

TWO WORLDS APART!

CLOSING THE GAP BETWEEN
REGULATING EU CONSENT AND
EMPIRICAL USER STUDIES



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Harvard Journal of Law & Technology
Volume 37, Number 3 Symposium 2023

TWO WORLDS APART! CLOSING THE GAP BETWEEN REGULATING EU CONSENT AND USER STUDIES

Nataliia Bielova, Cristiana Santos** & Colin M. Gray****

ABSTRACT

The EU ePrivacy Directive requires consent before using cookies or other tracking technologies, while the EU General Data Protection Regulation (“GDPR”) sets high-level and principle-based requirements for such consent to be valid. However, the translation of such requirements into concrete design interfaces for consent banners is far from straightforward. This situation has given rise to the use of manipulative tactics in user experience (“UX”), commonly known as dark patterns, which influence users’ decision-making and may violate the GDPR requirements for valid consent. To address this problem, EU regulators aim to interpret GDPR requirements and to limit the design space of consent banners within their guidelines. Academic researchers from various disciplines address the same problem by performing user studies to evaluate the impact of design and dark patterns on users’ decision making.

Regrettably, the guidelines and user studies rarely impact each other. In this Essay, we collected and analyzed seventeen official guidelines issued by EU regulators and the EU Data Protection Board (“EDPB”), as well as eleven consent-focused empirical user studies which we thoroughly studied from a User Interface (“UI”) design perspective. We identified numerous gaps between consent banner designs recommended by regulators and those evaluated in user studies. By doing so, we contribute to both the regulatory discourse and future user studies. We pinpoint EU regulatory inconsistencies and provide actionable recommendations for regulators. For academic scholars, we synthesize insights on design elements discussed by regulators requiring further user study evaluations. Finally, we recommend that EDPB and EU regulators, alongside usability, Human-Computer Interaction

III
Tome
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Collection
Bibliothèque de l'IRJS - *André Tunc*
Actes

Vers un droit neuro-éthique ? *Towards a Neuro-ethical Law?*

*Réflexion à partir des pratiques numériques
d'influence et de manipulation des consommateurs*

Sous la direction scientifique de
Sabine BERNHEIM-DESVAUX et Juliette SÉNÉCHAL

*Cycle de recherche scientifique
mené de septembre 2023 à juin 2024*




IRJS Éditions

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EU LAW
REQUIREMENTS:
ePRIVACY, GDPR

BINDING CASE LAW

EU REGULATORY
GUIDELINES

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GUIDELINES

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Liste de nos partenaires IAB

