



**CNIL.**

Direction interministérielle de la  
transformation publique



# The Effect of Design Patterns on (Present and Future) Cookie Consent Decisions

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# Cookie consent banners

**We Care About Your Privacy**

We and our partners store and/or access information on a device, such as unique IDs in cookies to process personal data. You may accept or manage your choices by clicking below or at any time in the privacy policy page. These choices will be signaled to our partners and will not affect browsing data.

**We and our partners process data to provide:**

Actively scan device characteristics for identification. Use precise geolocation data. Store and/or access information on a device. Personalised ads and content, ad and content measurement, audience insights and product development.

[List of Partners \(vendors\)](#)

**actu.fr**

Nous et nos partenaires stockons et utilisons des informations non sensibles sur votre appareil, comme des cookies ou l'identifiant unique de votre appareil, afin de personnaliser nos contenus, produits et services, l'interaction avec des services proposés, l'affichage de publicités personnalisées et de publicités ciblées par profilage, l'affichage de contenu personnalisé, la mesure de performance des publicités et du contenu, les données d'audience et le développement de produit. Vous pouvez donner votre consentement spécifique pour l'utilisation de la géolocalisation précise et/ou des informations sur les caractéristiques de votre appareil.

En cliquant sur 'Accepter et fermer', vous consentez aux finalités ci-dessus conformément à nos politiques [Cookies](#) et [Données personnelles](#).

Vous pouvez, à tout moment, modifier vos choix cookies en bas de nos pages.

[Voir nos partenaires](#)

**Allow the use of cookies from Instagram in this browser?**

We use cookies and similar technologies to help:

- Provide and improve content on Facebook Products
- Provide a safer experience by using information that we receive from cookies on and off Instagram
- Provide and improve Facebook Products for people who have an account

For advertising and measurement services off Facebook Products, for analytics and to provide certain features and improve our services for you, we use tools from other companies on Instagram. These companies also use cookies.

You can allow the use of all cookies, just essential cookies or you can choose more options below. You can learn more about cookies and how we use them and review or change your choice at any time in our [Cookie Policy](#).

**Essential cookies**

These cookies are required to use Facebook Products. They're necessary for these sites to work as intended.

**Optional cookies**

**Cookies from other companies**

We use tools from other companies for advertising and measurement services off Facebook Products, for analytics and to provide certain features and improve our services for you, we use tools from other companies on Instagram. These companies also use cookies.

[Allow essential and optional cookies](#)

**LADEPECHE.fr**

Nous et nos partenaires stockons et accédons à des informations non sensibles sur votre appareil, comme des cookies ou l'identifiant unique de votre appareil, et traitons vos données à caractère personnel comme votre adresse IP ou un identifiant cookie, pour des traitements de données comme l'affichage de publicités personnalisées, la mesure des préférences de nos visiteurs, etc.

Vous pouvez faire un choix ici et modifier vos préférences à tout moment dans notre Politique de confidentialité sur ce site web.

Certains partenaires ne demandent pas votre consentement pour traiter vos données et s'appuient sur leur intérêt commercial légitime. Vous pouvez vous opposer à ces traitements de données en cliquant sur «En savoir plus».

Avec nos partenaires, nous traitons les données suivantes en nous basant sur votre consentement et/ou vos intérêts légitimes:

- Publicités et contenu personnalisés, mesure de performance des publicités et du contenu, données d'audience et développement de produit, données de géolocalisation précises et identification par analyse du terminal"

[Voir nos partenaires](#)

# How are they regulated?



'consent' of the data subject means any **freely given, specific, informed and unambiguous indication** of the data subject's wishes

## EU case law (binding)



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Decline option hidden on the second layer is not compliant

### Your data, your experience

Yahoo is part of Verizon Media. Click 'I agree' to allow Verizon Media and our partners to use cookies and similar technologies to access your device and use your data (including location) to understand your interests, and provide and measure personalised ads. We will also provide you with personalised ads on partner products. Learn more about how we use your data in our [Privacy Centre](#). Once you confirm your privacy choices here, you can make changes at any time by visiting your [Privacy dashboard](#).

Click 'Learn more' to learn and customise how Verizon Media and our partners collect and use data.

I agree

Learn more



## Guidelines with best practices (non-binding)



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Identical design of accept and decline options is compliant



Votre consentement

PERSONALISER  
MES CHOIX

TOUT REFUSER

TOUT ACCEPTER

# Effect of cookie consent banners design

## Dark patterns in consent banners!



**Dark patterns** are design practices that **deceive, coerce, or manipulate users** into making choices that are often not in their best interest (Gray et al. 2021).

