

What Makes a Dark Pattern... Dark?

Design Attributes, Normative Considerations, and Measurement Methods

Arunesh Mathur, Jonathan Mayer, Mihir Kshirsagar



The trick questions dark pattern

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Dark pattern taxonomies

TYPES OF DARK PATTERN

Trick questions

While filling in a form you respond to a question that tricks you into giving an answer you don't intend. When glanced upon quickly the question appears to ask one thing, but when read carefully it asks another thing entirely.

Sneak into Basket

You attempt to purchase something, but somewhere in the purchasing journey the site sneaks an additional item into your basket, often through the use of an opt-out radio button or checkbox on a prior page.

Roach Motel

You get into a situation very easily, but then you find it is hard to get out of it (e.g. a premium subscription).

Privacy Zuckering

You are tricked into publicly sharing more information about yourself than you really intend. Named after Facebook CEO Mark Zuckerberg.

Price Comparison Prevention

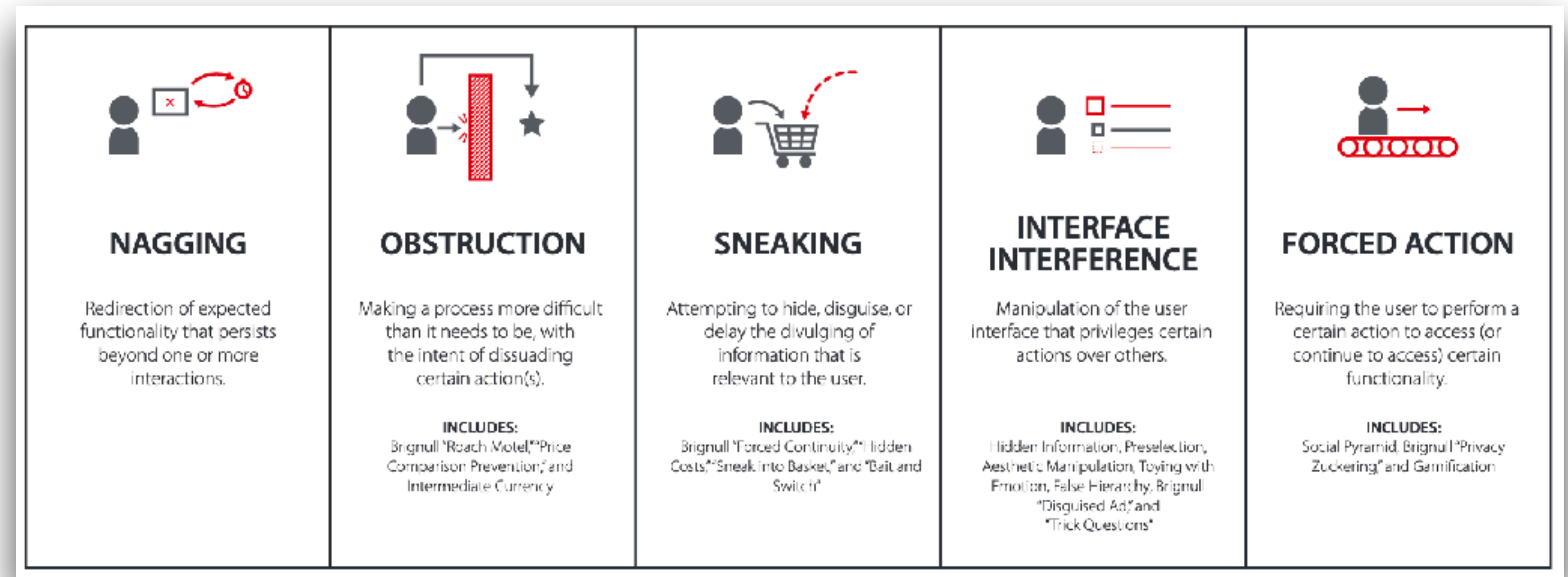
The retailer makes it hard for you to compare the price of an item with another item, so you can't make an informed decision.

Misdirection

The design purposefully focuses your attention on one thing in order to distract your attention from another.

Hidden Costs

You get to the last step of the checkout process, only to discover some unexpected charge has appeared, e.g. delivery charges, tax, etc.



Gray et al., The Dark (Patterns) Side of UX Design, 2018

Brignull, <https://darkpatterns.org>

Motivating questions

1. What makes a user interface design a dark pattern?
2. What makes a dark pattern normatively problematic?
3. How can researchers help policymakers decide when to intervene?

A review of the dark patterns literature

- Reviewed the dark patterns literature from the HCI community, security and privacy community, and law journals
 - ➡ 20 academic publications compiled by searching the ACM Digital Library, Google Scholar, and arXiv
- Additionally included legislation and regulatory materials about dark patterns
 - ➡ DETOUR Act, CCPA, reports from the CNIL and the NCC

A review of the dark patterns literature

- Significant variation among the facets reflected in the dark pattern definitions
- Definitions diverge along several facets
- Conceptual inconsistency with the dark pattern types in the taxonomies