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J'ACCEPTÉ

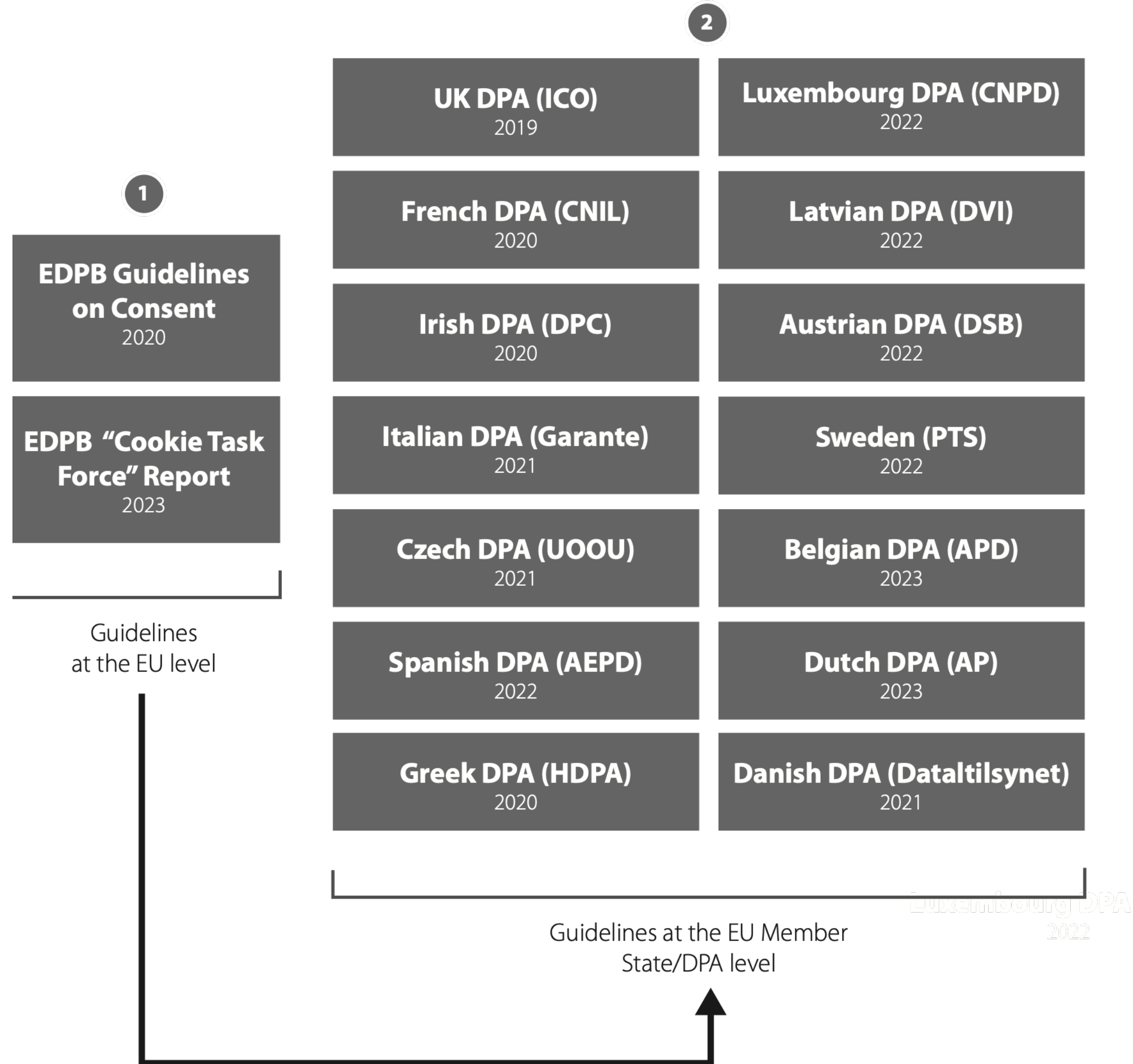
HUMAN-
COMPUTER
INTERACTION

SECURITY &
PRIVACY

SOCIAL
COMPUTING



2 EDPB GUIDELINES 14 GUIDELINES AT EU STATE LEVEL



REGULATORY 2019-2023



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☐ Do Not Agree

☒ Agree

Continue

[This analysis is used to personalize the ads you consent to this use more information in our [Policy](#).

Accept

Decline


Cookie Settings

We use cookies to optimize our website. Such cookies can be categorized into those that are necessary for using the website, as well as those that are optional. You can choose which cookies you want to use. Please note that some features might not be available if you do not accept all cookies.

☐ Statistics☐ Comfort☐ Personalization

Select all and confirm

Confirm selection



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We use cookies to make the website work properly, enhance performance, create personalized functionality, and deliver targeted ads. Some cookies are optional—click 'Allow all cookies' to accept all cookies, or select only the cookies you want and click 'Allow selected cookies.' To update your preferences at any time, click on the 'Cookie Preferences' button on the bottom right corner of this website. For more information, please see our [Privacy Policy](#).

Allow selected cookies

Allow all cookies

☒ Strictly necessary☐ Performance☐ Functional☐ Targeting[Show details](#)