**Bright patterns** are **dark patterns used for the interest of the users.**

## Prior studies may not be specific enough to be used in guidelines or to inform policy makers!



**No prior work** studied the impact of consent banner design **on French population.**

Most studies are preliminary **with only 20-200 participants per banner** and rely on **different statistical tests**, making their results hard to compare and reuse (Bielova 2022).

Colin M. Gray, Cristiana Santos, Nataliia Bielova, Michael Toth, Damian Clifford. Dark Patterns and the Legal Requirements of Consent Banners: An Interaction Criticism Perspective. ACM CHI Conference on Human Factors in Computing Systems (ACM CHI 2021).

Nataliia Bielova, A survey of user studies as evidence for dark patterns in consent banners, CNIL, LINC report, 2022.

<https://linc.cnil.fr/survey-user-studies-evidence-dark-patterns-consent-banners>

# Our objectives



## Knowledge and attitudes on data sharing online

Measure the level of knowledge and understand the attitudes that Internet users have towards cookies and their use



## Impact of dark patterns

Measuring the effect of dark patterns on the behavior of Internet users when faced with a cookie banner



## Impact of bright and new patterns

Measure the effect of bright and new patterns, based on behavioral levers, on the same behavior.



## The influence of the past

Explore whether banners seen in the past affect users future choices, and thus whether the effect of bright or dark patterns persists even in their absence.

# Tested banners (1/2)

## Your cookie preferences

Our site and our partners use **cookies** that are placed on your device.

Some of these cookies are said to be **essential** and are strictly necessary for the proper technical functioning of the site. They include tracers that **enable audience measurement**.

If you consent, **non-essential** cookies may also be placed (you may withdraw your consent at any time). They are used to:

- accurately measure your interactions with the site in order to improve our services;
- display multimedia content from other sites;
- display personalised advertising based on your profil and browsing history;
- share content on the social networks included on our site (e.g. Facebook).

Accept all

Decline all

[Customise my choices](#)

**Control**

*Recommended consent design*

## Your cookie preferences

Our site and our partners use **cookies** that are placed on your device.

Some of these cookies are said to be **essential** and are strictly necessary for the proper technical functioning of the site. They include tracers that **enable audience measurement**.

If you consent, **non-essential** cookies may also be placed (you may withdraw your consent at any time). They allow:

- to accurately measure your interactions with the site in order to improve our services;
- display multimedia content from other sites;
- display personalised advertising based on your profil and browsing history;
- share content on the social networks included on our site (e.g. Facebook).

Accept all

[Customise my choices](#)

 **Dark Pattern – No decline**

*Only statistically significant result on 40 US students (Nouwens et al. 2020)*

## Your cookie preferences

Our site and our partners use **cookies** that are placed on your device.

Some of these cookies are said to be **essential** and are strictly necessary for the proper technical functioning of the site. They include tracers that **enable audience measurement**.

If you consent, **non-essential** cookies may also be placed (you may withdraw your consent at any time). They are used to:

- accurately measure your interactions with the site in order to improve our services;
- display multimedia content from other sites;
- display personalised advertising based on your profil and browsing history;
- share content on the social networks included on our site (e.g. Facebook).

Accept all

Decline all

[Customise my choices](#)

 **Dark pattern – Highlighted accept**

*No statistically significant difference found in previous research.*

# Tested banners (2/2)

## Your cookie preferences

Our site and our partners use **cookies** that are placed on your device.

Some of these cookies are said to be **essential** and are strictly necessary for the proper technical functioning of the site. They include tracers that **enable audience measurement**.

If you consent, **non-essential** cookies may also be placed (you may withdraw your consent at any time). They are used to:

- accurately measure your interactions with the site in order to improve our services;
- display multimedia content from other sites;
- display personalised advertising based on your profil and browsing history;
- share content on the social networks included on our site (e.g. Facebook).

Decline all

Accept all

[Customise my choices](#)



## Bright Pattern – Highlighted Decline

*No statistically significant difference found in previous research.*

## Your cookie preferences

Our site and our partners use **cookies** that are placed on your device.

Some of these cookies are said to be **essential** and are strictly necessary for the proper technical functioning of the site. They include tracers that **enable audience measurement**.

