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#### **DOI**

[10.1016/j.jbusres.2023.114490](https://doi.org/10.1016/j.jbusres.2023.114490)

#### **Publication date**

2024

#### **Document Version**

Final published version

#### **Published in**

Journal of Business Research

#### **License**

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[Link to publication](#)

#### **Citation for published version (APA):**

Strycharz, J., & Segijn, C. M. (2024). Ethical side-effect of dataveillance in advertising: Impact of data collection, trust, privacy concerns and regulatory differences on chilling effects.

*Journal of Business Research*, 173, Article 114490.

<https://doi.org/10.1016/j.jbusres.2023.114490>

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# Ethical side-effect of dataveillance in advertising: Impact of data collection, trust, privacy concerns and regulatory differences on chilling effects

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## ARTICLE INFO

### Keywords:

Digital advertising  
Personalized advertising  
Chilling effects  
Consumer privacy  
Surveillance

## ABSTRACT

Technological advancements have resulted in the availability and usage of consumer data for digital advertising. This so-called reality of dataveillance may result in unintended ethical side-effects, such as chilling effects that involve self-regulation of media usage as a response to surveillance practices. The current study utilizes a two-step approach with a cross-national survey ( $N = 334$ ) and an online experiment ( $N = 536$ ), to study how different data collection methods for digital advertising (i.e., online profiling, watermarking), regulatory cross-country contexts (i.e., U.S., the Netherlands), and boundary effects (i.e., trust, privacy concerns) result in chilling effects. We found that chilling effects are context-dependent as they are mostly driven by watermarking and are more prevalent in the U.S. than in the Netherlands. These findings show that chilling effects are one of the possible side-effects of digital advertising. Cross-country differences show the importance of the cultural context and regulatory regime for consumer behavior.

## 1. Introduction

Enhanced computing capabilities, the development of mathematical models and algorithms, and the presence of technology infrastructure offers an explosion in the volume, variety, and velocity of consumer data that is being collected, processed, and stored (Rodgers, 2021). Data collection for modern targeting techniques contributes to the so-called reality of dataveillance, i.e., “the automated, continuous, and unspecific collection, retention, and analysis of digital traces by state and corporate actors” (Büchi et al., 2022, p. 1). One of the ways consumers deal with dataveillance is to self-regulate their behavior, so-called chilling effects (Büchi et al., 2022; Solove, 2007). For example, consumers report to change their behavior online when they are aware that their data are being collected (McDonald & Cranor, 2010). This chilling effect is seen as an ethical side-effect of dataveillance because it affects consumer autonomy (Büchi et al., 2022). Although chilling effects have been mainly studied in relation to governmental surveillance, it has been argued that data collection by commercial organizations could also potentially lead to chilling effects (Büchi et al., 2019; Strycharz & Segijn, 2022a). The aim of the current study is to get a better understanding of chilling effects in a response to dataveillance in advertising. Specifically, we will examine the role of data collection method, cross-country

differences, as well as the moderating role of trust and privacy-related variables (e.g., privacy concerns).

First, we will examine the impact of different data collection methods as they have previously been shown to affect consumers’ levels of perceived surveillance (Segijn & Van Ooijen, 2020). Specifically, we will focus on the two data collection techniques, online profiling and watermarking because previous research has found that online profiling was perceived as the least surveilling, while watermarking was the most surveilling data collection method across generations (Segijn & Van Ooijen, 2020). Online profiling involves using data collected online for personalization (Strycharz et al., 2019). Watermarking makes use of automated content recognition by placing a sound signal in the media content (Beattie, 2018). This technique extends the surveillance into the offline world and is therefore expected to lead to higher intention to change media diet (i.e., chilling effects) compared methods based on previously collected data, such as online profiling.

Second, due to substantial regulatory and institutional differences, the national context of dataveillance may impact the extent to which consumers show chilling effects. The goal of the European privacy regulations – General Data Protection Regulation (GDPR) – is to strengthen individual control in face of online data collection, whereas privacy regulations in the United States focus less on individual control (with the

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exception of the California Consumer Privacy Act) and give users less possibilities to influence how and what personal data are collected (Reding, 2011). Furthermore, they are more fragmented and sector-specific (e.g., Children's Online Privacy Protection Act, Health Insurance Portability and Accountability Act (HIPAA)), lacking an overarching privacy framework. This could possibly mean that in a context with less control guaranteed by the law, users are more likely to take matters into their own hand and regulate self-disclosure through chilling effects, but the impact of national context remains understudied. Therefore, we will compare effects from the United States with a country in the European Union (EU).

Third, to get a better understanding of chilling effects we examine the moderating role of trust and privacy-related variables (e.g., privacy concerns) in this context. Trust plays an important role in data-driven advertising as individuals who trust online companies are more willing to disclose their information for advertising purposes and online services (e.g., Metzger, 2004). Similarly, past research has shown that privacy-related factors impact different consumers' reactions to data-driven advertising by increasing their privacy protection behavior (e.g., the negative impact of privacy concerns on the use of online services and disclosure Baruh et al., 2017; Büchi et al., 2017) or by making them resigned (e.g., research on privacy cynicism Hoffmann et al., 2016). Given the importance of trust and privacy-related factors to the personalized advertising literature, we study these factors in the context of personalization and chilling effects.

The current study is novel for several reasons. First, it combines insights of a cross-national survey with a cross-national experiment to investigate ethical side-effects of modern targeting techniques. In the first step, we conducted a survey that focused on cross-national differences between the U.S. and a European country to map the differences that potentially explain why consumers' reactions to data collection would differ beyond regulatory differences. In the next step, we conducted a cross-national scenario experiment in which we manipulated data collection methods and measured the moderating role of trust and privacy-related variables. This allows us to further investigate the mechanisms behind the ethical implications of data collection and to compare them between the two countries. Second, the current study brings together advertising and marketing scholarship with normative literature on chilling effects to introduce this new construct to the field. It provides insights into the contexts (i.e., data collection method, country) and boundary conditions (i.e., trust, privacy-related factors) of chilling effects in digital advertising. Practically, studying chilling effects as an ethical implication of advertising is important because change in behavior as a consequence of dataveillance suggests that (hyper) targeting strategies can potentially undermine personal autonomy and privacy (Büchi et al., 2019). This suggests the need to regulate advertising techniques that involve certain types of data collection accordingly. Additionally, such effects are detrimental to the effectiveness of personalization strategies as they impact the quality of data collected for them. The quality of consumer data will be lower as chilling effects result in media behavior data change (e.g., change in frequency of use) that does not reflect accurate consumer media preferences because consumers restrained themselves in their media use due to surveillance. Consequently, this impacts advertising and marketing metrics as consumer data is central for the input of advertising tactics and strategies (Yun et al., 2020).

## 2. Theoretical background

### 2.1. Ethical implications of dataveillance in advertising

Data collection lies at the heart of data-driven advertising that relies on processing consumer data to create and deliver advertising messages and to measure their effects (Huh & Malthouse, 2020). Technologies such as cookies have enabled advertisers to track website visits and online behavior of individuals (Smit et al., 2014) and have made it easier

to collect, process, and store an enormous amount of consumer data for advertising purposes. These developments contribute to the continuous and unspecified data collection, so-called dataveillance (Büchi et al., 2022), which has broader ethical consequences impacting consumers' perception and behaviors (Strycharz & Segijn, 2022a). Extensive data collection and processing for advertising may trigger one's perception of being surveilled (i.e., *perceived surveillance*), which can be defined as the perceptions of the watching, listening to, or recording of personal data (Segijn et al., 2022). For example, exposure to a personalized ad could increase the feelings of being watched (Farman et al., 2020).

Such perceptions may have unintended effects on consumers. Among others, they might result in consumers trying to regulate what others can collect about them (Lyon, 2017). In case of data collection for advertising, this can be done through taking privacy protection measures, which are actions that consumers actively do to mitigate the collection, usage, and sharing of their personal information to protect their online privacy (Boerman et al., 2021). While privacy protection measures involve additional protective actions such as opting out from data collection for personalized advertising that is commonly offered by platforms (Strycharz et al., 2019) or installing ad blockers that can prevent companies from tracking one's online activity (Redondo & Aznar, 2018), consumers may also turn to changing their behavior to prevent advertisers from learning about it, so-called chilling effects. Chilling effects in the past have been defined as an "act of deterrence" or as the "fear, risk, and uncertainty" that may "deter people from exercising their rights" (Schauer, 1978, p. 689). In general, they describe the phenomenon of individuals refraining from actions or changing their actions due to the expectations that others may learn about these actions (Solove, 2007). Chilling effects raise ethical concerns as they threaten moral autonomy of individuals who are not free in their choices (Solove, 2007). In the current study, we examine the impact of different data collection methods for advertising on chilling effects.

