surprise project', *Surveillance and Society* 13(3–4): 437–54. doi:10.24908/ss.v13i3/4.5400.

Dreher, A. (2006) 'Does globalization affect growth? Evidence from a new index of globalization', *Applied Economics* 38(10): 1091–1110. doi:10.1080/00036840500392078.

Elliott, A. (2002) 'Beck's sociology of risk: a critical assessment', *Sociology* 36(2): 293–315. doi:10.1177/0038038502036002004.

EVS (2020) *European Values Study 2017: Integrated Dataset (EVS 2017)*. Version 4.0.0. Cologne. doi:10.4232/1.13560.

Flanagan, S. C. (1987) 'Value change in industrial societies: reply to Inglehart', *The American Political Science Review* 81(4): 1303–19.

Gygli, S., Haelg, F., Potrafke, N. and Sturm, J. E. (2019) 'The KOF globalisation index – revisited', *Review of International Organizations* 14(3): 543–74. doi:10.1007/s11558-019-09344-2.

Hakhverdian, A. and Mayne, Q. (2012) 'Institutional trust, education, and corruption: a micro-macro interactive approach', *Journal of Politics* 74(3): 739–50. doi:10.1017/S0022381612000412.

Hatuka, T. and Toch, E. (2017) 'Being visible in public space: the normalisation of asymmetrical visibility', *Urban Studies* 54(4): 984–98. doi:10.1177/0042098015624384.

Hox, J. J. (2002) *Multilevel Analysis: Techniques and Applications*, Mahwah, NJ: Lawrence Erlbaum Associates.

Ignazi, P. (1992) 'The silent counter-revolution: hypotheses on the emergence of extreme right-wing parties in Europe', *European Journal of Political Research* 22 (1): 3–34. doi:10.1111/j.1475-6765.1992.tb00303.x.

Inglehart, R. (1977) *Silent Revolution: Changing Values and Political Styles Among Western Publics*, Princeton, NJ: Princeton University Press.

Inglehart, R. (1981) 'Post-materialism in an environment of insecurity', *The American Political Science Review* 75(4): 880–900.

Knight, A. J. and Warland, R. (2005) 'Determinants of food safety risks: a multi-disciplinary approach', *Rural Sociology* 70(2): 253–75. doi:10.1526/0036011054776389.

Lind, F. and Boomgaarden, H. G. (2019) 'What we do and don't know: a meta-analysis of the knowledge gap hypothesis', *Annals of the International Communication Association* 43(3): 210–24. doi:10.1080/23808985.2019.1614475.

Luijkx, R., Jónsdóttir, G. A., Gummer, T., Ernst Stähli, M., Frederiksen, M., Ketola, K., Reeskens, T., Brislinger, E., Christmann, P., Gunnarsson, S. and Hjaltason, Á. B. (2021) 'The European values study 2017: on the way to the future using mixed-modes', *European Sociological Review*. doi:10.1093/esr/jcaa049.

Lutz, C. (2019) 'Digital inequalities in the age of artificial intelligence and big data', *Human Behavior and Emerging Technologies* 1(2): 141–8. doi:10.1002/hbe2.140.

Lyon, D. (2005) *Surveillance as Social Sorting. Privacy, Risk, and Digital Discrimination*, ed. D. Lyon, London/New York: Routledge. doi:10.1017/CBO9781107415324.004, arXiv: arXiv:1011. 1669v3.

Lyon, D. (2014) 'Surveillance, Snowden, and big data: capacities, consequences, critique', *Big Data and Society* 1(2): 1–13. doi:10.1177/2053951714541861.

Maineri, A. M., Achterberg, P. and Luijkx, R. (2021) 'The closing educational gap in e-privacy management in European perspective', *Sociological Research Online*, 1–21. doi:10.1177/13607804211023524.

Makarovs, K. and Achterberg, P. (2017) 'Contextualizing educational differences in "vaccination uptake": a thirty nation survey', *Social Science and Medicine* 188: 1–10. doi:10.1016/j.socscimed.2017.06.039.