☒ Essential☐ Analytics

☒ Site preferences☐ Marketing

Accept cookies

Customise cookies

11 USER STUDIES

3

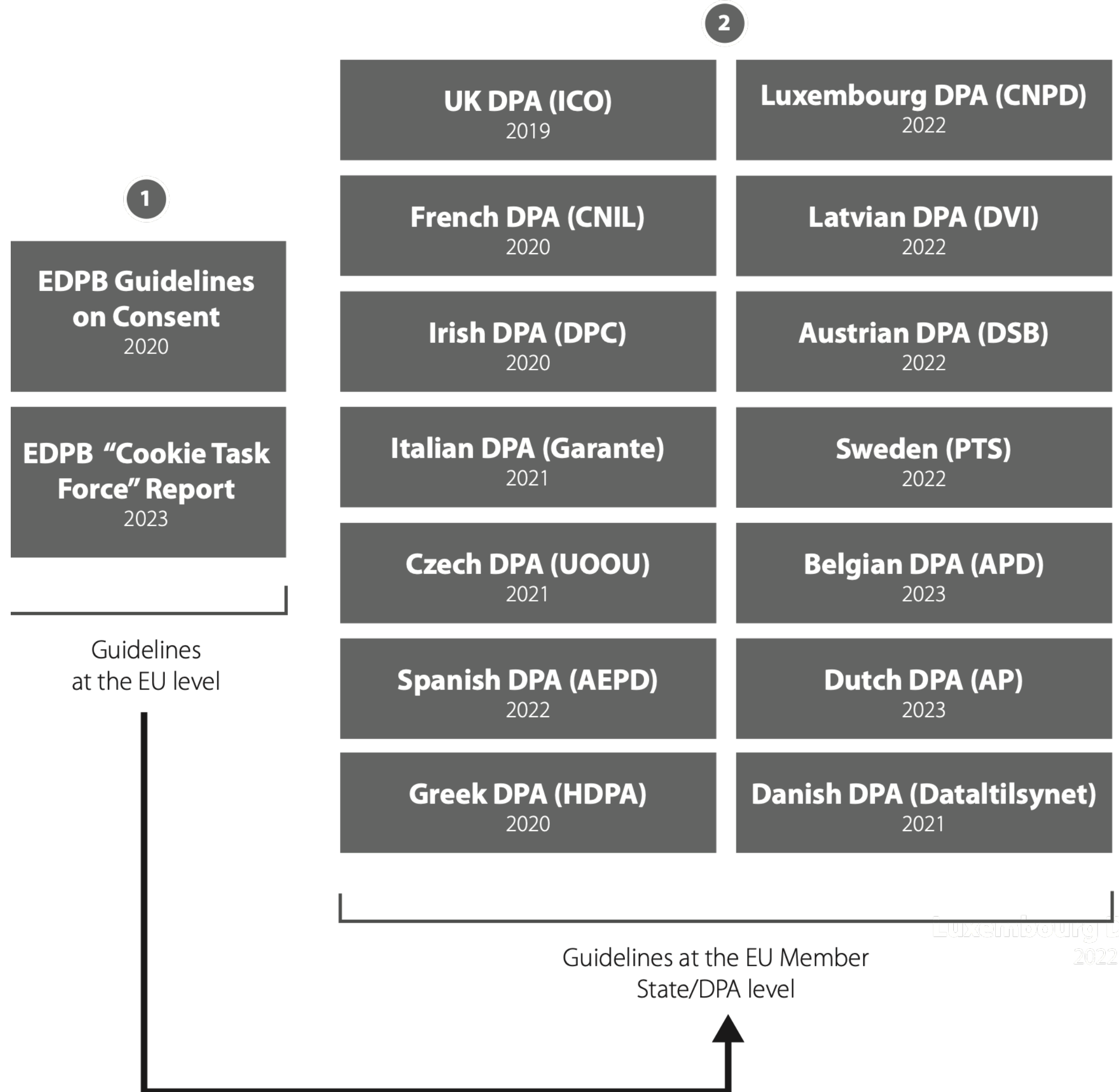
User Studies

Nouwens et al. (2020) Giese & Stabauer (2022) Habib et al. (2022) Ma & Birrell (2022) Bouma-Sims et al. (2023)	HCI
Utz et al. (2019) Machuletz & Böhme (2020) Berens et al. (2022)	Security & Privacy
Bermejo Fernandez et al. (2021) Grassl et al. (2021)	Social Computing
Bavel et al. (2016)	EU Commission Report

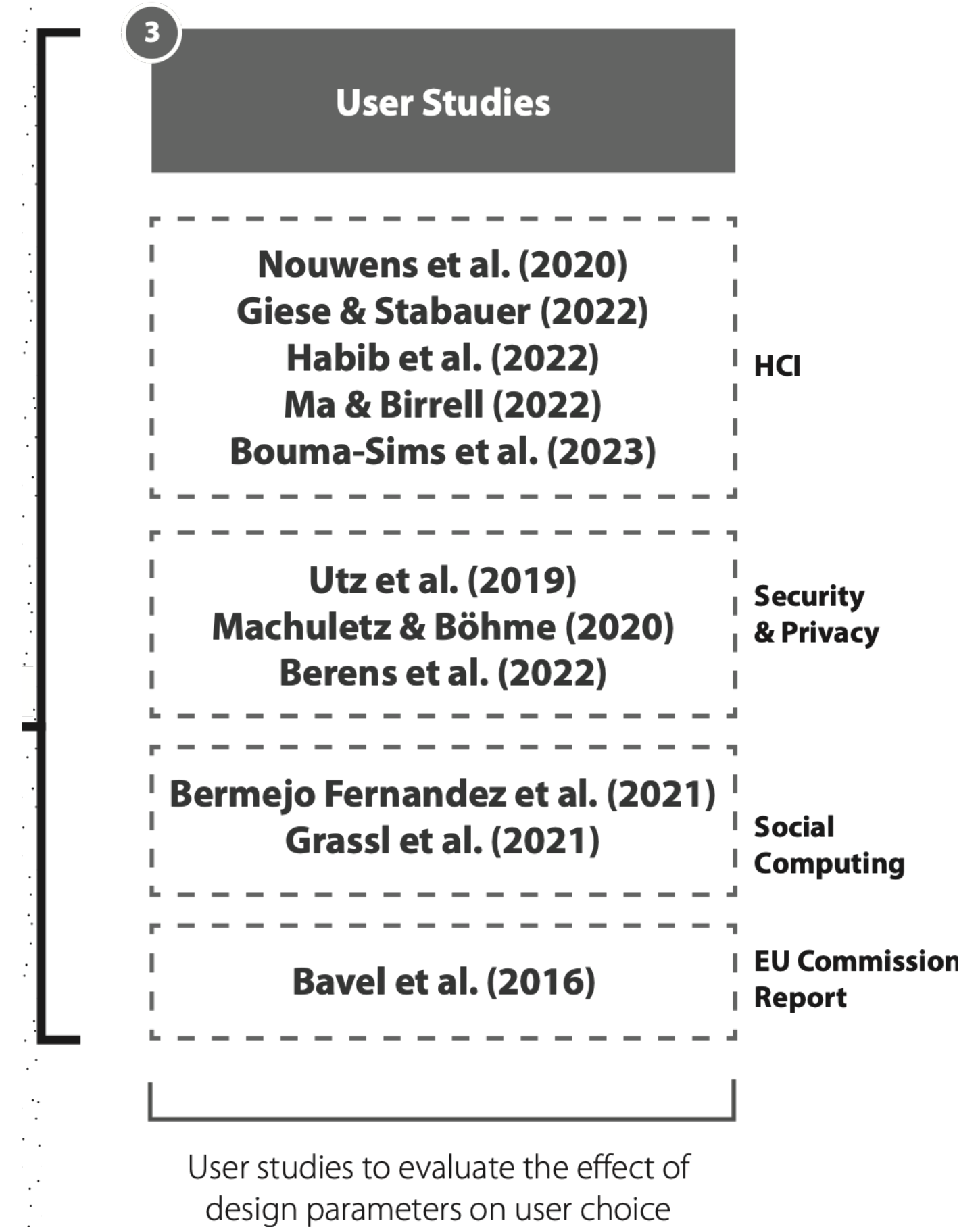
User studies to evaluate the effect of design parameters on user choice



