

Fake Reviews and Naive Consumers

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Introduction

- Online review platforms have gained tremendous importance in many of today's markets, but they are plagued by fake reviews: According to Fakespot.com, an estimated 42% of reviews posted on Amazon during the Pandemic were fake. (compared to 36% the year before)
- This is despite enormous efforts to fight fake reviews: In 2019 Amazon spent over 400m\$ to fight fake reviews, checking 10m reviews weekly. \implies limit, to what extent the problem can be addressed at its core.
- What makes things even worse: consumers are naive
 - 17% fully trust reviews on Amazon, 58% somewhat trust them (CPC Strategy, 2019)
 - 79% trust online reviews as much as recommendations from family and friends (Bright Local, 2020)

In a nutshell

- I study the effect of *educational policies* in a cheap talk model with fake (and real) reviews and naive (and sophisticated) consumers.

1. I find that different consumer groups are affected differently:

- Sophisticated consumers are harmed.
- Naives benefit - both the ones that are educated and the ones that are not.

\implies educational policies help protect the "weakest" consumers

2. When real reviews are written strategically, they are not always truthful. *Strategically honest reviewers underreport.*

3. When all real reviewers are strategically honest, the outcome is equivalent to the one where all consumers are sophisticated. \implies important in a context where the distinction between consumers and reviewers is fluid.