		Academic Publications														Government Materials					
		Brignull [3]	Conti & Sobiesk [9]	Zagal et al. [62]	Lewis [31]	Bösch et al. [4]	Gray et al. [21]	Mathur et al. [35]	Luguri & Strahilevitz [32]	Lacey & Caudwell [29]	Utz et al. [56]	Westin & Chiasson [59]	Waldman [57]	Day & Stemler [11]	Gray et al. [20]	Maier & Harr [34]	NCC [18]	CNIL [42]	DETOUR Act [58]	CPRA [40]	
Characteristics of the User Interface	Coercive							●							●						
	Deceptive						●	●							●						
	Malicious	●																			
	Misleading					●													●		
	Obnoxious														●						
	Seductive															●					
	Steering							●										●			
	Trickery	●											●								
Mechanisms of Effect on Users	Attack users		●																		
	Confuse users								●												
	Deceive users									●											
	Exploit users		●																		
	Manipulate users		●						●			●	●								
	Mislead users																●				
	Steer users														●						
	Subvert user intent	●			●	●							●	●	●						
	Subvert user preferences					●		●	●										●	●	●
	Trick users					●						●					●				
Role of User Interface Designers	Undermine user autonomy											●							●	●	
	Without user consent			●																	
	Without user knowledge																		●		
	Abuse of designer knowledge						●			●		●					●				
Benefits and Harms	Designer intent		●	●			●		●							●			●	●	●
	Benefit to service		●					●			●					●					
	Harm to users			●			●						●						●		

● Required element of “dark pattern” definition ● Alternative element of “dark pattern” definition

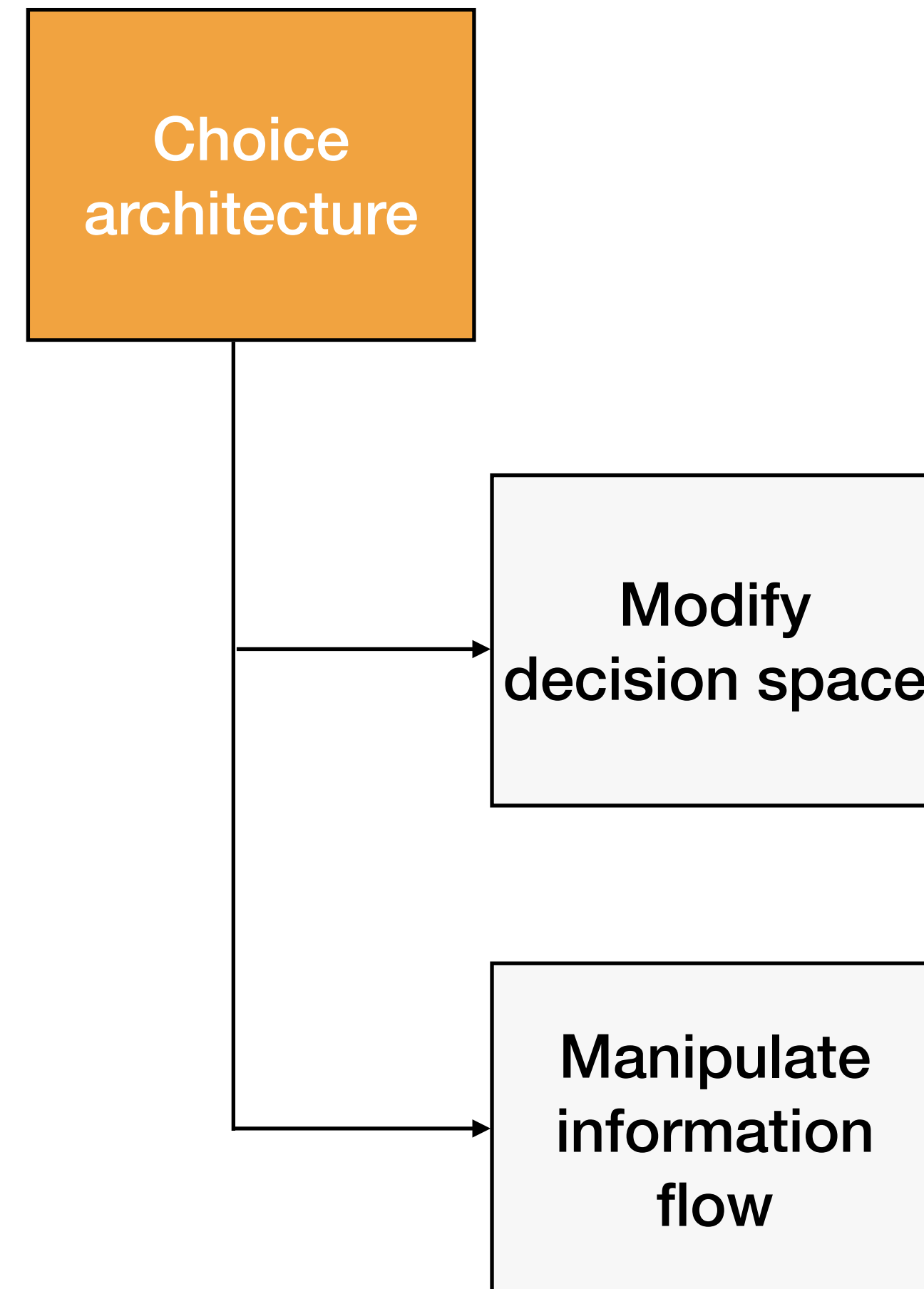
● Required element of “dark pattern” definition ● Alternative element of “dark pattern” definition

