Social norms, morals and self-interest as determinants of pro-environment behaviors: the case of household recycling

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References

1. Czajkowski, M., Kądziela, T., and Hanley, N., 2014. We want to sort! – assessing households' preferences for sorting waste. Resource and Energy Economics, 36(1):290-306.
2. Czajkowski, M., Hanley, N., and Nyborg, K., forthcoming. Social Norms, Morals and Self-interest as Determinants of Pro-environment Behaviours: The Case of Household Recycling. Environmental and Resource Economics.
3. Work in progress

Policy setting:
municipal waste management changes in Poland

- Prior to 2013:
  - Every house owner required to have a contract for having their sorted waste collected
  - Not specified how waste is supposed to be sorted (e.g. into how many fractions)
  - In practice – multiple companies operating simultaneously, followed different standards
- New regulations:
  - Waste owned and collected by municipalities (municipal companies or companies selected by municipalities)
  - Introduce per capita waste tax
  - Uniform standard for each municipality

Study #1 – Podkowa Leśna

- Municipality of Podkowa Leśna in Poland
  - One of the suburbs of Warsaw, one of the wealthiest municipalities in Poland
  - Detached houses
  - 1600 households, 3700 inhabitants

- What should the new standard be?
- Sort at home into:
  - no household level sorting
  - 2 fractions (recyclables, non-recyclables)
  - 3-7 fractions (organic, glass, paper, metal, plastic, other)
  - Additional sorting (and screening) performed at professional sorting facilities
- Cost vs. time/trouble/space

Discrete choice experiment

- Contingent scenario
  - Introduction of a new, uniform system of waste collection
- Attributes
  - Number of sorting categories (1, 2, 5)*
    - * The respondents were informed, that in either case the collected waste would undergo a screening process, and due to regulatory requirements, even if it was collected unsorted it would still be sorted in the central professional sorting facility
  - Number of collection times per month (1, 2, 4)
  - Cost (coercive tax, per household, per month)
- Experimental design
  - 6 choice-tasks per respondent
  - 3 alternatives
- Administration
  - Mail survey to every household in Podkowa Leśna
  - 311 of 1605 questionnaires returned (~20% response rate)

Example of a choice card

Choice Situation 1.	Alternative 1	Alternative 2	Alternative 3
Method of sorting in household	Into 5 categories	Into 2 categories	None
Frequency of collection	Once every 4 weeks	Once every 2 weeks	Once every week
Monthly cost for your household	75 PLN	50 PLN	100 PLN
Your choice:	☐	☐	☐

The results – MNL model (WTP-space in EUR)

Variable	Coefficient (s.e.)
Sort in 2 categories (vs. 1)	4.25***
	(0.77)
Sort in 5 categories (vs. 1)	9.03***
	(0.68)
Collect 2 times per month (vs. 1)	5.58***
	(0.69)
Collect 4 times per month (vs. 1)	7.50***
	(0.93)
- Monthly cost per household (EUR) * scale	0.12***
	(0.01)

The results – LC model (WTP-space in EUR)

Variable	Class 1	Class 2	Class 3
	Coefficient (s.e.)	Coefficient (s.e.)	Coefficient (s.e.)
Sort in 2 categories (vs. 1)	18.69*** (2.55)	-1.21 (1.61)	0.42 (0.80)
Sort in 5 categories (vs. 1)	30.05*** (3.48)	-8.91*** (1.74)	1.03 (0.66)
Collect 2 times per month (vs. 1)	7.74*** (1.32)	13.25*** (1.92)	-4.15*** (0.88)
Collect 4 times per month (vs. 1)	13.51*** (2.09)	12.26*** (2.28)	-2.03** (0.84)
- Monthly cost per household (EUR) * scale	0.11*** (0.01)	0.15*** (0.02)	0.45*** (0.07)
Class probability	0.53	0.21	0.26

But why?

- Much work has been undertaken on households' willingness to engage in recycling activity
  - For example, Bruvoll, Halvorsen, and Nyborg (2002) find that most respondents prefer central facility sorting
- Economic motives for recycling:
  - Altruism
  - Cost-saving

- Recycling is costly in terms of household time and effort
- Positive WTP for recycling may reflect:
  - Altruism: desire to reduce externalities from other sources of waste disposal, to reduce waste, etc.
  - Cost saving: belief that if everyone complies eventually the cost will decrease
  - Warm glow: utility from action itself, irrespective of outcome
  - … but also – to promote a social image, and a positive self image

- What is the role of moral and social norms in determining recycling behavior?

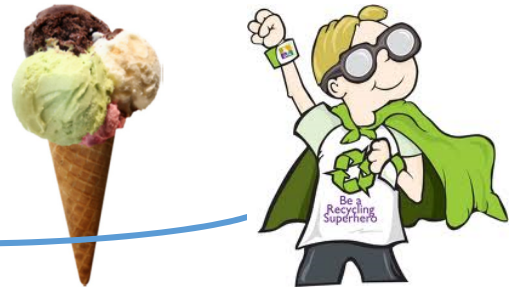
Moral and social norms

- Moral norm – individual sanctions self
- Social norm – sanction comes from others (social pressure)
  - Social norms are “shared views of ideal forms of behaviour” (Ostrom, 2000, Biccheri 2006) which individuals are predisposed to comply with
  - Predisposition depends on level of compliance within the relevant group
  - 2 factors matter: what I believe others are doing (% complying) and what I think other people expect me to do (Thorgensen, 2008)