### 2.2. Data collection method

The amount and complexity of data possible to collect such as online click streams, voice and video, locations, and sensors have increased over time (Kumar et al., 2021). The different data collection methods vary in the extent that they are perceived as acceptable and increase perceptions of surveillance in consumers (Segijn & Van Ooijen, 2020). Online profiling has been frequently used in the past for personalized communication and involves using data collected online. It involves "the practice of collecting data about an individual's online activities for use in selecting which advertisement to display" (McDonald and Cranor 2010, p. 2). Such data is used to infer information on for example interests and create consumer profiles that can be used to target them with information (Strycharz et al., 2019). For example, based on previous online searches advertisers may infer one's interest in a product or a TV show.

Another way to collect consumer data is watermarking, a content recognition technique. In this technique, a sound ('watermark'), encoded within an ad or a TV program, is recognized by the mobile device. This data collection method allows to personalize messages across media (e.g., TV and a mobile device) in real time (Beattie, 2018). Additionally, it extends dataveillance to gather information on offline behaviors (e.g., TV viewing) and extends surveillance to the private sphere, such as consumers' living rooms (Strycharz & Segijn, 2022b). As chilling effects are an act of deterrence that is aimed at limiting surveillance thought behavioral change (Solove, 2007), we expect that exposure to a personalized ad utilizing watermarking will lead to higher intention to change media diet (i.e., chilling effects) compared to exposure to a personalized ad based on online profiling. To this end, we hypothesize:

H1: Participants exposed to a personalized ad utilizing watermarking will show a higher chilling effects intention (i.e., intention to adjust their media diet) as compared to participants exposed to a personalized ad based on online profiling.

### 2.3. Cross-country differences in ethical implications

How consumers cope with data collection for advertising may depend on not only how their data is collected, but also in what national context the collection takes place. More specifically, countries differ in measures and indices that reflect their written codes and regulations (e.g., Jaskiewicz et al., 2021). Along these lines, privacy regulations and the amount of protection offered by the law differ substantially between the United States and the European Union (EU) (Tushnet & Goldman, 2020). On May 25, 2018, the GDPR was introduced in the EU. Its aim is to set high standards across the EU for the collection and processing of personal data. More specifically, the GDPR impacts how data are technically collected, what data are collected, and how consumers are informed about these practices (Tankard, 2016). A key goal of this regulation is to strengthen individual control of their data and give them agency over online data collection (Tushnet & Goldman, 2020). To achieve it, companies that collect and process consumer data are required to be transparent about this: it should be clear to consumers that personal data concerning them are collected, and to what extent the personal data are, or will be, processed. Companies are also obliged to offer high operational safeguards for securing data, including putting in place strong privacy controls (Tankard, 2016). For this research, the Netherlands has been chosen as a European country with a relatively high number of households with Internet access (97 %) and mobile access (91 %) (European Commission, 2018) that falls under the GDPR. Furthermore, past research has shown that the Dutch are highly aware of the GDPR and know at least some of the individual rights granted to them (Strycharz et al., 2020).

In contrast, privacy regulations in the United States are less specific on what data can be collected and put less requirements for informing consumers about these practices. In general, the regulations focus less on individual agency (except for the California Consumer Privacy Act) and give users less possibilities to control how and what personal data are collected (Tushnet & Goldman, 2020). We argue that when consumers are offered less control guaranteed by the law and when data collection is less strongly regulated, the ethical implications of data collection may be stronger. More specifically, less protected consumers may be more likely to take matters into their own hands and regulate data collection through chilling effects. This expectation can be tested when looking at consumers' reactions to data collection for personalized advertising in the United States and Europe. Because of substantial regulatory differences, we study the impact of data collection for personalized advertising in these two regulatory contexts:

RQ1: To what extent do the relationships between data collection method and chilling effects intention (e.g., intention to adjust media diet) investigated in the study differ between the U.S. and the Netherlands?

### 2.4. TV usage and moderating role of trust and privacy-related variables

As one of the investigated data collection methods involves personalizing advertising between TV content and mobile devices, we first aim to explore differences in TV usage between the U.S. and the Netherlands. Second, to further our understanding of cross-cultural differences in chilling effects in advertising, we aim to examine to what extent trust and privacy-related variables (i.e., privacy concerns, perceived surveillance, privacy cynicism) moderate the relationship between data collection methods and chilling effects in the U.S. and the Netherlands.

Understanding TV usage is important when studying chilling effects to provide a context for the changes in media consumption. Moreover, past research has shown that the value of the behavior is important for the decision of a user to give it up. For example, users would not give up privacy-invasive apps when these would be important to them (Wotrlich et al., 2018). Therefore, the dependency on and importance of media may possibly prevent users from changing their behavior. Regarding cross-national differences in this dependency, research has shown that

media adoption and (frequency of) media usage differ across countries (Voorveld et al., 2014). Therefore, to understand chilling effects, it is important to first get an understanding of media usage in general.

Regarding potential moderators, trust is an important factor in consumer transactions online (Jarvenpaa et al., 1999). It can be broadly defined as the willingness of one party to rely on or engage with another party in the presence of uncertainty and risk (Mayer et al., 1995). In the extant research, it has been demonstrated as an important factor facilitating interpersonal relations, commercial transactions, and online communication, particularly when one cannot avoid risk. For example, it predicts the extent to which consumers disclose personal information online (e.g., Metzger, 2004). Trust is a function of risk and control (Metzger, 2004) – in situations with less control and more risks, individuals tend to base their decisions on trust. Past research has shown that when people trust online companies, they are more willing to disclose personal information (e.g., Fletcher & Park, 2017). With less control over consumer data guaranteed by the law in the U.S. and hence more privacy risks, trust in data handling by companies plays an important role. At the same time, overall trust levels have been shown to differ between cultures. For example, individualistic cultures like the U.S. have been shown to have higher trust in online companies (Park et al., 2012). Given the interconnections between the industry (e.g., advertising, tech companies), the government, and regulators in the context of consumer data and advertising (Helberger et al., 2020), we study trust in these actors' handling and protecting data. Specifically, we examine trust in corporations, digital media tech companies, and the political system, as well as trust in data handling by advertisers, the government, and protection by the law.

Privacy-related factors have been shown to differ between countries in the past. A global survey conducted by Bellman et al. (2004) showed that privacy concerns – “concerns about [the] possible loss of privacy as a result of information disclosure to a specific external agent” (Xu et al., 2012, p. 2) – differ between countries with different cultural values and information privacy regulatory approaches. As European countries, such as the Netherlands and U.S., differ on cultural value dimensions (Hofstede, 2001) and have substantially different regulatory regimes, privacy concerns are the first investigated privacy-related variable. Another important privacy-related factor that impacts consumers' behavior is privacy cynicism, which is an attitude of uncertainty, powerlessness, and mistrust toward the handling of personal data by digital platforms, rendering privacy protection subjectively futile (Hoffmann et al., 2016). Individual levels of privacy cynicism are important factors related to privacy protection behaviors (Van Ooijen et al., 2022). Similarly, perceived surveillance – perception of being watched, listened to (Segijn et al., 2022) – is argued to be a driver of surveillance responses, such as privacy protection behaviors and chilling effects (Strycharz & Segijn, 2022a). Moreover, past research shows that cultural values influence how people perceive the possible consequences of surveillance (Kao & Sapp, 2022).

Before examining the moderating role of these factors, we first want to examine to what extent they differ across national contexts. This research follows a two-step procedure that consists of a cross-national survey and a cross-national experiment. The aim of this survey is to map the differences that potentially explain why consumers' reactions to data collection would differ beyond regulatory differences. Second, we conduct a cross-national scenario experiment to examine the effect of data collection methods on chilling effects. Additionally, the results of the survey will determine which factors will be included as moderators to further explain chilling effects. Therefore, we first ask:

RQ2: To what extent do the U.S. and the Netherlands differ in terms of trust- and privacy-related factors (e.g., privacy concerns, perceived surveillance, privacy cynicism)?

## 3. Method study 1

First, we conducted a survey to examine the differences between the

United States and the Netherlands to answer RQ2. The research question and measurements had been pre-registered before data collection.<sup>1</sup> We distributed similar questionnaires in English in the United States and in the Netherlands in March 2021. We made use of two different survey panels, namely Prolific in the United States and PanelClix in the Netherlands. We used quota sampling for age, gender, and education to get a good reflection of the populations. Individuals from California were excluded from participation in the study as the privacy laws there are substantially different than the rest of the U.S. In total, 149 U.S. respondents completed the survey of which 1 responded was excluded because of a failed attention check, and 194 Dutch respondents of which 38 were excluded due to a failed attention check. In total, 334 respondents completed the survey (U.S.:  $M_{age} = 34.08$ ,  $SD_{age} = 13.13$ , 47.6 % female; NL:  $M_{age} = 46.94$ ,  $SD_{age} = 15.96$ , 50.6 % female).

