

**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

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\*\*\* Utrecht University School of Law, The Netherlands. This work is funded in part by the research center RENFORCE. We would like to thank the organizers and participants of the *Harvard JOLT-U Iowa IBL Symposium: Beyond the FTC event in 2023* at Harvard Law School for their feedback on early versions of this work.

("HCI"), and design researchers, engage in transdisciplinary dialogue in order to close the gap between EU guidelines and user studies.

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I. INTRODUCTION

Every time EU users browse the Internet, they encounter an array of consent banners prompting them to consent to the use of cookies. These consent banners are subject to two important pieces of legislation: (1) Article 5(3) of the ePrivacy Directive (“ePD”), which

mandates consent banners as a means to request consent for unnecessary cookies (such as advertising),<sup>1</sup> and (2) the GDPR,<sup>2</sup> which sets the requirements for such consent to be valid. Since ePrivacy is an EU Directive, it is regulated at the national level of each EU member state by the competent national regulators. In most EU member states, ePrivacy regulators are national Data Protection Authorities. However, in some states, the regulators are the National Telecommunication Regulation Authority or other authorities. In this Essay, we refer to all authorities that enforce the ePD under the common term “regulators.”

### A. Regulatory Guidelines

The European Data Protection Board — established in the EU by the GDPR and composed by expert representatives of the European Data Protection Authorities<sup>3</sup> — updated its guidelines on consent in 2020 to lay out practical guidance on consent, harmonizing compliance with the GDPR across the EU.<sup>4</sup> Each of the twenty-eight EU national regulators (which are also responsible for enforcement at the national level) in turn issued their own guidelines on consent banners.<sup>5</sup> These guidelines, though not legally binding, provide (with rare visuals) recommended and prohibited designs. They set a level playing field for consent banners in each EU country, and the EDPB works to harmonize and streamline these guidelines. While binding case law from the Data Protection Authorities or the European Court of Justice decides in concrete and inter partes each consent banner-related case,<sup>6</sup> its scope is relatively narrow compared to guidelines that attempt to cover many consent-related cases.

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1. Directive 2009/136/EC, of the European Parliament and of the Council of 25 November 2009 amending Directive 2002/22/EC on Universal Service and Users’ Rights Relating to Electronic Communications Networks and Services, Directive 2002/58/EC on the Processing of Personal Data and the Protection of Privacy in the Electronic Communications Sector, Regulation (EC) No 2006/2004 on Cooperation Between National Authorities Responsible for the Enforcement of Consumer Protection Laws, 2009 O.J. (L 337) 11 [hereinafter ePrivacy Directive].

2. Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation), 2016 O.J. (L 119) 1 [hereinafter GDPR].

3. *EDPB Chairmanship*, EUR. DATA PROT. BD. (Aug. 1, 2023), [https://edpb.europa.eu/about-edpb/who-we-are/edpb-chairmanship\\_en](https://edpb.europa.eu/about-edpb/who-we-are/edpb-chairmanship_en) [<https://perma.cc/M48N-3ZF3>].

4. EUR. DATA PROT. BD., *GUIDELINES 05/2020 ON CONSENT UNDER REGULATION 2016/679* (2020), [https://edpb.europa.eu/sites/default/files/files/file1/edpb\\_guidelines\\_202005\\_consent\\_en.pdf](https://edpb.europa.eu/sites/default/files/files/file1/edpb_guidelines_202005_consent_en.pdf) [<https://perma.cc/2T3F-YDMH>].

5. As shown (and cited) in Figure 1, *infra*, we unite all such sources under a common term “guidelines.”

6. See, e.g., Case C-673/17, *Bundesverband der Verbraucherzentralen und Verbraucherverbände — Verbraucherzentrale Bundesverband e.V. v. Planet49 GmbH*, ECLI:EU:C:2019:246 (Oct. 1, 2019).

### B. Consent Design and Dark Patterns

While the regulators' goal is to provide users with consent banner designs that implement a "freely given, specific, informed and unambiguous indication of the data subject's wishes,"<sup>7</sup> in practice, the consent banner design space is still enormous and left at the discretion of designers of websites and apps. This situation has given rise to the use of manipulative UX tactics, commonly known as dark patterns — design practices that use knowledge of human psychology to trick users into performing actions online that are not in their best interests.<sup>8</sup> This concept has increasingly been used to describe design practices that are deceptive, manipulative, or coercive<sup>9</sup> — and has now entered the regulatory landscape within the EU Digital Services Act.<sup>10</sup> Various definitions of dark patterns that emerged over the last few years have been recently organized into an ontology by separating high-level strategies, meso-level angles of attack, and low-level patterns that describe means of execution.<sup>11</sup> Here, we refer to the definitions in this unified ontology when discussing dark patterns.

### C. User Studies Evaluate the Impact of Design and Dark Patterns on Users' Consent Decisions

Numerous studies focus on consent mechanisms, taking a variety of perspectives, including identifying dark patterns in the design of consent banners,<sup>12</sup> proposing taxonomies to define dark patterns in

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7. GDPR, *supra* note 2, art. 4(11).

8. Harry Brignull, *Dark Patterns: User Interfaces Designed to Trick People*, VERGE (Aug. 29, 2018, 11:15 AM), <https://www.theverge.com/2013/8/29/4640308/dark-patterns-inside-the-interfaces-designed-to-trick-you> [<https://perma.cc/59JF-Y43L>].

9. See Colin M. Gray, Yubo Kou, Bryan Battles, Joseph Hoggatt & Austin L. Toombs, *The Dark (Patterns) Side of UX Design*, PROC. 2018 CHI CONF. ON HUM. FACTORS COMPUTING SYS., Apr. 2018, at 1, 1.

10. Regulation 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market for Digital Services and amending Directive 2000/31/EC (Digital Services Act), art. 25(1), 2022 O.J. (L. 277) 1.

11. "High-level [dark] patterns are . . . general strategies that characterize the inclusion of manipulative, coercive, or deceptive elements that might limit user autonomy and decision making." Colin M. Gray, Cristiana Santos, Nataliia Bielova & Thomas Mildner, *An Ontology of Dark Patterns: Foundations, Definitions, and a Structure for Transdisciplinary Action*, PROC. CHI CONF. ON HUM. FACTORS COMPUTING SYS., May. 2024, at 1, 8 (emphasis omitted). "Meso-level patterns bridge high- and low-level forms of knowledge and describe an *angle of attack* or specific approach to limiting, impairing, or undermining the ability of the user to make autonomous and informed decisions or choices." *Id.* "Low-level patterns are the most . . . contextually dependent form of knowledge, including *specific means of execution* that limits or undermines user autonomy and decision making, is described in visual and/or temporal form(s) . . ." *Id.*

12. Midas Nouwens, Iliaria Liccardi, Michael Veale, David Karger & Lalana Kagel, *Dark Patterns After the GDPR: Scraping Consent Pop-ups and Demonstrating their Influence*, PROC. 2020 CONF. ON HUM. FACTORS COMPUTING SYS., Apr. 2020, at 1, 5–6.

consent,<sup>13</sup> reasoning about the tension between dark patterns and legal requirements for consent,<sup>14</sup> seeking out violations of the GDPR requirements in consent requests,<sup>15</sup> and assessing harms caused by consent-related dark patterns.<sup>16</sup> In particular, numerous studies provide evidence that design choices and dark patterns substantially influence users' choices. These studies, evaluating the effects of design choices in consent banners on the outcome of users' consent decisions, are a core subject of this Essay.<sup>17</sup>

#### *D. Bidirectional Approach*

In this Essay, we organized a transdisciplinary team of three authors in computer science, data protection law, and design, and took a bidirectional approach to analyze sixteen guidelines on consent banners from EU regulators and eleven user studies that evaluate the impact of design and dark patterns on users' consent decisions. When analyzing user studies, we focused on the consent user interface (“UI”) elements immediately available to the user, leaving technical requirements for consent (such as proof and storage thereof) outside the scope of this Essay. Through this analysis, we identified gaps between guidelines and user studies that we explore in this Essay. All studied sources are shown in Figure 1, which demonstrates our bidirectional methodology and the resulting consent UI elements where our contributions are located.

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13. Than Htut Soe, Oda Elise Nordberg, Frode Guribye & Marija Slavkocik, *Circumvention by Design — Dark Patterns in Cookie Consent for Online News Outlets*, PROC. 11TH NORDIC CONF. HUM.-COMP. INTERACTION, Oct. 2020, at 1, 8.

14. Colin M. Gray, Cristiana Santos, Nataliia Bielova, Michael Toth, & Damian Clifford, *Dark Patterns and the Legal Requirements of Consent Banners: An Interaction Criticism Perspective*, PROC. 2021 CHI CONF. ON HUM. FACTORS COMPUTING SYS., May 2021, at 1, 13–14.

15. Célestin Matte, Nataliia Bielova & Cristiana Santos, *Do Cookie Banners Respect My Choice? Measuring Legal Compliance of Banners from IAB Europe's Transparency and Consent Framework*, 2020 IEEE SYMP. ON SEC. & PRIV. 791, 791, 794–95.

16. See John Gunawan, Cristiana Santos & Irene Kamara, *Redress for Dark Patterns Privacy Harms? A Case Study on Consent Interactions*, PROC. 2022 SYMP. ON COMP. SCI. & L., Nov. 2022, at 1, 5–7.

17. Nataliia Bielova, *A Survey of User Studies as Evidence for Dark Patterns in Consent Banners*, LINC (June 12, 2023), [https://www.cnil.fr/sites/cnil/files/atoms/files/full\\_2022-12-02\\_v2.pdf](https://www.cnil.fr/sites/cnil/files/atoms/files/full_2022-12-02_v2.pdf) [<https://perma.cc/V6Q4-ULY3>].

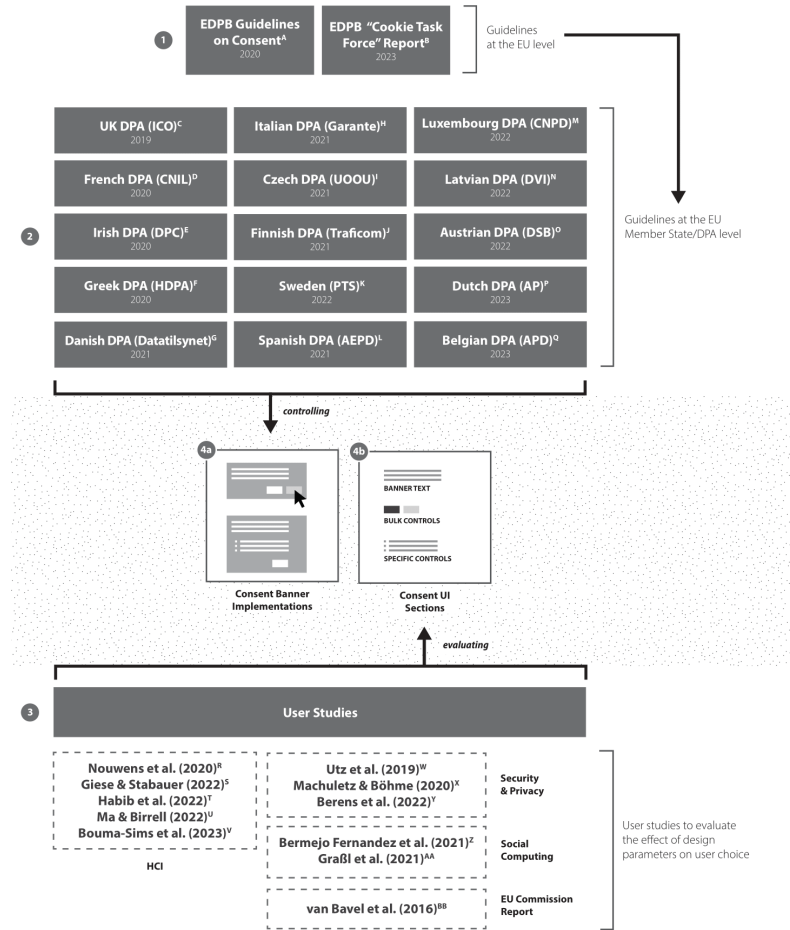


Figure 1: Analyzed Guidelines and User Studies to Identify Gaps and Insights for Both Regulatory and Research Communities.<sup>18</sup>

### E. Contributions

We provide contributions for two audiences in this Essay: regulators and researchers performing user studies. For regulators, this Essay

18. The notes for the figure are as follows:

[A] EUR. DATA PROT. BD., *supra* note 4.

