

# To buy or not to buy? Price salience in an online shopping field experiment

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- We estimate that around **10% of consumers** neglect shrouded fees.

In light of previous research on salience effects (e.g. Chetty et al. 2009, AER), our results point towards an interaction of price salience and cancellation costs.



## Shrouding and partitioning of prices can have substantial demand effects

The (empirical) literature on salience effects has focused on the practices of

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Both practices have, at least in certain environments, substantial demand effects:

- Chetty et al. (2009, AER) find that displaying otherwise shrouded sales taxes on the price tag decreases demand for cosmetic products by 8%.
- The effect of shrouding sales taxes has been confirmed in the lab by Feldman and Ruffle (2015, AEJ) and Taubinsky and Rees-Jones (2018, REStud).



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- Several experiments find that also partitioning of prices can increase demand (e.g. Morwitz et al. 1998, JMR; Brown et al. 2010, QJE).

## Salience effects may not play a role in environments with low cancellation costs

**Setup.** Consider a purchase process consisting of the following two stages:

- 1 The consumer observes the *price frame* (i.e., full price, shrouded surcharge, or partitioned price) and decides whether to **initiate** the purchase process.
- 2 The full price is presented and the consumer has to **confirm** the purchase.

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Inattention to shrouded attributes (e.g. Gabaix and Laibson 2006, QJE) +  
*Contrast effect* (e.g. Köszegi and Szeidl 2013, QJE) yields:

### Prediction 1

*Both, shrouding and partitioning of prices, weakly increase the probability that a consumer initiates a purchase process.*

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Cancelling at second stage can be costly (e.g. sunk cost fallacy, social pressure):

### Prediction 2

*Shrouding and partitioning of prices increase the probability that a consumer purchases the product if and only if cancellation costs are non-negligible.*

## Experimental setup

- Online store of a German multiplex cinema with  $>10,000$  bookings/month.
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- Purchase process in the cinema's online store involves [four] three screens:
  - [0. **Screen**: Consumer clicks on a movie show and logs into her account.]
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**Important:** Only after logging into their account consumers see the treatment.

**Inclusive Treatment: full price—including the 3D surcharge—on the first screen**

Ticket	Price	Number of Tickets
Normal*	10,00€	<input type="button" value="-"/> <input type="text" value="0"/> <input data-bbox="1053 482 1112 534" type="button" value="+"/>

\*Including 3D surcharge

Proceed

**Inclusive Treatment: full price—including the 3D surcharge—on the first screen**

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## Partitioned Treatment: full price is split up into base price and 3D surcharge

Ticket	Price	Number of Tickets
Normal	Base price	7,00€
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Ticket	Price	Number of Tickets
Normal*	7,00€	- 0 +

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## Behavior on first screen should differ across treatments, but purchases should not

As argued before, on average, consumers are more likely to initiate a purchase process for a 3D movie

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Assuming that the cancellation costs are negligible—a cancellation is done with a single mouse click and it involves no social pressure—, treatments should

(3) *not affect actual purchases* of tickets for 3D movies (and 2D movies).

## Our design has some advantages compared to previous studies

- Unique setting to study the demand effects of different price frames in an environment with low costs of cancelling a purchase process.
- We observe the behavior **inside** (on the first screen) and **outside** of a given price frame (on the second and third screen).
- Random treatment assignment using a unique user ID.
- We track consumers over a period of 9 months.

## Empirical strategy: Two sets of results

**Subsample of first clicks:** in a first step, we consider for each consumer only the first click on a 3D movie during the intervention period.

- Conditional on clicking on a 3D movie for the first time, the treatment allocation is random. Randomization Check
- This allows us to cleanly identify the short term treatment effects on (1) initiated and (2) completed purchase processes.

## Empirical strategy: Two sets of results

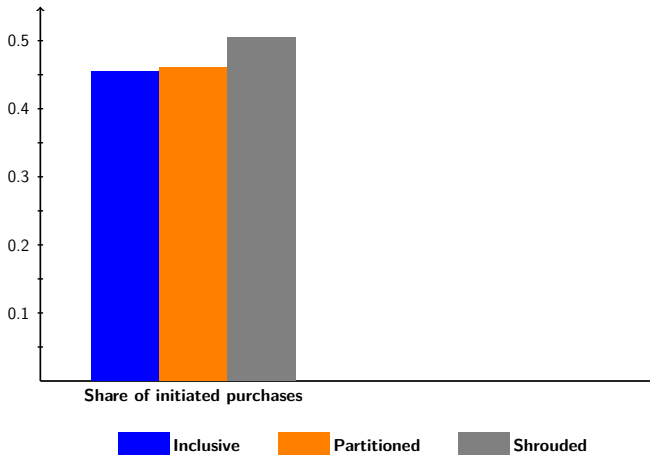
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**All clicks:** in a second step, we use all clicks over the 9 months.