### 3.1. Measures

For an overview of all items see survey material on OSF.<sup>2</sup> All items were measured on a 7-point Likert Scale (1 = *Strongly disagree*, 7 = *Strongly agree*) unless indicated differently. Before answering any of the trust and privacy statements, we explained to the respondents that “personal data” referred to any kind of online data about individuals (based on van Ooijen et al., 2022), including demographic information, but also behavioral data such as website visits, location data, and social media activity, and data about your personal interests.

#### 3.1.1. TV use

To compare media usage across countries, we measured which devices were used for TV viewing, time spent watching TV, and media multitasking. *Time spent watching TV* was measured by asking respondents to report how much time they spent watching linear TV (i.e., watching a TV program on the channel it’s presented at its scheduled time) in hours and minutes on an average weekday and weekend day, as well as non-linear TV (i.e., any non-live TV content watched over the internet, such as on-demand, streaming services, or video watching platforms) hours and minutes on an average weekday and weekend day. Following Molina et al. (2016), a number of daily TV hours was calculated based on this question.

#### 3.1.2. Trust in data handling and data protection

*Trust in data handling by advertisers* was measured with five items based on Mcknight et al. (2002). An example item is “Advertisers would be trustworthy in handling my personal data”. The scale showed good reliability (Cronbach’s alpha = 0.91,  $M = 2.86$ ,  $SD = 1.19$ ).

*Trust in data handling by the government* was measured with three items based on Mcknight et al. (2002) (Cronbach’s alpha = 0.92,  $M = 3.56$ ,  $SD = 1.52$ ). An example item is “The government is reliable in handling my personal data”.

*Trust in data protection law* was measured with four items (Cronbach’s alpha = 0.95,  $M = 3.19$ ,  $SD = 1.39$ , building on Malhotra et al., 2004; Mcknight et al., 2002). An example item is “I am confident that current laws make it safe to share my data online”.

Additionally, we measured general trust in corporations (based on Mcknight et al., 2002) and digital media tech companies (based on Mcknight et al., 2002) to get a better understanding of differences between the U.S. and the Netherlands.

<sup>1</sup> [https://osf.io/n4xu2/?view\\_only=38f918782fbf4b10bc85e2624d94ea28](https://osf.io/n4xu2/?view_only=38f918782fbf4b10bc85e2624d94ea28); formulation of the research question was adjusted for readability. Constructs of agency and autonomy included in pre-registration were left out as they did not relate to data collection, but general personality and we did not expect cross-cultural differences.

<sup>2</sup> [https://osf.io/mxjc7/?view\\_only=2f8b685252a146d59ff61ed0410a5e56](https://osf.io/mxjc7/?view_only=2f8b685252a146d59ff61ed0410a5e56).

### 3.1.3. Privacy-related variables

*Privacy concerns* were measured with five items (e.g., “I am concerned about misuse of my personal information”; Baek & Morimoto, 2012; Dolnicar & Jordaan, 2007) and averaged in a scale (Cronbach’s alpha = 0.86,  $M = 5.30$ ,  $SD = 1.06$ ).

*Privacy cynicism* was measured with 3 items (e.g., “I have become less interested in online privacy issues”) by Choi et al. (2018) and averaged in a scale (Cronbach’s alpha = 0.76,  $M = 4.16$ ,  $SD = 1.02$ ).

*Perceived surveillance* (Segijn et al., 2022) was measured with four items (Cronbach’s alpha = 0.89,  $M = 5.07$ ,  $SD = 1.29$ ). The respondents were asked: when you would receive a personalized ad, to what extent would you feel that companies are 1) looking over your shoulder, 2) entering your private space, 3) watching your every move, and 4) checking up on you.

## 4. Results study 1

### 4.1. TV usage

Regarding devices, in both countries respondents are most likely to watch TV programs on a television. In the U.S., other portable devices such as tablets are popular more than in the Netherlands (see Fig. 1).

When it comes to using media, the Dutch respondents overall spend more time watching linear TV in an average week than American respondents (Dutch:  $M = 415$  min,  $SD = 350$ ; American:  $M = 140$  min,  $SD = 206$ ,  $t(252) = 8.40$ ,  $p < .001$ ), while for non-linear TV, the comparison is the opposite (Dutch:  $M = 300$  min,  $SD = 313$ ; American:  $M = 404$  min,  $SD = 471$ ,  $t(260) = -2.27$ ,  $p = .024$ ).

### 4.2. Cross-national differences in trust and privacy

To identify differences between the countries, multiple t-tests were conducted. Before conducting t-tests, Levene’s tests were conducted on all variables to test equal variance assumption. Equal variance cannot be assumed for trust in corporations, which has been accounted for in the t-test. Table 1 shows an overview of the results.

#### 4.2.1. Trust

Fig. 2 shows comparison between the scores of Dutch and American respondents on different trust scales. Overall, the Dutch respondents scored higher on most trust measures, namely data handling by advertisers ( $p < .001$ ), government ( $p = .008$ ), and data protection by the law ( $p < .001$ ), as well as trust in digital media tech companies ( $p < .001$ ). The U.S. respondents distrust corporations more than the Dutch participants ( $p < .001$ ; Table 1).

#### 4.2.2. Privacy factors

Privacy concerns is the only variable that is significantly different between U.S. and Dutch respondents ( $p < .001$ ). The U.S. respondents are more concerned about their privacy ( $M = 5.59$ ,  $SD = 0.96$ ) than the Dutch respondents ( $M = 5.03$ ,  $SD = 1.08$ ). Perceived surveillance and privacy cynicism remain at a similar level in both countries (Table 1).

## 5. Discussion study 1

We examined to what extent people in the United States and the Netherlands differed in terms of trust, privacy-related factors, and media usage. We found significant differences for trust and privacy concerns. Therefore, trust and privacy concerns related to data handling will be included as moderators in Study 2 in which we will test the differential differences of surveillance through different data collection methods on chilling effects. Specifically, people in the Netherlands seem to have more trust in instances handling their data, have higher trust in data protection by the law, and are less concerned about their privacy, which could potentially be explained by protection offered by the GDPR. Despite the higher levels of trust by Dutch respondents, average trust in

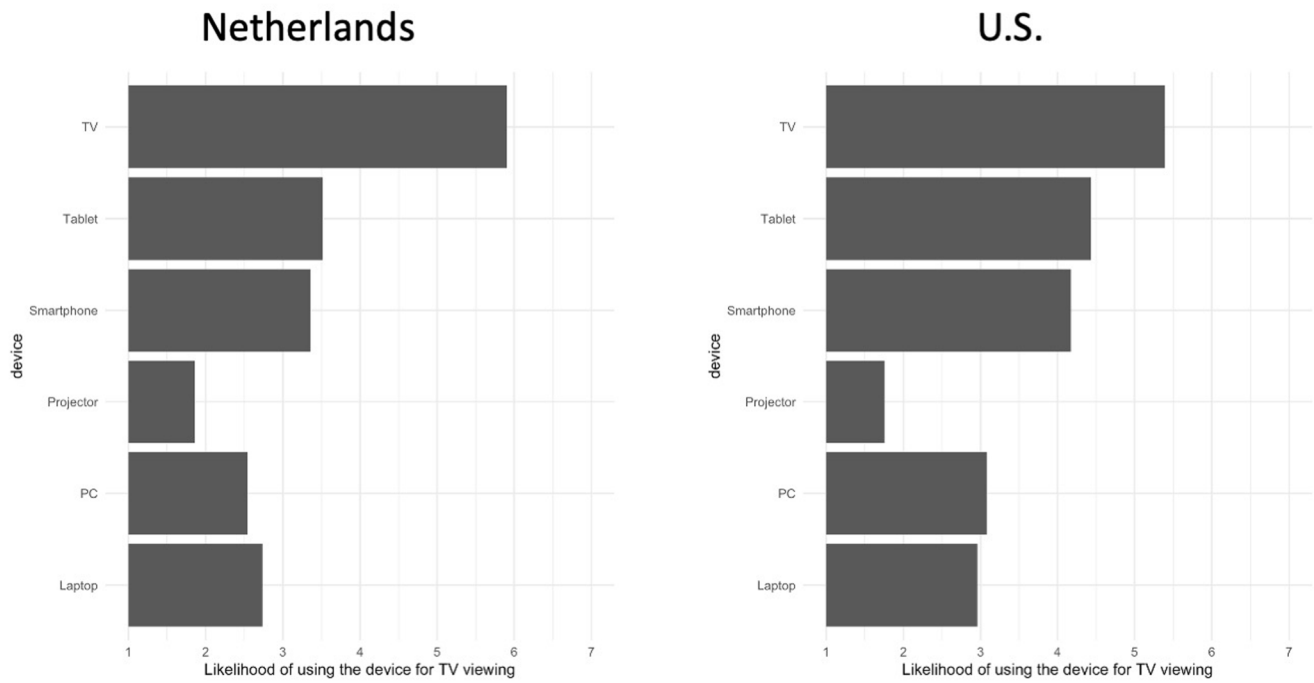


Fig. 1. Devices used for TV viewing across the U.S. and the Netherlands.