[B] EUR. DATA PROT. BD., REPORT OF THE WORK UNDERTAKEN BY THE COOKIE BANNER TASKFORCE (2023), [https://edpb.europa.eu/system/files/2023-01/edpb\\_20230118\\_report\\_cookie\\_banner\\_taskforce\\_en.pdf](https://edpb.europa.eu/system/files/2023-01/edpb_20230118_report_cookie_banner_taskforce_en.pdf) [<https://perma.cc/4ZZF-GEGU>].

[C] *Guidance on the Use of Cookies and Similar Technologies*, INFO. COMM'R'S OFF. (2019), <https://ico.org.uk/media/for-organisations/direct-marketing-and-privacy-and->

electronic-communications/guide-to-pecr/guidance-on-the-use-of-cookies-and-similar-technologies-1-0.pdf [https://perma.cc/7G8D-AZWD] [hereinafter ICO].

[D] COMMISSION NATIONALE DE L'INFORMATIQUE ET DES LIBERTÉS, RECOMMANDATION “COOKIES ET AUTRES TRACEURS,” [NAT'L COMM'N FOR COMPUTING & FREEDOMS, “COOKIES AND OTHER TRACKERS” RECOMMENDATION] (2020), <https://www.cnil.fr/sites/cnil/files/atoms/files/recommandation-cookies-et-autres-traceurs.pdf> [https://perma.cc/QT6T-QHTH] [hereinafter CNIL].

[E] DATA PROT. COMM'N, GUIDANCE NOTE: COOKIES AND OTHER TRACKING TECHNOLOGIES (2020), <https://www.dataprotection.ie/sites/default/files/uploads/2020-04/Guidance%20note%20on%20cookies%20and%20other%20tracking%20technologies.pdf> [https://perma.cc/9BPC-V5D4] [hereinafter DPC].

[F] ΑΡΧΗ ΠΡΟΣΤΑΣΙΑΣ ΔΕΔΟΜΕΝΩΝ, ΣΥΣΤΑΣΕΙΣ 1/2020 ΣΥΜΜΟΡΦΩΣΗ ΥΠΗΕΡΘΥΝΩΝ ΕΠΙΧΕΙΡΗΣΙΑΣ ΔΕΔΟΜΕΝΩΝ ΜΕ ΤΗΝ ΕΙΔΙΚΗ ΝΟΜΟΘΕΣΙΑ ΓΙΑ ΤΙΣ ΗΛΕΚΤΡΟΝΙΚΕΣ ΕΠΙΚΟΙΝΩΝΙΕΣ [PRINCIPLE OF DATA PROTECTION, RECOMMENDATIONS 1/2020 COMPLIANCE OF DATA CONTROLLERS WITH SPECIFIC LEGISLATION ON ELECTRONIC COMMUNICATIONS] (2020), <https://www.dpa.gr/el/enimerwtiko/deltia/systaseis-gia-ti-symmorfosi-ypeythynon-epexergasias-dedomenon-me-tin-eidiki> [https://perma.cc/69RC-AVQS] [hereinafter HDPA].

[G] DATATILSYNET, QUICK-GUIDE TIL AT SÆTTE COOKIES [DATA SUPERVISION, QUICK GUIDE TO SETTING COOKIES] (2021), <https://datatilsynet.dk/Media/E/7/Quickguide.pdf> [https://perma.cc/BB9B-3Y47] [hereinafter DATATILSYNET].

[H] Linee guida 10 giugno 2021, n.163, G.U. July 19, 2021., n. 231 (It.), <https://www.garanteprivacy.it/web/guest/home/docweb/-/docweb-display/docweb/9677876> [https://perma.cc/K46E-QPXG] [hereinafter GARANTE].

[I] *Cookie Listy a Udělování Souhlasu*, ÚRAD PRO OCHRANU OSOBNÍCH ÚDAJŮ [*Cookie Bars and Granting of Consent*, OFF. FOR PROT. PERS. DATA] (2021), <https://www.uoou.cz/cookie-listy-a-udelovani-souhlasu/ds-6912/archiv=1&p1=2611> [https://perma.cc/3W9B-UUMQ] [hereinafter UOOU].

[J] TRAFICOM: FINNISH TRANS. & COMMC'NS AGENCY, COOKIES AND OTHER DATA STORED ON USERS' TERMINAL DEVICES AND THE USE OF SUCH DATA – GUIDELINES FOR SERVICE PROVIDERS (2021), [https://www.traficom.fi/sites/default/files/media/file/Guidance\\_on\\_the\\_use\\_of\\_web\\_cookies\\_for\\_the\\_service\\_providers.pdf](https://www.traficom.fi/sites/default/files/media/file/Guidance_on_the_use_of_web_cookies_for_the_service_providers.pdf) [https://perma.cc/VRY9-CGJK] [hereinafter TRAFICOM].

[K] *Information om Kakor*, PTS (2022), <https://pts.se/sv/bransch/internet/integritet/information-om-kakor/#omkakor> [https://perma.cc/XLH3-L5PX] [hereinafter PTS].

[L] AGENCIA ESPAÑOLA DE PROTECCIÓN DE DATOS, GUÍA SOBRE EL USO DE LAS COOKIES [SPANISH DATA PROTECTION AGENCY, GUIDE ON THE USE OF COOKIES] (2021), <https://www.aepd.es/guides/guide-on-use-of-cookies.pdf> [https://perma.cc/59KM-ACH8] [hereinafter AEPD].

[M] COMMISSION NATIONALE POUR LA PROTECTION DES DONNEE, LIGNES DIRECTRICES EN MATIERE DE COOKIES ET AUTRES TRACEURS [NAT'L COMM'N FOR DATA PROT., GUIDELINES ON COOKIES AND OTHER TRACKERS] (2022), <https://cnpd.public.lu/content/dam/cnpd/fr/dossiers-thematiques/cookies/CNPD-LD-Cookies.pdf> [https://perma.cc/M62B-NED7] [hereinafter CNPD].

[N] DATU VALSTS INSPEKCIJA, VADLĪNIJAS SĪKDATŅU IZMANTOŠANAI TĪMEKLĀ VIETNĒ [NAT'L DATA INSPECTION, GUIDELINES FOR THE USE OF COOKIES ON THE WEBSITE] (2022), <https://www.dvi.gov.lv/lv/media/1517/download> [https://perma.cc/2HLG-R46P] [hereinafter DVI].

[O] *FAQ zum Thema Cookies und Datenschutz*, DATENSCHUTZ BEHORDE [*FAQ on Cookies and Data Protection*, DATA PROT. AUTH.] (May 3, 2023), [https://www.dsb.gv.at/download-links/FAQ-zum-Thema-Cookies-und-Datenschutz.html#Frage\\_6](https://www.dsb.gv.at/download-links/FAQ-zum-Thema-Cookies-und-Datenschutz.html#Frage_6) [https://perma.cc/F4PV-8RX9] [hereinafter DSB].

[P] *Cookies*, AUTORITEIT PERSOONSGEGEVENS [PERS. DATA AUTH.], <https://autoriteitpersoonsgegevens.nl/themas/internet-slimme-apparaten/cookies> [https://perma.cc/8NX9-ZUI9] [hereinafter AP].

[Q] *Bannières Cookies: L'EDPB Publie Des Exemples De Pratiques Non Conformes*, AUTORITE DE PROTECTION DES DONNEES [*Cookie Banners: EDPB Publishes Examples of Non-Compliant Practices*, DATA PROT. AUTH.] (Feb. 10, 2023),



provides the following contributions with a focus on mitigating gaps. First, we identify agreements and misalignments in the recommended consent banner designs across EU regulators and EDPB guidelines. Second, we demonstrate consistencies where designs recommended by EU regulators are beneficial to users, according to user studies. Third, we identify new design parameters and implementations that are not considered by EU regulators but have been explored by user studies. We then provide recommendations to regulators to update their guidance on design parameters that are shown to be ineffective or confusing by user studies. Finally, our body of literature can help regulators identify findings that are relevant for harmonizing the interpretation of consent among EU regulators.

For researchers, we provide the following contributions with a focus on identifying insights. First, we survey all existing user studies and identify areas of disagreement between the results of user studies where further research is needed. Second, we identify design parameters that are recommended by EU regulators, but which have not been evaluated through user studies, thus guiding future usable privacy and HCI community research. Finally, we highlight unexplored design parameters on which regulators provide varying recommendations, motivating researchers in future studies, which, if undertaken, could aid in harmonizing approaches of different regulators.

In this Essay, we first describe our methodology to collect and analyze guidelines and user studies and identify three main sections of consent UI — main banner text, bulk controls, and specific controls — in Part II. In Parts III, IV, and V, we present gaps and insights for each of the three identified parts of the UI. Finally, Part VI concludes the Essay.

## II. METHODOLOGY

To analyze the guidelines and research literature from multiple perspectives, three authors in computer science, law, and design have engaged in a transdisciplinary dialogue. Specifically, a data protection scholar (Cristiana) collected all guidelines; a computer scientist with expertise in regulation (Nataliia) performed a thorough review of usable security and privacy literature; and together with a researcher in design and HCI (Colin), the authors discussed and mapped various designs found in the guidelines with those studied in the research literature. A summary of the sources we considered is included as a timeline in Figure 2.

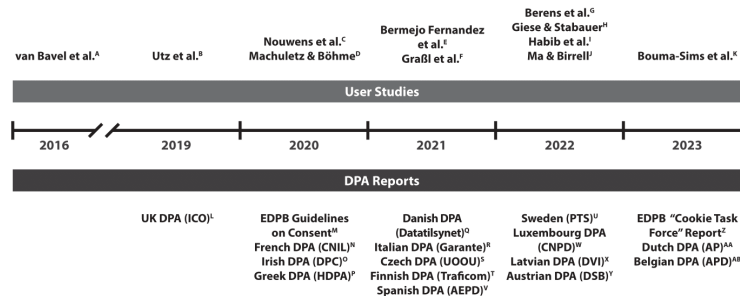


Figure 2: A Timeline Describing the Publication Dates for the User Studies and Regulatory Reports We Evaluated.<sup>19</sup>

### A. Collection of Regulatory Guidelines

We first identified the EU Data Protection Authorities (“DPAs”) and other competent regulators that provide guidelines and

19. The notes for the figure are as follows:

[A] RENÉ VAN BAVEL & NURIA RODRÍGUEZ-PRIEGO, TESTING THE EFFECT OF THE COOKIE BANNERS ON BEHAVIOUR, JRC EUR. COMM’N (2016).