Dark patterns as a thematic research area



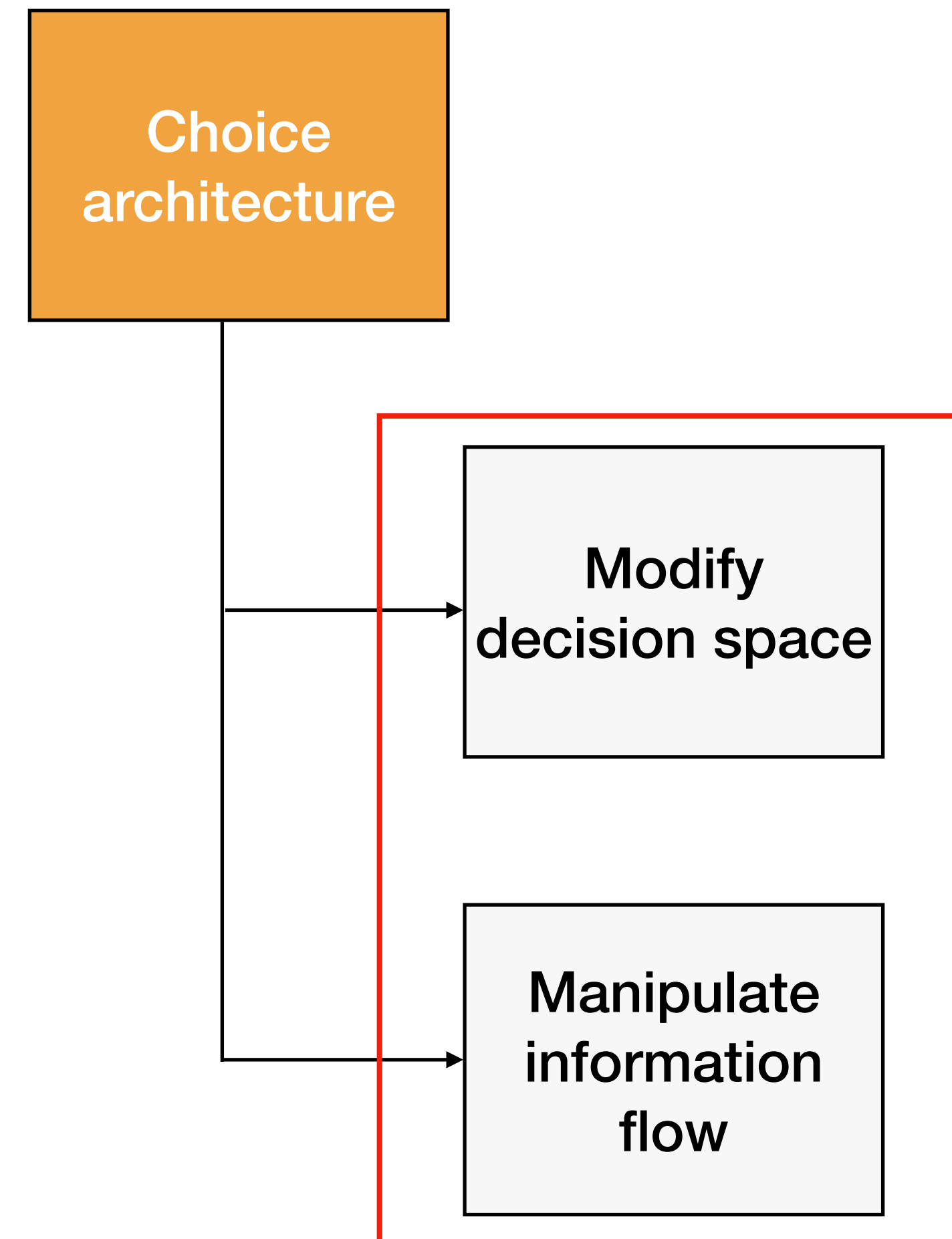
Choice
architecture

Dark patterns as a thematic research area



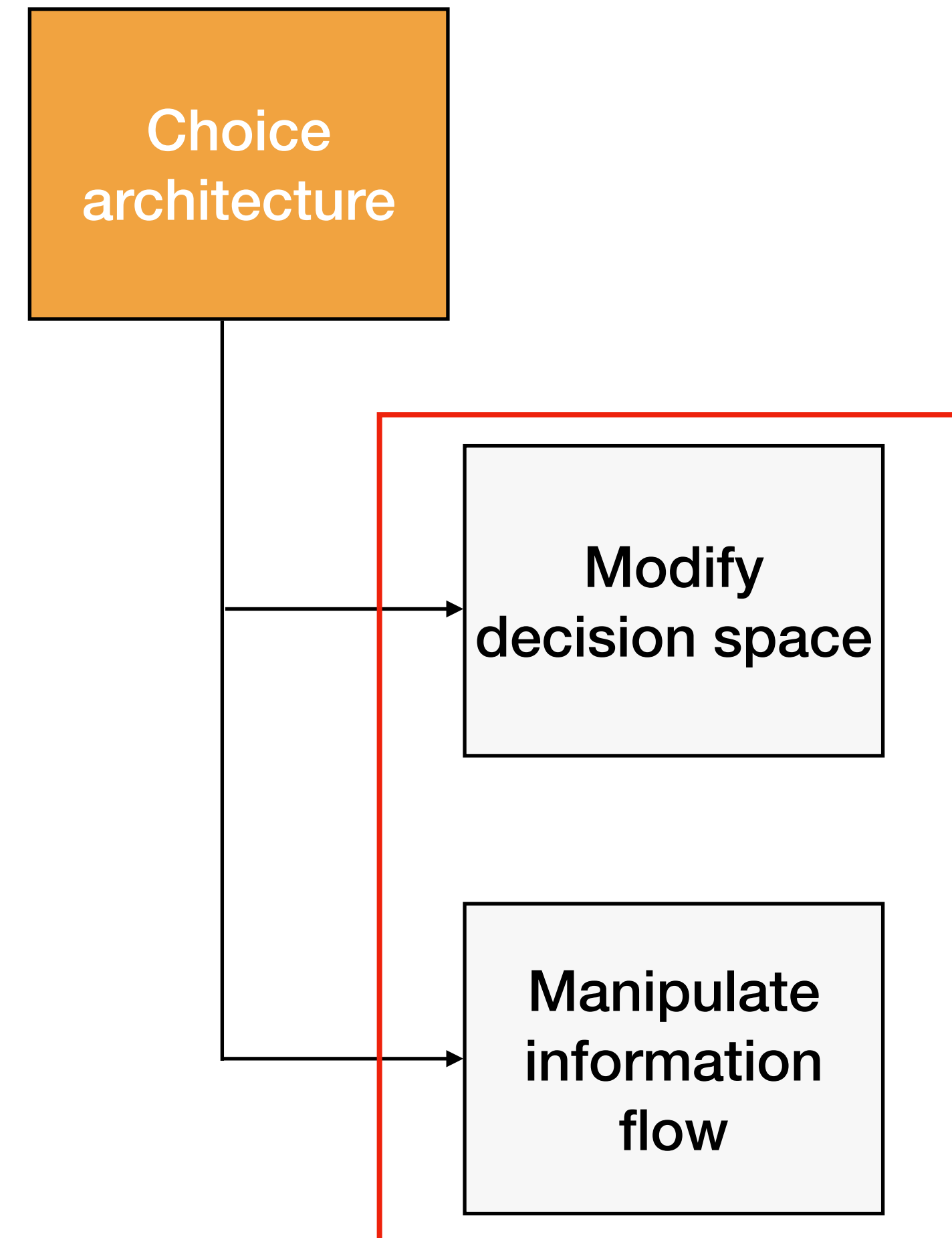
Dark patterns as a thematic research area