Mann, M. and Matzner, T. (2019) 'Challenging algorithmic profiling: the limits of data protection and antidiscrimination in responding to emergent discrimination', *Big Data & Society*, 1–11. doi:10.1177/2053951719895805.

Marwick, A. E. and Hargittai, E. (2018) 'Nothing to hide, nothing to lose? Incentives and disincentives to sharing information with institutions online', *Information Communication and Society* 22(12): 1–17. doi:10.1080/1369118X.2018.1450432.

Nisbet, M. and Markowitz, E. M. (2014) 'Understanding public opinion in debates over biomedical research: looking beyond political partisanship to focus on beliefs about science and society', *PLoS One* 9: 2. doi:10.1371/journal.pone.0088473.

Norris, P. and Inglehart, R. (2018) *Cultural Backlash Trump, Brexit, and the Rise of Authoritarian Populism*, New York: Cambridge University Press, pp. 1–37.

Park, Y. J. and Chung, J. E. (2017) 'Health privacy as sociotechnical capital', *Computers in Human Behavior* 76: 227–36. doi:10.1016/j.chb.2017.07.025.

Pinheiro, J., Bates, D., DebRoy, S., Sarkar, D. and Core Team, R. (2020) *nlme: Linear and Nonlinear Mixed Effects Models*. R Package Version 3.1-149. https://CRAN.R-project.org/package=nlme.

Price, A. M. and Peterson, L. P. (2016) 'Scientific progress, risk, and development: explaining attitudes toward science cross-nationally', *International Sociology* 31 (1): 57–80. doi:10.1177/0268580915614593.

R Core Team (2020) *R: A Language and Environment for Statistical Computing*, Vienna: R Foundation for Statistical Computing. https://www.R-project.org/.

Samatas, M. (2005) 'Studying surveillance in Greece: methodological and other problems related to an authoritarian surveillance culture', *Surveillance and Society* 3 (2–3): 181–97. doi:10.24908/ss.v3i2/3.3500.

Scheerder, A., van Deursen, A. J. and van Dijk, J. A. (2017) 'Determinants of internet skills, use and outcomes. A systematic review of the second- and third-level digital divide', *Telematics and Informatics* 34(8): 1607–24. doi:10.1016/j.tele.2017.07.007.

Schneider, S. L. (2009) 'Confusing credentials: the cross-nationally comparable measurement of educational Attainment', Ph.D. thesis, Department of Sociology, Oxford. doi:10.13140/RG.2.2.35997.51683.

Snijders, T. A. B. and Bosker, R. J. (1999) 'Chap. 13: multivariate multilevel models', in *Multilevel Analysis. An Introduction to Basic and Advanced Multilevel Modeling*, Sage Publications, pp. 200–6.

Stubager, R. (2008) 'Education effects on authoritarian-libertarian values: a question of socialization', *British Journal of Sociology* 59(2): 327–50. doi:10.1111/j.1468-4446.2008.00196.x.

Trüdinger, E. M. and Steckermeier, L. C. (2017) 'Trusting and controlling? Political trust, information and acceptance of surveillance policies: the case of Germany', *Government Information Quarterly* 34(3): 421–33. doi:10.1016/j.giq.2017.07.003.

Van De Werfhorst, H. G. and De Graaf, N. D. (2004) 'The sources of political orientations in post-industrial society: social class and education revisited', *British Journal of Sociology* 55(2): 211–35. doi:10.1111/j.1468-4446.2004.00016.x.

van den Broek, T., Ooms, M., Friedewald, M., van Lieshout, M. and Rung, S. (2017) 'Chap 1: privacy and security. Citizens' desires for an equal footing', in M. Friedewald, J. P. Burgess, J. Cas, R. Bellanova and W. Peissl (eds.), *Surveillance, Privacy and Security. Citizens' Perspective*, pp. 15–35. doi:10.1109/MPRV.2015.11.