[B] Christine Utz, Martin Degeling, Sascha Fahl, Florian Schaub & Thorsten Holz, *(Un)informed Consent: Studying GDPR Consent Notices in the Field*, PROC. 2019 ACM SIGSAC CONF. ON COMP. & COMM’NS SEC., Nov. 2019.

[C] Nouwens et al., *supra* note 12.

[D] Dominique Machuletz & Rainer Böhme, *Multiple Purposes, Multiple Problems: A User Study of Consent Dialogs after GDPR*, 2020 PROC. ON PRIV. ENHANCING TECHS., Apr. 2020.

[E] Carlos Bermejo Fernandez, Dimitris Chatziopoulos & Dimitrios Papadopoulos, *This Website Uses Nudging: MTurk Workers’ Behaviour on Cookie Consent Notices*, 5 PROC. ACM ON HUM.-COMPUT. INTERACTION, Oct. 2021.

[F] Paul Graßl, Hanna Schraffenberger, Frederik Zuiderveen Borgesius & Moniek Buijzen, *Dark and Bright Patterns in Cookie Consent Requests*, 3 J. DIGIT. SOC. RSCH. 1 (2021).

[G] Benjamin Maximilian Berens, Heike Dietmann, Chiara Krisam, Oksana Kulyk & Melanie Volkamer, *Cookie Disclaimers: Impact of Design and Users’ Attitude*, PROC. 17TH INT’L CONF. ON AVAILABILITY, RELIABILITY & SEC., Aug. 2022.

[H] Julia Giese & Martin Stabauer, *Factors That Influence Cookie Acceptance: Characteristics of Cookie Notices That Users Perceive to Affect Their Decisions*, 2022 HCI BUS., GOV. & ORGS: 9TH INT’L CONF. 272.

[I] Hana Habib, Megan Li, Ellie Young & Lorrie Cranor, *“Okay, Whatever”: An Evaluation of Cookie Consent Interfaces*, PROC. 2022 ACM CONF. ON HUM. FACTORS COMPUTING SYS., Apr. 2022.

[J] Eryn Ma & Eleanor Birrell, *Prospective Consent: The Effect of Framing on Cookie Consent Decisions*, EXTENDED ABSTRACTS 2022 CHI CONF. ON HUM. FACTORS COMPUTING SYS., Apr. 2022.

[K] Elijah Bouma-Sims, Megan Li, Yanzi Lin, Adia Sakura-Lemessy, Alexandra Nisenoff, Ellie Young et al., *A US-UK Usability Evaluation of Consent Management Platform Cookie Consent Interface Design on Desktop and Mobile*, PROC. 2023 CHI CONF. ON HUM FACTORS IN COMPUTING SYST., Apr. 2023.

[L] ICO, *supra* note 18.

[M] EUR. DATA PROT. BD., *supra* note 4.

recommendations on consent to cookies and other tracking technologies,<sup>20</sup> though we did not aim to exhaustively analyze and compare the guidelines of all European Economic Area regulators. We considered the guidelines of the EDPB since it represents all EU data protection regulators. In early 2023, the EDPB “Cookie Taskforce”<sup>21</sup> report presented the positions of the EU regulators while handling the “cookie banner” complaints received from the nongovernmental organization “NOYB — European Center for Digital Rights.”<sup>22</sup> As mentioned in the disclaimer of the EDPB report, these positions reflect a minimum threshold to assess the placement or reading of cookies and the subsequent processing of collected data; they do not constitute stand-alone recommendations to obtain a green light from a competent authority.<sup>23</sup>

Santos et al. have already analyzed the DPAs’ guidelines and case law published before 2019.<sup>24</sup> We extend their work by analyzing new guidelines updated since then. Out of twenty-eight EU regulators, fourteen have provided guidelines on “cookies and other tracking technologies” and recommendations on consent banner design since 2019 until March 2023 when this research was conducted. We gathered these fourteen sources as well as the two EDPB guidelines. All studied sources are listed and cited in Figure 1.

We analyzed the original version of the guidelines in the languages we understand: English, Spanish, Portuguese, French, and Italian. We also analyzed the English versions of these guidelines. When no English version was available, we translated the guidelines using tools such

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[N] CNIL, *supra* note 18.

[O] DPC, *supra* note 18.

[P] HDP, *supra* note 18.

[Q] DATATILSYNET, *supra* note 18.

[R] GARANTE, *supra* note 18.

[S] UOOU, *supra* note 18.

[T] TRAFICOM, *supra* note 18.

[U] PTS, *supra* note 18.

[V] AEPD, *supra* note 18.

[W] CNPD, *supra* note 18.

[X] DVI, *supra* note 18.

[Y] DSB, *supra* note 18.

[Z] EUR. DATA PROT. BD., *supra* note 18.

[AA] AP, *supra* note 18.

[AB] APD, *supra* note 18.

20. While most regulators have official guidelines, some of them provide information on their websites or in FAQ documents. We, however, use the term “guidelines” as a common denominator.

21. EUR. DATA PROT. BD., *supra* note 18, at 3.

22. Originally, NOYB stands for “None of Your Business” but the organization’s official name does not refer to it anymore. See *Our Detailed Concept*, NOYB, <https://noyb.eu/en/our-detailed-concept> [<https://perma.cc/8LDG-86RD>].

23. EUR. DATA PROT. BD., *supra* note 18, at 3.

24. Cristiana Santos, Nataliia Bielova & Célestin Matte, *Are Cookie Banners Indeed Compliant with The Law? Deciphering EU Legal Requirements on Consent and Technical Means to Verify Compliance of Cookie Banners*, 2020 *TECH. & REG.* 91, 99–125.

as DeepL Translate and Google Translate, acknowledging that the actual and precise meaning of the official translation might not always be apprehended completely.

### *B. Collection of User Studies*

Our goal was to collect all academic peer reviewed literature that evaluated the effect of consent banner design on the outcome of users' consent decisions; such evaluation was a mandatory criterion for a given study to be added to our corpus. We included user studies only if they contained some measurable effect of design parameters on the outcome of users' consent decisions, as these insights may be useful for discussions among regulators and potentially help update guidelines.

We identified two foundational papers analyzing the impact of consent banner design on user consent decisions: Utz et al. in 2019<sup>25</sup> and Nouwens et al. in 2020.<sup>26</sup> We analyzed all 518 citations of these two articles and considered only articles published or accepted for publication with peer review and available in English. We performed a citation-bounded search instead of analyzing individual conferences or journals in order to include publications from different domains. We identified twelve articles published in the following domains: Human-Computer Interaction (six articles), Computer Security and Privacy (four articles), and Social Computing (two articles).

We also identified the earliest study testing the effect of consent banners on users' consent decisions performed in 2016 by the EU Commission researchers (van Bavel et al.).<sup>27</sup> This study primarily evaluated the impact of the main banner text<sup>28</sup> (see Table 1), and we included this study in our body of literature for a total of thirteen user studies.

By thoroughly analyzing thirteen user studies, we concluded that two studies would not contribute directly to this Essay. The study of Borberg et al. evaluated consent banners on real-world websites that significantly differed in their design, making it difficult to compare implementations of a design parameter.<sup>29</sup> The study of Bauer et al. evaluated banners that differed in the number of implementations of a design

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25. Utz et al., *supra* note 19, at 973.

26. Nouwens et al., *supra* note 12.

27. See VAN BAVEL ET AL., *supra* note 19.

28. *Id.* at 9 fig.4 presents seven tested consent banners, six of which are identical in design and differ only in the main banner text.

29. Ida Borberg, René Hougaard, Willard Rafnsson & Oksana Kulyk, "So I Sold My Soul": Effects of Dark Patterns in Cookie Notices on End-User Behavior and Perceptions, USABLE SEC. & PRIV. SYMP., Mar. 2022, at 1, 4.

parameter, making it difficult to identify which implementation impacted a consent decision.<sup>30</sup>

As a result, we focused on eleven user studies (summarized in Table 2 in Section II.C). We indicate the number of users per consent banner that were tested and the origin of participants as important background information to interpret the results of the studies relating to guidelines.


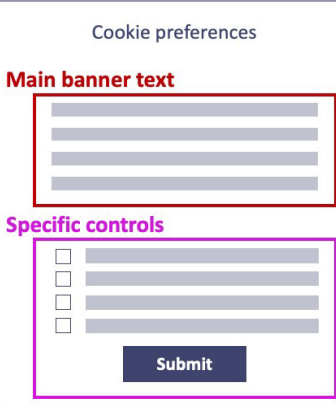
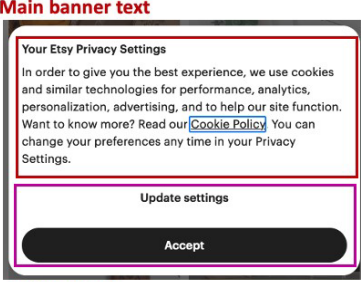
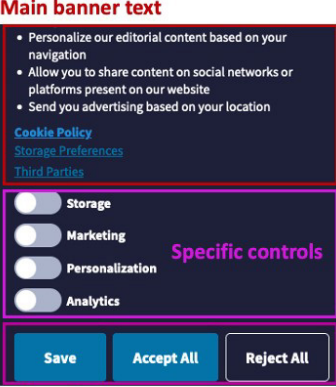
### *C. Consent Banners from a Design Perspective*

Our analysis focuses on the first layer of the banner only and reveals how complex it is to compare insights from guidelines and user studies even at this reduced level of evaluation. Therefore, we do not study the recommendations for the second layer of the banner that is normally accessible under the “settings” button or link that provides more granular choices.

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30. Jan Michael Bauer, Regitze Bergström & Rune Foss-Madsen, *Are You Sure, You Want a Cookie — The Effects of Choice Architecture on Users’ Decisions About Sharing Private Online Data*, COMPUTS. HUM. BEHAV., July 2021, at 1, 2–3.