If you consent, **non-essential** cookies may also be placed (you may withdraw your consent at any time). They are used to:

- accurately measure your interactions with the site in order to improve our services;
- display multimedia content from other sites;
- display personalised advertising based on your profil and browsing history;
- share content on the social networks included on our site (e.g. Facebook).

Accept to be traced

Continue without being traced

[Customise my choices](#)

## New Pattern - Consequences

*CNIL recommendations require users to be informed of the consequences of their choices.*

## Your cookie preferences

Our site and our partners use **cookies** that are placed on your device.

Some of these cookies are said to be **essential** and are strictly necessary for the proper technical functioning of the site. They include tracers that **enable audience measurement**.

If you consent, **non-essential** cookies may also be placed (you may withdraw your consent at any time). They are used to:

- accurately measure your interactions with the site in order to improve our services;
- display multimedia content from other sites;
- display personalised advertising based on your profil and browsing history;
- share content on the social networks included on our site (e.g. Facebook).

Decline all

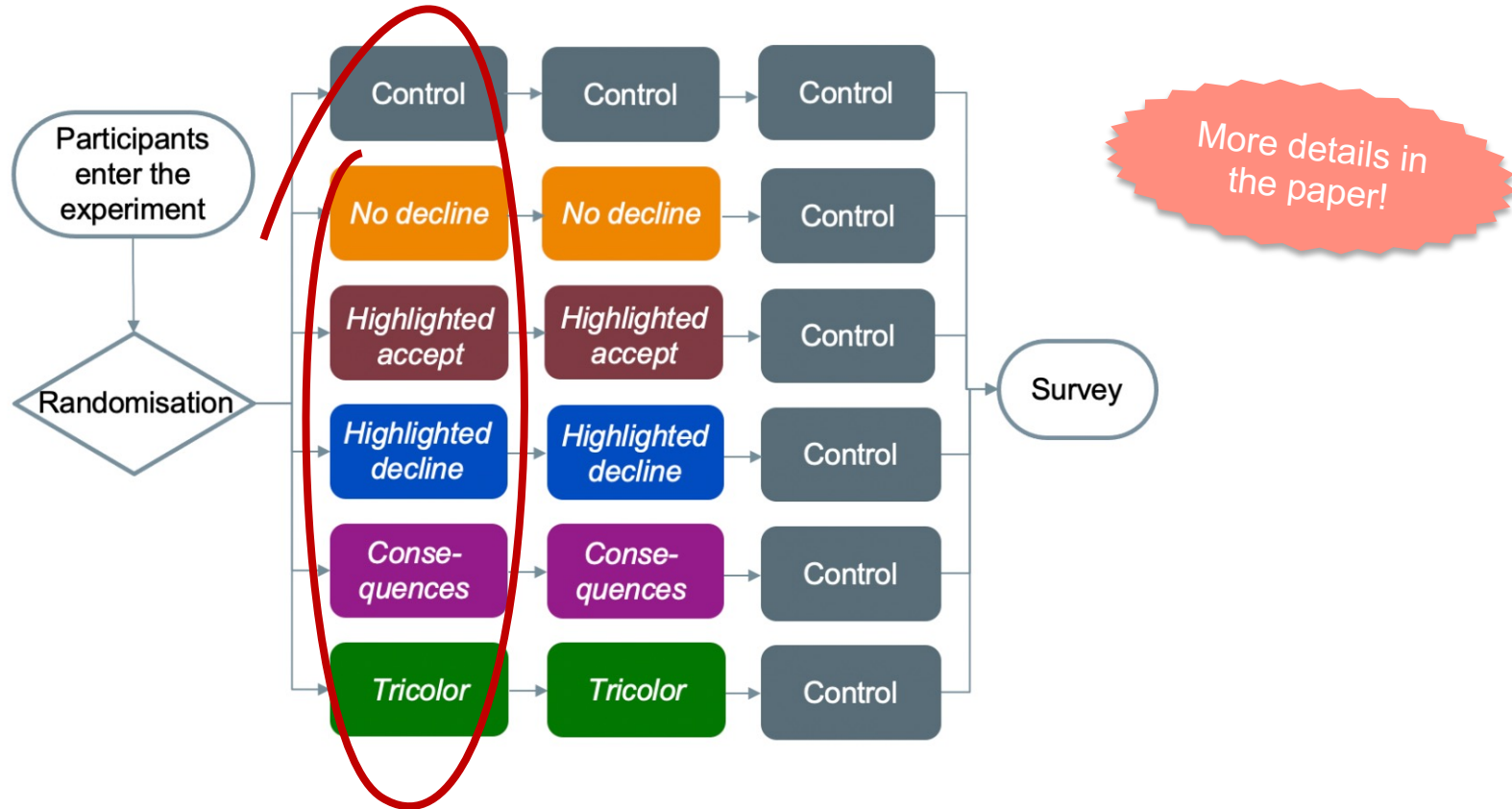
Customise my choices

Accept all

## New Pattern - Tricolor

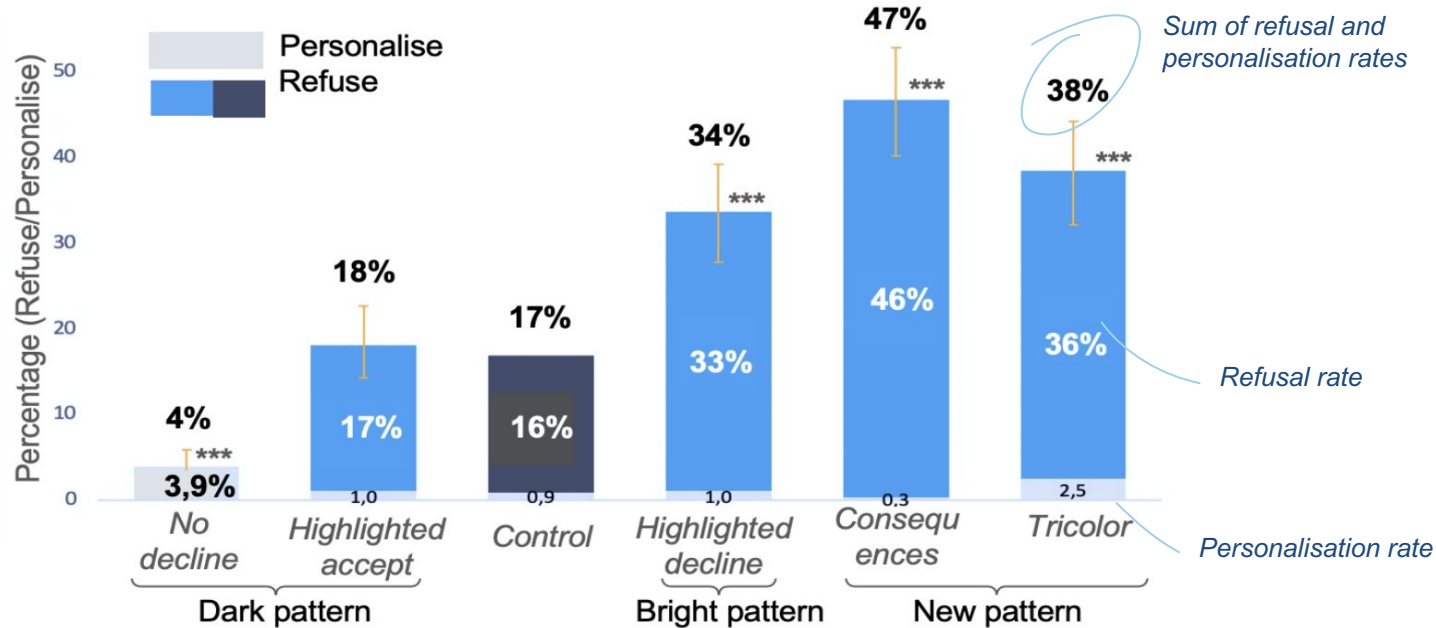
*Inspired by (Egelman et al. 2013) who used colored bars to encourage users to create more complex passwords*

