On Nudging and Psychological Reactance

David R. Just

Gnel Gabrielyan

Dyson
Cornell
SC Johnson College of Business

What we eat is a public health issue

- 75% of adults are overweight or obese (GBD).
- 49.7% are either obese or extremely obese
- Almost 1 in 5 children are overweight or obese (CDC)
- Closely related to disease
  - Total annual medical costs due to overweight $126 billion (Nagi et al. 2024)

We want choice

Bring back our snacks!

L.A. schools' healthful lunch menu panned by students

For many students, Los Angeles Unified's introduction of healthful lunches — part of a campaign against obesity, diabetes and other problems — has been a flop. The district says the menu will be revised.

December 17, 2011 | By Teresa Watanabe, Los Angeles Times

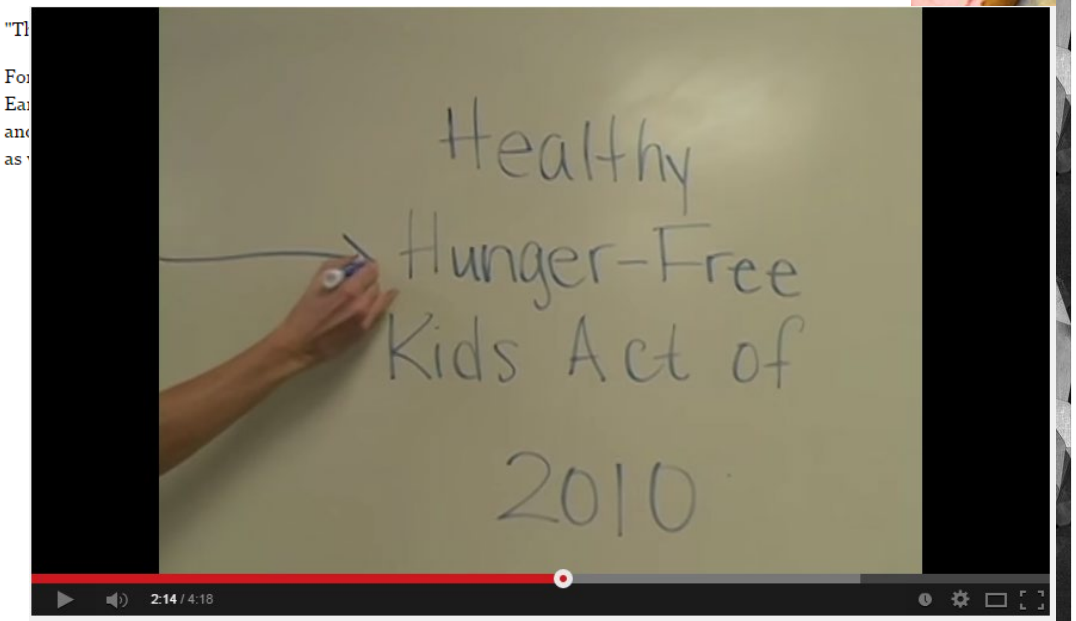
Email Share 87 Tweet 31 Recommend 1

It's lunchtime at Van Nuys High School and students stream into the cafeteria to check out the day's fare: black bean burgers, tostada salad, fresh pears and other items on a new healthful menu introduced this year by the Los Angeles Unified School District.

But Iraides Renteria and Mayra Gutierrez don't even bother to line up. Iraides said the school food previously made her throw up, and Mayra calls it "nasty, rotty stuff." So what do they eat? The juniors pull three bags of Flamin' Hot Cheetos and soda from their backpacks.

"Tl

For
Ea
an
as



We Are Hungry

Don’t tax our fat

Denmark’s food taxes

A fat chance

The Danish government rescinds its unwieldy fat tax

Nov 17th 2012 | COPENHAGEN | From the print edition

Timekeeper Like 797 Tweet 87

No more tax, thank God

FARMERS, retailers and shoppers whooped with joy this week when the government announced the abolition of one of its most hated taxes: a tariff on saturated fats, imposed just over a year ago. The tax was undoubtedly well intentioned. Higher prices for unhealthy foods would reduce consumption and improve public health; obesity levels and cardiovascular disease would fall; strains on health-care budgets would be eased.