16 EU REGULATORY GUIDELINES



11 USER STUDIES



16 EU REGULATORY GUIDELINES



2

UK DPA (ICO) 2019	Luxembourg DPA (CNPD) 2022
French DPA (CNIL) 2020	Latvian DPA (DVI) 2022
Irish DPA (DPC) 2020	Austrian DPA (DSB) 2022
Italian DPA (Garante) 2021	Sweden (PTS) 2022
Czech DPA (UOOU) 2021	Belgian DPA (APD) 2023
Spanish DPA (AEPD) 2022	Dutch DPA (AP) 2023
Greek DPA (HDP) 2020	Danish DPA (DataTilsynet) 2021

Guidelines at the EU Member
State/DPA level

1

**EDPB Guidelines
on Consent**
2020

**EDPB “Cookie Task
Force” Report**
2023

Guidelines
at the EU level

11 USER STUDIES



3

User Studies

Nouwens et al. (2020)
Giese & Stabauer (2022)
Habib et al. (2022)
Ma & Birrell (2022)
Bouma-Sims et al. (2023)

HCI

Utz et al. (2019)
Machuletz & Böhme (2020)
Berens et al. (2022)

Security
& Privacy

Bermejo Fernandez et al. (2021)
Grassl et al. (2021)

Social
Computing

Bavel et al. (2016)

EU Commission
Report

User studies to evaluate the effect of
design parameters on user choice

controlling

**Consent Banner
Implementations**

4b

BANNER TEXT
BULK CONTROLS
SPECIFIC CONTROLS

**Consent UI
Sections**

evaluating

TRANSLATIONAL GAP

CONSENT BANNER UI SECTIONS

Cookie preferences

Main banner text

Bulk controls

Decline All **Accept All**

Cookie preferences

Main banner text

Specific controls

☐ ☐ ☐ ☐

Submit

QUIZ
Time

WHICH CONSENT BANNER IS COMPLIANT?

Cookie preferences

Decline All

Accept All

Cookie preferences

Accept All

Cookie preferences

You may reject or set up your preferred configuration by clicking [HERE](#).

Accept All

WHICH CONSENT BANNER IS COMPLIANT?

Cookie preferences

Decline All **Accept All**

**Accept and decline
on the first layer**

French, Spanish, Luxembourg,
Irish, Dutch, UK, Denmark,
Greek, Latvian, Czech, Austrian
and Finnish DPAs

Cookie preferences ✕

Accept All

**Closing the banner
means no consent is
given**

Italian, Latvian DPAs

Cookie preferences

You may reject or set up your preferred
configuration by clicking [HERE](#).

Accept All

**“at least provide
information that allows
the user to reject non-
necessary cookies”**

Irish DPAs

GAP: REMOVING THE DECLINE BUTTON MAKES A SIGNIFICANT EFFECT ON USERS CONSENT DECISIONS

HERE.' Below this text are two buttons: a white button with a pink border and a dark blue button labeled 'Accept All'."/>

Cookie preferences

You may reject or set up your preferred configuration by clicking [HERE](#).