# Experimental design with 3,947 participants





# Overview of results and interpretation

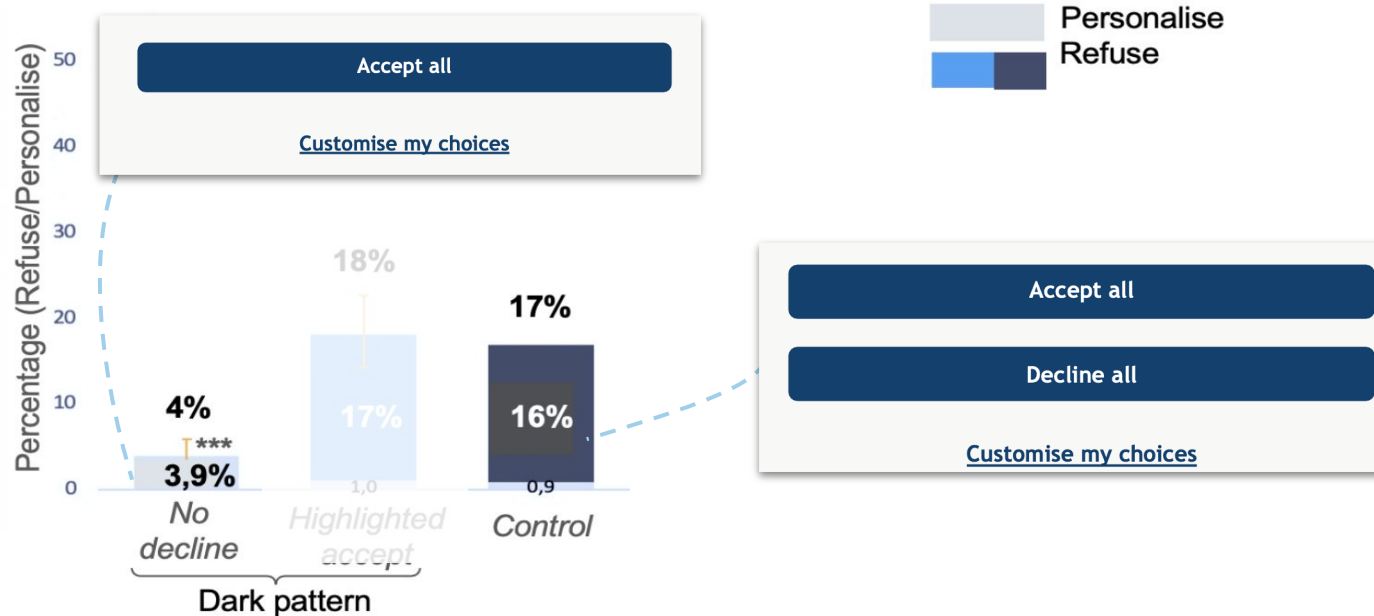


N=3 947

\*\*\* p<0.01, \* p<0.05

Primary analysis corrected for multiple comparisons, and controlling for age, gender, education level and employment status of individuals. Numbers above the bars represent the sum of the refusal and personalization rates. Numbers above the bars do not exactly match the sum of the numbers displayed in the bars of the graph due to rounding.