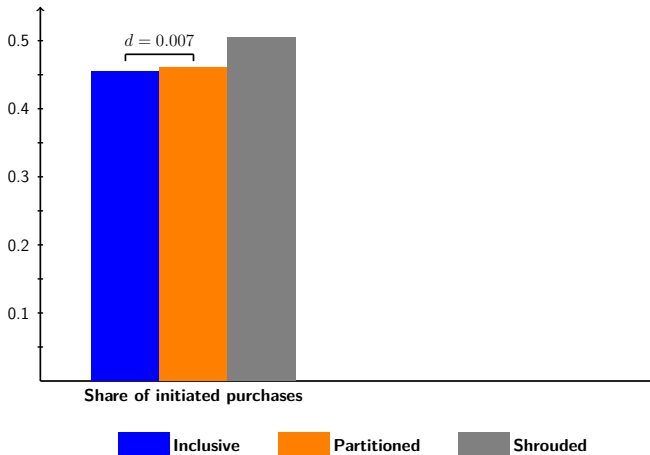
- **Selection issue:** due to differential attrition, comparing the average # of initiated purchases across treatments might be problematic, but it is not.
- By looking at repeated purchases, we can analyze long-run intervention effects.

## First Clicks: initiated purchase processes vary by treatment, but purchases do not



**Note:** Using only the first clicks, the figure illustrates the share of initiated purchase processes and purchases, respectively, for 34,902 consumers. Significance: \*: 10%, \*\*: 5%, \*\*\*: 1%.

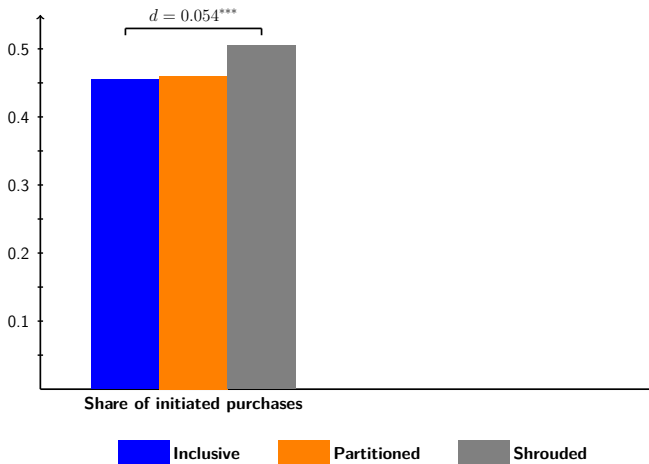
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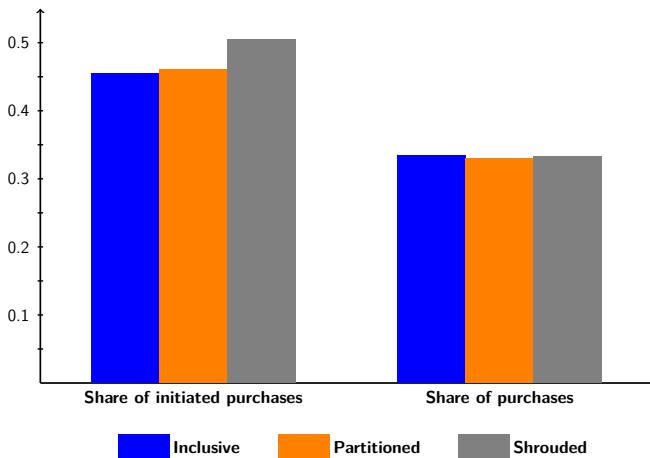