Accept All

**“at least provide
information that allows
the user to reject non-
necessary cookies”**

Irish DPAs

**The refusal rate drops by 50%
when the decline button is
removed from the first layer.**

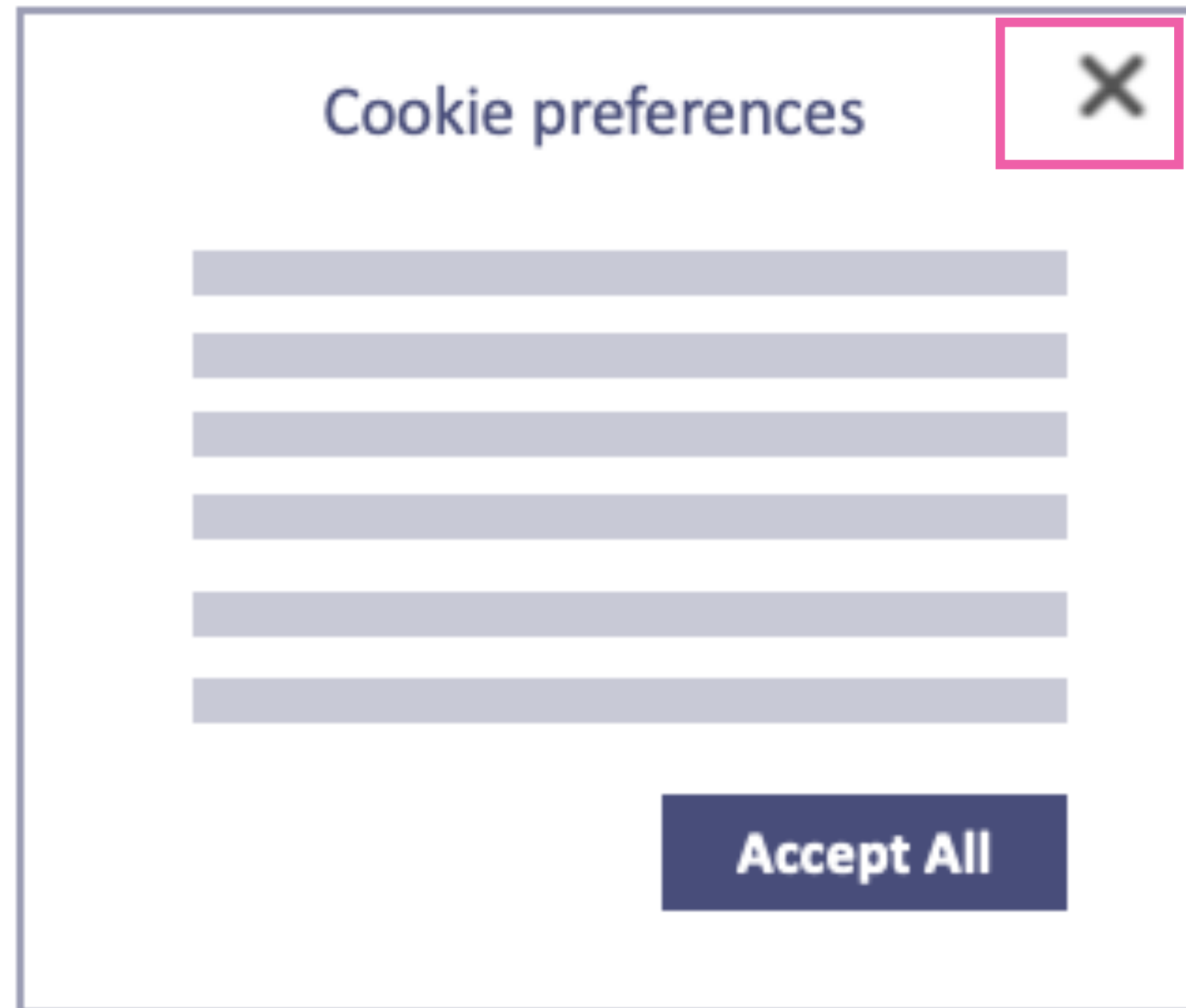
Nouwens et al. 2020

**The refusal rate drops from
17% to 4% when the decline
button is moved from the first
layer to the second layer.**

Bielova et al. 2025

Cookie preferences

Accept All



**Closing the banner means
no consent is given**

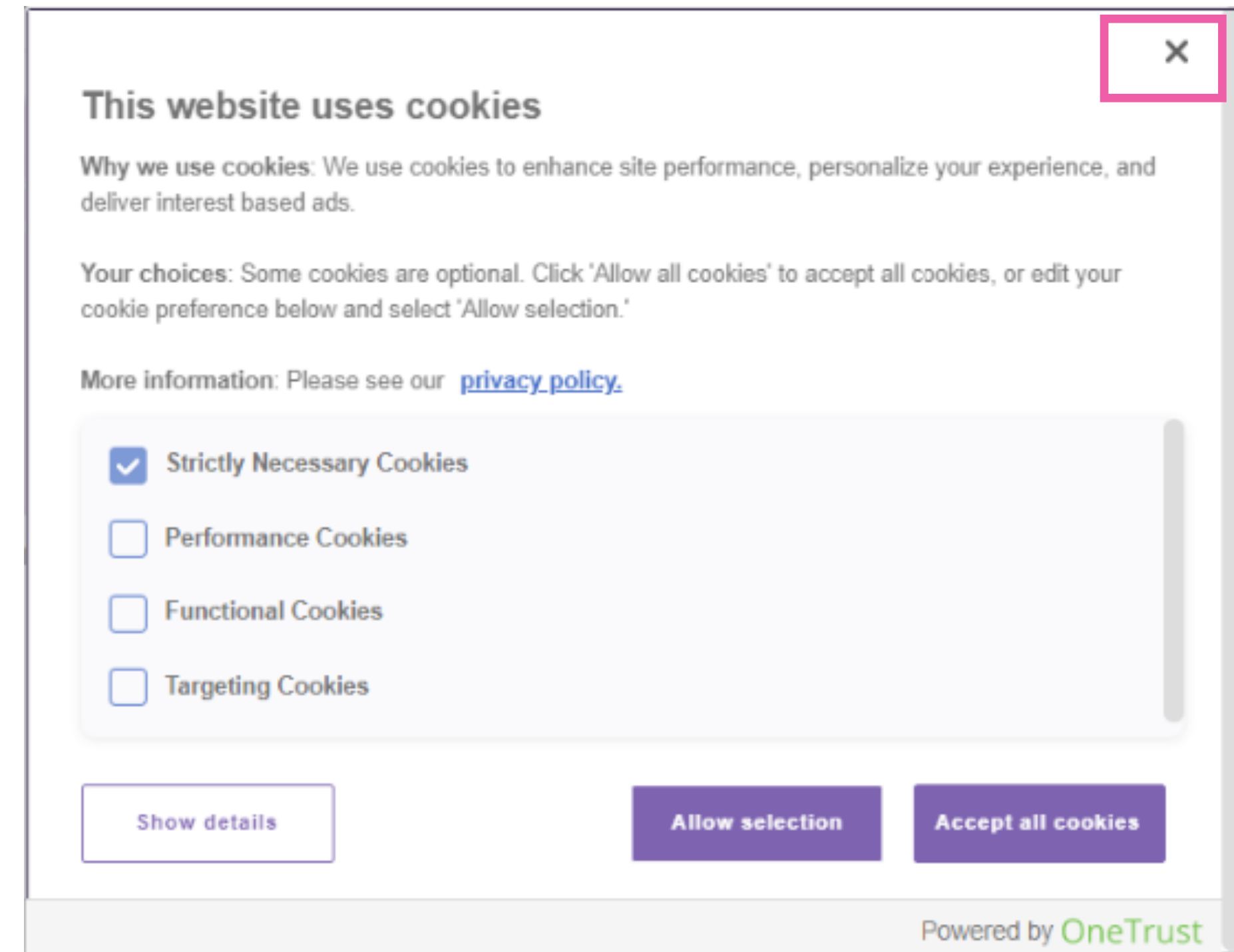
Italian, Latvian DPAs

GAP: “CROSS-SIGN” IS CONFUSING FOR THE USERS



Closing the banner means
no consent is given

Italian, Latvian DPAs



Users were confused about what would occur:
24% expected to receive no cookies,
17% expected the website to set some or all
cookies by default

Bouma-Sims et al. 2023

QUIZ
Time

WHICH BANNER TEXT INFLUENCES USER'S DECISION?

This site uses cookies to offer you a better browsing experience.
Find out more on [how we use cookies and change your setting.](#)

I accept cookies

I refuse cookies

This site uses cookies to offer you a better browsing experience.
Most users know what cookies are. Do you?
Find out more on [how we use cookies and change your setting.](#)

I accept cookies

I refuse cookies

This site uses cookies to offer you a better browsing experience.
You should know that cookies may collect, track and share information such as
your IP address, location, and other personal data with third parties
Find out more on [how we use cookies and change your setting.](#)

I accept cookies

I refuse cookies

This site uses cookies to offer you a better browsing experience.
You can easily choose with who you want to share your personal data by setting your own preferences.
Find out more on [how we use cookies and change your setting.](#)

I accept cookies

I refuse cookies

This site uses cookies to offer you a better browsing experience.
You should know that cookies may collect, track and share information such as
your IP address, location, and other personal data with third parties.
You can easily choose with who you want to share your personal data by setting your own preferences.
Find out more on [how we use cookies and change your setting.](#)

I accept cookies

I refuse cookies

This site uses cookies to offer you a better browsing experience.
However, you can continue browsing without accepting cookies.
Find out more on [how we use cookies and change your setting.](#)

I accept cookies

I refuse cookies

First layer of the banner must contain the minimum information:

- a) identification of data controller(s)*
- b) personal data purposes*
- c) legal basis
- d) right to withdrawal and how to exercise it
- e) whether there are “site-specific” cookies
“third-party” cookies or both
- f) the way users can accept, set or reject
cookies, and the consequences of refusing
(if relevant)
- g) link to the privacy or cookie policy.

