



Carnegie Mellon University
Security and Privacy Institute

CyLab

Carnegie Mellon University

privacy
ENGINEERING

Informing the design of cookie consent interfaces with research

X

Lorrie Faith Cranor
@lorrietweet

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A usable consent interface should

1. Address user needs
2. Require minimal user effort
3. Make users aware of what choices exist and where to find them
4. Convey choices and their implications so users understand them easily
5. Satisfy users and engender trust
6. Allow users to change their decision due to errors or changing their mind
7. Avoid nudging users towards less privacy-protective options

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Functionality Allowed

- Provide secure log-in
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- Make sure the website looks consistent
- Allow you to share pages with social networks
- Allow you to post comments
- Serve ads relevant to your interests

This page transmits information using HTTPS protocol. Some vendors cannot support HTTPS opt-out requests. TrustArc will submit your preferences through HTTP in a pop-up window.

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Strictly Necessary Cookies

Performance Cookies

Functional Cookies

Targeting Cookies

Marketing Cookies

Targeting Cookies



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FOREVER 21

THEN

The screenshot shows the 'THEN' state of the Forever 21 website. It features a main image of a woman in a colorful striped dress sitting on a wicker chair. Below this image are two smaller images: one labeled 'Mens' and another labeled 'Accessories'. At the bottom of the page, there is a cookie consent banner with a purple border. The banner contains the text 'On this site, measure the web or interact and manage your' followed by a link 'Manage Settings' and a button 'Accept All Cookies'. A purple arrow points from the 'THEN' label to the 'Accept All Cookies' button.

Mens Accessories

On this site, measure the web or interact and manage your

[Manage Settings](#) **Accept All Cookies**

NOW

The screenshot shows the 'NOW' state of the Forever 21 website. It features the same main image of a woman in a colorful striped dress sitting on a wicker chair. Below this image are two smaller images: one labeled 'Accessories' and another labeled 'Accessories'. At the bottom of the page, there is a cookie consent banner with a purple border. The banner contains the text 'On this site, measure the web or interact and manage your' followed by three buttons: 'Cookies Settings', 'Reject All', and 'Accept All Cookies'. A purple arrow points from the 'NOW' label to the 'Reject All' button.

Accessories Accessories

On this site, measure the web or interact and manage your

Cookies Settings **Reject All** **Accept All Cookies**

Your Privacy

Strictly Necessary Cookies

Performance Cookies

Functional Cookies

Targeting Cookies

Marketing Cookies

Targeting Cookies



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+ Strictly Necessary Technologies

Always Active

+ Performance Technologies



+ Functional Technologies



+ Analytics Technologies



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This website uses cookies

We occasionally run membership recruitment campaigns on social media channels and use cookies to track post-clicks. We also share information about your use of our site with our social media, advertising and analytics partners who may combine it with other information that you've provided to them or that they've collected from your use of their services. Use the check boxes below to choose the types of cookies you consent to have stored on your device.

Use necessary cookies only

Allow selected cookies


Allow all cookies

Necessary

Preferences

Statistics

Marketing

Show details 

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Necessary



Preferences



Statistics



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Hide details



Cookie declaration

About

Necessary (23)

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Preferences (8)

Statistics (14)

Marketing (31)

Unclassified (4)

| Name | Provider | Purpose | Expiry | Type |
|--------------|---------------------------|--------------------------|---------|------|
| BACKEND [x4] | ACM | Pending | Session | HTTP |
| CookieConsen | Cookiebot | Stores the user's cookie | 1 year | HTTP |

Cookie declaration last updated on 6/4/22 by [Cookiebot](#)

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“Okay, whatever”: An Evaluation of Cookie Consent Interfaces