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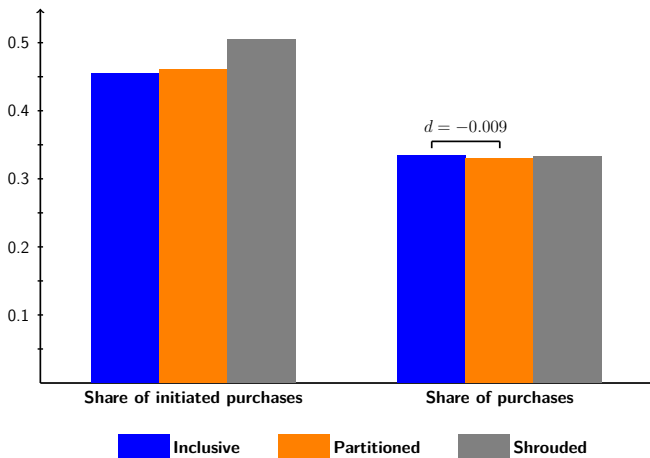
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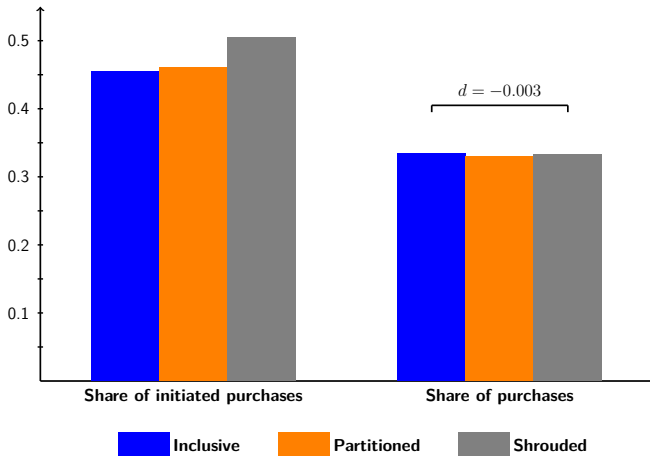
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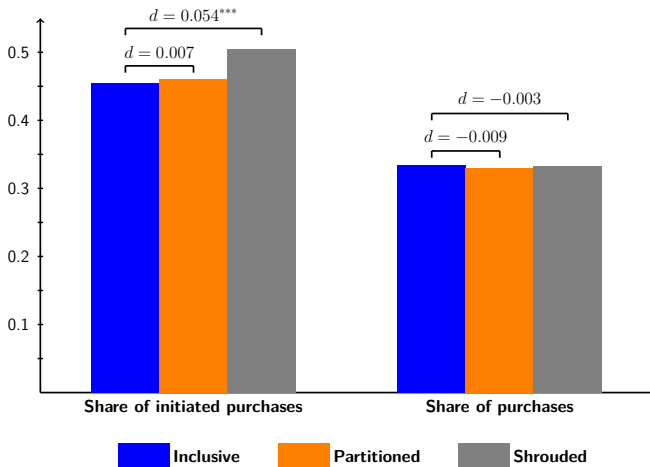
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## Summary and robustness of the results on the subsample of first clicks

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Treatment effects do not vary depending on ...

- whether a 2D show of the same movie runs at broadly the same time;
- whether the movie runs at a different cinema at broadly the same time;
- whether the movie can be categorized as a “blockbuster”;
- whether the show is scheduled for a weekend or not.



## A rough estimate of the share of inattentive consumers

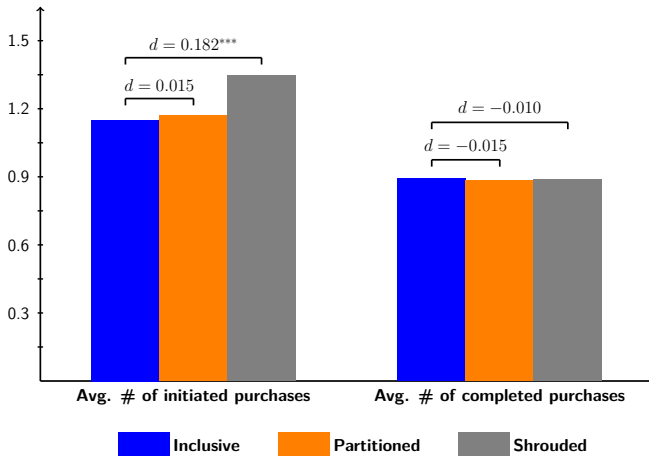
**Assumptions:** (i) consumers initiating the process in Inclusive do so in Shrouded;  
 (ii) valuation and inattention to shrouded surcharge are independent.

Using only the first clicks, we estimate that

$$\frac{\text{Share of initiations in Shrouded} - \text{Share of initiations in Inclusive}}{\text{Share of initiations in Shrouded}} = 10.49\%$$