* All consulted guidelines, other requirements found in only some DPA guidelines.

GAP: NO SIGNIFICANT IMPACT OF BANNER TEXT ON USERS' CONSENT DECISIONS

First layer of the banner must contain the minimum information:

- a) identification of data controller(s)*
- b) personal data purposes*
- c) legal basis
- d) right to withdrawal and how to exercise it
- e) whether there are “site-specific” cookies
“third-party” cookies or both
- f) the way users can accept, set or reject
cookies, and the consequences of refusing
(if relevant)
- g) link to the privacy or cookie policy.

* All consulted guidelines, other requirements found in only some DPA guidelines.

**No impact on consent decisions among
all six tested banners.**

van Bavel et al. 2016

**29% read the banner text occasionally.
Only 7% users said they always read it**

Giese & Stabauer 2022

CONSENT BANNER UI SECTIONS

Cookie preferences

Specific controls

☐☐☐☐

Submit

Les Cookies chez FIRME

Le site de FIRME utilise pour son compte et celui de ses partenaires des cookies strictement nécessaires au fonctionnement de son site et des cookies nécessitant votre consentement pour les finalités suivantes.

Merci de nous indiquer votre choix pour chaque finalité: *Refus coché par défaut*

Choix par finalité	non	oui
- Publicité comportementale	<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Géolocalisation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Interactions avec les réseaux sociaux	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Pour plus d'informations sur les cookies utilisées, veuillez consulter notre politique de confidentialité.

Vous avez la possibilité de retirer votre consentement à tout moment en cliquant sur le lien "cookies" en bas de page.

Pour information, le refus de certains cookies pourrait affecter les fonctionnalités X/Y du site.

- Informations détaillées disponibles dans un document séparé
- Information sur le retrait de consentement
- Information sur les conséquences d'un refus.

Valider

Présentation succincte des types de cookies et des responsables.

Compliant banner example
Luxembourg DPA

Les Cookies chez FIRME

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- Information sur les conséquences d'un refus.

Valider

This website uses cookies

- **Why we use cookies:** To make the website work properly, enhance performance, create personalized functionality, and deliver targeted ads
- **Your choices:** Some cookies are optional—click 'Allow all cookies' to accept all cookies, or select only the cookies you want and click 'Allow selected'
- **Updating preferences:** Click on the 'Cookie Policy' link in the footer of this website
- **More information:** Please see our [Privacy Policy](#)

Allow selected cookies **Allow all cookies**

☒ Strictly necessary ☐ Performance ☐ Functional ☐ Targeting [Show details](#)

Compliant banner example
Luxembourg DPA

Control group banner
Habib et al. 2022

INSIGHT: SOME USER STUDIES INCLUDE “ACCEPT ALL” NEXT
TO “SAVE”, NUDGING USERS TOWARDS ACCEPTANCE!

Cookie preferences

☐ _____

☐ _____

☐ _____

☐ _____

Submit

Compliant banner example
Luxembourg DPA

Cookie preferences

☐ _____

☐ _____

☐ _____

☐ _____

Allow selected Allow all

Control group banner
Habib et al. 2022

INSIGHT: SOME USER STUDIES INCLUDE “ACCEPT ALL” NEXT TO “SAVE”, NUDGING USERS TOWARDS ACCEPTANCE!

