

# Persuasive Puffery

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# Puffery

Sellers tend to exaggerate

- “World’s best hotdogs!”
- “That suit looks perfect on you!”
- “Our service can’t be beat!”

How can such “puffery” be persuasive?

- Seller has clear incentive to exaggerate
- Buyers should anticipate this and ignore seller
- So puffery preys on credulous buyers

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## Legally Defined Term

Court ruled Papa John's slogan of "better ingredients, better pizza" was puffery



FTC definition: Puffery is "term frequently used to denote the exaggerations reasonably to be expected of a seller as to the degree of quality of his product, the truth or falsity of which cannot be precisely determined."

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# How model puffery?

Signaling game (e.g., Spence, 1973)?

- But messages are not costly

Persuasion/disclosure game (e.g., Milgrom, 1981)?

- But messages are not verifiable

Screening game (e.g., Stiglitz, 1975)?

- But no commitment by receiver

Puffery seems just like “cheap talk”

- Costless, unverifiable messages with no commitment by receiver (Crawford and Sobel, 1982)

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# Puffery as comparative cheap talk

What does “World’s best hotdogs” mean?

- “Don’t eat our hamburgers!”

“Our service can’t be beat!”

- “Good thing because you’ll need it.”

“That suit looks perfect on you!”

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## Can be a lot of information in puffery



# Marketing literature seems consistent

Marketing experiments find puffery is surprising credible

- Puffery of a product's attribute raises buyer impressions of it
- But also lowers buyer impressions of other attributes

Overall puffery is sometimes persuasive

- Tends to raise purchase intent when intent is low
- And lower purchase intent when intent is high

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# When does communication raise the probability of a sale?

- Buyer utility for good  $i$  is  $V_i + \varepsilon_i$
- Buyer has expectation  $E[V_i] = v_i$
- Buy good  $i$  if  $v_i + \varepsilon_i > \max_{j \neq i} \{v_j + \varepsilon_j\}$
- Assume logit model so  $P_i = e^{v_i} / (1 + \sum_j e^{v_j})$
- Suppose  $V_1 = \beta_1 \theta_1 - p_1$  where seller knows  $\theta_1$
- Should seller reveal  $\theta_1$  to buyer?
- $P_i$  is S-shaped so first convex then concave
- Information induces greater dispersion in  $v_1$
- So on average information raises  $E[P_i]$  if  $P_i$  is low

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## Gains from disclosure of information generally

- We show that convexity of  $P_1$  for low values and concavity for high values extends to a broad class of discrete choice models
- Then just use Jensen's inequality

### Proposition

*On average for different realizations of a seller's information, truthfully disclosing information raises (lowers) the probability of a sale if this probability is sufficiently low (high) for all  $V_i$ .*

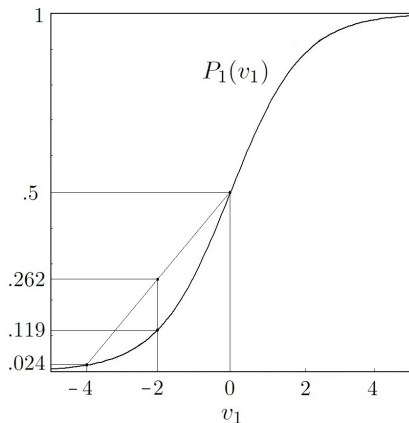
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# Example with one good and outside option



- $V_1 = \beta_1 \theta_1 - p_1$
- $\beta_1 = 4, p_1 = 4$
- $Pr[\theta_1 = 0] = Pr[\theta_1 = 1] = 1/2$
- No info:
  - $v_1 = 4E[\theta_1] - 4 = -2,$
  - $P_1 = e^{-2} / (1 + e^{-2}) = .119$
- Good news:
  - $v_1 = 4(1) - 4 = 0, \text{ so}$
  - $P_1 = .5$
- Bad news:
  - $v_1 = 4(0) - 4 = -4, \text{ so}$
  - $P_1 = .024$

# Does information have to be verifiable?

- Communication of seller information raises probability of a sale on average when probability is low
- So, ex ante, a seller would like to commit to truthfully revealing information
- But a seller with bad information would like to lie and claim to have good information
- So most of the literature looks at verifiable information
- Can puffery also be persuasive?