Table 1: Consent UI Sections Identified via Our Analysis of Guidelines and User Studies and Examples of Consent Banners at the First Layer

 <p>Cookie preferences</p> <p><b>Main banner text</b></p> <p><b>Bulk controls</b></p> <p>Decline All Accept All</p>	 <p>Cookie preferences</p> <p><b>Main banner text</b></p> <p><b>Specific controls</b></p> <p>Submit</p>
<p>(a) Main banner text and bulk controls.</p>	<p>(b) Main banner text and specific controls.</p>
 <p><b>Main banner text</b></p> <p>Your Etsy Privacy Settings</p> <p>In order to give you the best experience, we use cookies and similar technologies for performance, analytics, personalization, advertising, and to help our site function. Want to know more? Read our <a href="#">Cookie Policy</a>. You can change your preferences any time in your Privacy Settings.</p> <p>Update settings</p> <p>Accept</p> <p><b>Bulk controls</b></p>	 <p><b>Main banner text</b></p> <ul style="list-style-type: none"> <li>Personalize our editorial content based on your navigation</li> <li>Allow you to share content on social networks or platforms present on our website</li> <li>Send you advertising based on your location</li> </ul> <p><a href="#">Cookie Policy</a>  <a href="#">Storage Preferences</a>  <a href="#">Third Parties</a></p> <p><b>Specific controls</b></p> <p>Storage  Marketing  Personalization  Analytics</p> <p>Save Accept All Reject All</p> <p><b>Bulk controls</b></p>
<p>(c) Consent banner with bulk controls on <a href="http://www.etsy.com">www.etsy.com</a>, accessed from France on March 10, 2022.</p>	<p>(d) Consent banner with both specific and bulk controls on <a href="http://slideshare.net">slideshare.net</a> (main text needs to be scrolled), accessed from France on March 10, 2022.</p>

By analyzing the corpus of user studies, trying to identify studied design choices, we found that user studies examined different variations of consent banner implementations. Therefore, in order to compare implementations found in user studies, we have identified several sections of the consent UI that are typically addressed. Within the UI, the first layer of the banner’s interface contains two major sections —

the main banner text and controls — shown in Table 1. While some regulators require bulk controls to let users accept or decline consent for all cookies and purposes at once, others recommend also using specific controls — for example, to let the user accept or decline consent per purpose. With this approach, we identified the sections of consent banners evaluated in user studies, shown in Table 1.

Table 2: Overview of User Studies on Consent Banners Along with the Number and Location of Participants and Coverage by Sections of the Consent UI

User study	Sample size per consent banner	Location of participants	Main banner text	Specific controls	Bulk controls
van Bavel et al. (2016) <sup>31</sup>	86	Spain	✓		✓
Utz et al. (2019) <sup>32</sup>	1,700 mobile, 300 desktop	Germany		✓	✓
Nouwens et al. (2020) <sup>33</sup>	40	United States		✓	✓
Machuletz & Böhme (2020) <sup>34</sup>	48 to 52	Austria, Germany		✓	✓
Bermejo Fernandez et al. (2021) <sup>35</sup>	137	60% North America 40% not reported in the study		✓	✓

31. VAN BAVEL et al., *supra* note 19, at 12 tbl.1.

32. Utz et al., *supra* note 19, at 8–9 (describing that the sample size was computed based on the 4,044 participants in each condition and on the reported distribution of mobile and desktop visitors (78.28% and 21.72%, respectively)).

33. Nouwens et al., *supra* note 12, at 7.

34. Machuletz et al., *supra* note 19, at 481, 489 tbl.2.

35. Bermejo Fernandez et al., *supra* note 19, at 7–8 (describing how a sample of 1,100 participants were divided by eight tested banner designs).

Graßl et al. (2021) <sup>36</sup>	228 and 255	United Kingdom			✓
Berens et al. (2022) <sup>37</sup>	7 to 15	Germany	✓		✓
Habib et al. (2022) <sup>38</sup>	around 92	United States	✓	✓	✓
Giese & Stabauer (2022) <sup>39</sup>	28,720 mobile, 17,792 desktop	Germany (45.9%), Austria (37.5%), others		✓	✓
Ma & Birrell (2022) <sup>40</sup>	290 to 337	United States			✓
Bouma-Sims et al. (2023) <sup>41</sup>	Around 96	United States and United Kingdom	✓	✓	✓

In practice, however, websites adopt several variations of these UI sections. While it is impossible to list all design variations, we present examples from popular websites to demonstrate common banners. Bulk controls may exclude the decline option, as shown in Table Entry 1(c), while specific controls can be presented together with bulk controls, as shown in Table Entry 1(d).

We found that guidelines and early user studies do not explicitly organize discussion of consent banner UI by design parameter, as suggested by Habib et al.<sup>42</sup> We therefore engaged in extensive transdisciplinary dialogue among the authors to map guidelines and user studies to design parameters. Within our analysis we also mapped their

36. Graßl et al., *supra* note 19, at 10 (describing a 288-participant sample); *id.* at 19 (255 participants).

37. Berens et al., *supra* note 19, at 5 tbl.1.

38. Habib et al., *supra* note 19, at 5 (describing 1,109 participants divided by twelve design variants).

39. Giese et al., *supra* note 19, at 278.

40. Ma et al., *supra* note 19, at 3.

41. Bouma-Sims et al., *supra* note 19, at 7.

42. Habib et al., *supra* note 19, at 7.



implementations to our unified corpus of dark patterns,<sup>43</sup> which we extensively build upon in the rest of this Essay. Table 3 lists all consent UI areas, their identified design parameters, implementations, and mappings to meso- and low-level dark patterns.<sup>44</sup>

Table 3: List of Design Parameters and Their Possible Implementations Mapped to Potential Dark Patterns

Design Parameter	Possible Implementations	Dark Patterns
<b>Main banner text (§ 3)</b>		
Main banner area	<i>text with multiple types of information</i>	-
	<i>text with visual cues nudging toward acceptance</i>	<i>Emotional or Sensory Manipulations through Cuteness</i>
	<i>text with unclear definition of purpose</i>	<i>Language Inaccessibility through Complex Language</i>
<b>Bulk controls (§ 4)</b>		
Path to decline	<i>equal (accept and decline on first layer)</i>	-
	<i>unequal (decline is only accessible on the second layer)</i>	<i>Manipulating Choice Architecture through False Hierarchy; Obstruction by Adding Steps</i>
	<i>closing the banner (with cross-sign or warning)</i>	<i>Forced Communication or Disclosure</i>
Visualization of accept and decline options	<i>neutral (accept and decline buttons are shown with identical neutral color, equal shape, and equal size)</i>	-

43. Gray et al., *supra* note 11, at 9–10.

44. High-level patterns are not included in the table but are explicitly mentioned in the text.

	<i>highlighted accept</i> (accept and decline shown as buttons, but accept is more visually prominent than decline)	<i>Manipulating Choice Architecture through Visual Prominence</i>
	<i>decline as a link</i> (decline option is shown as a link, while accept is a button)	<i>Manipulating Choice Architecture through False Hierarchy</i>
Text labels on accept and decline options	<i>generic</i> (“Accept all” and “Decline all”)	-
	<i>only necessary</i> (“Accept all” and “Accept only necessary”)	-
	<i>other types</i> (various options proposed by regulators and tested in user studies)	<i>Feedforward Ambiguity</i>
<b>Specific controls (§5)</b>		
Confirmation options	<i>one confirm button</i>	-
	<i>confirm and accept</i> (bulk “accept all” button is located next to confirm button)	<i>Manipulating Choice Architecture through Bundling and Visual Prominence</i>

### III. IDENTIFYING GAPS AND INSIGHTS FOR MAIN BANNER TEXT

The main banner text section usually contains textual statements that invite users to consent to the use of cookies and other trackers. When analyzing guidelines, we focus on the type of information that should be provided in the main text on the first layer of the consent banner (including purposes), and potential visual elements alongside the main text area of the banner.

*A. Regulatory Guidelines*

Article 5(3) of the ePrivacy Directive<sup>45</sup> requires websites to give clear and comprehensive information when requesting consent. Article 5(1)(a) and Recital 60 of the GDPR<sup>46</sup> also require disclosure of information which is triggered by the principles of lawfulness, fairness, and transparency. Pursuant to the principle of purpose limitation (Article 5(1)(b) GDPR), personal data can be collected for specified, explicit, and legitimate purposes only.<sup>47</sup> Previous research studied the requirements for purposes in consent banners,<sup>48</sup> and thus we focus here on the categories of purposes recommended by regulators. We found that most guidelines do not differentiate clearly between what information must be provided in the main banner text and what must be provided in the privacy policy, which makes it difficult to extract concrete requirements for the main banner text.

*i. Multiple Pieces of Information are Required on the First Layer of the Banner*

While no consensus exists on which informational elements should be present in the main banner text, some regulators define the minimum information: (1) identification of data controller(s) (all consulted guidelines), (2) personal data purposes (all consulted guidelines), (3) legal basis,<sup>49</sup> (4) right to withdraw and how to exercise it,<sup>50</sup> (5) whether there are “site-specific” cookies, “third-party” cookies or both,<sup>51</sup> (6) the way users can accept, set, or reject cookies, and the consequences of refusing (if relevant),<sup>52</sup> and (7) link to the privacy or cookie policy.<sup>53</sup>

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45. ePrivacy Directive, *supra* note 1.

46. GDPR, *supra* note 2, art. 5(1)(a).

47. *Id.* art. 5(1)(b); ART. 29 DATA PROT. WORKING PARTY. OP. 03/2013 ON PURPOSE LIMITATION § 3 (2013).

48. Cristiana Santos, Arianna Rossi, Lorena Sánchez Chamorro, Kerstin Bongard-Blanchy & Ruba Abu-Salma, *Cookie Banners, What's the Purpose? Analyzing Cookie Banner Text Through a Legal Lens*, WPES '21: WORKSHOP ON PRIVACY ELEC. SOC'Y 187, 188–89 (2021); Imane Fouad, Cristiana Santos, Feras Al Kassar, Nataliia Bielova & Stefano Calzavara, *On Compliance of Cookie Purposes with the Purpose Specification Principle*, PROC. INT'L WORKSHOP ON PRIV. ENG'G at 2 (2020); Célestin Matte, Cristiana Santos & Nataliia Bielova, *Purposes in IAB Europe's TCF: Which legal basis and how are they used by advertisers?*, 2020 ANN. PRIV. F. 163, 164–65 (2020).

49. DVI, *supra* note 18, at 10–13.

50. *Id.*; CNPD, *supra* note 18, at 10–11.

51. CNPD, *supra* note 18, at 15–16.

52. DVI, *supra* note 18, at 10–13; CNPD, *supra* note 18, at 11–12.

53. CNPD, *supra* note 18, at 19–21.

## ii. Regulators Demand Purposes to be Formulated in a Clear Way

Multiple guidelines provide examples of purposes, yet there is no consensus on which formulation of purposes is preferred. The Italian DPA confirms the absence of a standardized naming convention for the purpose of cookies.<sup>54</sup> The U.K. DPA acknowledges that, while providing information about cookies' purposes follows transparency requirements, users may not always understand that information.<sup>55</sup> The U.K. DPA encourages websites to make an effort to explain their activities in an easy-to-understand manner, but it does not impose strict requirements. In contrast, the Latvian DPA requires that the information provided not contain unduly legal or technical language.<sup>56</sup> And the French DPA recommends formulating purposes "in an intelligible way, in a suitable language and clear enough to allow users to understand precisely what they are consenting to."<sup>57</sup>

*B. Identified Gaps and Actionable Insights*

Gap 1: Guidelines require disclosure of multiple types of information, but users are not impacted. Bavel et al. tested six banner texts with different information (about data collected and shared, possibility to change preferences, and using social pressure), yet the authors found no significant impact of the banner text on users' decisions.<sup>58</sup> Berens et al. recently tested two main texts: with bias, nudging participants to accept all cookies, and without such bias, and they confirmed the result of Bavel et al.<sup>59</sup> Habib et al. found that users' decisions are not influenced by whether the text is organized with bullet points or in a single paragraph,<sup>60</sup> and Bouma-Sims et al. confirmed this result.<sup>61</sup> Giese & Stabauer found that only twenty-nine percent of participants claimed they occasionally read the main banner text, and only seven percent said they always read it.<sup>62</sup> Though the listed user studies did not test in detail the regulators' recommendations, their results suggest that the main banner text does not impact the users' consent decisions. Therefore, recommended disclosure and transparency measures may be

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54. L. n. 163/2021 (It.) § 8.2.