Van Dijck, J. (2014) 'Datafication, dataism and dataveillance: big data between scientific paradigm and ideology', *Surveillance & Society* 12(2): 197–208.

van Heek, J., Arning, K. and Ziefle, M. (2017) 'The surveillance society: which factors form public acceptance of surveillance technologies?', in M. Helfert, C. Klein, B. Donnellan and O. Gusikhin (eds.), *Smart Cities, Green Technologies, and Intelligent Transport Systems. VEHITS 2016, SMARTGREENS 2016. Communications in Computer and Information Science*, Cham: Springer, pp. 170–91.

Wegscheider, C. and Stark, T. (2020) 'What drives citizens' evaluation of democratic performance? The interaction of citizens' democratic', *Zeitschrift fur Vergleichende Politikwissenschaft*. doi:10.1007/s12286-020-00467-0.

Wester, M. and Giesecke, J. (2019) 'Accepting surveillance – an increased sense of security after terror strikes?', *Safety Science* 120: 383–7.

Appendix

List of countries included in EVS 2017–2020: Albania (AL); Armenia (AM); Austria (AT); Azerbaijan (AZ); Bosnia and Herzegovina (BA); Belarus (BY); Bulgaria (BG); Croatia (HR); Czechia (CZ); Denmark (DK); Estonia (EE); Finland (FI); France (FR); Georgia (GE); Germany (DE); Great Britain (GB); Hungary (HU); Iceland (IS); Italy (IT); Lithuania (LT); Montenegro (ME); Netherlands (NL); North Macedonia (MK); Norway (NO); Poland (PL); Portugal (PT); Romania (RO); Russia (RU); Serbia (RS); Slovakia (SK); Slovenia (SI); Spain (ES); Sweden (SE); Switzerland (CH).

Table A1. Percentage of missing values (Don't know + I prefer not to answer) per variable.

Variable	*N*	% cases with missing values
Acceptance of video surveillance in public	54,943	2.57
Acceptance of online surveillance	54,943	4.15
Educational level	54,943	0.82
Preference for having a strong leader	54,943	6.64
Institutional knowledge	54,943	2.36
Age	54,943	0.59
Female	54,943	0.05

Table A2. Descriptive statistics of individual-level variables.

Statistic	*N*	Min	Max	Mean/Proportion	St. Dev.
Acceptance of video surveillance in public	48,047	1	4	2.71	1.08
Acceptance of online surveillance	48,047	1	4	1.86	0.95
Educational level	48,047	0	7	4.21	1.75
Preference for having a strong leader	48,047	0	3	1.07	1.03
Institutional knowledge	48,047	0.00	1.00	0.52	0.24
Age	48,047	18	82	49.26	17.51
Female	48,047	0	1	0.54	
Mode: Cawi	48,047	0	1	0.12	
Mode: Mail	48,047	0	1	0.03	

Institutional knowledge. A principal axis factor analysis with promax rotation was conducted to ascertain that the three items selected to test knowledge of democratic systems and the three items selected for the knowledge of authoritarian systems load on different factors. As showed in Table A3 the three 'democratic' items load on a factor explaining 24% of the variance, whereas the three 'authoritarian' items load on a second factor explaining 16% of the variance.

Table A3. Factor loadings after promax rotation ($N = 54{,}689$).

Variable	Democracy	Authoritarian regime
People choose leaders	0.705	
Civil rights protect from oppression	0.651	
Women have the same rights as men	0.693	
Religious authorities interpret the law		0.585
The army takes over		0.602
People obey their rulers		0.499
Explained variance	24%	16%

Note: Only factor loadings >0.4 are showed.
Source: EVS (2020), own calculations.