- Instead, interrelated themes bind the current dark patterns scholarship together



Dark patterns as a thematic research area

- Instead, interrelated themes bind the current dark patterns scholarship together
- Parallel to Solove's seminal observation that privacy is a Wittgensteinian family of distinct concepts



Descriptive → normative considerations

- We argue that researchers should focus on the normative considerations that motivate the descriptive themes
- Choice architecture research in other disciplines (e.g., behavioral psychology/economics & philosophy) has surfaced various normative considerations

Four normative lenses

Individual
welfare

Collective
welfare

Regulatory
compliance

Individual
autonomy

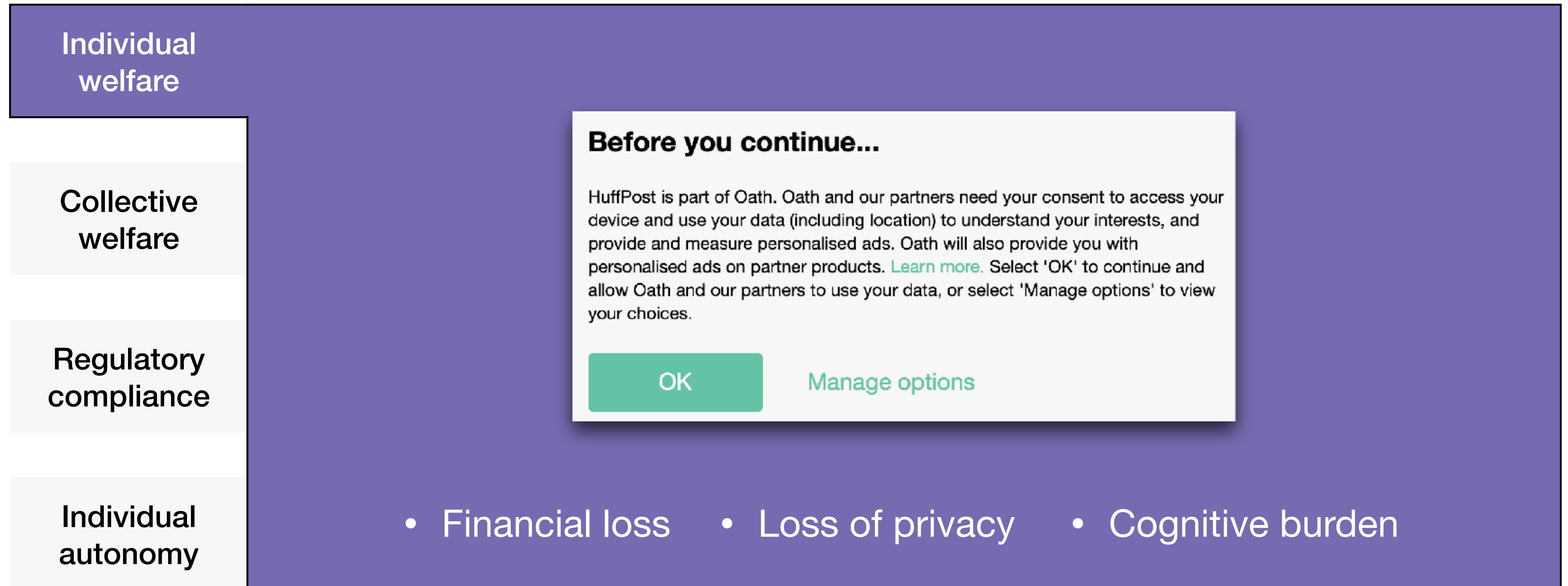