# More effort for decline (more clicks) decreases the refusal rate by 76% (from 17% to 4%)

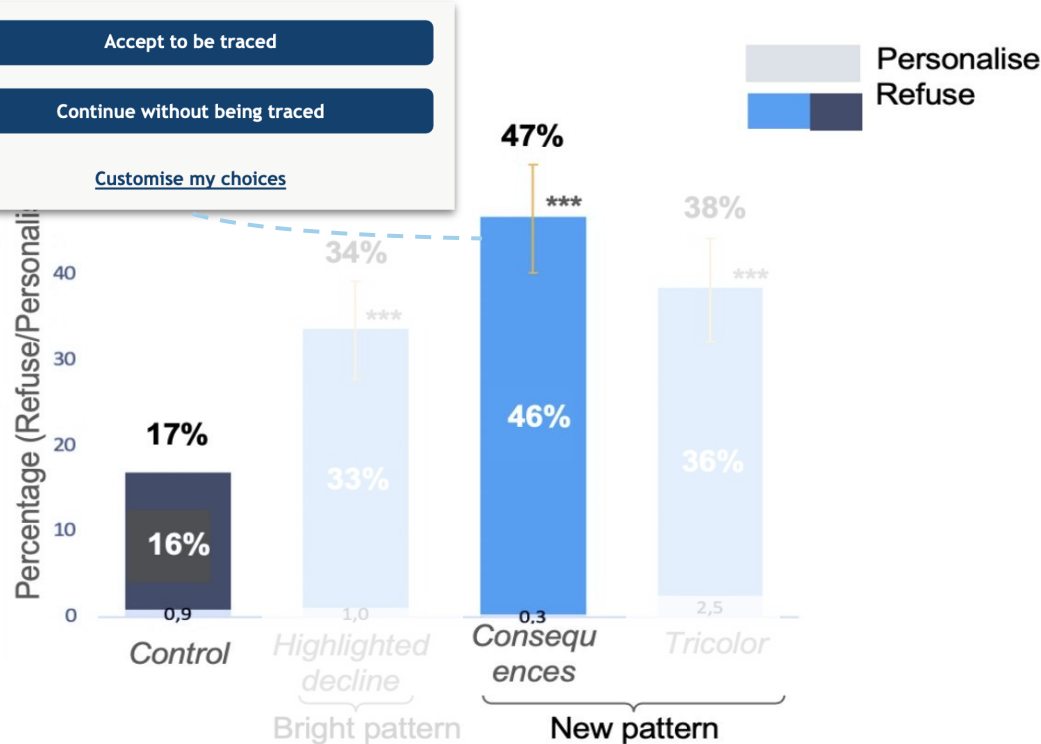


N=3 947

\*\*\* p<0.01, \* p<0.05

Primary analysis corrected for multiple comparisons, and controlling for age, gender, education level and employment status of individuals. Numbers above the bars represent the sum of the refusal and personalization rates. Numbers above the bars do not exactly match the sum of the numbers displayed in the bars of the graph due to rounding.

# Stating the consequences of acceptance directly on the buttons multiplies by three the proportion of participants who decline



## Potential explanation

According to our survey, **48% participants are not ready to share their data** (31% in any case, 17% depending on the purpose)

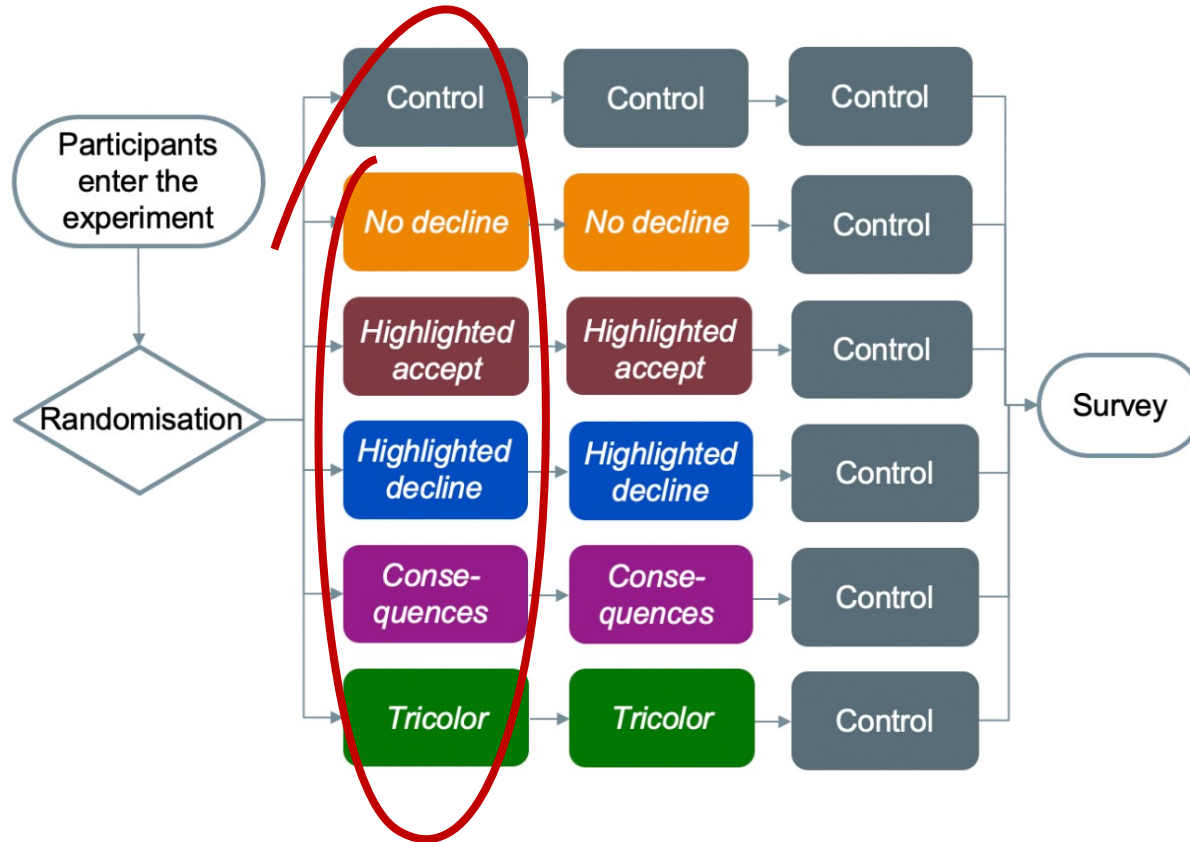
Moreover, **57%** participants state that they decline consent to **avoid being tracked**