**Table 1**  
Results of cross-country comparison (Study 1).

| Factor                                   | U.S. <i>M</i> ( <i>SD</i> ) | Netherlands <i>M</i> ( <i>SD</i> ) | <i>t</i> ( <i>df</i> ) | <i>p</i> |
|--|-----------------------------|------------------------------------|------------------------|----------|
| <i>Trust factors</i>                     |                             |                                    |                        |          |
| Trust in data handling by advertisers    | 2.61 (1.22)                 | 3.10 (1.11)                        | 3.63                   | <0.001   |
| Trust in data handling by the government | 3.32 (1.56)                 | 3.78 (1.45)                        | 2.66(305)              | 0.008    |
| Trust in data protection law             | 2.88 (1.43)                 | 3.50 (1.27)                        | 4.03(305)              | <0.001   |
| Trust in corporations*                   | 5.37 (1.07)                 | 4.8 (0.94)                         | -4.96(296)             | <0.001   |
| Trust in digital media tech companies    | 2.58 (1.43)                 | 3.21 (1.27)                        | 4.61(305)              | <0.001   |
| Trust in the political system            | 3.14 (1.39)                 | 4.13 (1.39)                        | 6.22(305)              | <0.001   |
| <i>Privacy factors</i>                   |                             |                                    |                        |          |
| Privacy concerns                         | 5.59 (0.96)                 | 5.03 (1.08)                        | -4.86(305)             | <0.001   |
| Privacy cynicism                         | 4.18 (1.08)                 | 4.14 (0.97)                        | -0.35(305)             | 0.73     |
| Perceived surveillance                   | 5.19 (1.39)                 | 4.96 (1.18)                        | -1.56(294)             | 0.12     |

Note: Variances are not equal, which is accounted for in the *t*-test.

the law is still slightly below the midpoint of the scale. To what extent trust and privacy concerns have an impact on the relationship between data collection and chilling effects will be examined in Study 2.

### 6. Study 2 context and moderating hypotheses

The aim of Study 2 is to examine the effects of data collection methods for personalized advertising on chilling effects and examine the impact of trust and privacy concerns in the U.S. and the Netherlands. We study chilling effects in the context of synced advertising, which is a hyper-targeting strategy in which ads are synchronized across media in real time (Segijn, 2019). For example, consumers can be targeted with an ad on their mobile device that is of the same brand/product that is simultaneously displayed in a TV commercial. We chose this form of personalized advertising because 1) different data collection methods (incl. online profiling, watermarking) have been used for this strategy (Segijn & Van Ooijen, 2020), 2) synced advertising is an advertising strategy unfamiliar to consumers (Segijn & Van Ooijen, 2020) and at the same time, one that requires different types of data, hence it may result in consumers changing their behavior, and 3) synced advertising is found to increase perceptions of surveillance (Segijn et al., 2021), which is a driver of chilling effects.

How data collection for advertising potentially constrains individual

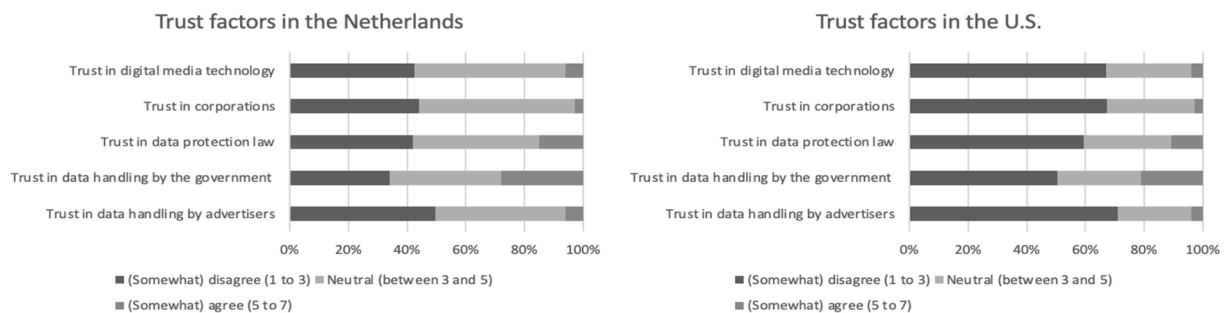


Fig. 2. Trust factors in the U.S. and the Netherlands. Note: The items for each trust scale were presented as statements that respondents could agree or disagree with on a 7-point scale.

behavior remains under-researched. In a series of experimental studies, Strycharz and Segijn (2021) showed that collecting information on offline media diets for synced advertising may lead to behavior change intention among individuals, but the boundaries (e.g., trust levels, privacy concerns) for this change remain unknown. Therefore, the current research focuses on the impact of data collection for synced advertising on consumers' intention to adjust their media-related behaviors (H1), examine cross-country differences (RQ1), and examine potential moderators of this effect. Based on the results of Study 1, we selected trust and privacy concerns as potential moderators.

Regarding trust, McKnight and Chervany (2002) argue that the greater the risk, the greater role trust plays in human behavior, and Metzger (2006) considers trust a "social lubricant" that mitigates perceptions of the risk involved in online transactions. Having high trust, "people can rely on others because of structures, situations, or roles that provide assurances that things will go well" (McKnight & Chervany, 2002, p. 46). Past research on the role of trust in data collection has shown that when people trust online companies or a brand, they are more willing to disclose personal information to them (Fletcher & Park, 2017). Hence, it suggests that trust mitigates the risks involved in data collection. Therefore, we can expect that trust in the environment and parties involved also takes the mitigating role and trusting individuals in general have a smaller tendency to change their behavior. Hence, we hypothesize that:

H2: Participants with high trust will show lower chilling effects intention (e.g., intention to adjust their media diet) regardless of how their data is collected compared to participants with low trust.

In prior literature, it has been shown that privacy concern increases ad skepticism and avoidance for personalized advertising and lowers attitude towards such advertising (Baek & Morimoto, 2012). At the same time, privacy concern moderates the impact of data collection: intrusiveness of data collection reduces advertising effectiveness for consumers concerned about their privacy (Goldfarb & Tucker, 2011). Translating this to the context of chilling effects, one could expect that how data are collected does not matter to concerned consumers as they are more skeptical and negative towards personalization regardless of the data collection method. At the same time, when one is less concerned, the move towards offline data collection of one's TV viewing behavior through mobile phones (watermarking) may make a difference to how acceptable they find it (with watermarking being shown as less acceptable in past research, Segijn & van Ooijen, 2020) and how it impacts their behavior:

H3a: Participants with low privacy concern will show higher chilling effects intention (e.g., intention to adjust their media diet) when exposed to synced advertising based on watermarking compared to synced advertising based on online profiling.

H3b: Participants with high privacy concern will show higher chilling effects intention (e.g., intention to adjust their media diet) regardless of how their data is collected compared to participants with low privacy concern.

## 7. Method study 2

### 7.1. Design and participants

The method of this study was preregistered before data collection, and we followed the procedures as outlined in the preregistration.<sup>3</sup> We conducted a scenario-based online experiment with two between subject conditions (data collection technique: online profiling × watermarking) simultaneously in the U.S. and the Netherlands (July 2021). The scenarios were adopted from Strycharz & Segijn (2022b) and adjusted to

<sup>3</sup> [https://osf.io/v72ng/?view\\_only=63985370dbb94692aeeabf5df7a727c2](https://osf.io/v72ng/?view_only=63985370dbb94692aeeabf5df7a727c2), this study includes section 2 of pre-registration. Construct of privacy cynicism was not investigated based on findings from Study 1.

the context of this study. Additionally, we tested the scenarios for clarity with an advertising ethics expert and in a think-aloud pretest with 7 participants (ages ranging from 28 to 70 with varied education levels).

A quota sample in terms of age, gender, and ethnicity was recruited through the same online panels (U.S.: Prolific, NL: Panelclix) as in Study 1. Participants who participated in Study 1 were excluded from Study 2 and similar to Study 1, individuals from California were not able to participate. A-priori power analysis (0.8 power, small effects) indicated a sample size of 536 (268 Europe and 268 U.S.), which was reached. In total, 604 participants completed the questionnaires (U.S.  $N = 298$ , NL  $N = 306$ ) after exclusion of Participants who failed at least one attention check ( $N = 13$ ). The mean age was 46 ( $SD = 16.17$ ) with a range of 18–83. About half of them were female ( $N = 299$ ).