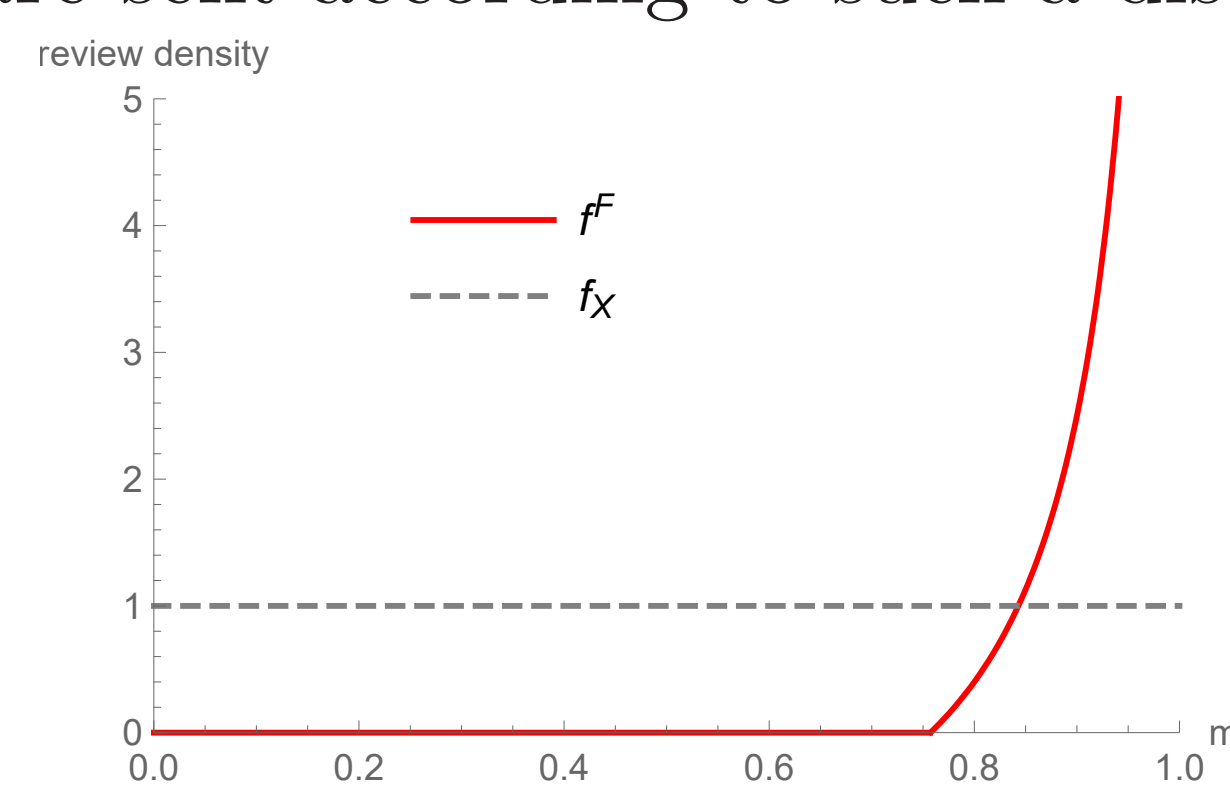
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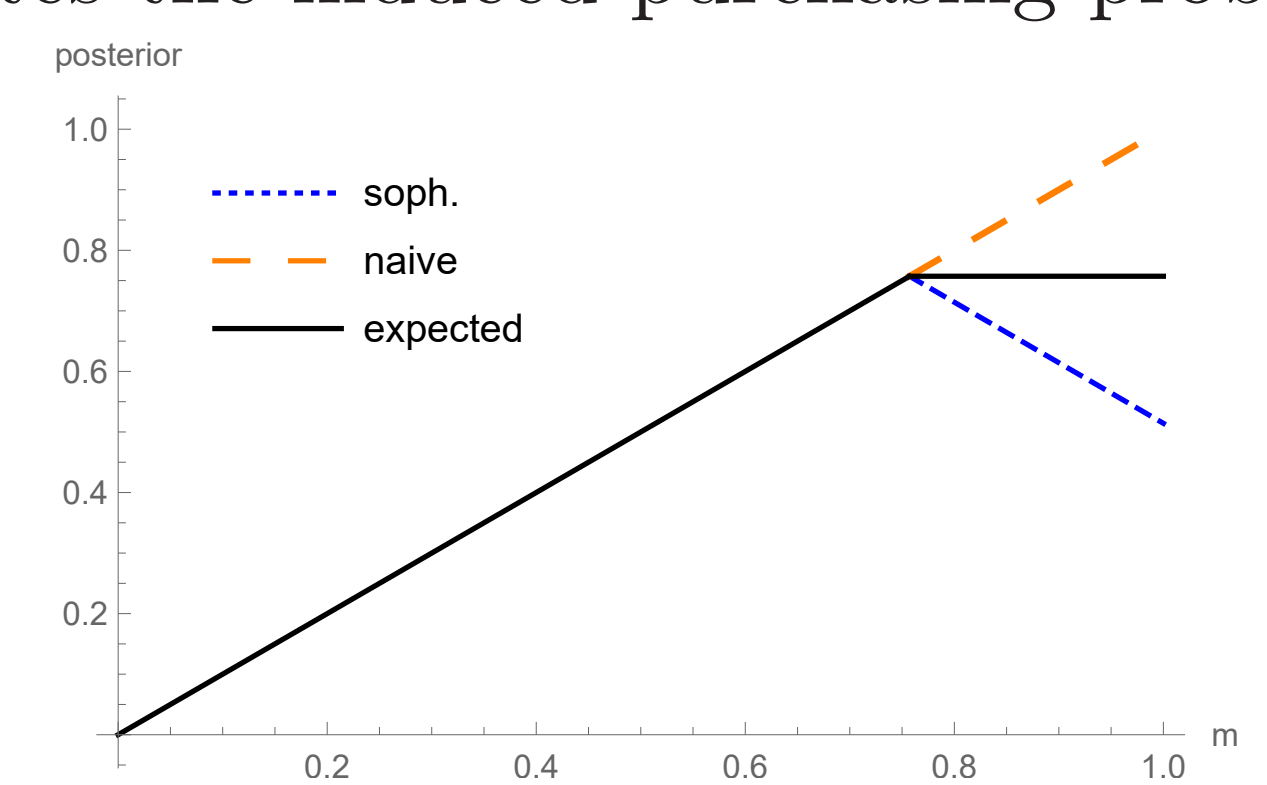
Baseline model

- Consumer considers purchasing a good of unknown quality X . She has an outside option of y and wants to make the purchase if she expects the good to be better.
- A real reviewer observes $x \in [0, 1]$ and writes an honest review $m = x$.
- A fake reviewer writes a review without observing the quality. His goal is to maximize the purchasing probability.
- Naive consumer: $\mathbb{E}^n[X|m] = m$
- Sophisticated consumer: $\mathbb{E}^s[X|m] = Pr(fake|m)\mathbb{E}[X] + (1 - Pr(fake|m))m$