Yet in practice, the world’s first fat tax proved to be a cumbersome chore with undesirable side effects. The tax’s advocates wanted to hit things like potato crisps and hot dogs, but it was applied also to high-end fare like speciality cheeses. One gourmet cheesemaker cut his range of products when his creamy Danish blue saw a price increase of 25%.

Critics saw the tax as the worst excesses of the nanny state. Bakers fretted over the fat content of cupcakes. Pig farmers said their famous bacon would cost more than imports.

In this section

When all parties lead to Angela

Reactance

- Breahm (1966): if a behavior is reduced or threatened with reduction, the actor will be “directed toward the re-establishment of whatever freedom has been lost or threatened”
- Rebelling against a threat to freedom
- Graffiti
- Fat tax versus a thin subsidy
- Limits on ketchup

The appeal of nudging

- Food behaviors were some of the earliest suggested targets (Thaler and Sunstein 2008)
  - Many decisions, little time to focus, environment is known to play a role
- Nudging does not change the choice set
  - Strictly speaking, it does not threaten freedom of choice
  - Claims that reactance is an unlikely response to food choice nudges
  - Claims more palatable for consumers and voters
  - Perhaps more effective in practice for those who are the targets
    - Those who currently choose to overeat or eat poorly are most likely to resist
    - Could nudges work without generating reactance among these groups?

Growing evidence that people don't like *some* nudges

- Sunstein (2015) examining the ethics of nudging
  - People tend to prefer nudges that promote autonomy
  - System 2 nudges – encourage deliberation
- Some studies find some evidence of reactance when autonomy is threatened
  - Bruns and Perino (2023)
  - Schutze, Spitzer and Wichardt (2023)
- Transparency is also an issue
  - Banerjee et al 2023 – Those who wish to buy green and opt for a default nudge overrule the nudge

Hypotheses

Will revealing the purpose of a food choice nudge lead to reactance?

Will a food choice nudge retain its effectiveness if consumers actively select it?

Replicating a Famous but Problematic Nudge

- Geier, Wansink and Rozin (2012)
  - 2 studies– Illinois (n = 59) and U Penn (n = 39)
  - Treatment: color every jth chip
  - j = 7 or 14
- Watched either BBC or a 25 minute clip from a movie
- Find consumption in a single sitting dropped significantly (by 100/180 calories or 20/180 calories)
- Excluded those who ate no chips

Methodology

- Participants were randomly assigned to one of four different treatment groups
- They were asked to take a can of Pringle chips and watch a TV show;
  - (2.38 Oz) of Pringles chips (each can consisting of 35 chips)
  - An episode from Big Bang Theory.
- They could take another can if they finished their first one
- Nudged Pringles cans contained an assortment of chips in which every fifth chip was colored red

Treatments

Control

No information was provided to participants and the cans were not nudged.

Basic Nudge

Participants were told that every fifth chip was colored red

Transparent Nudge

Participants were told that every fifth chip was colored red and they were informed of the reasoning for the colored chips prior to selecting a can

Endogenous Transparent Nudge

Participants were asked whether they wanted a nudged can or not

If they said no, they were randomly assigned either a nudged or standard can

Data - Chips Experiment

- 212 observations
  - 66% were female
  - 60% were between the ages of 18-28
  - 50% - bachelor’s degree or higher
  - Eliminated sessions of under 5 people
- Participants were asked about their
  - purchasing behavior in general,
  - purchasing and consumption habits for low nutritional foods, salty snacks, potato chips, and desserts,
  - attitudes towards being nudged or buying a product or a service that nudges them to eat less.