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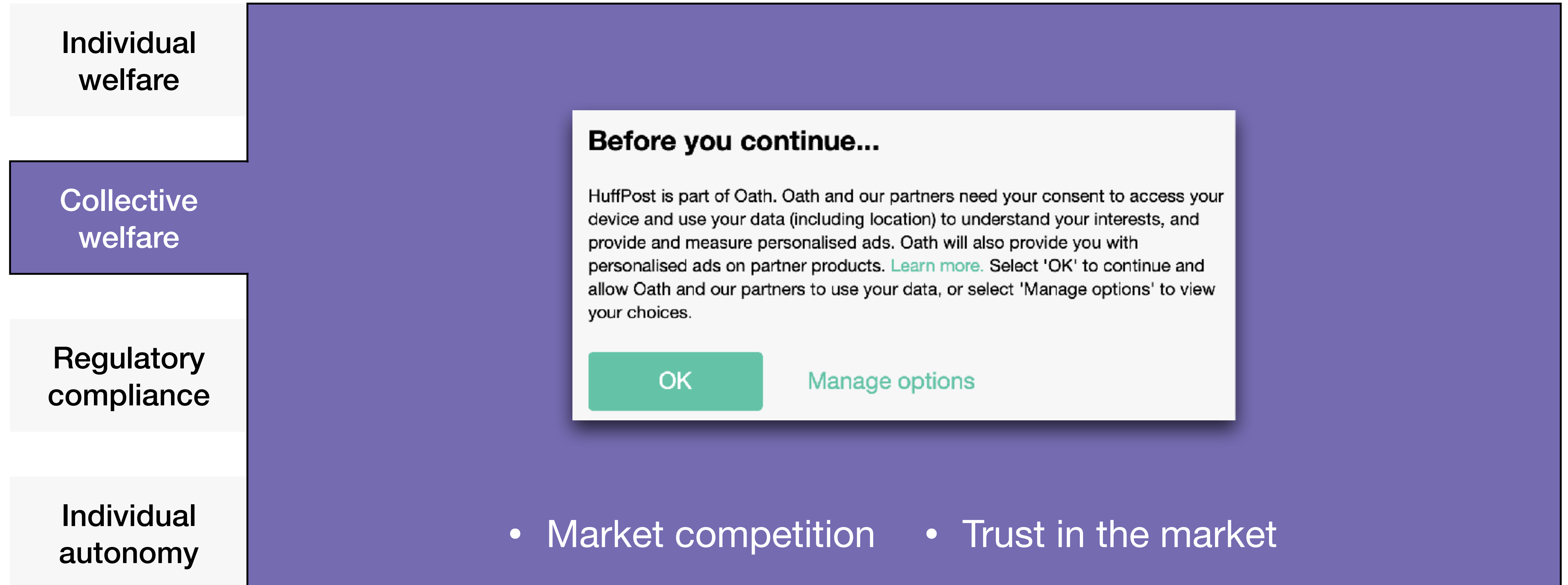
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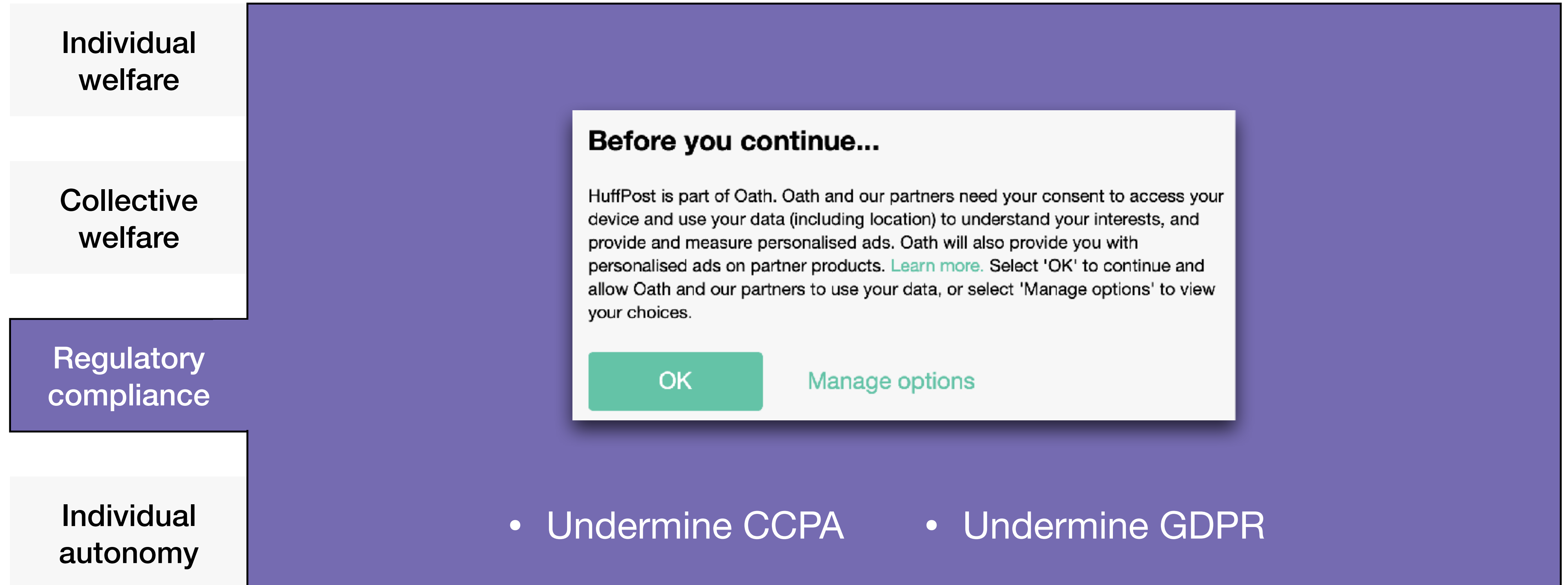
Four normative lenses



Four normative lenses



Four normative lenses



Four normative lenses

Individual
welfare

Collective
welfare

Regulatory
compliance

Individual
autonomy

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- Impede free and informed decision making

Normative lenses → measurements

- The four normative lenses offer us different perspectives to view dark patterns
- ➡ HCI researchers can use established empirical methods to analyze dark patterns through these normative lenses
- ➡ Such analyses can help us move beyond ad hoc and descriptive labels, and instead focus on assessing how, exactly, dark patterns raise specific normative concerns