## Example of puffery that pushes one attribute

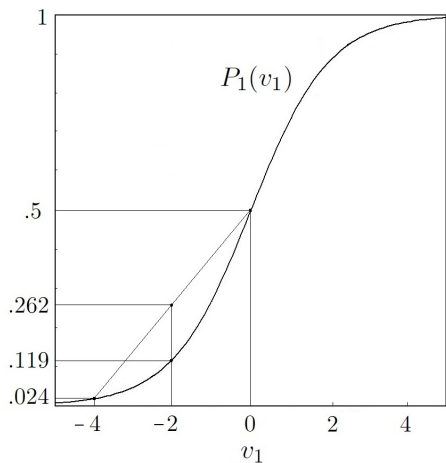
- Suppose  $V_1 = \beta_1\theta_1 + \beta_2\theta_2 - p_1$
- Seller knows  $\theta_1, \theta_2$  and buyer knows  $\beta_1, \beta_2$
- $\Pr[\theta_1 = 1, \theta_2 = 0] = \Pr[\theta_1 = 0, \theta_2 = 1] = 1/2$
- $\Pr[\beta_1 = 4, \beta_2 = 0] = \Pr[\beta_1 = 0, \beta_2 = 4] = 1/2$
- No information revealed:
  - Half time  $v_1 = 4E[\theta_1] + 0E[\theta_2] - 4 = -2$
  - Half time  $v_1 = 0E[\theta_1] + 4E[\theta_2] - 4 = -2$
- Seller indicates  $\theta_1 > \theta_2$  so  $E[\theta_1] = 1, E[\theta_2] = 0$ 
  - Half time  $v_1 = 4(1) + 0(0) - 4 = 0$
  - Half time  $v_1 = 0(1) + 4(0) - 4 = -4$
- Seller indicates  $\theta_2 > \theta_1$  so  $E[\theta_1] = 0, E[\theta_2] = 1$ 
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# Puffery increases variance of buyer valuations



- $V_1 = \beta_1\theta_1 + \beta_2\theta_2 - p_1$
- No info:  $v_1 = -2$  so  $E[P_1] = .119$
- Puffery of attribute 1:  $v_1 = 0$  or  $v_1 = -4$  so  $E[P_1] = .262$
- Puffery of attribute 2:  $v_1 = -4$  or  $v_1 = 0$  so  $E[P_1] = .262$

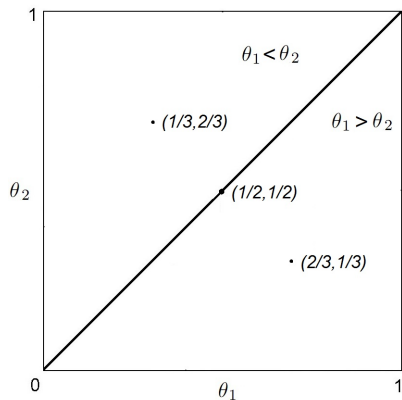
## Persuasive puffery – example

- Previous example a bit suspicious
- Suppose again  $V_1 = \beta_1\theta_1 + \beta_2\theta_2 - p_1$
- But assume  $\theta_i$  uniform i.i.d. so prior  $E[\theta_i] = 1/2$  or  $a_i = 1/2$
- And assume  $\beta_i$  normal i.i.d. with mean  $\mu$  and variance  $\sigma^2$
- Seller puffs up one attribute at expense of other
- Suppose two messages  $m \in \{m^1, m^2\}$  where  $m^1$  interpreted as  $\theta_1 \geq \theta_2$  and  $m^2$  interpreted as  $\theta_1 < \theta_2$
- Use notation  $a_i^j = E[\theta_i | m^j]$
- Then by uniformity  $(a_1^1, a_2^1) = (\frac{2}{3}, \frac{1}{3})$  and  $(a_1^2, a_2^2) = (\frac{1}{3}, \frac{2}{3})$

