(UN)INFORMED CONSENT: STUDYING GDPR CONSENT NOTICES IN THE FIELD

Christine Utz, Martin Degeling, Sascha Fahl, Florian Schaub, Thorsten Holz
CONSENT NOTICES
a.k.a. cookie banners, cookie notices, privacy notices, …

- Legal foundation:
  - 2009 amendment to Article 5(3) of the ePrivacy Directive
  - Article 6 (1)(a) GDPR: consent as one of six legal bases for the processing of personal data

- Prevalence [1]:
  - 46.1 % in January 2018
  - 62.1 % after GDPR enforcement date

VARYING COMPLEXITY

COOKIE SETTINGS

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**FUNCTIONAL**
Functional cookies are required for the website to operate correctly. These cookies cannot be disabled.
This is the default setting for your country.

**OPTIMIZED**
Optimization cookies allow us to analyze site usage so we can measure and improve our website.

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STUDYING CONSENT NOTICES “IN THE FIELD”

- Between-subjects study with visitors of a German e-commerce website
- Website: ~ 15–20K unique visitors per month, mostly single-page
- Modified WordPress plugin
- 3 experiments conducted iteratively from Nov 2018 – Mar 2019
UI PARAMETERS

link to privacy policy / additional information

nudging / dark patterns?

Formatting

text

choices

Accept all
Manage consents
Sample & inspect 1000 real-world consent notices, identify design space

Experiment 1: Position

Experiment 2: Choices / nudging

Experiment 3: Privacy policy link / (non) technical language
User visits website
User is shown 1 of n consent notices. Plugin logs all interactions with notice
30 seconds without user interaction
User clicks consent notice
Notice is replaced with invitation to survey
Behavior-/notice-specific survey
### EXPERIMENT 1 - POSITION

<table>
<thead>
<tr>
<th>Top Left, “dialog”</th>
<th>Top, “bar” (27%)</th>
<th>Top Right, “dialog” (0.2%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom Left, “dialog” (3.7%)</td>
<td>Bottom, “bar” (57.9%)</td>
<td>Bottom Right, “dialog” (3.0%)</td>
</tr>
</tbody>
</table>

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- **Accept**
- **Decline**
EXPERIMENT 1: RESULTS

- 30 Nov – 18 Dec 2018 (19 days)
- ~ 14K website visitors, ~ 80% mobile
- Higher interaction rates on mobile devices
- Highest interaction rate: bottom left
- Possible explanations:
  - notice is more likely to cover website content
  - bottom position easier to reach on smartphones
EXPERIMENT 2 – CHOICES & NUDGING

- Choices: binary
- Nudging: no ("Accept" and "Refuse" buttons look the same)
EXPERIMENT 2 – CHOICES & NUDGING

- Choices: confirmation (visible)
- Nudging:
EXPERIMENT 2 – CHOICES & NUDGING

- Choices: confirmation (visible) / categories (hidden)
- Nudging: yes ("OK" button highlighted, "Settings" link hard to see, pre-ticked checkboxes)
EXPERIMENT 2: NOTICES

non-nudging

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No option</td>
<td>26.3%</td>
</tr>
<tr>
<td>Confirmation</td>
<td>59.9%</td>
</tr>
<tr>
<td>Binary</td>
<td>4.0%</td>
</tr>
<tr>
<td>Categories</td>
<td>8.1%</td>
</tr>
<tr>
<td>Vendors</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

nudging

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accept</td>
<td></td>
</tr>
<tr>
<td>Decline</td>
<td></td>
</tr>
</tbody>
</table>

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EXPERIMENT 2: RESULTS

- 19 Dec 2018 – 28 Jan 2019 (41 days)
- 36,530 website visitors
- Less options $\Rightarrow$ higher interaction
- Strong impact of nudging / preselections
EXPERIMENT 2: SELECTIONS