Hana Habib

Carnegie Mellon University
Pittsburgh, PA, USA
htq@cs.cmu.edu

Megan Li

Harvey Mudd College
Claremont, CA, USA
mlli@hmc.edu

Ellie Young

New College of Florida
Sarasota, FL, USA
eleanor.young18@ncf.edu

Lorrie Faith Cranor

Carnegie Mellon University
Pittsburgh, PA, USA
lorrie@cmu.edu

ABSTRACT

Many websites have added cookie consent interfaces to meet regulatory consent requirements. While prior work has demonstrated that they often use dark patterns — design techniques that lead users to less privacy-protective options — other usability aspects of these interfaces have been less explored. This study contributes a comprehensive, two-stage usability assessment of cookie consent interfaces. We first inspected 191 consent interfaces against five dark pattern heuristics and identified design choices that may impact usability. We then conducted a 1,109-participant online between-subjects experiment exploring the usability impact of seven design parameters. Participants were exposed to one of 12 consent interface variants during a shopping task on a prototype e-commerce website and answered a survey about their experience. Our findings suggest that a fully-blocking consent interface with in-line cookie options accompanied by a persistent button enabling users to later change their consent decision best meets several design objectives.

CCS CONCEPTS

- **Security and privacy** → **Usability in security and privacy**; • **Social and professional topics** → *Computing / technology policy*;
- **Human-centered computing** → Empirical studies in HCI.

KEYWORDS

cookie consent, GDPR, privacy choice, privacy notice

consent interfaces must be usable, there are no existing standards for usable consent interfaces. As a result, organizations use a wide range of design practices in their implementations, some of which have been highlighted in prior work as dark patterns [10, 29]. Dark patterns within cookie consent interfaces are design practices that nudge users toward less privacy-protective options and could lead to users unknowingly consenting to data collection or failing to exercise their preferred privacy choices. Beyond dark patterns, it is important to consider other usability aspects of cookie consent interfaces, such as user awareness and comprehension of choices, as interfaces with poor usability could cause privacy fatigue in users, described as “the tendency of consumers to disclose greater information over time when using more complex and less-usable privacy controls” [17].

We conducted a comprehensive two-stage evaluation of cookie consent interfaces to more holistically assess the usability impact of common interface designs beyond the presence of dark patterns. Our study contributes a comprehensive definition of usability for the context of consent interfaces and provides a better understanding of design choices that improve the consent experience. Our results can be leveraged by websites, self-regulatory organizations, and Consent Management Platforms (CMPs) to improve consent interfaces, as well as by legislators and regulators who define and enforce usable consent interface requirements.

We based our evaluation of cookie consent interfaces on those implemented through CMPs. These services have emerged to help or-