Cookie preferences

☐ _____

☐ _____

☐ _____

☐ _____

Submit

Compliant banner example
Luxembourg DPA

Cookie preferences

☐ _____

☐ _____

☐ _____

☐ _____

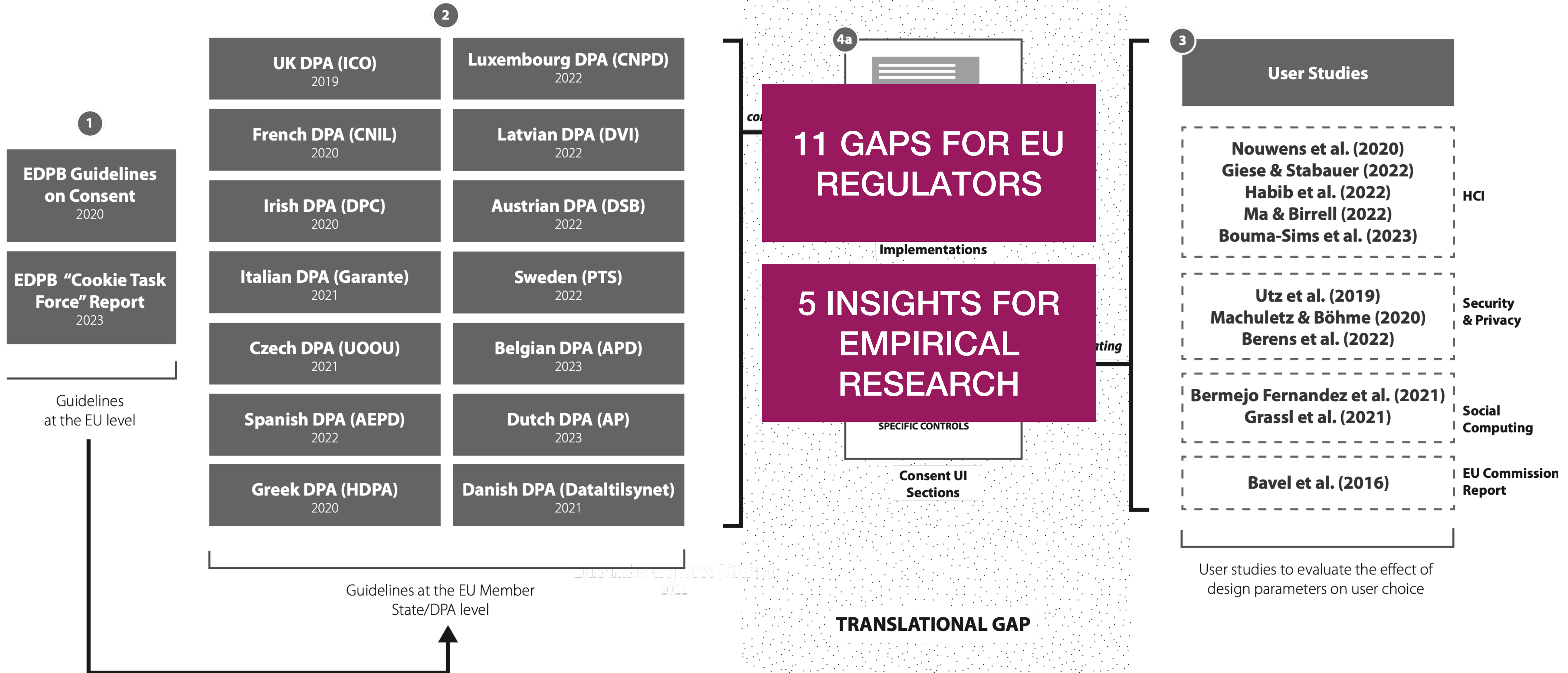
☐ _____


Save Selection **Accept all**

Control group banner
Giese & Stabauer 2022

16 EU REGULATORY GUIDELINES


11 USER STUDIES





BRIDGING THE GAP BETWEEN REGULATORY GUIDELINES AND EMPIRICAL USER STUDIES

Regulators
should
consider
empirical user
study results



BRIDGING THE GAP BETWEEN REGULATORY GUIDELINES AND EMPIRICAL USER STUDIES

Regulators
should
consider
empirical user
study results

```
graph LR; A[Regulators should consider empirical user study results] --> B[BRIDGING THE GAP BETWEEN REGULATORY GUIDELINES AND EMPIRICAL USER STUDIES]; B --> C[Empirical studies could provide evidence to help harmonizing guidelines]
```

BRIDGING THE GAP BETWEEN REGULATORY GUIDELINES AND EMPIRICAL USER STUDIES

Empirical studies
could provide
evidence to help
harmonizing
guidelines

Regulators
should
consider
empirical user
study results

BRIDGING THE GAP BETWEEN REGULATORY GUIDELINES AND EMPIRICAL USER STUDIES

Empirical studies
could provide
evidence to help
harmonizing
guidelines

Development of common
interfaces is needed

Regulators
should
consider
empirical user
study results

BRIDGING THE GAP BETWEEN REGULATORY GUIDELINES AND EMPIRICAL USER STUDIES

Empirical studies
could provide
evidence to help
harmonizing
guidelines

Robust methodology
shared across regulators is
needed

Development of common
interfaces is needed



This work is funded in part by the National Science Foundation under Grant No. 1909714, the ANR JCJC project PrivaWeb (ANR-18-CE39-0008), EU project SPARTA (H2020-SPARTA-13729) and the ANR 22-PECY-0002 IPOP (Interdisciplinary Project on Privacy) project of the Cybersecurity PEPR.

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Inria