Case study: Trick questions

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Case study: Trick questions

Case study: Trick questions

Step 1: Select a normative lens

Individual
welfare

Collective
welfare

Regulatory
compliance

Individual
autonomy

Case study: Trick questions

Step 1: Select a normative lens

Individual
welfare

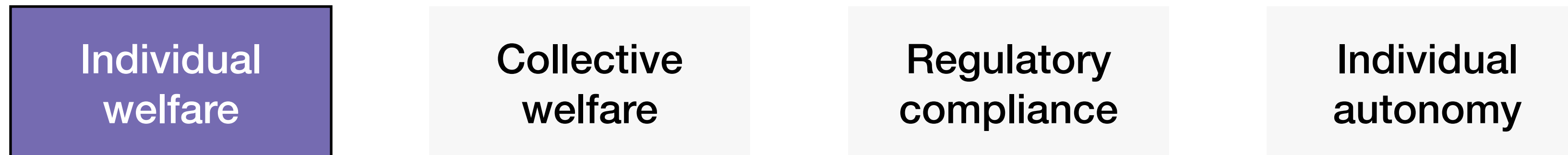
Collective
welfare

Regulatory
compliance

Individual
autonomy

Case study: Trick questions

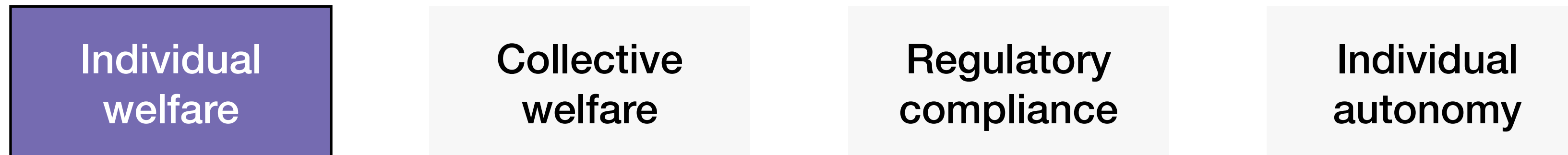
Step 1: Select a normative lens



Step 2: Select a measurement method

Case study: Trick questions

Step 1: Select a normative lens



Step 2: Select a measurement method

➡ Lab experiment

Case study: Trick questions

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☒☒

Dark pattern

Case study: Trick questions

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Dark pattern

Individual
welfare

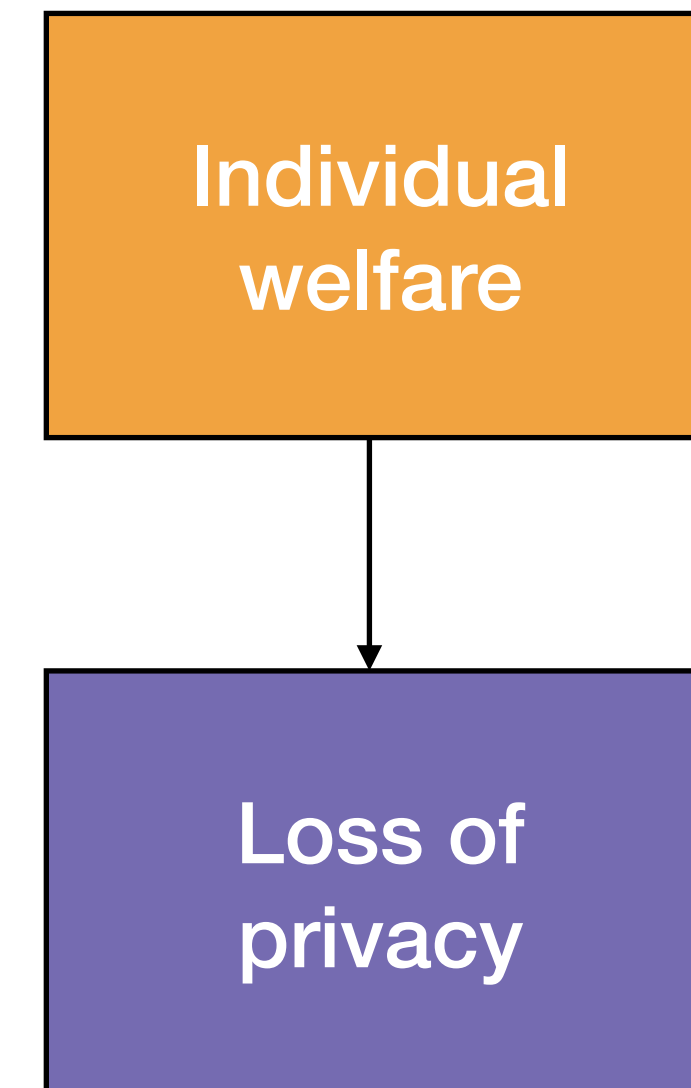
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Dark pattern