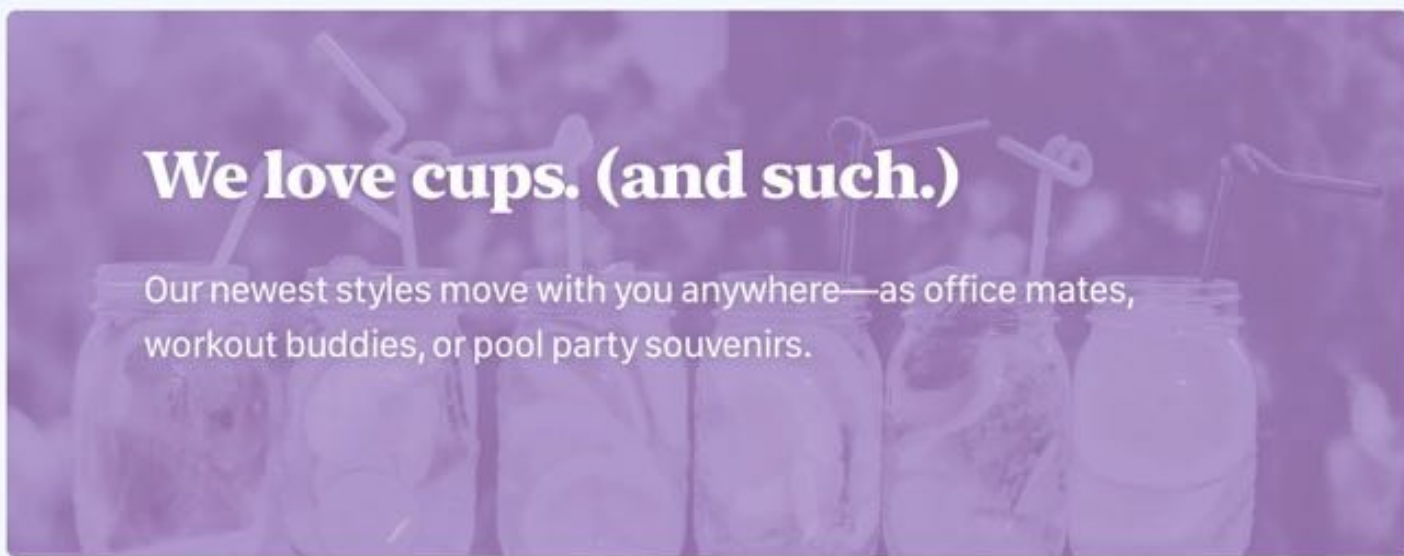


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Functional



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