In equilibrium, sophisticates are increasingly sceptical of high reviews, while naives trust them. Fake reviews are sent according to such a distribution that equates the induced purchasing probability:



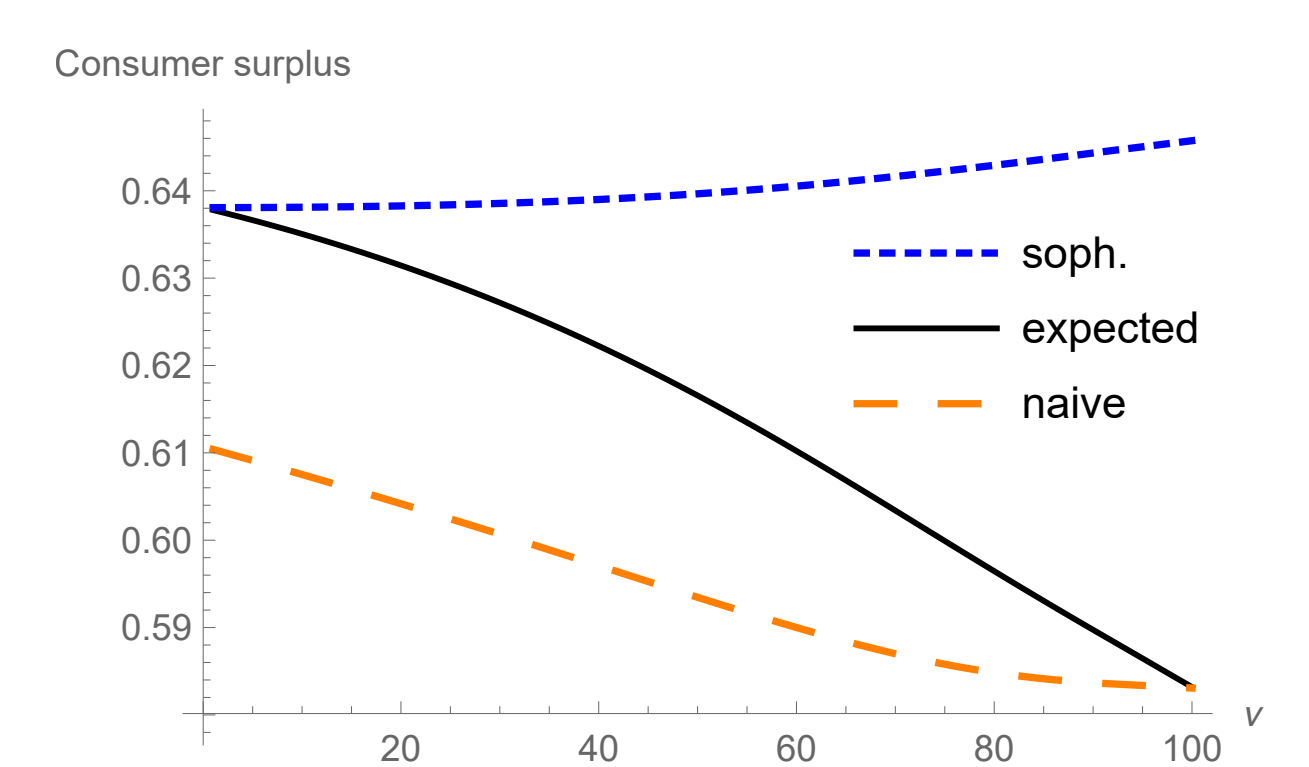
Equilibrium review densities, $\beta = 0.5$, $\nu = 0.25$



Equilibrium posterior beliefs, $\beta = 0.5$, $\nu = 0.5$

When the share of naives goes up, fake reviewers shift probability mass to higher reviews in a first-order stochastically dominant way. Because different consumer types interpret reviews differently, this has heterogeneous effects on consumers. Educational policies have 3 partial effects:

- *direct effect* is positive because sophisticates enjoy higher welfare than naives
- *separation effect* is negative because reviews are less informative for sophisticates (**blue**)
- *deception effect* is positive because naives are deceived less often (**orange**)
- *overall effect* aggregate consumer surplus increases (**black**)