55. ICO, *supra* note 18, at 10.

56. DVI, *supra* note 18, at 9.

57. CNIL, *supra* note 18, at 3.

58. *Id.*

59. See Berens et al., *supra* note 19, at 7.

60. See Habib et al., *supra* note 19, at 10–11 (finding that participants in text-layout paragraph condition were not significantly more likely to accept all cookies compared to those in best-practices condition).

61. Bouma-Sims et al., *supra* note 19, at 31 tbl.4 (discussing the "baseline" and "text-paragraph" conditions).

62. Giese et al., *supra* note 19, at 282.

insufficient to give data subjects informed and meaningful choices when such information is shown in the main banner text.

Gap 2: Regulators do not prohibit specific nudging in the main banner text area and user studies do not evaluate it, yet it is present on the web. Guidelines do not specifically discuss whether users can be manipulated by the text in the main banner section, which (usually) contains other visual elements or cues accompanying such text. An example of a consent banner from the popular website twitch.tv, shown in Figure 3, illustrates the potential nudging of users by creating an illusion of comfort with cookies. This example could include an “Interface Interference” high-level dark pattern that corresponds to “any manipulation of the user interface that privileges specific actions over others, thereby confusing the user or limiting discoverability of important action possibilities.”<sup>63</sup> Moreover, it corresponds to the “Emotional or Sensory Manipulation” meso-level pattern that includes any use of language, style, color, or other design elements to evoke an emotion or manipulate the senses in order to persuade the user into a particular action.<sup>64</sup> Finally, it also represents the “Cuteness” low-level dark pattern<sup>65</sup> to provide positive nudging toward cookie acceptance. Regulators should further discuss the lawfulness of such examples in their guidelines and assess what limits can or should be placed on “branding” or positively framing cookie acceptance.

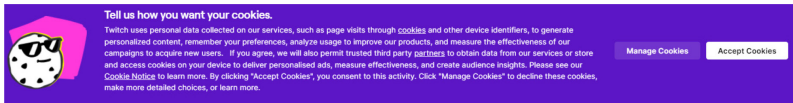


Figure 3: Example of a Consent Banner from twitch.tv Containing a Nudging Image of a Cookie with Glasses, Creating a Positive Attitude Toward Cookies (Accessed in May 2023).

Gap 3: Regulators require clear formulation of purposes for users to understand, but user studies found that purposes of “performance” and “functionality” are the most misunderstood by users. Habib et al.<sup>66</sup> studied user comprehension of four purpose categories developed by

63. Gray et al., *supra* note 9, at 7.

64. “Emotional or Sensory Manipulation” meso-level pattern groups patterns relate to the “Toying with emotion” pattern described in earlier works. See Gray et al., *supra* note 14, at 5, 7.

65. “Cuteness” dark pattern represents cases when users’ trust is increased when interacting with “cute” interfaces. It was first described by Lacey and Caudwell in the context of interaction with attractive robots in 2019. Cherie Lacey & Catherine Caudwell, *Cuteness as a ‘Dark Pattern’ in Home Robots*, 2019 PROC. 14TH ACM/IEEE INT’L CONF. ON HUM.-ROBOT INTERACTION, Mar. 2019, at 374, 379.

66. Habib et al., *supra* note 19, at 7–8.

“The UK International Chamber of Commerce”<sup>67</sup> — (1) Strictly Necessary, (2) Performance, (3) Functionality, and (4) Targeting/Advertising — that are used today by OneTrust, one of the most popular consent management platforms. The authors found that the “performance” and “functionality” categories are the most misunderstood by users.<sup>68</sup> Bouma-Sims et al. discovered that few participants actually read the definitions of purposes; moreover, no significant difference in comprehension was observed when definitions were provided.<sup>69</sup> This miscomprehension could potentially point toward the low-level dark pattern “Complex language” where “[t]he choice architect makes information difficult to understand by using obscure word choices and/or sentence structure” which could result in uninformed choices.<sup>70</sup>

Insight 1: Comprehension of purposes should be thoroughly studied, which will require further research. However, it might be hard to choose specific formulations because regulators have not reached a consensus on purpose formulation. That being said, regulators should be informed of such upcoming studies so that they can understand how to update their guidelines to ensure users comprehend the banners they read.

#### IV. IDENTIFYING GAPS AND INSIGHTS IN BULK CONTROLS

##### *A. Path to Decline*

This design parameter (see Table 3) settles whether the decline option is located: (1) on the first layer of the banner, normally next to the accept option (equal path); (2) only accessible by visiting the second layer of the banner (unequal path); or (3) whether closing the banner implies decline (closing the banner).

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67. U.K. INT’L CHAMBER OF COMMERCE, COOKIE GUIDE 11–12 (2012).

68. Habib et al., *supra* note 19, 13–14.

69. Bouma-Sims et al., *supra* note 19, at 16.

70. This low-level dark pattern was introduced by the U.K. Competition and Markets Authority and was included in the preliminary ontology of dark patterns knowledge. U.K. COMPETITION & MKTS. AUTH., EVIDENCE REVIEW OF ONLINE CHOICE ARCHITECTURE AND CONSUMER AND COMPETITION HARM (2022); see Gray et al., *supra* note 11, at 8 (discussing the dark pattern).

## i. Regulatory Guidelines

The vast majority of authorities recommend the path to decline to be equal to the path to accept consent. This path is evaluated by the existence of a decline button accessible on the first layer of a consent banner. This design is supported by the French, Spanish, Luxembourgish, Irish, Dutch, U.K., Danish, Greek, Latvian, Czech, Austrian, and Finnish DPAs.<sup>71</sup> This design choice echoes GDPR Article 7(3), which asserts that both consent withdrawal and acceptance should be easy.<sup>72</sup>

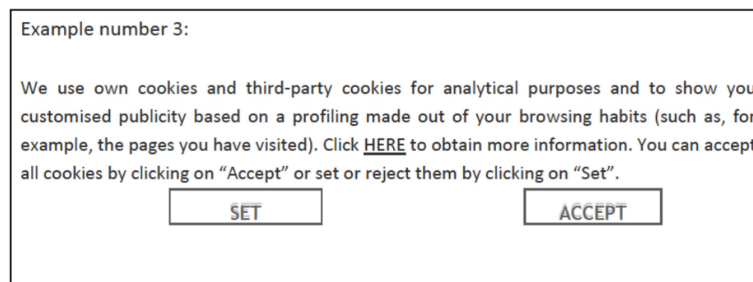


Figure 4: Example of a First Layer, Proposed by the Spanish DPA.<sup>73</sup>

Some guidelines require the same level of effort to decline and accept consent. Some DPAs require the same number of clicks as an indication of the same level of effort to accept consent. For example, the French DPA states:

[C]onsent collection interfaces that require a single click to consent to tracking while several actions are necessary to “parameterize” a refusal to consent present, in most cases, the risk of biasing the choice of the user, who wants to be able to view the site or use the application quickly.<sup>74</sup>

The Greek DPA requires the same number of clicks and level of effort to decline consent, explaining that “the user must be able to accept or decline the use of trackers . . . with the same number of actions (‘clicks’) and from the same level, either all or each category

71. CNIL, *supra* note 18, at 7; AEPD, *supra* note 18, at 20; CNPD, *supra* note 18, at 16; DPC, *supra* note 18, at 9; AP, *supra* note 18, first answer in “Fast answers” section; ICO, *supra* note 18, at 32; DATATILSYNET, *supra* note 18, at 13; HDP, *supra* note 18, at 5; DVI, *supra* note 18, at 13; UOOU, *supra* note 18, at 3; DSB, *supra* note 18, at 4; TRAFICOM, *supra* note 18, at 9.

72. GDPR, *supra* note 2, art. 7(3).

73. AEPD, *supra* note 18, at 23.

74. CNIL, *supra* note 18, para. 31.

separately.”<sup>75</sup> The Austrian DPA adds the element of interaction to decline: “Not giving consent should not require more interactions with the cookie banner than giving consent.”<sup>76</sup> According to the Austrian DPA, it cannot be required of the data subject that they can only make the decision not to give their consent on a button at a second or third level.<sup>77</sup>

Few guidelines support an unequal path to decline. We found only two DPAs that explicitly support an unequal path to decline. The Spanish DPA proposes an example of a consent interface where the user is asked to visit the second layer to reject cookies (Figure 4). The Irish DPA does not explicitly request the decline button to be present but requires the website to “at least provide information that allows the user to reject non-necessary cookies or to request more information about the use of cookies.”<sup>78</sup> Other DPAs support an unequal path to decline more indirectly. The Italian DPA prohibits the decline option on the first layer of the banner, writing that “the affirmative action the user is empowered to perform when first accessing a website must in any case be aimed at giving his or her consent (so-called ‘opt-in’) and can never refer instead to the expression of a denial (so-called ‘opt-out’).”<sup>79</sup> Similarly, the EDPB Taskforce Report states that “a vast majority of authorities considered that the absence of refuse/reject/not consent options on any layer with a consent button of the cookie consent banner is not in line with the requirements for a valid consent and thus constitutes an infringement.”<sup>80</sup> In the same report, EDPB also mentions that “[f]ew authorities argue that Article 5(3) of the ePD does not explicitly mention a ‘reject option’ to deposit cookies.”<sup>81</sup>

Regulators disagree whether closing the consent banner means no decision or decline. While the Latvian,<sup>82</sup> Swedish,<sup>83</sup> and Czech<sup>84</sup> DPAs understand that closing the banner means that the user did not decide yet, the French DPA considers that closing the banner should be interpreted as refusal of consent.<sup>85</sup> Regulators also disagree on the meaning of absence of user action in the consent banner: while the Italian DPA suggests that no action means no decision,<sup>86</sup> the Luxembourgish and French DPA clearly state that no user action should be considered as refusal.<sup>87</sup> Most DPAs claim it means that the user did not decide yet.

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75. HDP, *supra* note 18, § C.4.