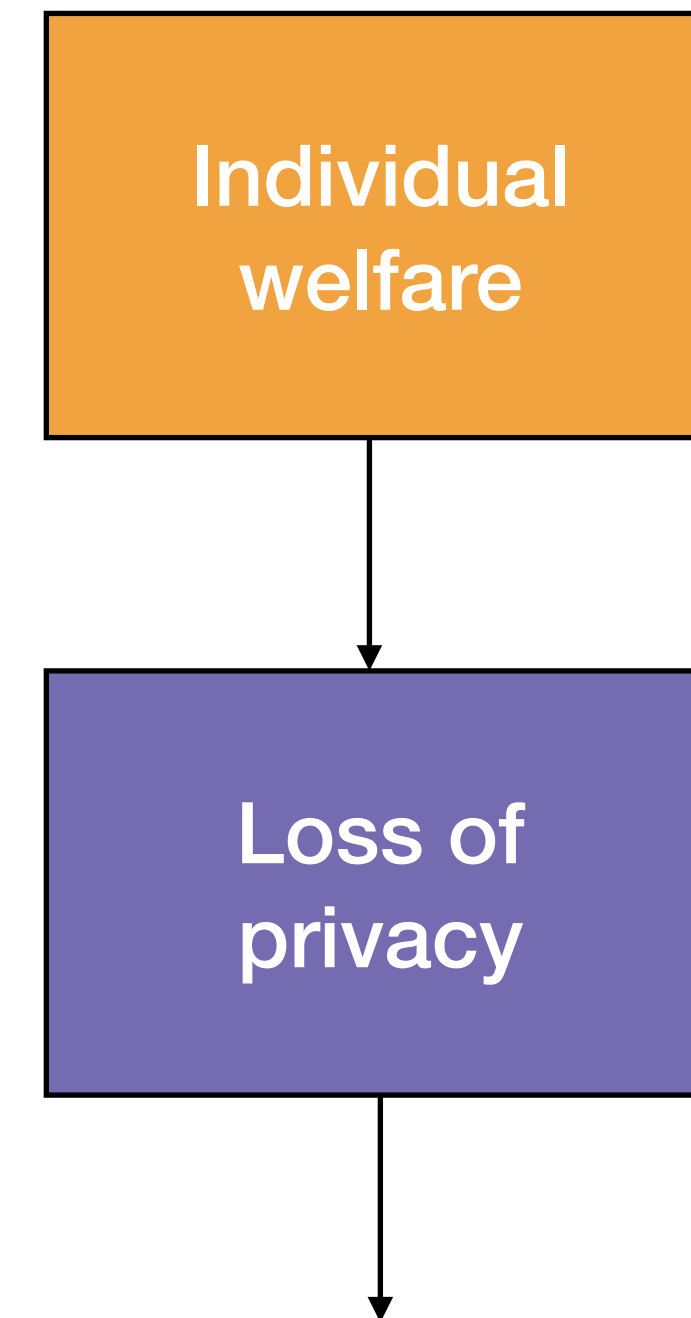
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Dark pattern



Compare alignment with users' privacy preferences

Case study: Trick questions

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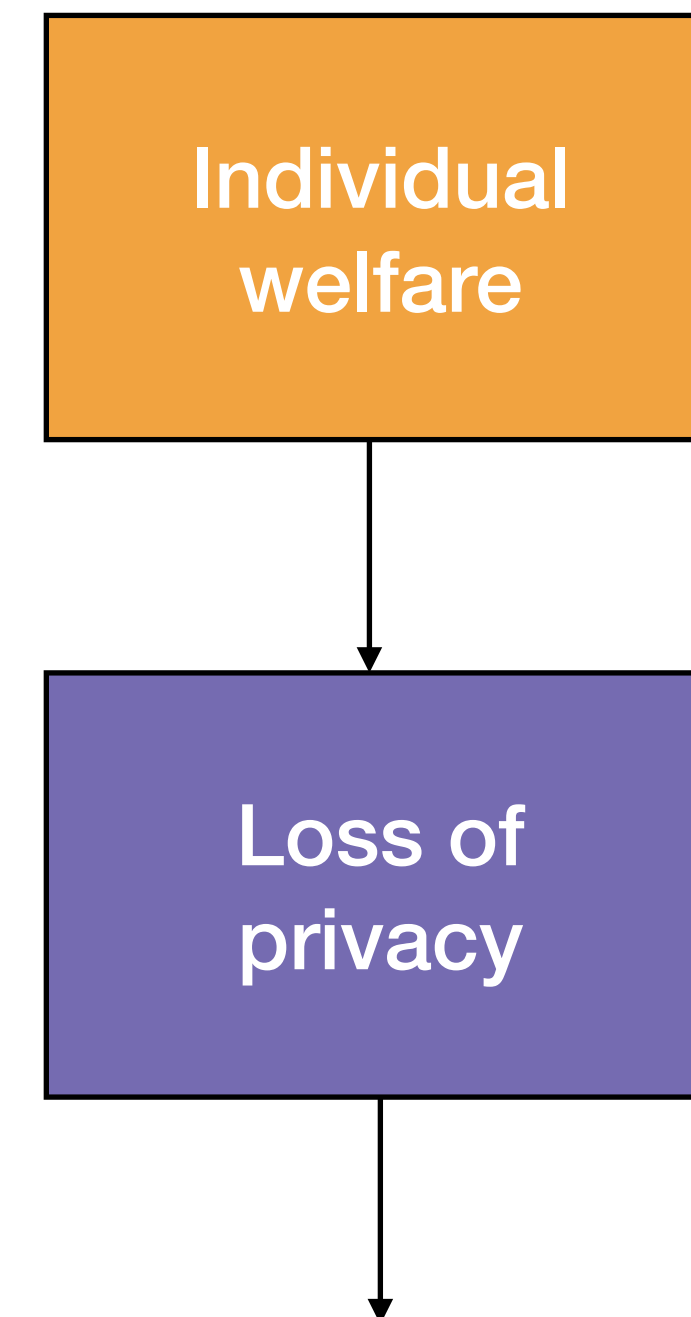
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Dark pattern