N=3 947

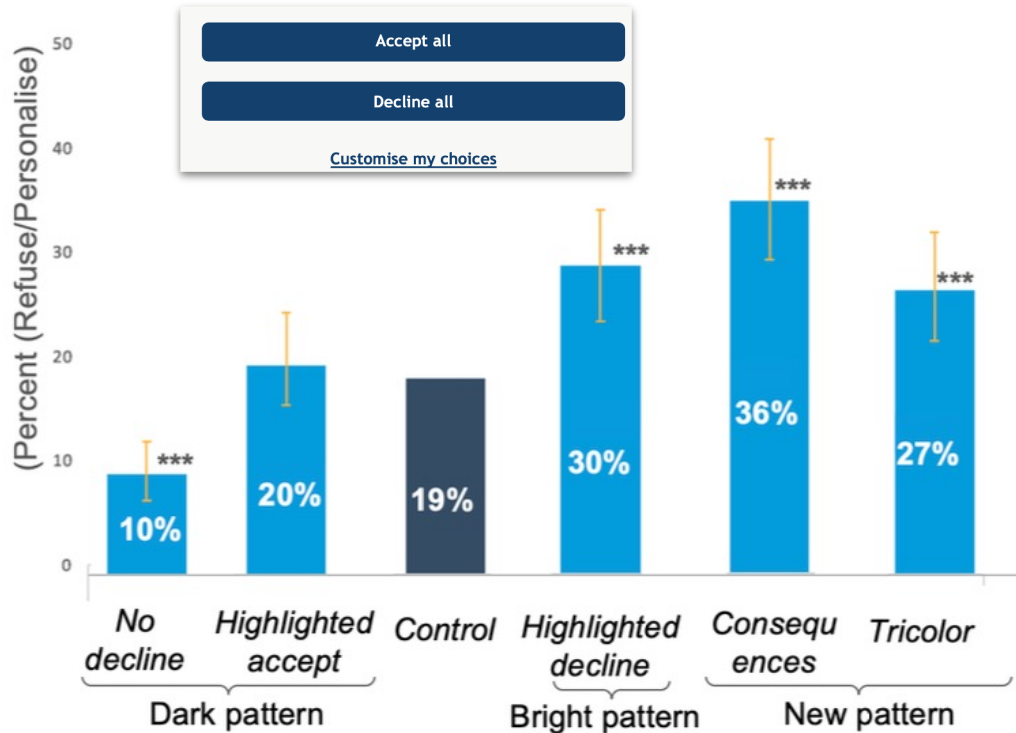
\*\*\* p<0.01, \* p<0.05

Primary analysis corrected for multiple comparisons, and controlling for age, gender, education level and employment status of individuals. Numbers above the bars represent the sum of the refusal and personalization rates. Numbers above the bars do not exactly match the sum of the numbers displayed in the bars of the graph due to rounding.

# Measuring the short-term effect on future decisions



# Interacting with two banners impacts the refusal rate on the next banner, even when the banner is neutral!



## Observations

Users behavior when facing the **neutral banner is already affected by the past banners** the user has interacted with. Another baseline is needed for the control group!

The adoption of bright pattern even by a small number of sites (if possible influential) **could therefore be enough to generate new habits.**

N=3 947

Exploratory analysis carried out on the choice made by individuals facing the first banner (#1) and the third banner (#3), controlling for the age, gender, level of education and professional situation of the individuals.

# Design implications & conclusions

## ▪ Impact of dark patterns on user decisions

- *No decline* design **should be prohibited** uniformly across the EU
- **True privacy preferences** should be taken as control group additionally to *Neutral*
- Need to further quantify **long-term effect** of design

## ▪ Need for legally-required built-in solutions

- **Only half (54%) users are satisfied** with their choice in *Neutral* banner
- **62% participants would be willing to use browser extensions to automatize consent**

## ▪ Recommendations and call for action

- **Regulators** could target most popular platforms in their enforcement actions
- **Developers and practitioners**, who put privacy and ethics at the core of their business values, could be motivated to provide exemplary banners
- **Researchers** should collaborate more closely with the regulators and practitioners to study their motivations and interests in improving consent banner design