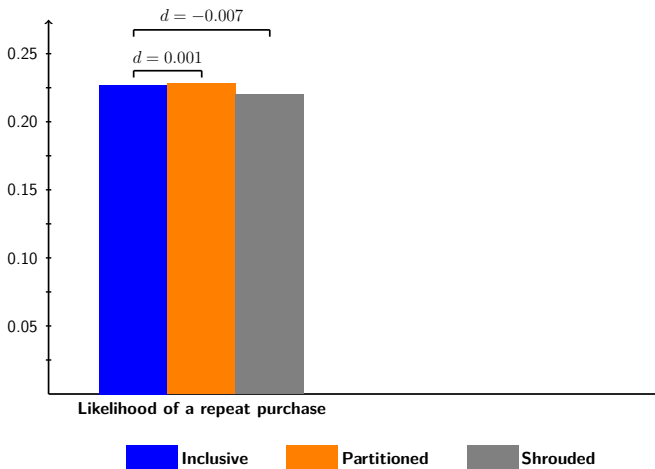
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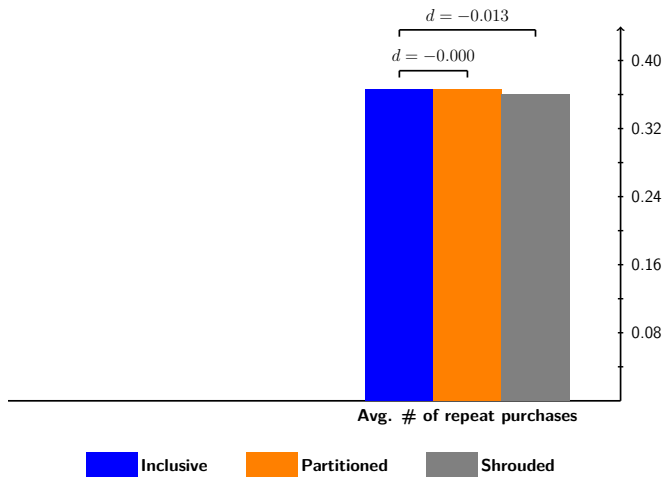
**Note:** Using all clicks, the figure illustrates the avg. # of initiated purchase processes and purchases, respectively, for 34,902 consumers. Significance: \*: 10%, \*\*: 5%, \*\*\*: 1%.

## No long-run effects (i.e., consumers in Shrouded not annoyed etc.)



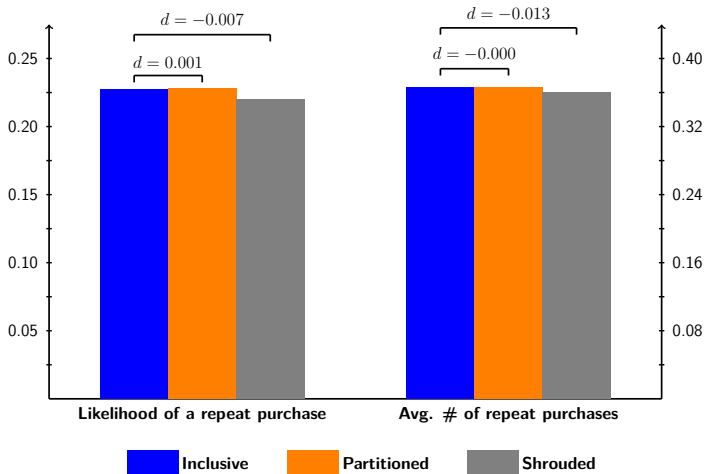
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- the average number of purchases for 3D movies over 9 months,
- the average number of purchased tickets for 3D movies over 9 months,
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- the average per-customer revenue (incl. 2D) over 9 months.

The results do not change if we estimate count models instead of OLS.



## Reconciliation with the literature

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One reason can be **frictions** that make it costly to cancel an initiated purchase:

- (A) *Attachment effect* (Kőszegi and Rabin, 2006).
- (B) *Social image concerns*.
- (C) *Sunk-cost fallacy*.

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- (B) *Social image concerns*.
- (C) *Sunk-cost fallacy*.

All these frictions are plausibly negligible in our setup:

- (A) ... since surcharge avoidable by substituting to the 2D variant of a 3D movie, thereby avoiding the loss in consumption value.
- (B) ... since cancelling an initiated purchase process is unobserved by others.
- (C) ... since the purchase process is very short.

## Conclusion

- We find that initially non-salient price components do not affect purchases in an environment with low cancellation costs.
- Previous research has documented substantial demand effects of non-salient prices in environments where cancellations costs are high.
- This points towards an interaction of price salience and cancellation costs that might be important for the design of policies (e.g. regarding taxes).

Thank you for your attention!

## Randomization Check

Table: Distribution of consumers across treatments.

First Clicks – 3D movies	Inclusive	Partitioned	Shrouded
Drop-out first screen	6,295	6,260	5,747
Cancel later screen	1,352	1,535	2,025
Purchase	3,924	3,838	3,926
# Consumers	11,571	11,633	11,698

We cannot reject the null-hypothesis of a uniform distribution across treatments ( $p$ -value = 0.707,  $\chi^2$ -test). The result is the same conditional on observables.