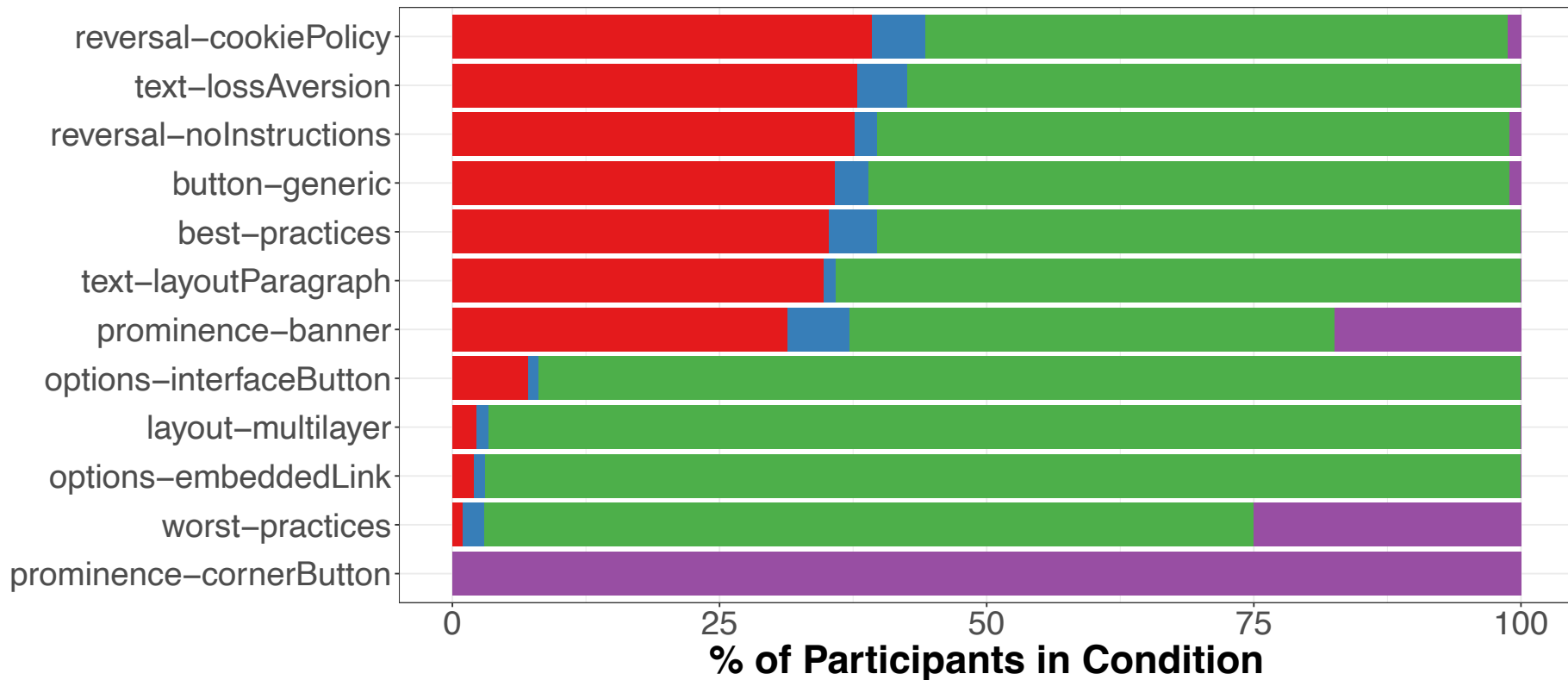
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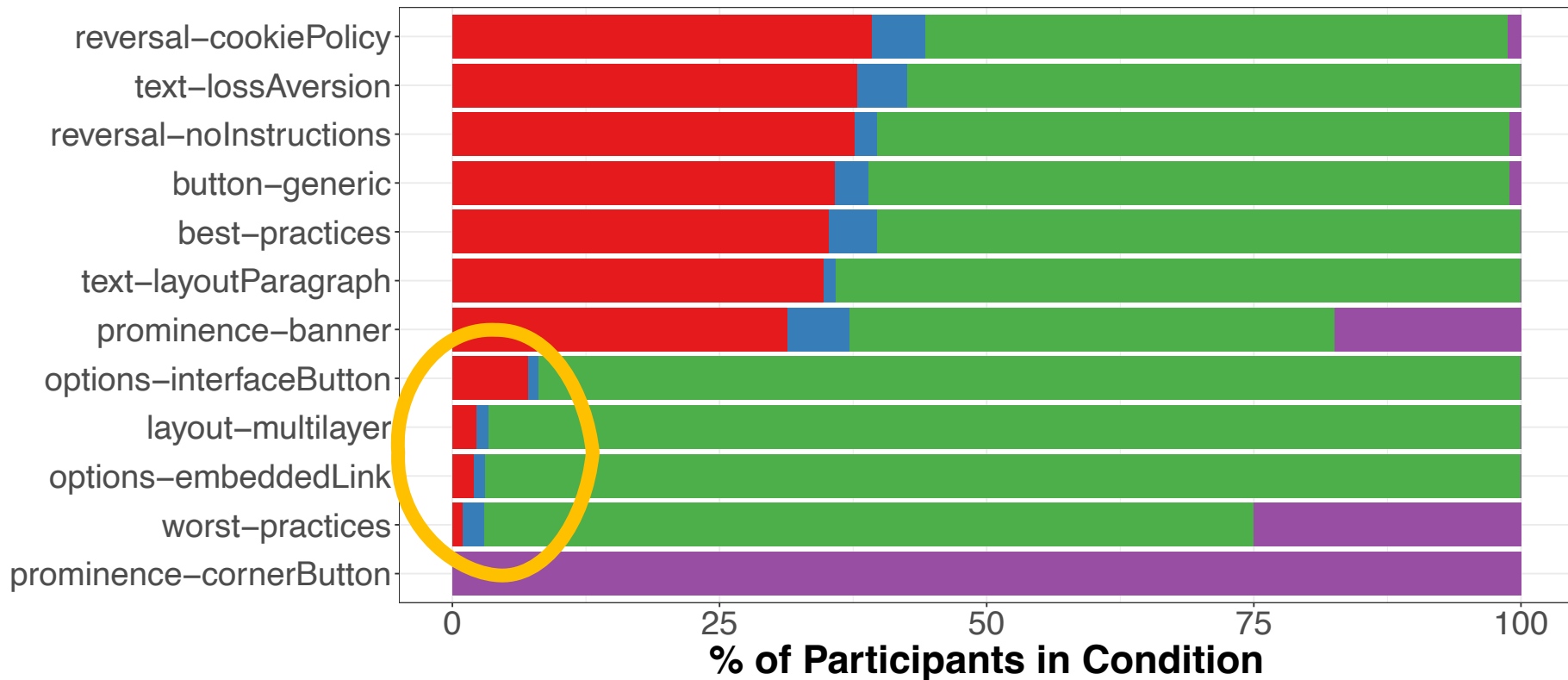