76. DSB, *supra* note 18, para. 7.

77. *Id.*

78. DPC, *supra* note 18, at 12.

79. L. n. 163/2021 (It.) § 7.1.

80. EUR. DATA PROT. BD., *supra* note 18, at 5.

81. *Id.*

82. DVI, *supra* note 18, at 11.

83. PTS, *supra* note 18.

84. UOOU, *supra* note 18.

85. CNIL, *supra* note 18, at 9.

86. L. n. 163/2021 (It.) § 7.1.

87. CNPD, *supra* note 18, § 3.2.5 (Luxembourg); CNIL, *supra* note 18, § 9 (France).



For example, the Latvian DPA states that “[c]losing the cookie alert window is an active action by the user, indicating that the user has not made a choice regarding the use of cookies on the website”<sup>88</sup> — a position shared by the Czech<sup>89</sup> and Italian DPAs.<sup>90</sup>

Some guidelines require an “X” icon to close the banner, alongside a warning. The Italian DPA insists on using an “X” or “cross-sign” to close the consent banner, explaining:

If the user chooses . . . to keep the default settings and therefore not to give his or her consent . . . that user should therefore simply close the banner by clicking on the command that is usually meant to enable this action — i.e., the “X” . . . without having to access other ad-hoc areas or pages.<sup>91</sup>

Additionally, the Italian DPA requires that a banner contain “[a] warning to the effect that if the banner is closed by clicking on the ‘X’ at its top right end, the default settings are left unchanged and therefore browsing can continue without cookies or other tracking tools other than technical ones.”<sup>92</sup> The Latvian DPA also supports the “X” sign as a visual indication of closing the consent banner, but without considering that consent has been given.<sup>93</sup>

## ii. Identified Gaps and Actionable Insights

Consistency 1: Most regulators support an equal path, and user studies show that an unequal path drastically increases the acceptance rate. Most regulators recommend an equal path to decline, which is consistent with the results of numerous user studies. Nouwens et al. found that the acceptance rate decreases by twenty-three percent when the decline button is moved from the first layer to the second layer.<sup>94</sup> Habib et al. also found that participants who were exposed to banners without a decline option on the first layer were significantly more likely to consent to all cookies compared to those who faced banners with a decline option.<sup>95</sup> Bouma-Sims et al. confirmed this finding: they observed a statistically significant higher acceptance rate in banners where a

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88. DVI, *supra* note 18, § 4.1.2(d).

89. UOOU, *supra* note 18.

90. L. n. 163/2021 (It.) § 7.1.

91. *Id.*

92. *Id.*

93. DVI, *supra* note 18, § 4.1.2.

94. Nouwens et al., *supra* note 12, at 8.

95. Habib et al., *supra* note 19, at 10–11.

decline option was not accessible on the first layer compared to banners where a decline option was accessible on the first layer.<sup>96</sup>

Gap 4: Some guidelines contradict the results of these user studies by recommending an unequal path to decline. We identified above that the Spanish DPA recognizes an unequal path as valid, while the Italian DPA explicitly prohibits an equal path. We recommend that regulators reevaluate their approaches in light of user studies that show, across years and populations, that an unequal path significantly increases users' acceptance relative to an equal path. This difference suggests that users are being manipulated by websites that use an unequal path. This unequal path is an example of the high-level dark pattern "Interface Interference" (see Section III.B), which is inscribed into the UI as a "Manipulating Choice Architecture" meso-level pattern that offers a presentation of options, encouraging the user to select such options which are not in their best interest.<sup>97</sup> This example also implements the "False Hierarchy" low-level pattern that "gives one or more options visual or interactive precedence over others, particularly where items should be in parallel rather than hierarchical."<sup>98</sup> In particular, the presence of an unequal path may also constitute an "Obstruction" high-level dark pattern,<sup>99</sup> in that it adds steps to the UI ("Adding Steps" meso-level pattern that requires more steps from users than the number of steps necessary for the given task)<sup>100</sup> that makes rejection more difficult than it needs to be.

Gap 5: Regulators seem to rely on "privacy by default," but users are confused about the meaning of the cross-sign "X." While relying on website compliance — no tracking when users close a banner — regulators seem to assume that users know that when they click "close," the default settings will still apply, and they will not be tracked. However, Bouma-Sims et al. included the cross-sign "X" in their tested banners and found that users were confused about what would occur if they clicked it: out of the 16.2 percent of participants who closed the banner, 24.0 percent "expected to receive no cookies," while 17.2 percent "expected the website to enable some or all of the cookies by default."<sup>101</sup>

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96. Bouma-Sims et al., *supra* note 19, at 15.

97. This dark pattern, introduced in the ontology (Gray et al., *supra* note 11, at 9), is based on two dark patterns, "Framing" and "Ranking," that relate to the presentation and order of options presented to the consumer. These patterns were first introduced by the U.K. Competition & Markets Authority. See *supra* note 70.

98. This dark pattern was first introduced in 2018 in Gray et al., *supra* note 9, at 7.

99. This dark pattern, first introduced by Gray et al. and later used in numerous taxonomies, is defined as "impeding a task flow, making an interaction more difficult than it inherently needs to be with the intent to dissuade an action. Obstruction often manifests as a major barrier to a particular task that the user may want to accomplish." *Id.* at 5.

100. Originally introduced by the EDPB as the "Longer than necessary" dark pattern. EUR. DATA. PROT. BD., GUIDELINES 03/2022 ON DECEPTIVE DESIGN PATTERNS IN SOCIAL MEDIA PLATFORM INTERFACES: HOW TO RECOGNISE AND AVOID THEM VERSION 2.0 68–69 (2023).

101. Bouma-Sims et al., *supra* note 19, at 15.

Whenever a banner is closed via “X” and unnecessary trackers are used, there appear to be dark patterns such as a “Forced Action” high-level dark pattern<sup>102</sup> and specifically a meso-level pattern of “Forced Communication or Disclosure,”<sup>103</sup> where a user’s data is disclosed to third parties via tracking technologies without giving the user an ability to withhold from such disclosure.

Gap 6: Some regulators recommend information disclosure about declining in main banner text, but user studies show this is not efficient. As mentioned above, the Irish DPA only requires that the banner text include information about the possibility to reject.<sup>104</sup> Even though the only user study that included an “X” did not fulfill all requirements of the Italian DPA — the banner text did not explain that clicking “X” means default settings without tracking — previous results from Part III show that users rarely read the main banner text and are not impacted by it when consenting. Hence, the recommendation of adding text informing users about the possibility of declining or the meaning of a cross-sign may not be effective for users. These DPAs could benefit from this result when updating their guidelines.

Insight 2: Text labels next to the “X” sign need to be further evaluated. Bouma-Sims et al. recommend labeling the “X” sign with a phrase such as “close without accepting optional cookies.”<sup>105</sup> Interestingly, a very similar suggestion — a “continue without accepting” label located on the top-right corner of the banner — has already been recommended by the French DPA and is currently actively present on the French web.<sup>106</sup> More user studies could evaluate the usability and impact of this design on users’ decision making.

Insight 3: Further research is needed on continuous exposure of users to dark patterns. Users who are continuously exposed to dark patterns appear not to be substantially impacted by an unequal path. Graßl et al. found no substantial impact on the outcome of consent decisions between equal and unequal paths to decline.<sup>107</sup> However, in that study, users interacted with banners that included dark patterns that nudged them to accept cookies. Such users may have been quickly habituated to click “accept,” and this can explain why the authors did not observe

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102. This dark pattern is defined as “any situation in which users are required to perform a specific action to access (or continue to access) specific functionality. This action may manifest as a required step to complete a process, or may appear disguised as an option that the user will greatly benefit from.” Gray et al., *supra* note 9, at 8.

103. This meso-level pattern first appeared in the preliminary ontology of Gray et al., and though not specifically defined, it refers to multiple types of low-level patterns where the user is tricked into disclosing their personal information or information about other people. Gray et al., *supra* note 11, at 5.

104. DPC, *supra* note 18, at 12.

105. Bouma-Sims et al., *supra* note 19, at 16.

106. CNIL, *supra* note 18, at 10.

107. Graßl et al., *supra* note 19, at 14 (finding that there was no substantial effect of obstruction (unequal path) on the outcome of consent decision).

any effects of placing decline on the second layer of the banner. Further research is needed to evaluate whether continuous exposure to dark patterns, either discretely or in combination, impacts users' consent.

### *B. Visualization of Accept and Decline Options*

This design parameter describes how accept and decline options are visualized. While the most neutral implementation is to visualize both options with identical design (identical color, shape, size, font, etc.), we also consider implementations where the accept option is a button, visually highlighted over decline (highlighted accept), or where the decline option is shown as a link and accept is a button (decline as a link).

#### i. Regulatory Guidelines

From a design perspective, the “path to decline” (Section IV.A) and “visualization of decline” consist of two different design parameters, yet guidelines do not clearly differentiate between them.

Most guidelines recommend neutral implementation of options. Specifically, most guidelines indicate that users should not be subject to unfair practices (which are also referred to in the guidelines as being nudged, urged, encouraged, influenced, pressured, or misled) to consent, nor should they be faced with a situation where it is more difficult to decline than to accept in a consent banner interface. Most regulators insist on equal settings for accept and decline, operationalized through fonts, colors, size, tone, level, location, format, contrast, visibility, and ease of reading, to provide the same level of reception to the attention of the user. Further, the Luxembourgish DPA<sup>108</sup> requires websites to avoid misleading users — consciously or not — when seeking to obtain user consent. The Luxembourgish regulator provides concrete examples of misleading design practices “which are part of the ‘dark patterns’ phenomenon” and alleges that these practices could impact the free, informed, and unequivocal consent of users.<sup>109</sup>

The 2023 EDPB “Task Force” states that a general banner standard cannot be imposed: “In order to assess the conformity of a banner, a case-by-case verification must be carried out in order to check that the contrast and colours used are not obviously misleading for the users . . . .”<sup>110</sup> The EDPB, however, has identified three cases that do not lead to valid consent, and are thus violations: (1) decline option presented with the link embedded in a paragraph of the main text; (2) decline option offered via a link placed outside the consent banner; and

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108. CNPD, *supra* note 18, § 3.2.4.

109. *Id.*

110. EUR. DATA PROT. BD., *supra* note 18, at 6.

(3) decline option presented as a button, where the contrast between the text and the button background is so minimal that the text is unreadable to virtually any user.<sup>111</sup>

## ii. Identified Gaps and Actionable Insights

Gap 7: Highlighted accept is not recommended by regulators; however, no user study shows that it could impact acceptance rate. Even though many DPAs do not recommend highlighted accept, user studies found no support for the hypothesis that this implementation impacts user decisions. Utz et al. found that visually highlighting the accept option with color does not significantly change the acceptance rate of users with respect to a banner where accept and decline options were shown in exactly the same format and color.<sup>112</sup> Bermejo Fernandez et al. tested banners without a decline option where the difference between the banners was in the color of the accept option — in one banner the option was green and the other banner it was just the background color — and found no significant effect on users across banners.<sup>113</sup> Graßl et al. found no significant effect of highlighting either the accept or the decline button.<sup>114</sup> Berens et al. evaluated both highlighted accept and highlighted decline — confirming the results of Graßl et al. Berens et al. found no significant difference between the neutral banners (with identical accept and decline buttons) and highlighting either accept or decline.<sup>115</sup>

Insight 4: Highlighted accept is not officially prohibited by any regulator, and more user studies should explore it. Using different formatting to show a “preferred” path could be construed as an example of “Interface Interference” high-level dark pattern (see Section III.B) that implements a meso-level pattern of “Manipulating Choice Architecture” (see Section IV.A.ii) and results in an instance of the low-level dark pattern denoted “Visual Prominence,”<sup>116</sup> even though user studies have not found that its presence affects user action in a substantial way. This phenomenon has been recently explored further. Bielova et al.’s

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111. *Id.* at 5–6.

112. Utz et al., *supra* note 19, at 981 fig.4 (finding that the distribution of consent choices in binary “non nudging” (accept and decline options were shown in exactly the same format and color) and “nudging” (accept option is visually highlighted) conditions are very similar).

113. Bermejo Fernandez et al., *supra* note 19, at 12–13; *id.* at 5 fig.1a (default banner), at 6 fig.2 (accept option is highlighted).