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# Persuasive attribute puffery – example



- $E[\theta_i] = 1/2$
- $E[\theta_1 | \theta_1 > \theta_2] = 2/3$
- $E[\theta_2 | \theta_1 > \theta_2] = 1/3$
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## Persuasive attribute puffery – example

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- No information  $Var[v_1] = \sigma^2(1/2)^2 + \sigma^2(1/2)^2 = (1/2)\sigma^2$
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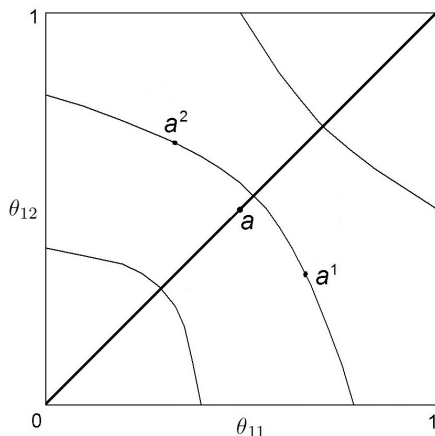
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# This example with two goods



- $\theta_{1j}$  i.i.d. on  $[0, 1]$ , and  $\theta_{2j}$  i.i.d. on  $[0, 1.2]$
- $\beta_1$  and  $\beta_2$  normal, mean 10 and variance 5
- Prices same,  $p_1 = p_2 = 10$
- Without puffery:  
 $P_1 = 5.4\%$ ,  $P_2 = 58.2\%$
- With attribute puffery:  
 $P_2 = 10.7\%$ ,  $P_2 = 50.2\%$

## General results: Puffery of product attributes

- Example assumes  $\theta_i$  iid and  $\beta_i$  iid
- But if buyer is already leaning toward one good is that a problem?
- Seller has an incentive to pander to buyer preferences – buyer anticipates this and “discounts” puffery of that good
- Using results from Chakraborty and Harbaugh (2010) show puffery is still credible

### Proposition

*For random coefficients, puffery of an attribute of product  $i$  strictly raises (lowers) sales if sales are sufficiently small (large) for all  $V_i$ .*

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- What if seller has information on competing product?
- Could then engage in negative puffery and credibly highlight weakness of that product
- Good idea when market share is low
- (But in logit example not as good as highlighting own strength)

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Puffery that highlights the comparative advantage of own product

Increases variance in buyer valuations for your product

- Pulls in some buyers
- And pushes some buyers away

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- Could also compare own overall quality with competitor's
- Surprisingly, this can be credible!
- But definitely not a good idea if there is insufficient uncertainty over coefficients

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# Can unverifiable puffery beat full verifiable disclosure?

- Disclosure of all information helps a seller (on average) when  $P_i$  is convex
- Puffery (always) helps a seller when  $P_i$  is quasiconvex
- So if  $P_i$  is quasiconvex but not convex then puffery can be better
- Hotdogs and hamburgers example?
- Seller can be better off credibility indicating that one is better and nothing more

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# Puffery as cheap talk

- Definition of puffery seems to be that of “cheap talk”
- One dimensional cheap talk models require some commonality of interest between expert and decision maker
- But what if seller only interested in making a sale?
- Suppose seller knows about two attributes of product
- Seller benefits from cheap talk if probability of a sale is low
- Fits results from the marketing literature?

# Persuasion vs cheap talk games in advertising

## Persuasion game approach

- “Objective/verifiable/hard information”
- Meaning of a message clear – but will the seller disclose it?
- In equilibrium usually have unravelling so all types disclose
- Good information types benefit, bad information types lose
- Regulation focuses on preventing lying

## Cheap talk game approach

- “Subjective/nonverifiable/soft information”
- Meaning of messages endogenous to seller incentives
- Buyers must be knowledgeable, sophisticated
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- Legal exception for puffery seems to make sense
- Regulation should focus on making incentives transparent?

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