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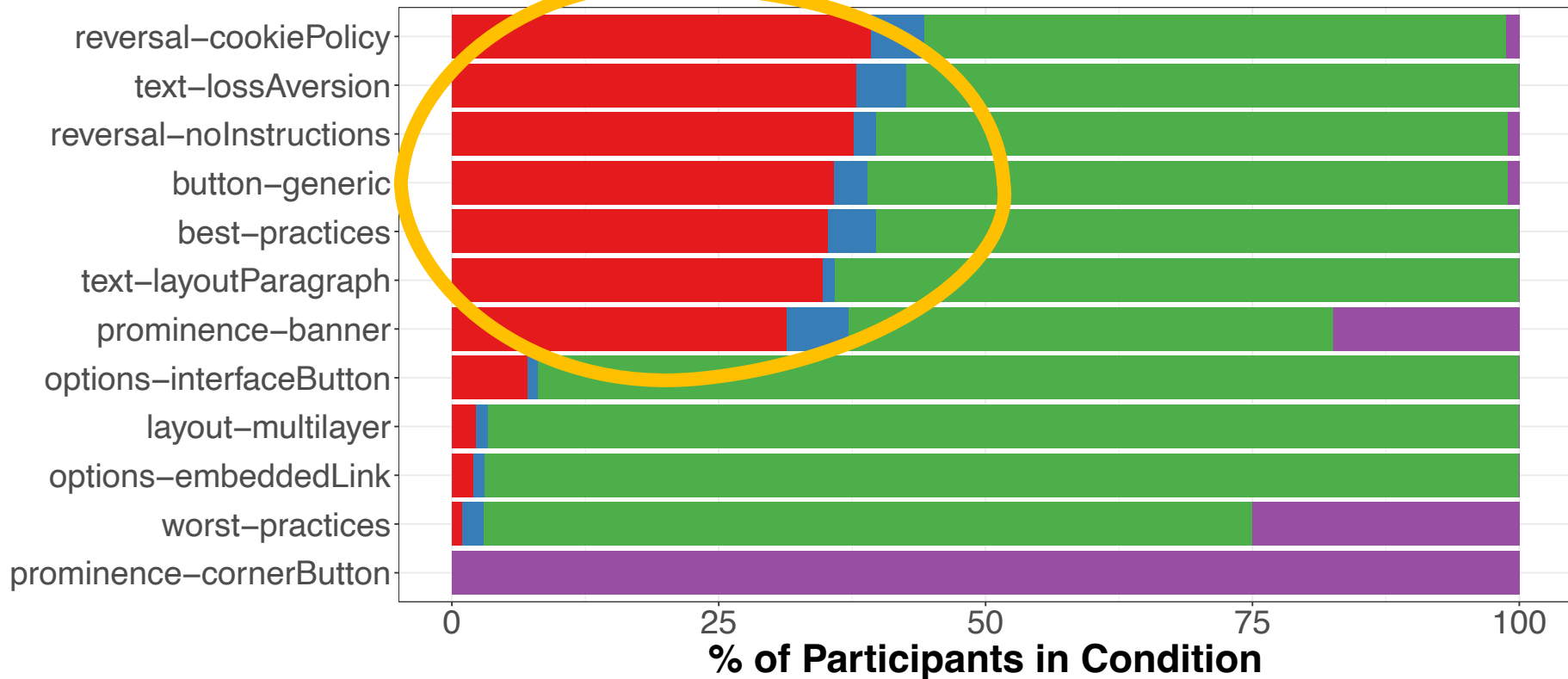
Only strictly necessary Custom All cookies No selection