114. See Graßl et al., *supra* note 19, at 14, 20 (discussing highlighted accept option, and highlighted decline (called “aesthetic manipulation” in this paper)).

115. Berens et al., *supra* note 19, at 12–13, 13 tbl.8.

116. This dark pattern from the ontology of dark patterns was originally proposed by the EDPB and was called “Look over here” — it represents a case where “action or information is put in competition with another element,” and therefore “[w]hen users choose this distracting option, they are likely to forget about the other, even if it was their primary intent.” EUR. DATA. PROT. BD., *supra* note 100, at 66–67.

user study with French participants has revealed that highlighted accept does not impact users' consent decisions after being exposed two times to this type of design.<sup>117</sup> This can be explained by the long-term impact of such design that already happened to most EU users and which might be even harder to measure with empirical user studies.

Consistency 2: The 2023 EDPB Task Force claims that “decline as a link” hidden in the text is a violation,<sup>118</sup> and user studies show that this impacts consent decisions. Berens et al. show that this implementation impacts users. The authors tested decline as a link and positioned it either at the end or in the middle of the main banner text, and they found a significant difference in users' consent decisions: users are five to twelve times less likely to accept consent if the decline option is presented as a button.<sup>119</sup> This indicates that while manipulation of the visual choice architecture through the “False Hierarchy” dark pattern has manipulative power over users, other changes in visual choice architecture, such as color or other visual prominence (as discussed previously), may not.

Gap 8: Decline as a link located at the end of main banner text also impacts consent decisions, but regulators do not claim that this implementation is a violation. Berens et al. show that even when the link to decline consent is located at the end of the main banner text, it still impacts users' consent decisions more than it does when presented as a button.<sup>120</sup> Regulators should therefore consider including this type of implementation as well, since it appears in current consent banners (see Figure 5). This, too, is an example of the meso-level dark pattern “Manipulating Choice Architecture” (see Section IV.A.ii), which is realized through the introduction of the low-level pattern “False Hierarchy” (see

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117. Nataliia Bielova, Laura Litvine, Anysia Nguyen, Mariam Chammat, Vincent Toubiana & Estelle Hary, *The Effect of Design Patterns on (Present and Future) Cookie Consent Decisions*, 2024 USENIX SEC. SYMP. (forthcoming 2024) at 12–13.

118. EUR. DATA PROT. BD., *supra* note 18, at 5–6.

119. Berens et al., *supra* note 19, at 5.

120. *Id.*

Section IV.A.ii) — in this case, by placing one choice in a different section of the UI than the other.

Figure 5: Example of a Consent Banner from bfmtv.com Containing the Decline Option as a Link Under the Main Banner Text (Labeled “Continue without agreeing” and Accessed on November 8, 2023).

With your agreement, we and [our partners](#) use cookies or similar technologies to store, access, and process personal data like your visit on this website. You can withdraw your consent or object to data processing based on legitimate interest at any time by clicking on “Learn More” or in our Privacy Policy on this website.

We and our partners do the following data processing:

Personalised ads and content, ad and content measurement, audience insights and product development, Store and/or access information on a device

Continue without agreeing →

Learn More →

Agree and close

### *C. Text Labels on Accept and Decline Options*

Text labels on accept and decline options contain multiple implementations of proposed text in both guidelines and user studies. To discuss all such proposals, we group them as generic (“accept all” and “decline all”), only necessary (e.g., “accept all” and “accept only necessary”), and other.

#### *i. Regulatory Guidelines*

Few regulators refer to the text labels on the options to accept or reject consent, and even fewer provide visualizations of recommended consent banners with specific examples of text on accept and decline options. It was therefore challenging to retrieve concrete recommendations for text labels from the guidelines. The French DPA alerts that the option’s label needs to be easily understandable and “does not require effort of concentration or interpretation on the part of the user.”<sup>121</sup>

Guidelines are flexible regarding the text labels for options. For example, the French DPA proposes different variations of symmetric textual labels for accept and decline, such as “accept all” and “reject all,” “consent” and “not consent,” or “I authorize” and “I do not authorize.”<sup>122</sup> The Latvian DPA proposes examples of texts, such as “I agree”

121. CNIL, *supra* note 18, § 23.

122. *Id.* § 27.

and “I do not agree,” as well as “I agree” and “leave technical cookies.”<sup>123</sup>

The Finnish and Latvian DPAs use the concrete terminology from Article 5(3) of the ePrivacy Directive,<sup>124</sup> which refers to the consent exemption from necessary cookies.<sup>125</sup> The Finnish regulator suggests labeling the decline option with “Refuse non-necessary cookies,”<sup>126</sup> while the Latvian DPA recommends using “Leave technical cookies” to label the decline.<sup>127</sup> Such phrasing might require users to be able to differentiate between cookies that are necessary from the ones that are not.

## ii. Identified Gaps and Actionable Insights

Gap 9: Regulators provide different text label examples; however, user studies show that text labels significantly impact consent decisions. Habib et al. compared generic text labels and “necessary-only” labels and found no significant impact on users’ consent decisions.<sup>128</sup> However, Berens et al. found that labeling the decline option with “only necessary cookies” made users 2.5 times less likely to accept cookies compared to labeling this option “reject.”<sup>129</sup> Moreover, Ma et al. tested banners that differed only in the banners’ labels: in total, they included five combinations of accept and decline texts combined from three versions of accept and three versions of decline.<sup>130</sup> They found a statistically significant impact of button text that describes consequences of accept and decline on users’ consent decisions.<sup>131</sup> Therefore, regulators should consider that text labels must be designed carefully to avoid steering effects, and it would be beneficial if more regulators included concrete examples of text labels to avoid the manipulation of users via text labels on accept and decline options. This lack of clarity currently allows websites to use language with ambiguous implications and is perhaps poorly understood by users. This could be an example of a high-level dark pattern of “Interface Interference” (see Section III.B) with the meso-level dark pattern “Feedforward Ambiguity,” which provides “[a] discrepancy between information and actions available to

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123. DVI, *supra* note 18, § 4.2.1.

124. ePrivacy Directive, *supra* note 1.

125. *Id.* (Latvian); TRAFICOM, *supra* note 18, § 4.1 (Finnish).

126. TRAFICOM, *supra* note 18, § 4.1 (Finnish).

127. DVI, *supra* note 18, § 4.2.1.

128. Habib et al., *supra* note 19, at 10–11 (finding no significant effect found between button-generic and best-practices conditions).

129. Berens et al., *supra* note 19, at 6.

130. Ma et al., *supra* note 19, at 4 tbl.1.

131. *Id.* at 3–4.



users” that results in an outcome that is different from what the user expects.<sup>132</sup>

## V. IDENTIFYING GAPS AND INSIGHTS IN SPECIFIC CONTROLS

To implement specific controls, we identified one design parameter — confirmation options — that can be implemented with only one button that confirms the selection of users’ choices or confirm button with the bulk accept option located next to it (see Table 3).

### *A. Regulatory Guidelines*

The “unambiguous” consent requirement in Article 4(11) of the GDPR means that websites must obtain from users an “unambiguous indication” through a “clear and affirmative action” to non-essential trackers. However, few regulators provide detailed information on how to implement interfaces accordingly.

Many guidelines rely on the established prohibition of prechecked boxes. In 2019, the Court of Justice of the European Union (“CJEU”) held in the *Planet49* case<sup>133</sup> that prechecked boxes in the consent interface do not constitute informed and valid consent.<sup>134</sup> Following the *Planet49* case, together with Recital 32 of GDPR<sup>135</sup> that forbids prechecked boxes, all consulted guidelines explicitly mention that the pre-selection of purposes is not allowed.

Guidelines differ on recommending controls per purpose or per cookie. The Latvian, Czech, Belgian, Danish, French, and Luxembourgish DPAs recommend consent per purpose on the first layer of a banner.<sup>136</sup> However, three regulators (the Spanish, Czech, and Irish DPAs) recommend controls both per purpose and per cookie.<sup>137</sup>

Only one DPA proposes a specific control with one “submit” button to confirm the selection of purposes. Among all regulators that discuss granular controls, only the Luxembourgish DPA provides a visual example of a control per purpose, shown in Figure 6.<sup>138</sup> Interestingly, it contains only one “submit” button. Other regulators do not discuss

132. This meso-level pattern from the ontology of dark patterns relates to a specific definition of “Misleading action” from the EDPB guidelines on deceptive design. EUR. DATA. PROT. BD., *supra* note 100, at 68–69.

133. Case C-673/17, Bundesverband der Verbraucherzentralen und Verbraucherverbände — Verbraucherzentrale Bundesverband eV v. Planet49 GmbH, ECLI:EU:C:2019:246 (Oct. 1, 2019).

134. *Id.* § 55, § 57, § 63.

135. GDPR, *supra* note 2, recital 32.

136. CNIL *supra* note 18, § 14; DATATILSYNET, *supra* note 18; UOOU, *supra* note 18; CNPD, *supra* note 18, § 3.2.6; DVI, *supra* note 18, § 4.2.2; APD, *supra* note 18.

137. AEPD, *supra* note 18, § 3.1.2.2; UOOU, *supra* note 18; DPC, *supra* note 18, at 10.

138. CNPD, *supra* note 18, § 3.2.11.

which buttons are recommended to confirm selection or whether bulk accept and decline options are recommended for this type of design.

**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**

Figure 6: Example of a Compliant Consent Banner from the Luxembourgish Guidelines.

#### i. Identified Gaps and Actionable Insights

Consistency 3: Regulators prohibited prechecked boxes in 2019 and user studies no longer evaluate them. Utz et al.<sup>139</sup> studied prechecked boxes in 2019 when the *Planet49* ruling<sup>140</sup> came out (Figure 2). Notably, Utz et al. found that when each purpose is listed separately and consent for each purpose is prechecked, 86% of users accept at least one purpose.<sup>141</sup> Meanwhile, only 2.7% of users accept at least one

139. Utz et al., *supra* note 19, at 978 fig.1(d).

140. *Planet49 GmbH*, *supra* note 133.

141. Utz et al., *supra* note 19, at 981 fig.4. The acceptance rate of 86% is computed using the numbers reported in "Categories, nudging" condition, fig.4. The percentage of mobile visitors that accepted at least one purpose is 33.9% (33.1% accepted all purposes plus 0.8% accepted some purposes), while overall number of mobile visitors that interacted with the banner is 39.5% (100% minus 60.5% who made no action). Therefore, the percentage of mobile visitors that accepted at least one purpose among all visitors that interacted with the banner is 33.9% divided by 39.5%, which constitutes 86%.

purpose when consent for each purpose is not prechecked.<sup>142</sup> Interestingly, we find that researchers were aware of the *Planet49* CJEU case that prohibited prechecked boxes in consent interfaces across the EU, because all studies, starting from Nouwens et al. in 2020, no longer included consent banners with prechecked boxes.<sup>143</sup>

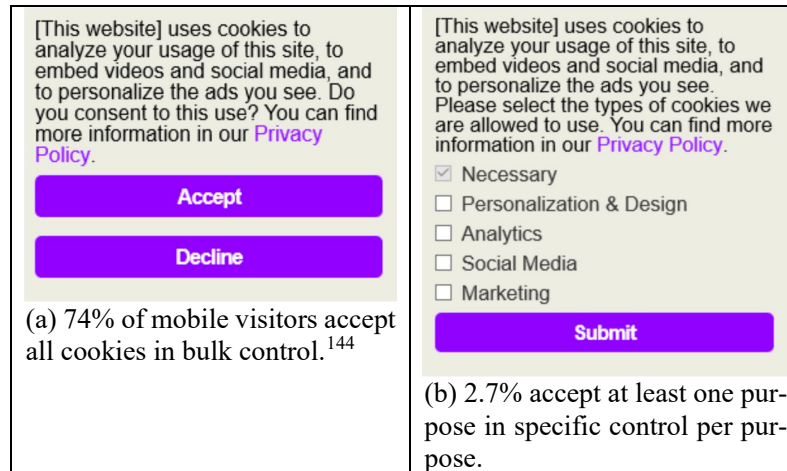


Figure 7: Two Consent Banners Tested by Utz et al.