### 7.2. Procedure

Participants were randomly assigned to one of the two conditions in which they were asked to read a scenario. The beginning of the scenarios was an introduction of the media scenario (i.e., "watching a television program and seeing an advertisement for a product. While watching, you look at your mobile phone. You want to check out whether it will rain later today") and an explanation that they received a synced ad on their phone ("When you search for the weather online, you see an advertisement for the same product you are seeing on the TV. It is not a coincidence that you are seeing advertisements for the same products simultaneously on TV and your mobile device. The advertisement on your phone is based on what you are watching."). This part was the same for all participants. After that, we explained the data collection technique, which was either a description of online profiling or watermarking.<sup>4</sup> Directly after the scenarios, participants were asked to fill out the chilling effects questions, followed by the moderators (trust before privacy concerns), and demographic questions. Similar to Study 1, we explained what we meant with personal data before asking the trust and privacy concerns questions. At the end of the questionnaire, participants were debriefed about the purpose of the study, thanked for their participation, and received a monetary incentive for completing the questionnaire.

### 7.3. Variables

#### 7.3.1. Chilling effects

To measure chilling effects in media, we followed the procedure by Strycharz & Segijn (2022b), focused on TV and mobile usage given the synced advertising scenario, and asked about frequency of media use as well as how media are used. To measure (1) decrease and (2) increase of the amount of TV viewing, participants were asked to report how likely they were to change their linear and non-linear TV viewing habits in the next two weeks with four items, two asking about likelihood to decrease and two about likelihood to increase (1 = *Very unlikely* – 7 = *Very likely*). How media was used was divided into three categories: activity type, phone use, and multitasking.

To measure chilling effects in specific media behaviors, we provided a list with 21 items with specific examples how people could change their media behavior due to corporate surveillance (Table 2). This list was created based on the results of a content analysis examining chilling effects in everyday life (Strycharz et al., 2022). We asked 'After reading the scenario, how likely is it for you to (continue to) engage in the following behaviors in the next 2 weeks?'. The answer options ranged from 'very unlikely' to 'very likely' on a 6-point Likert scale, and also included a 'not applicable' option.

<sup>4</sup> See [https://osf.io/mxjc7/?view\\_only=2f8b685252a146d59ff61ed0410a5e56](https://osf.io/mxjc7/?view_only=2f8b685252a146d59ff61ed0410a5e56) for scenarios.

**Table 2**  
Factor analysis results for the chilling effect measures (Study 2).

| Items   | Loadings | Cronbach's alpha |
|---|----------|------------------|
| <i>Increase of TV consumption and multitasking</i>  |          |                  |
| Increase linear TV viewing  | 0.74     | 0.72             |
| Increase non-linear TV viewing  | 0.67     |                  |
| Increase your mobile use while watching TV content  | 0.63     |                  |
| <i>Decrease of TV consumption, multitasking and adjusting settings</i>                            |          |                  |
| Decrease linear TV viewing  | 0.70     | 0.72             |
| Decrease mobile use while watching TV   | 0.70     |                  |
| Change privacy settings on any device   | 0.56     |                  |
| <i>Change in type of media activity</i>   |          |                  |
| I would avoid watching certain TV shows   | 0.50     | 0.85             |
| I would watch TV with headphones or earphones   | 0.64     |                  |
| I would do something else other than watching TV  | 0.71     |                  |
| I would read (e.g., book, newspaper, magazine) instead of watching TV                             | 0.69     | 0.85             |
| I would listen to radio/podcast/music instead of watching TV                                      | 0.77     |                  |
| <i>Changes related to the mobile device</i>   |          |                  |
| I would avoid opening certain websites on my phone  | 0.51     | 0.92             |
| I would change settings on my phone (e.g., data sharing)  | 0.85     |                  |
| I would uninstall apps that have access to the microphone of my phone                             | 0.68     |                  |
| I would disable apps from having access to my phone's microphone using privacy settings           | 0.83     | 0.89             |
| I would install/use ad blockers on my phone   | 0.66     |                  |
| I would control access of apps on my smartphone to my personal information using privacy settings | 0.83     |                  |
| I would reject cookies being placed on my phone   | 0.67     | 0.89             |
| I would use an incognito browser on my phone  | 0.56     |                  |
| I would turn off location services on my phone  | 0.65     |                  |
| I would install/use a VPN connection on my phone  | 0.49     | 0.89             |
| I would avoid opening certain apps on my phone  | 0.49     |                  |
| <i>Changes related to multitasking behavior</i>   |          |                  |
| I would not use my phone while watching TV  | 0.85     | 0.89             |
| I would avoid using my phone while watching TV  | 0.82     |                  |
| I would turn off my phone while watching TV   | 0.63     |                  |
| I would put away my phone while watching TV   | 0.79     | 0.89             |
| I would turn off the Wifi of my phone while watching TV   | 0.46     |                  |

7.3.2. Trust and privacy concerns

We measured trust in data handling by advertisers (Cronbach's alpha = 0.90,  $M = 2.73$ ,  $SD = 1.21$ ), government (Cronbach's alpha = 0.90,  $M = 3.63$ ,  $SD = 1.50$ ), and data protection law (Cronbach's alpha = 0.96,  $M = 2.44$ ,  $SD = 1.06$ ), as well as privacy concerns (Cronbach's alpha = 0.88,  $M = 5.31$ ,  $SD = 1.11$ ) same as in Study 1.

8. Results study 2

Table 3 shows mean chilling effects in both conditions for the U.S. and the Netherlands.

8.1. Direct effects

A One-Way ANCOVA with conditions as the independent variable and country as covariate was conducted to test whether the method of data collection affects chilling effects intention (H1). We found that when watermarking was used to collect data this led to a higher intention to decrease TV consumption ( $M = 4.05$ ,  $SD = 1.36$ ) than when online profiling was used ( $M = 3.62$ ,  $SD = 1.32$ ;  $F(1, 597) = 16.33$ ,  $p < .001$ ). No significant difference of data collection method was found for any of the other types of chilling effects (Table 3).

Additionally, to answer RQ1, we found a main effect of the country for decrease of TV consumption, change of activity type, and phone usage, but no interaction effects. In general, U.S. participants were more likely to decrease TV viewing ( $M = 4.03$ ,  $SD = 1.38$ ) than the Dutch participants ( $M = 3.64$ ,  $SD = 1.30$ ;  $F(1, 597) = 13.62$ ,  $p < .001$ ). The U.S.

**Table 3**  
Means ( $M$ ) and standard deviations ( $SD$ ) across countries and conditions (Study 2).

|                                      |             | Data collection technique |      |              |      |
|--------------------------------------|-------------|---------------------------|------|--------------|------|
|                                      |             | Online Profiling          |      | Watermarking |      |
|                                      |             | M                         | SD   | M            | SD   |
| Decrease of the amount of TV viewing | U.S.        | 3.81                      | 1.37 | 4.26         | 1.36 |
|                                      | Netherlands | 3.42                      | 1.23 | 3.85         | 1.34 |
| Increase of the amount of TV viewing | U.S.        | 3.14                      | 1.30 | 3.27         | 1.33 |
| Change in the type of activity       | Netherlands | 3.16                      | 1.31 | 3.07         | 1.20 |
|                                      | U.S.        | 3.10                      | 1.44 | 2.90         | 1.32 |
|                                      | Netherlands | 2.73                      | 1.20 | 2.70         | 1.34 |
| Change in phone use                  | U.S.        | 4.20                      | 1.37 | 4.40         | 1.32 |
|                                      | Netherlands | 3.84                      | 1.34 | 4.07         | 1.36 |
| Change in multitasking behavior      | U.S.        | 2.84                      | 1.48 | 3.14         | 1.50 |
|                                      | Netherlands | 2.94                      | 1.33 | 2.95         | 1.50 |

participants were also more likely to change the type of activity ( $M = 3.00$ ,  $SD = 1.38$ ) than the Dutch participants ( $M = 2.71$ ,  $SD = 1.27$ ;  $F(1, 599) = 7.07$ ,  $p = .008$ ) and to use their phone differently ( $M = 4.30$ ,  $SD = 1.35$ ) than the Dutch participants ( $M = 3.96$ ,  $SD = 1.35$ ;  $F(1, 599) = 10.12$ ,  $p = .002$ ). This means that in general, we observed a higher intention to change behavior in the U.S. independent of condition.

8.2. Moderating role of trust

To study the moderating role of trust in data handling by advertisers, government, and data protection law (H2), we conducted separate three-way ANOVAs for each trust variable and for each type of chilling effect with condition and country as the independent variables. For all three types of trust, we found that the higher the trust the less likely participants would be to decrease the amount of TV viewing (advertisers  $F(1, 593) = 10.91$ ,  $p = .001$ ; government  $F(1, 593) = 11.10$ ,  $p < .001$ ;  $F(1, 593) = 20.28$ ,  $p = .001$ ) or to change their phone usage (advertisers  $F(1, 595) = 19.63$ ,  $p < .001$ ; government  $F(1, 595) = 16.03$ ,  $p < .001$ ; law  $F(1, 595) = 34.59$ ,  $p < .001$ ), and the more likely they would be to increase the amount of TV viewing (advertisers  $F(1, 595) = 56.78$ ,  $p < .001$ ; government  $F(1, 595) = 4.56$ ,  $p = .032$ ;  $F(1, 595) = 17.40$ ,  $p < .001$ ). Additionally, for trust in data handling by advertisers we also found a positive relation with change in the type of activity ( $F(1, 593) = 15.94$ ,  $p < .001$ ).