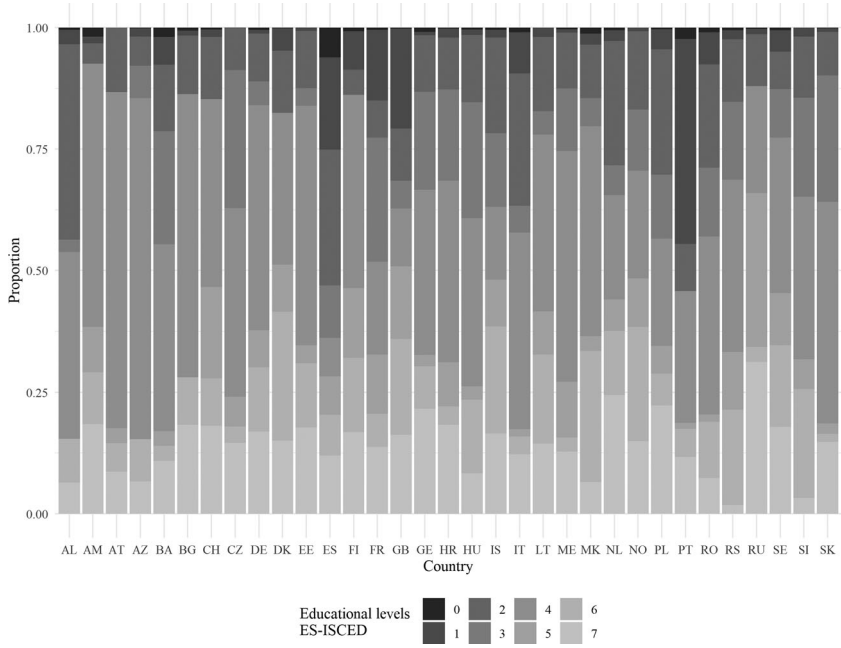

Figure A1. Distribution of the ES-ISCED educational attainment by countries ($N = 48{,}047$). Source: EVS (2020), own calculations.

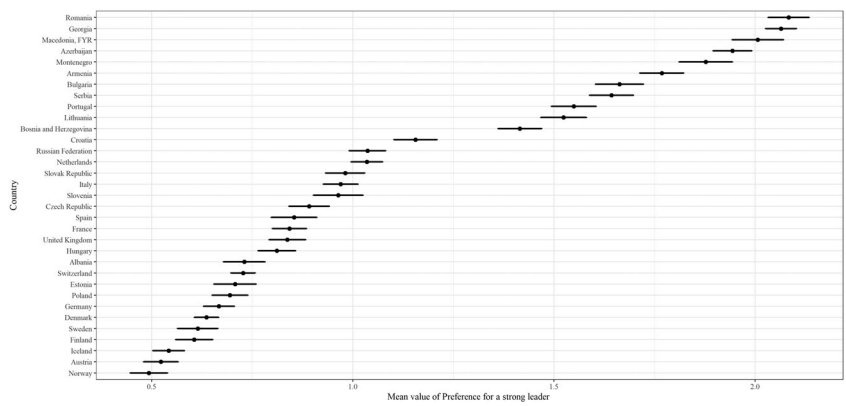

Figure A2. Average score on item measuring the preference for a strong leader across countries with 95% confidence intervals. Source: EVS (2020), own calculations.