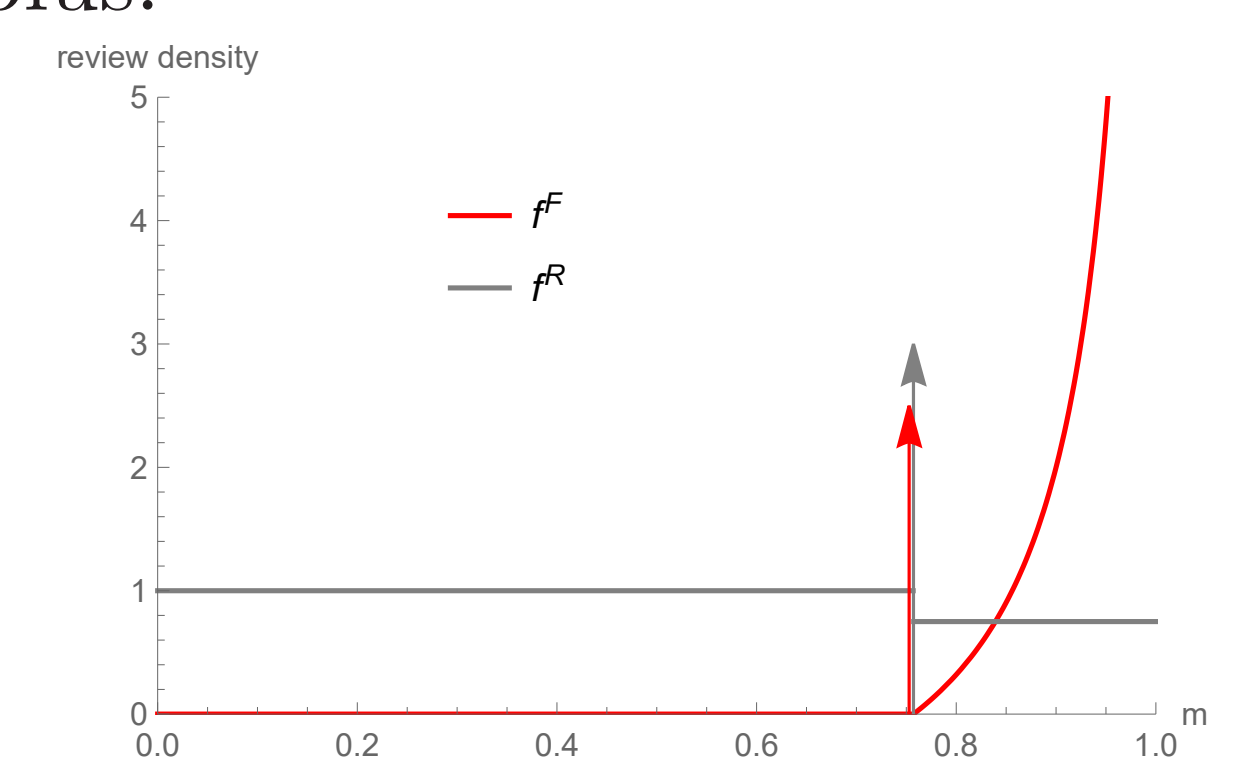
Effect of educational policies: x-axis shows the share of naives

Model with *strategically honest* reviewers

Same setup as in baseline model but now a fraction of real reviewers is strategic and free to write *any* review with the objective to maximize expected consumer surplus.

\implies A Perfect Bayesian Equilibrium, where all real reviewers tell the truth, does not exist.

- Instead, strategically honest reviewers *underreport* when quality is above a threshold. In equilibrium, fake reviewers feed off of the credibility of the underreport and we have pooling behaviour. (arrows in the graph represent atoms in the review distributions)



Review densities in an equilibrium with strategically honest reviewers.

Proposition: *Given the market conditions are not too unfavourable (large share of naive consumers and large share of fake reviewers), as the share of behaviorally honest reviewers disappears, the equilibrium outcome is equivalent to the case where the share of naives goes to zero.*

\implies Main takeaway: Educational policies can be effective even if they do not target consumers directly but rather make reviewers more strategic.