Additionally, for all three types of trust we found a two-way relationship between trust and country on increase of TV viewing (advertisers  $F(1, 595) = 21.00$ ,  $p < .001$ ; government  $F(1, 595) = 11.01$ ,  $p < .001$ ; law  $F(1, 595) = 20.24$ ,  $p < .001$ ) in that the positive relationship only existed in the U.S., and no relationship (i.e., trust in data handling by advertisers: Fig. 3, government: Fig. 4a) or a weak negative relationship (i.e., trust in data protection law: Fig. 5a) was found for Dutch participants. Similarly, regarding change of activity, we found for the trust in data handling by the government ( $F(1, 595) = 9.78$ ,  $p = .017$ ) and data protection law ( $F(1, 595) = 6.47$ ,  $p = .011$ ) a positive relationship for U.S. participants only and a weak negative relationship for Dutch participants (Fig. 4b, 5b). Finally, for trust in data protection law, we found a similar pattern for multitasking ( $F(1, 595) = 4.78$ ,  $p = .029$ ), with a positive relationship in the U.S. sample and no relationship for Dutch participants (Fig. 5c). Furthermore, for change of activity we found a two-way interaction between data collection method and trust in data handling by the government ( $F(1, 595) = 15.54$ ,  $p < .001$ , Fig. 4c). For online profiling, the relation between trust in data handling by the government and intention to change the activity was negative (i.e., the higher the trust, the less intention to change), while for watermarking, this relationship was positive (i.e., the higher the trust, the more intention to change).



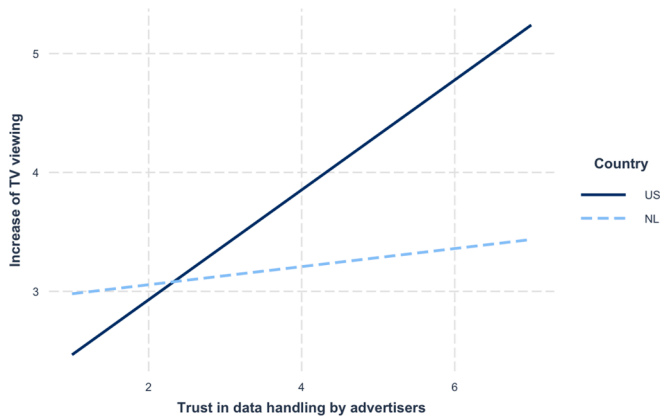


Fig. 3. Interaction effect between country and trust in data handling by advertisers on increase of TV viewing.

Finally, we found a three-way interaction between data collection method, country, and trust in data handling by the government ( $F(1, 595) = 9.97, p = .002$ ) and data protection law ( $F(1, 595) = 4.36, p = .037$ ) for phone usage. For Dutch participants, we found a negative relationship between trust and phone usage for both data collection methods. However, for U.S. participants we found a negative effect of trust in the government for online profiling but a positive relationship for watermarking (Fig. 4d). Similarly, we found a strong negative relation for trust in data protection law for online profiling, but a weaker negative relation for watermarking (Fig. 5d).

8.3. Privacy concerns

To study the moderating role of privacy concerns (H3), we conducted separate three-way ANOVAs for each type of chilling effects with condition and country as the independent variable and with privacy

concerns as the moderating variable. The results showed a positive main effect of privacy concerns on the intention to decrease the amount of TV viewing ( $F(1, 593) = 47.21, p = .001$ ), to change phone usage ( $F(1, 595) = 141.95, p < .001$ ), and to multitask ( $F(1, 595) = 7.59, p = .006$ ). The higher the privacy concerns the more likely participants would be to decrease the amount of TV viewing, change their phone usage, and change multitasking habits. Additionally, we found a significant two-way interaction effect between privacy concerns and country for increase of the amount of TV viewing ( $F(1, 595) = 14.05, p < .001$ ) and multitasking ( $F(1, 595) = 6.75, p = .010$ ), in that we found a strong negative relationship between privacy concerns and the increase of amount of TV viewing for U.S. participants and a slightly positive relationship for Dutch participants (Fig. 6a) and a strong positive relationship between privacy concerns and change in multitasking behavior for Dutch participants and a non-significant relationship for U.S. participants (Fig. 6b).

Finally, we found a significant three-way interaction effect for multitasking ( $F(1, 595) = 4.24, p = .040$ , Fig. 6c). For Dutch participants who were concerned about their privacy, data collection method did not matter – for both, they had a higher intention to change the way they multitask. At the same time, for low concerned Dutch participants online profiling led to slightly higher intention to change the way they multitask compared to watermarking. For U.S. participants, in a similar pattern, when they were highly concerned, the data collection did not matter. At the same time, for low concerned U.S. participants, watermarking led to higher intention to change the way they multitask compared to online profiling.

9. Discussion study 2

To examine the effect of dataveillance on chilling effects, we conducted an online experiment in which we studied the effect of two data collection methods (online profiling vs. watermarking) on chilling effects, and the moderating role of trust and privacy concerns, in the U.S. and in the Netherlands. In line with the first hypothesis, we found that

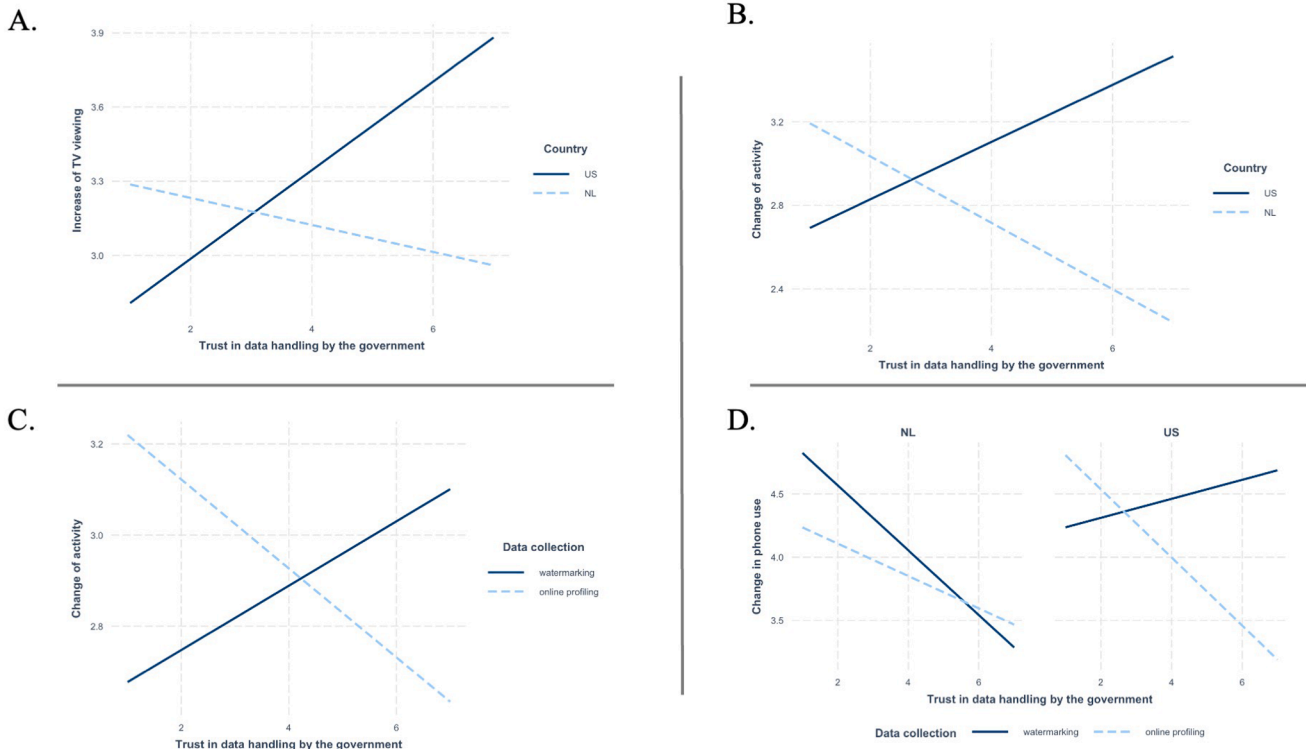


Fig. 4. Interaction effects between country and data collection and trust in data handling by the government on different chilling effects measures.