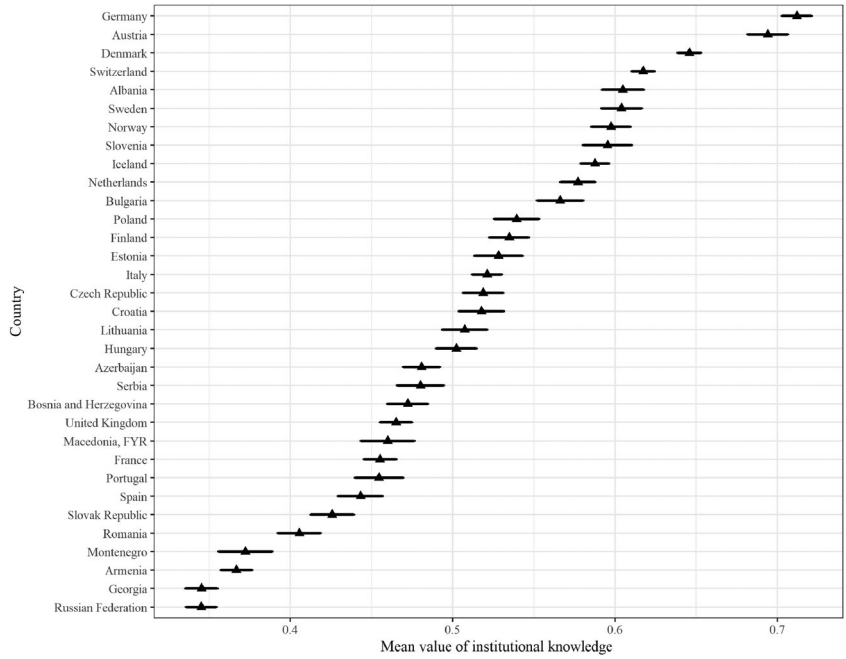

Figure A3. Average score of institutional knowledge across countries with 95% confidence intervals. Source: EVS (2020), own calculations.

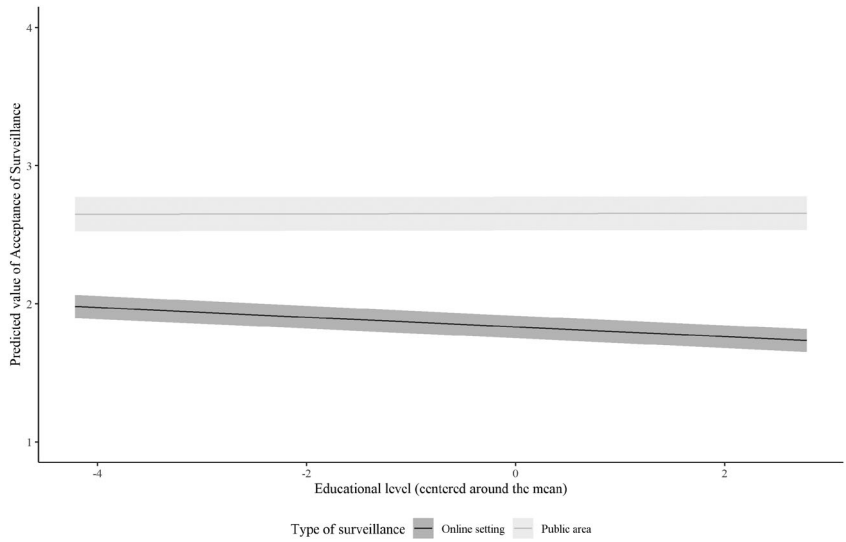

Figure A4. Predicted Acceptance of Surveillance by education (based on M1 in Table 1). Source: EVS (2020). Own calculations

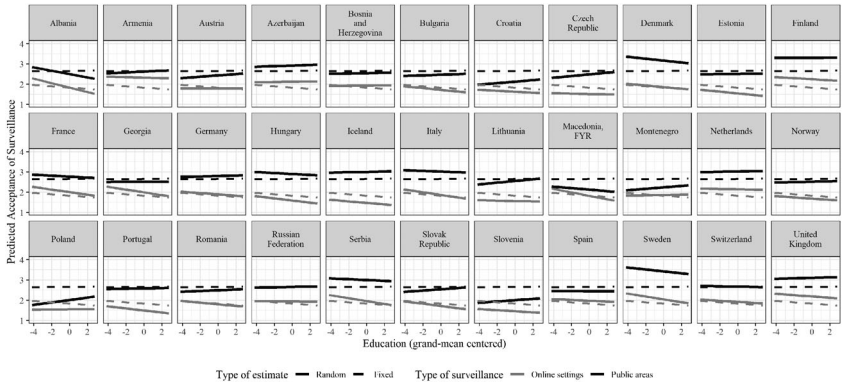

Figure A5. Fixed and random slopes (estimated from M5, Table 1). Dashed lines represent the slopes of education for the pooled sample whereas the solid lines represent the slopes for each country. Source: EVS (2020). Own calculations.