Table 2. Definition of each treatment and the number of observations in each group

Treatment	Description	Reference Name	N	Chips eaten (St. Dev.)
1	Standard can of Pringles	"Control"	39	9.3 (12.5)
2	Nudged can with the nudge's intent not provided to subjects	"No Info"	65	8.1 (11.2)
3	Nudged can with the nudge's intent provided to subjects	"Info"	37	15.6 (12.7)
4	Nudged can (with intent provided) + Option for standard can	"Choice"	71	13.6 (12.6)
4.11	Chose a standard can and picked a standard can	Normal-Normal	16	12.3 (13.1)
4.12	Chose a standard can and picked a nudged can	Normal-Red	14	15.1 (13.3)
4.2	Chose a nudged can at the beginning	Red	41	13.6 (12.0)

Table 8: Consumption Differences between Main Treatment Groups: Results of t-test Statistics

Treatment groups			Control	Basic Nudge	Transparent Nudge	Endogenous	Consumption (in units)
			p-values of two-tailed tests				Mean (Std. Err.)
Control		p-values of one-tailed tests		0.618	**0.031**	0.088	9.3 (12.5)
Basic Nudge			0.309		0.003	0.008	8.1 (11.2)
Transparent Nudge			0.016	0.001		0.412	15.6 (12.7)
Endogenous			0.044	0.004	0.206		13.6 (12.6)
						F-test (p-value)	4.25 (0.006)

Table 8.1: Consumption Differences between Sub-groups in the 4th Treatment Group (Choice): Results of t-test Statistics

Treatment groups		Standard - Standard	Standard - Nudged	Nudged - Nudged	Consumption (in units)
		p-values of two-tailed tests*			Mean (Std. Err.)
Standard-Standard	p-values of one-tailed tests**		0.573	0.737	12.3 (13.1)
Standard - Nudged		0.286		0.689	15.1 (13.3)
Nudged - Nudged		0.368	0.656		13.6 (12.0)
				F-test (p-value)	0.18 (0.834)

Coefficient estimates using least squares			
Variables	OLS		
	Coefficient	Robust Std. Err	P-value
Basic Nudge	- 1.86	2.44	0.447
Transparent Nudge	5.46**	2.67	0.043
Endogenous – Standard-Standard	1.37	3.46	0.692
Endogenous – Standard-Red	5.10	3.48	0.144
Endogenous – Red-Red	2.54	3.02	0.403
Age 29 and above	- 5.33***	1.96	0.007
Middle income ($30,000-$74,999)	1.49	2.85	0.601
High income ($30,000-$74,999)	0.61	2.77	0.827
Bachelor's Degree or higher	- 1.38	1.87	0.459
Race – none white	2.08	1.77	0.244

Coefficient estimates using Tobit			
Variables	OLS		
	Coefficient	Robust Std. Err	P-value
Basic Nudge	-2.44	3.36	0.469
Transparent Nudge	9.01**	3.69	0.016
Endogenous – Standard-Standard	3.90	4.76	0.413
Endogenous – Standard-Red	9.53*	4.93	0.055
Endogenous – Red-Red	4.02	3.65	0.272
Age 29 and above	- 6.66**	2.60	0.011
Middle income ($30,000-$74,999)	1.50	3.55	0.673
High income ($30,000-$74,999)	-0.03	3.50	0.993
Bachelor's Degree or higher	-1.85	2.42	0.446
Race – none white	-2.44	3.36	0.469

Replication

- The result was very ambiguous
  - We are including zero consumption in our estimates – perhaps accounts for the difference
  - Directionally similar
  - Frustratingly inconclusive

Reactance

- We find behavior that is very consistent with reactance in the face of transparency
- When individuals choose a nudge, they eat more than in control or basic nudge
  - Could this be more of a priming or licensing effect?
- When individuals prefer no nudge but are nudged anyway, very weak evidence of reactance
  - Only significant using Tobit, and only at a 0.10 level

Conclusion

- Transparency is a big barrier to using nudges for health
- Policymakers discussing and debating could undermine the nudge
- Marketers claiming a nudge will help consumers could undermine the nudge
- Both marketers and policymakers are motivated to provide transparency
  - Profit requires differentiation
  - Credit taking requires voter knowledge
- We need substantially more understanding of how behavioral policies operate under transparency