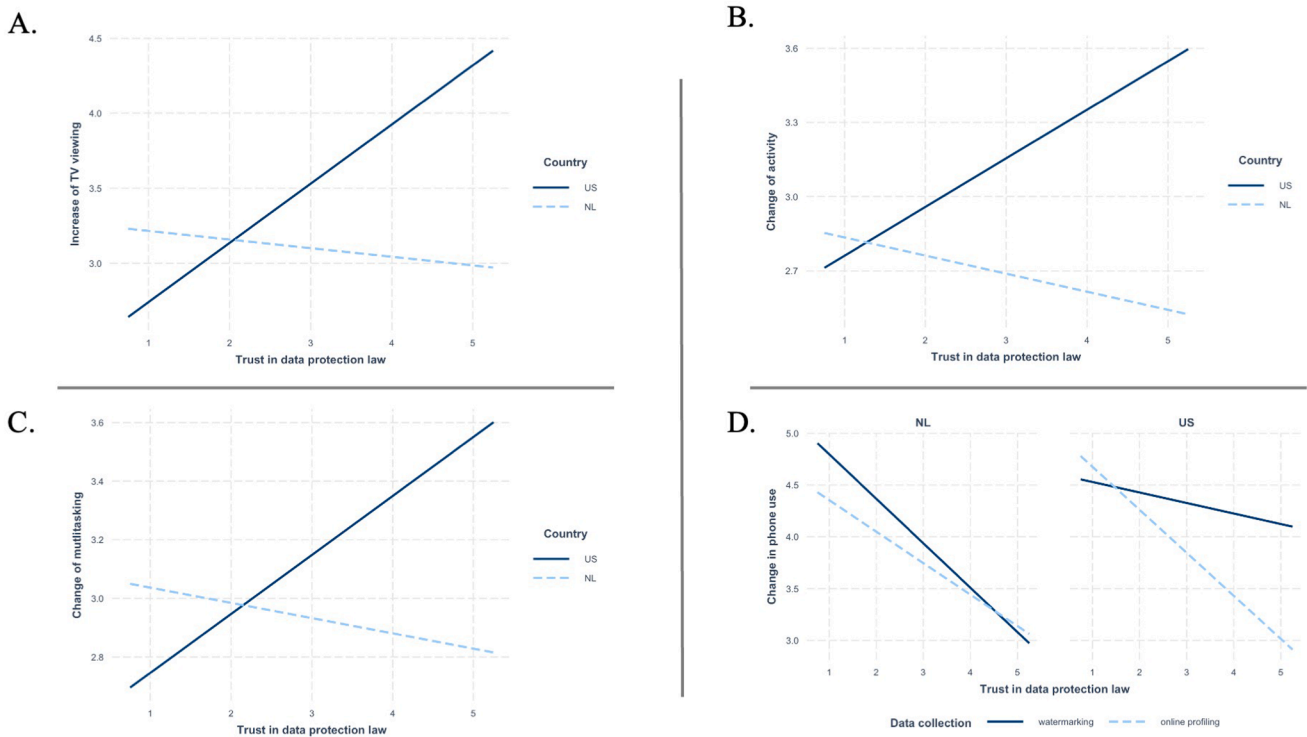


Fig. 5. Interaction effects between country and data collection method and trust in data protection law on different chilling effect measures.

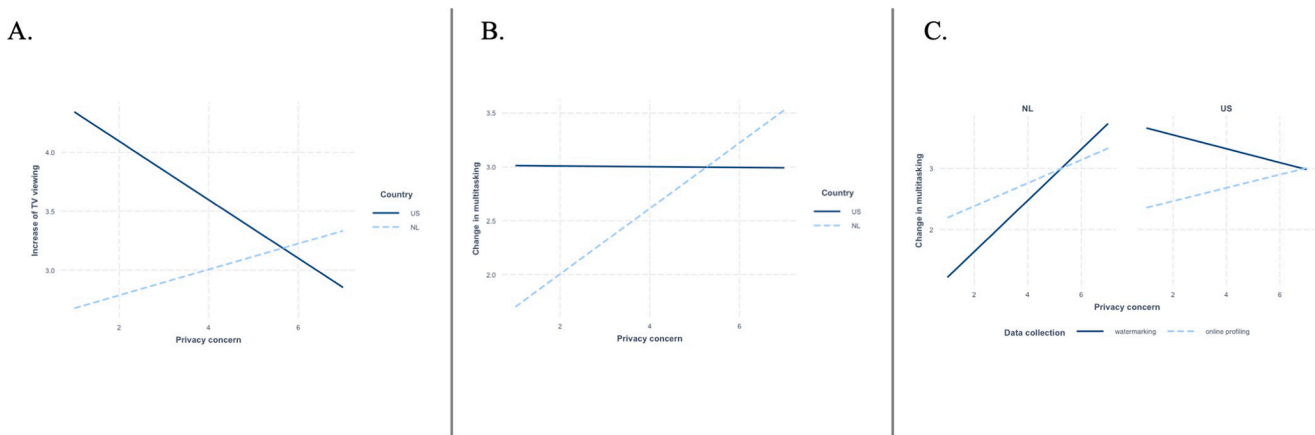


Fig. 6. Interaction effects between country and data collection method and privacy concern on different chilling effects measures.

when watermarking was used to collect data this led to a higher intention to decrease the amount of TV consumption. However, we did not find any other significant direct effects of data collection method on other types of chilling effects. Therefore, H1 was supported for a decrease in the amount of TV viewing only. The fact that we only found an effect for TV viewing may be related to the scenario used and data collection method described – in the scenario, the personalized ad was directly based on data related to TV viewing behavior.

Regarding H2, we expected that higher trust would decrease chilling effects regardless of data collection method. This was indeed true for trust in data handling by advertising, but partially true for trust in data handling by the government, and trust in data protection law. The three types of trust all can be seen as so-called situational trust (it is one’s trust in the specific environment or societal structure where a trust object is situated, Mcknight & Chervany, 2002). In the study’s context, the most relevant trust object are advertisers, which may explain that the findings

are fully in line with expectations for trust in data handling by advertising. For trust in data handling by the government, we found a differential effect of data collection method in that trust in data handling by the government had a negative relation with intention to change the activity for online profiling but a positive relation for watermarking. Additionally, for both trust in data handling by the government and trust in data protection law, we found a differential effect for data collection methods that interacted with trust for U.S. participants only. This can be explained by the context in which trust plays a role, namely when a situation involves uncertainty and risks (Mcknight & Chervany, 2002). As privacy protection laws substantially differ between the U.S. and the Netherlands with the law offering more protection in the EU (Tushnet & Goldman, 2020), this may explain why trust in the law plays a greater role in the U.S., a country with less protection and hence inherently more risk.

Regarding H3b, we found that indeed privacy concerns led to more

chilling effects regardless of data collection method. For the intention to change multitasking behavior, we observed that this effect differed depending on how concerned one was and what country they were from. For highly concerned individuals, indeed privacy concerns led to more chilling effects regardless of data collection method both in the U.S. and the Netherlands. However, for less concerned participants in the U.S., exposure to watermarking led to more intention to change multitasking behavior than online profiling, while in the Netherlands, there was little difference between conditions for low concerned individuals. This could be explained by the centrality of the multitasking behavior. Past research has shown that media multitasking is most common in the U.S. and least common in the Netherlands (Voorveld et al., 2014). As giving up important behavior is more difficult (Wottrich et al., 2018), U.S. respondents who are not concerned may be only willing to give up multitasking when an intrusive data collection technique that involves their mobile devices is used.

## 10. General discussion and conclusion

Technological innovations have significantly shaped the advertising industry. The developments of mathematical models and algorithms and the presence of infrastructure offer new ways to collect, process, and store consumer data to optimize advertising tactics and strategies (Kumar et al., 2021; Yun et al., 2020). The aim of the current study was to examine chilling effects (i.e., a form of self-regulation in response to surveillance practices; Büchi et al., 2022) as an ethical side-effect of such data collection practices. Specifically, we studied how different data collection methods (i.e., online profiling vs. watermarking; low and high in perceived surveillance), regulatory cross-country context (i.e., U.S. vs. the Netherlands), and the moderators (i.e., trust, privacy concerns) affected chilling effects. In a two-step process, we first examined cross-country differences with surveys, followed by a cross-country experiment to study effects.

### 10.1. Theoretical contributions

Overall, the study contributes to past theories on chilling effects and to research on cross-country differences in five ways. First, we demonstrated a differential effect for the type of data collection: chilling effects intention was stronger when data had been collected through the innovative technique of watermarking compared to more common online profiling. This confirms concerns about the role and value of data collection and processing for marketing purposes in a privacy-concerned society (Sivarajah et al., 2017). Although consumers may typically not know what data collection has been used for marketing purposes, we argue that this does not matter as much because it is about consumers' perceptions and beliefs about surveillance and data collection practices (Strycharz & Segijn, 2022a). These beliefs are formed based on information through literacy programs, the news, but also consumers' experiences with personalized advertising and do not have to reflect actual data collection practices. Along these lines, past research has shown the so-called surveillance effect, i.e., "the phenomenon that people worry that their smart devices listen in on them and relevant ads are displayed in social media feeds or websites based on recent conversation topics" (Frick et al., 2021, p. 3). This effect occurs regardless if smart devices are indeed used for data collection. The current study shows that consumers intend to change their behavior because of their belief in how their data is collected extending the application of chilling effects theories, in the past commonly applied in the non-commercial context (e.g., Penney, 2017), to data-driven advertising.