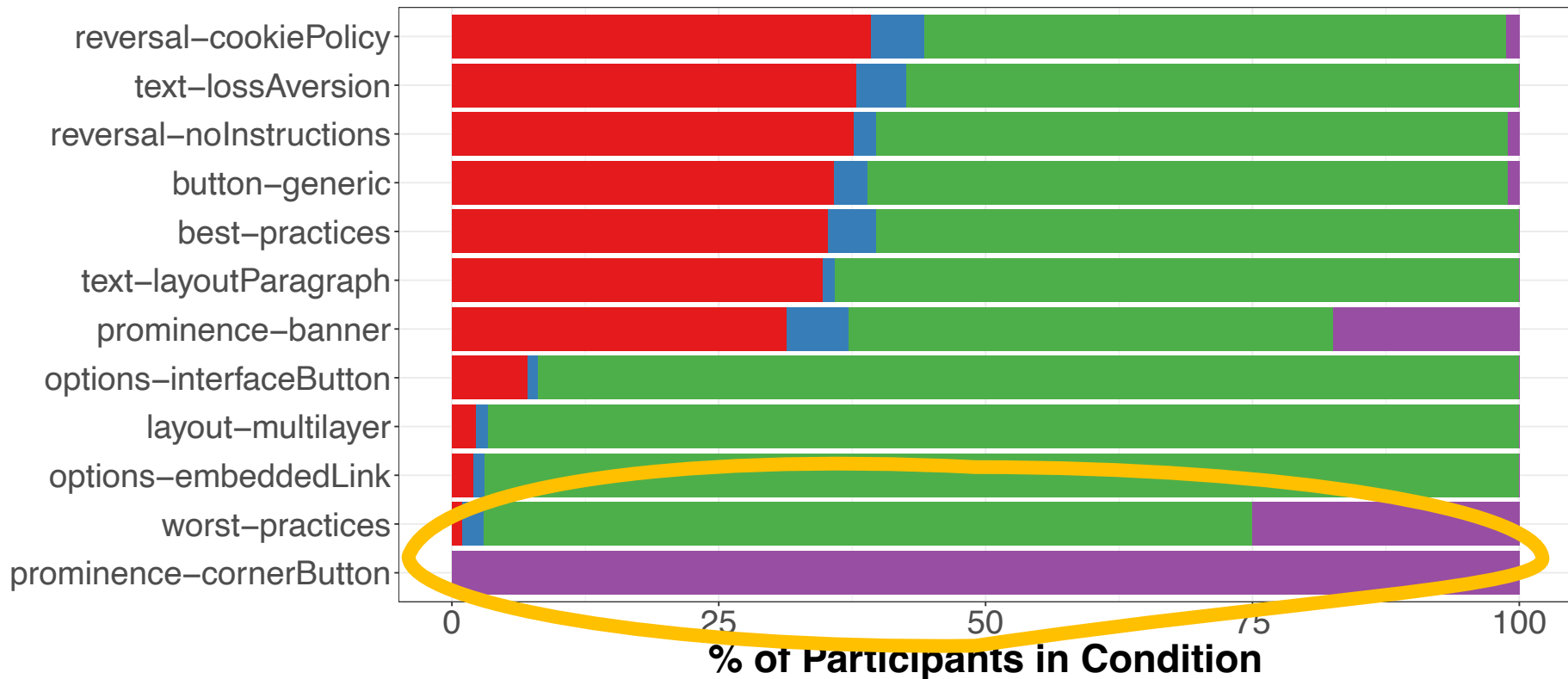
■ Only strictly necessary ■ Custom ■ All cookies ■ No selection