Baseline



Compare alignment with users' privacy preferences

Case study: Trick questions

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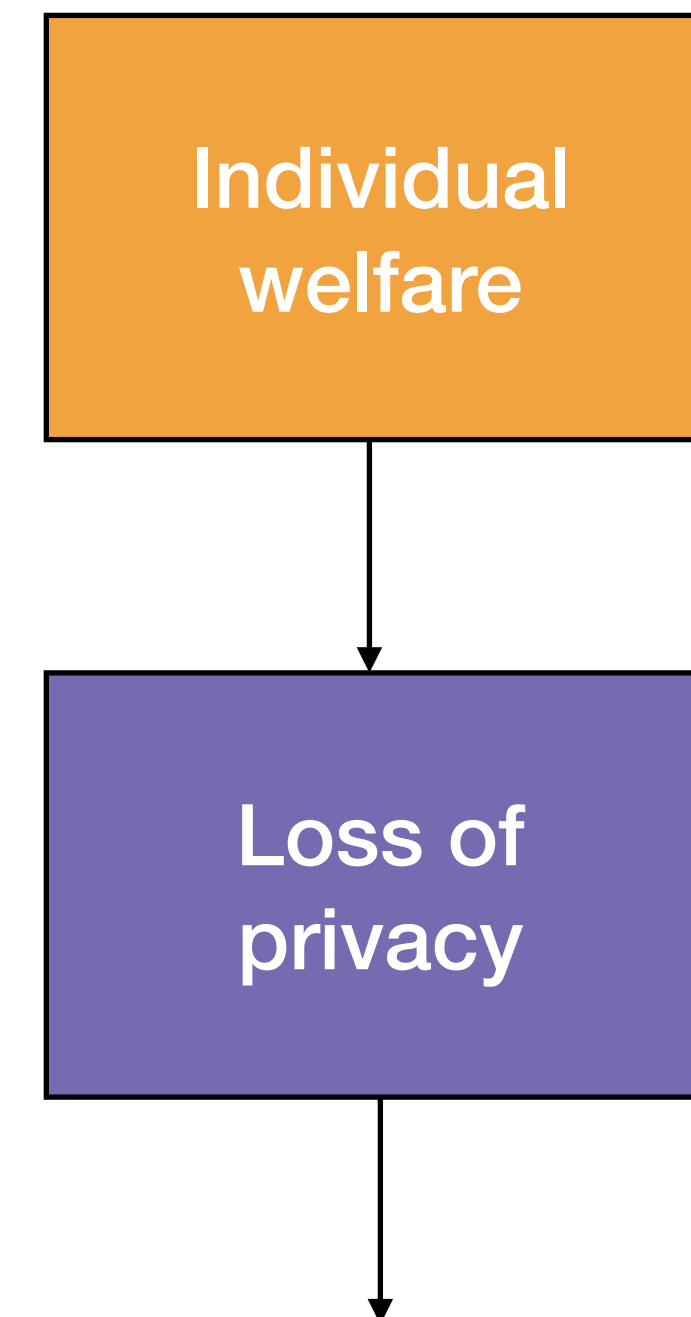
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Dark pattern

Baseline



Compare alignment with users' privacy preferences

→ Interpret a *sufficient* deviation from the baseline to conclude that trick questions is a dark pattern under the individual welfare lens

Case study: Trick questions

Step 1: Select a normative lens

Individual
welfare

Collective
welfare

Regulatory
compliance

Individual
autonomy

Case study: Trick questions

Step 1: Select a normative lens

Individual
welfare

Collective
welfare

Regulatory
compliance

Individual
autonomy

Case study: Trick questions

Step 1: Select a normative lens

Individual
welfare

Collective
welfare

Regulatory
compliance

Individual
autonomy

Step 2: Select a measurement method

➡ Survey

Case study: Trick questions

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Dark pattern

Case study: Trick questions

Individual
autonomy

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Dark pattern

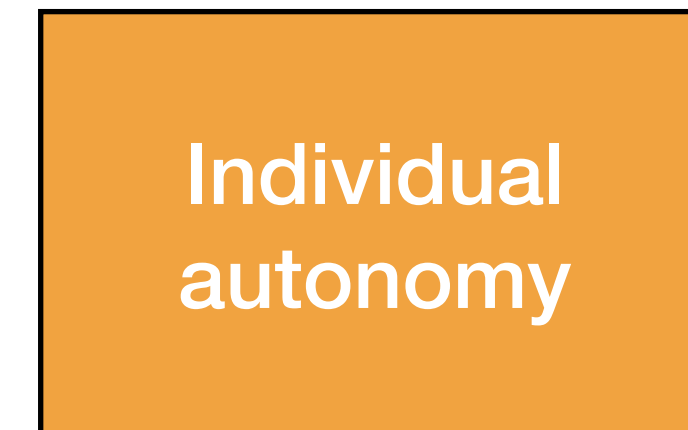
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Dark pattern



Do users notice the available options in the user interface?

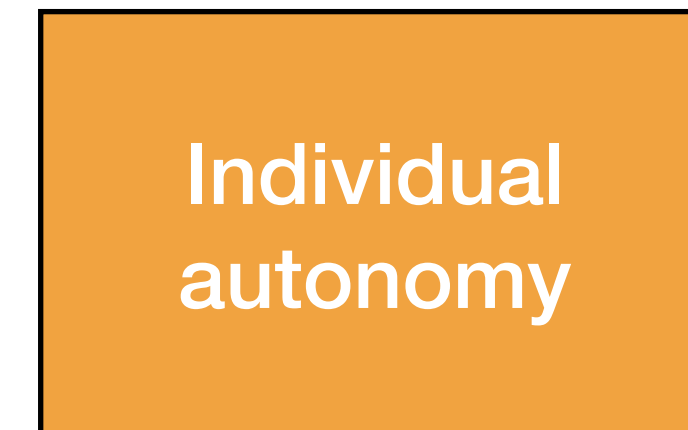
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Dark pattern



Do users notice the available options in the user interface?

→ Interpret if only a *small proportion* of users recognize the full range of options as evidence that trick questions is a dark pattern under the individual autonomy lens

What makes a dark pattern... dark?

- We reviewed the dark patterns literature in HCI and related areas of computer science, identify two themes that describe dark patterns
- We described a set of four normative lenses that could guide future dark patterns research
- We propose that HCI researchers use methods that align with those normative perspectives to demonstrate when a user interface becomes “dark”



@aruneshmathur



amathur@princeton.edu