Gap 10: Regulators recommend both bulk controls and specific controls, but user studies show that specific controls significantly reduce the acceptance rate. As stated in Section IV.B, most regulators recommend bulk control with neutral implementation (when both accept and decline buttons are equally visualized). Many regulators also support specific controls per purpose<sup>145</sup> and sometimes per cookie.<sup>146</sup> Utz et al. found that using specific controls with one submit button significantly reduces the users' acceptance relative to using bulk controls (2.7% accept at least one purpose in specific control per purpose, while

142. *Id.* The acceptance rate of 2.7% is computed from the numbers reported in “Categories, non-nudging” condition of fig.4: the percentage of mobile visitors that accepted at least one purpose is 1% (0.1% accepted all purposes plus 0.9% accepted some purposes), while overall number of mobile visitors that interacted with the banner is 36.7% (100% minus 63.3% who made no action). Therefore, the percentage of mobile visitors that accepted at least one purpose among all visitors that interacted with the banner is 1% divided by 36%, which constitutes 2.7%.

143. Nouwens et al., *supra* note 12, at 8 fig.3.

144. Utz et al., *supra* note 19, at 981. The acceptance rate of 74% for mobile users is computed from the “Binary, non-nudging” condition of fig.4 by dividing 41.0% of users that accept by overall number of mobile visitors that interacted with the banner, which is 55.3% (100% minus 44.7%), resulting in 74%.

145. CNIL *supra* note 18, para. 14; DATATILSYNET, *supra* note 18; UOOU, *supra* note 18; CNPD, *supra* note 18, § 3.2.6; DVI, *supra* note 18, § 4.2.2; APD, *supra* note 18.

146. AEPD, *supra* note 18, § 3.1.2.2.; UOOU, *supra* note 18; DPC, *supra* note 18, at 10.

74% accept in bulk control, as shown in Figure 7).<sup>147</sup> Similarly, Nouwens et al. found that specific controls together with bulk accept and decline options also reduces the acceptance rate by eight to twenty percent with respect to neutral bulk controls.<sup>148</sup> Regulators should therefore consider this difference in users' decisions for both models of banners when preparing guidelines.

Gap 11: Most regulators do not specify the buttons to be included in specific control, but user studies show that users are nudged with additional bulk accept. While the majority of regulators do not discuss buttons to confirm selection, Machuletz & Böhme found that adding a bulk accept button to specific controls per purpose nudged users toward acceptance of all purposes and increased the acceptance rate by twenty percent with respect to a banner with specific controls and one "submit" button (Figure 8).<sup>149</sup> Bermejo Fernandez et al. also found that a dark pattern that highlights the accept option in specific controls has a significant effect on users' interactions.<sup>150</sup> This reflects the potential use of "Interface Interference" high-level dark pattern (see Section III.B) and specifically "Manipulating Choice Architecture" meso-level pattern (see Section IV.A.ii) through implementing "Bundling"<sup>151</sup> and "Visual Prominence" (see Section IV.B.ii) low-level patterns to manipulate users into accepting more purposes than they might otherwise. Regulators should address these findings in the recommendations, and, if possible, prohibit adding a bulk accept button.

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147. Utz et al., *supra* note 19.

148. Nouwens et al., *supra* note 12, at 9.

149. Machuletz et al., *supra* note 19, at 490.

150. Bermejo Fernandez et al., *supra* note 19, at 12.

151. Originally introduced by the U.K. Competition and Markets Authority, the "Bundling" dark pattern represents a case when "two or more products and/or services are grouped in a single 'package.'" U.K. COMPETITION & MKTS. AUTH., *supra* note 70.

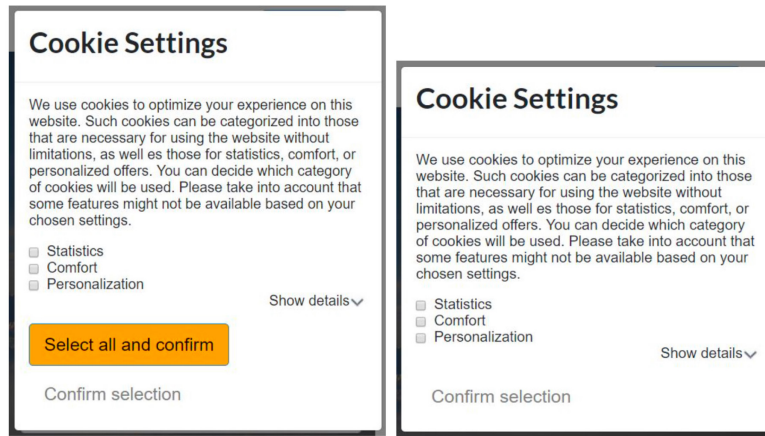


Figure 8: Banners tested by Machuletz & Bohme: Prominent “select all and confirm” button (left) increases acceptance rate by twenty percent with respect to a banner with specific controls and one “submit” button (right) option next to specific controls that nudge users toward acceptance.<sup>152</sup>

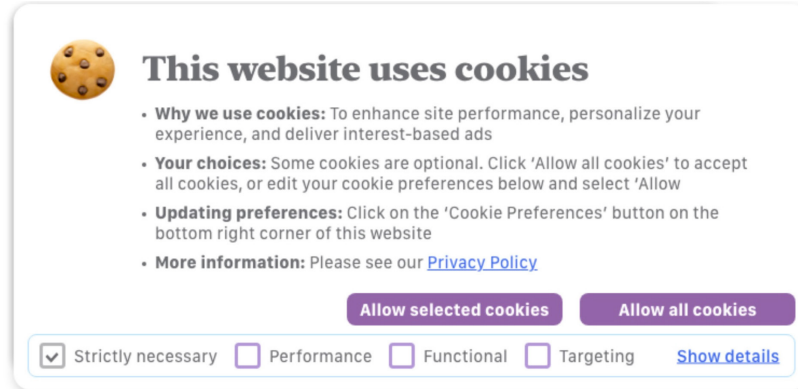


Figure 9: Banner Tested by Habib et al.: Banner with specific control was considered *best practice*; however, it contained a bulk accept option.<sup>153</sup>

Insight 5: User studies often include an accept button, but they should consider instead specific controls with one submit button, following the EU guidelines for Luxembourg.<sup>154</sup> Several studies have

152. Machuletz et al., *supra* note 19, at 488 fig.2.

153. Habib et al., *supra* note 19, at 8 fig.2a.

154. CNPD, *supra* note 18, § 3.2.11.

further tested specific controls per purpose on the users' consent decision. However, studies by Habib et al. (see Figure 9), Giese & Stabauer,<sup>155</sup> and Bouma-Sims et al.<sup>156</sup> included banners with a specific control that, in addition to a select button, also included a bulk accept option, which nudged users toward acceptance. Moreover, Habib et al. and Giese & Stabauer did not compare such banners to the banners with equal path to decline, as recommended by many regulators (see Section IV.A.i). Researchers therefore should consider comparing specific controls with only one submit button versus bulk controls with equal paths to provide guidance to EU regulators.

## VI. CONCLUSION

In this work, we hope to bridge the gap between EU regulators and researchers in their empirical evaluations of consent banners via user studies. Our analysis of guidelines and user studies yielded eleven gaps between them, as well as five insights and only three consistencies. If regulators considered results from user studies, they could immediately recommend designs of consent banners that are both aligned with users' expectations and at the same time compliant with the law. If researchers were well-informed of regulators' needs, they could provide evidence to regulators worldwide on the impact of specific design choices of consent banners on users' decision-making. Moreover, user studies could help regulators to harmonize the interpretation of the law across the EU and help the EDPB in its mission. We further recommend that the EDPB and regulators involve usable privacy, human-computer interaction, design, law, economics, psychology, computer science, and transdisciplinary experts in their discussions to support their own guidelines with qualitative and quantitative user research methods.

We hope there will be further development of consent interface standardization. While the EDPB Task Force states that "a general banner standard concerning color and/or contrast cannot be imposed,"<sup>157</sup> only the French DPA encourages "the development of standardized interfaces, operating in the same way and using a uniform vocabulary."<sup>158</sup> Such a standardization need echoes recently proposed tools and protocols that either offer automatic interaction with consent banners based on users' preferences, like the Consent-O-Matic browser extension,<sup>159</sup> or propose solutions to express consent directly in the browser and

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155. Giese et al., *supra* note 19, at 277 fig.2.

156. Bouma-Sims et al., *supra* note 19, at 6 fig.2a.

157. EUR. DATA PROT. BD., *supra* note 18, at 6.

158. CNIL *supra* note 18, § 11.

159. See Midas Nouwens, Rolf Bagge, Janus Bager Kristensen & Clemens Nylandstedt Klokmose, *Consent-O-Matic: Automatically Answering Consent Pop-Ups Using Adversarial Interoperability*, EXTENDED ABSTRACTS 2022 CHI CONF. ON HUM. FACTORS COMPUT. SYS., Apr. 2022, at 1, 1.

communicate users' consent preferences via new communication protocols, such as the Global Privacy Control ("GPC"),<sup>160</sup> and the more recent Advanced Data Protection Control<sup>161</sup> that aims to be specifically compliant with the EU Data Protection requirements. Such standards could help harmonize the application of the law across the EU, but also initiate discussions about compliance and usability of consent banners in countries where user consent is required by the national laws.

The same misalignment between guidelines and empirical user studies may exist and should be studied within other legal institutes, such as other legal bases like "legitimate interest" introduced in the GDPR,<sup>162</sup> or data subject rights imposed by the GDPR.<sup>163</sup> We believe that regulators should use a robust methodology, shared across regulators, to run further empirical user studies in order to recommend designs and implementations of consent that are actually usable and understood by users.

This work can serve as a foundation for the improvement of future guidelines, catalyzing future consent and dark patterns community engagement. We hope this work will help to intersect and enrich empirical results and legal assessments across transdisciplinary boundaries and also help identify areas of tension that may impact the uptake of scholarship in law and regulatory action.

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160. *Take Control of Your Privacy*, GLOB. PRIV. CONTROL, <https://globalprivacycontrol.org> [<https://perma.cc/2BZ6-P7XB>].

161. *Advanced Data Protection Control (ADPC)*, ADPC, <https://www.dataprotectioncontrol.org> [<https://perma.cc/H5NJ-KRCM>].

162. GDPR, *supra* note 2, art. 6(1)(f).

163. GDPR, *supra* note 2, arts. 15, 16, 17, 18, 20, 21.