Second, the current study shows that it is important to take different regulatory contexts into account when examining topics such as ethical side-effects of digital data-driven advertising (e.g., personalized advertising, algorithmic decision making). In Study 2, overall, Dutch participants reported less intention to change their behavior, while U.S. participants scored higher on all types of chilling effects. Linking this

back to differences in trust between the countries found in Study 1, it indicates that indeed trust and lack of concerns might mitigate risks involved in personalized advertising and limit the unintended ethical side-effects. Past research has shown that consumers' positive emotions can mitigate the negative effect of personalization (Grigorios et al., 2022). Further research is needed to explore the role of stable factors, such as trust on the effects of data-driven advertising. These findings can also be driven by the actual control over data collection given to the Dutch and Americans by the law (Tushnet & Goldman, 2020). In the past, control over data has been shown to drive data sharing and mitigate concerns about it (Brandimarte et al., 2013). In the context of ethical-side effects of data driven advertising this might mean that control mitigates concerns related to data collection methods perceived as more intrusive.

Third, while trust is an important factor that explains chilling effects as a side-effect of personalization, the current study shows that the object of trust is important, which is in line with trust theories (McKnight & Chervany, 2002). When consumers trust that advertisers treat their data well, they are less likely to change their behavior – the trust mitigates the risk involved in sharing their data with advertisers. The effects of trust in governmental data practices or the law, while they both can be considered relevant to the environment in which personalization happens and hence contribute to situational trust, are less clear. More specifically, they are more important in the U.S. than in the Netherlands, which can possibly be brought back to the regulatory differences. In fact, McKnight and Chervany (2002) argued that the greater the risk, the greater role trust plays in human behavior. In case the law offers less guarantees, trust might kick in as a mitigation mechanism.

Fourth, regarding privacy concern, the current study confirms that it is central when studying the effects of personalized advertising. In prior literature, privacy concern has been investigated as an important factor that drives consumers to reject data collection online, stop sharing their data (including voluntary sharing of information online (Krasnova et al., 2010)), stop using certain data-driven services (e.g., use of social networking sites (Dienlin & Trepte, 2015)), as well as to engage in privacy protection behaviors (e.g., Büchi et al., 2017). The current study extends these findings to chilling effects in the advertising context. Interestingly, while privacy concern seems to drive chilling effects, it does not clearly moderate the relation between how data is collected for personalization and consumers' intention to change behavior. This is only true for intention to change multitasking behavior – in that case indeed, when privacy concern is low, how data is collected matters, but only in the U.S. In the Netherlands, low concerned respondents did not show stronger reactions to watermarking than online profiling, while in the U.S., this was the case. As the survey in Study 1 showed that respondents in the Netherlands were overall more trusting and less concerned about their privacy, we may observe so-called control paradox; meaning perceiving less risk and being more trusting increases the willingness to disclose information (Brandimarte et al., 2013).

Finally, we also found a differential effect for type of chilling effects, which has implications for future research on such behavioral changes. The results seem to suggest that consumers are more likely to decrease the amount of TV usage or change their phone usage. This may indicate that some media behaviors might be easier to change than others. This is in line with past research that has shown that the value of the behavior is important for the decision of a user to give it up (e.g., Wottrich et al., 2018). Similarly, it might be easier to decrease the amount of TV usage (i.e., lowest 'costs') compared to giving it up by changing it for a different activity. Theoretically, it suggests that chilling effects are complex, and some are more likely to occur than others. While past research traditionally conceptualized chilling effects as refraining from certain behaviors due to surveillance (e.g., Bar-Tal, 2017), recent theoretical studies argued that "chilling effects involve not just absence – a lack of speaking or doing – but also *shape* behavior" (Penney, 2022, p. 1455). The current study confirms that differentiating between behavior inhibition and behavior adjustment is necessary as behaviors differ in

prevalence and value to individuals. Future research on chilling effects hence needs to broaden its conceptualization, as looking at inhibition only might omit important ethical-side effects of surveillance.

### 10.2. Practical implications

Our work's findings have important implications for advertisers and marketing managers interested in collecting and processing consumer data for advertising purposes. The survey conducted in Study 1 showed differences in levels of trust and privacy concerns between the U.S. and the Netherlands, with higher levels of trust and lower levels of concerns in the Netherlands. As trust is known as a "social lubricant" that mitigates perceptions of the risk involved in online transactions (Metzger, 2006), lower levels of trust in the U.S. may impact consumers' online interaction and willingness to share data. Hence, international organizations should consider not only adjusting their data-driven marketing strategies to local regulations (for example as it has been observed in case of the impact of the GDPR on the global technology development), but also to cultural differences related to technology.

Furthermore, chilling effects triggered by data-driven advertising can have severe consequences for the industry, the quality of data and eventually personalization. When consumers who are uncomfortable with data collection are informed about how their data is collected and processed for advertising purposes (which is in fact required by the GDPR), they might try to deter this data collection by chilling effects. Although, as suggested by findings in Study 2, decreasing the amount of TV viewing might seem like a lower cost for consumers, this may have important implications for the advertising and tech industry that rely on such data (Yun et al., 2020). More specifically, chilling effects lower the quality of the data as the data do not reflect real preferences of the consumer, but preferences are chilled and follow social conformity rules (for discussion on social conformity and chilling effects see Penney, 2022). Hence, companies need to consider the trade-off between amount and types of data they collect and how this will impact data and inferences quality in the long term.

Besides the industry, the current study also carries implications for the regulators. While the so-called transparency and choice paradigm is the central empowerment mechanism in the E.U. privacy regulations, the current study shows a potential side-effect of transparency. In past research, it has been questioned if informing consumers really enhances their privacy protection behavior (e.g., Strycharz et al., 2021). Adding to that, the current study shows that informing consumers about the different data collection methods could instead elicit intentions to change their media behavior. Chilling effects can be seen as an extreme form of social conformity and are a threat to intellectual privacy as individuals limit their own access to information by not being able to consume media freely (Penney, 2022). Hence, regulators need to be aware of the potential adversarial effects of transparency and pair it with effective empowerment measures that would prevent chilling effects.

### 10.3. Limitations and future research

Although the findings of the current research provide an extension to previous work on ethical side-effects of data-driven advertising, they have some limitations which offer opportunities for future research. While the current study offers comparative insights driven by regulatory differences, a caveat is that we only studied the Netherlands as one of the countries in Europe under the GDPR. The Netherlands is a country with high GDPR awareness (Strycharz et al., 2020) and moderate privacy concerns (Eurobarometer study revealed that 45 % of the Dutch were fairly very worried about the misuse of their data, while such numbers were substantially higher for Germany, France and Italy, and substantially lower for Eastern European countries, European Commission (2009)). Regarding regional differences in the EU, past research has also shown that individuals regard disclosure differently in the south (as a choice) and east (as forced) (Miltgen and Peyrat-Guillard, 2014). Future

research should further examine what patterns exist in other European countries as well as include countries outside of Europe and the U.S. The current study is a first step in examining cross-country regulatory contexts and the results stress the needs of more cross-country research.

Regarding data collection for advertising purposes, the current study focuses on online data collection (as explained to the participants in the definition provided to them). As companies have increasing possibilities for collecting data offline through devices with e.g., microphones, cameras, heart-, eye trackers (Yun et al., 2020), future research needs to examine the ethical side-effects of such offline data collection.

### 10.4. Conclusions

The current study investigated chilling effects – a potential side-effect of data-driven advertising strategies. It shows that modern personalization techniques may indeed lead to consumers changing how they use media, but that the extent of this phenomena is context-dependent. While considering the possible chilling effects is important for advertisers who may unintentionally lead to a change in consumer behavior, it also has strong societal consequences. In particular from a societal perspective, the fact that data collection for advertising may trigger chilling effects is worrisome as chilling effects threaten moral autonomy of individuals (Solove, 2007). When one cannot simply decide when and how to watch TV, it threatens consumers' intellectual privacy as the sphere in which they could consume media beyond the gaze of others is breached.

### CRedit authorship contribution statement

**Joanna Strycharz:** Conceptualization, Methodology, Funding acquisition, Formal analysis, Visualization, Writing - Original Draft, Review & Editing. **Claire M. Segijn:** Conceptualization, Methodology, Formal analysis, Visualization, Funding acquisition, Writing - Original Draft, Review & Editing.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Acknowledgments

This work was supported by the Emerging Scholar Award 2020 of the Association for Education in Journalism and Mass Communication

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