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*The Earth... Is A Cup.
(Holds Things)
— ancient proverb*

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Mostly cups but also other things
and such.

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ICC UK Cookie guide

Second edition November 2012

| | |
|--|-----------|
| Introduction | 2 |
| Part 1: Guidance for website operators | 3 |
| Part 2: Categories of cookies | 6 |
| Part 3: Technical notes and definitions | 10 |
| Part 4: Consent wording | 12 |
| Further reading | 14 |

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| + Targeting Cookies | <input type="checkbox"/> |

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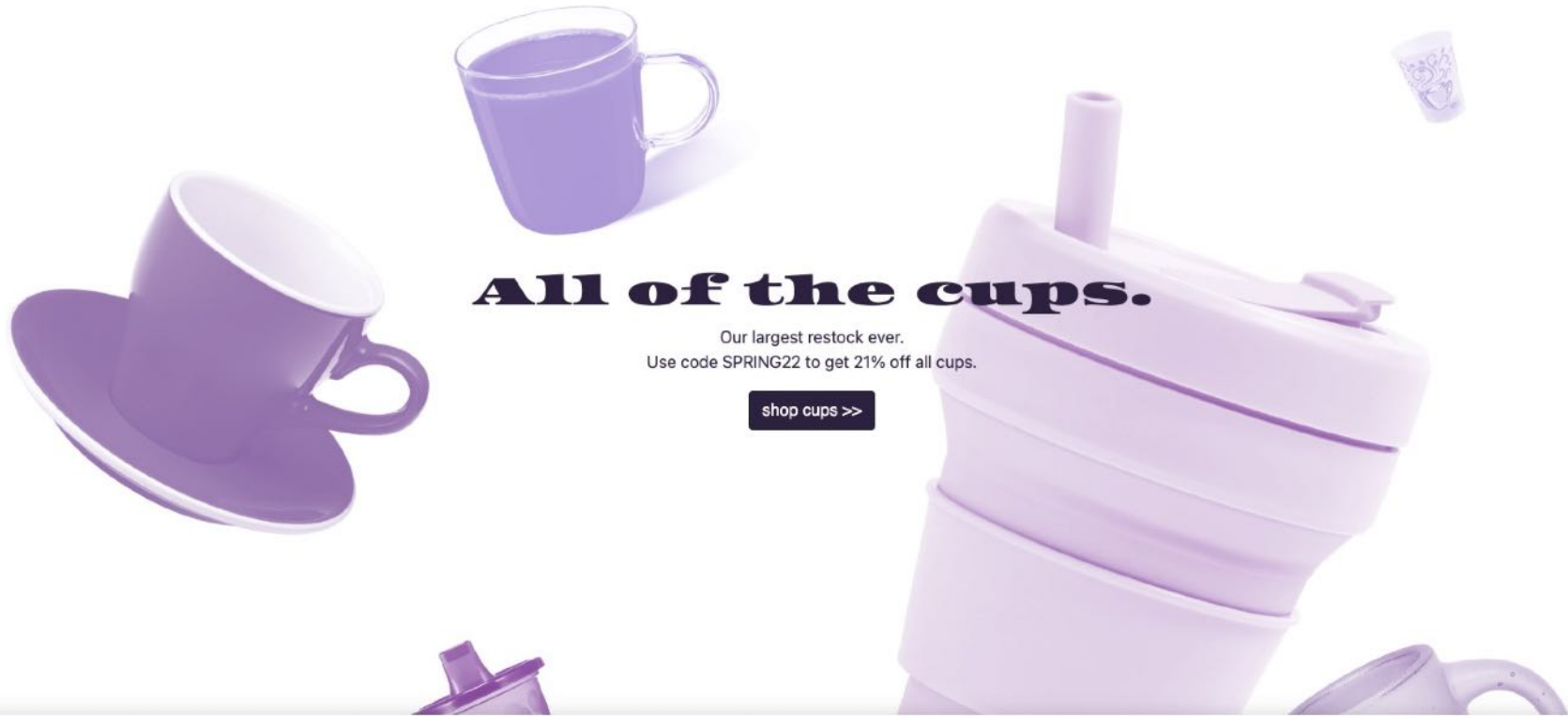
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|-----------------------------------|--------------------------|
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| + Functional Technologies | <input type="checkbox"/> |
| + Analytics Technologies | <input type="checkbox"/> |

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