<table>
<thead>
<tr>
<th>Element</th>
<th>Opt-in</th>
<th>Opt-out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit</td>
<td>29.8%</td>
<td>35.1%</td>
</tr>
<tr>
<td>Privacy Policy</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Ionic</td>
<td>1.3%</td>
<td>10%</td>
</tr>
<tr>
<td>Youtube</td>
<td>0.9%</td>
<td>10%</td>
</tr>
<tr>
<td>Google fonts</td>
<td>0.7%</td>
<td>10%</td>
</tr>
<tr>
<td>Google Analytics</td>
<td>0.8%</td>
<td>10%</td>
</tr>
<tr>
<td>Google Ads</td>
<td>1%</td>
<td>10%</td>
</tr>
<tr>
<td>Facebook</td>
<td>0.8%</td>
<td>10.3%</td>
</tr>
</tbody>
</table>

Absolute values:
- Facebook: 0.8%
- Google Ads: 1%
- Google Analytics: 0.8%
- Google fonts: 0.7%
- Ionic: 1.3%
- Youtube: 0.9%
- Privacy Policy: 0.6%
- Submit: 29.8%
- Facebook: 10.3%
- Google Ads: 10%
- Google Analytics: 10%
- Google fonts: 10%
- Ionic: 10%
- Youtube: 10%
- Privacy Policy: 0.4%
- Submit: 35.1%
EXPERIMENT 3 – LANGUAGE & PP LINK

privacy policy link (92.3 %)

- Technical (“cookies”) (96.4 % in sample)

- Non-technical (“data”) (3 %)

no privacy policy link (6.6 %)
EXPERIMENT 3: RESULTS

- 29 Jan 2018 – 15 Mar 2018 (46 days)
- ~ 32K website visitors
- PP link: no significant effect
- Slightly higher interaction rates with technical language ("cookies")
- Habituation effect?
SURVEY RESULTS

- Link to survey was clicked by 804 visitors (0.97 %)
- Responses: 110 (0.13 %)

We have received your selection! [This website] has partnered with Ruhr University Bochum to evaluate cookie notices. Would you mind answering a couple of questions? You can win a gift voucher of your choice worth 25 €.

Participate!

Close
SURVEY: MOTIVATION FOR CLICKING

1. annoyed
2. website does not work otherwise
3. habituation
4. privacy
5. security
6. less ads
SURVEY: MOTIVATION FOR NOT CLICKING

1. did not see notice
2. no effect
3. do not care
4. not enough choices
SURVEY: COMPLEX CONSENT NOTICES

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- Necessary
- Analytics
- Social Media
- Marketing
- Personalization & Design

Submit

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- Ionic
- Google Analytics
- YouTube
- Google Fonts
- Google Ads
- Facebook

Submit
SURVEY: COMPLEX CONSENT NOTICES

- transparency

“Having options makes me feel secure” (P2-619)

“I like [...] that only [the] necessary option is selected and all of the others are deactivated” (P3-88)

“[I liked that] I could directly select the options without going to the settings. It would be great if this was the default” (P3-171)
SURVEY: COMPLEX CONSENT NOTICES

- options unclear

“Necessary [...] does not say much. Cookies aren’t necessary to view a website” (P3-215)

“Something could be hidden [behind the Necessary category]” (P2-557)
SURVEY: UNDERSTANDING OF CONSENT NOTICES

Q7: What do you think happens when you click “Decline“?
1. website cannot be accessed
2. website functionality is limited
3. no change
4. no cookies stored
5. no data collected
6. website can be accessed

Q8: What do you think happens when you click “Accept“?
1. data collected
2. ads
3. profiling
4. cookies stored

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TAKEAWAYS

- Influence of UI parameters on interaction rate?
  - Position: +
  - Nudging / preselections: ++
  - Privacy policy link: -
  - Wording: o

- Hints in survey: categories > vendors (in line with GDPR, also recommended by various DPAs)

- Misconceptions about how consent notices work
  - Site cannot be accessed unless consent is given ⇒ inform about functionality limitations
  - No data collected before a decision is made (“privacy by default”)
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Get in touch!

christine.utz@rub.de
@christine_utz

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GitHub

https://github.com/RUB-SysSec/uninformed-consent

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