Moral, social and economic motives

- Brekke et al. (2003, 2010), Nyborg (2011) model:
  - Duty-orientated individuals derive utility from an image of themselves as socially responsible people
    - Their recycling actions, which are costly to each person in time and effort, are increasing in the degree to which they believe others are also recycling
  - Recycling motivated by gap between my level of action and the social norm, since warm glow depends on the size of this gap
    - As my level of recycling goes up, I get more of a warm glow
    - But as my perceived sense of responsibility goes up, my utility goes down (I feel I should always do better)
  - Argued it was impossible to separately identify warm glow effects from social norm effects

Moral, social and economic motives



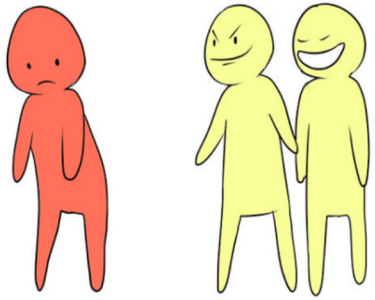
– Budget constraint: $W = c + pg$

– Utility function: $U = u(c, G) + S + J$

– Self image: $S = -a\left(g - g^{*}\right)^{2}$

– Judgement from others: $J = -b\left(g - g^{**}\right)^{2}$

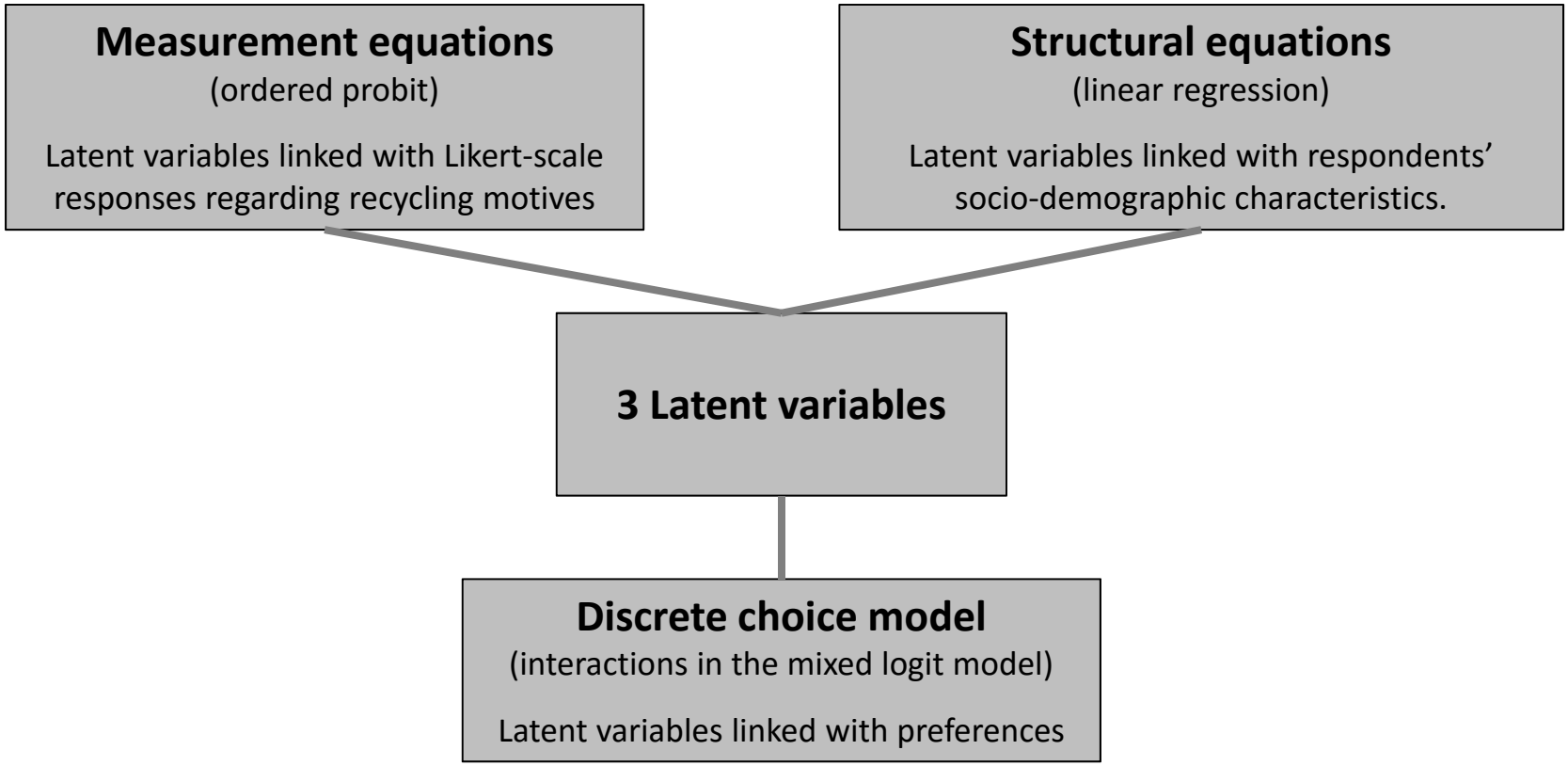
– FOC: $g = \dfrac{ag^{*} + bg^{**} - 2pu_{c}^{'}}{a + b}$



Study #2 – Janówek and Hrubieszów

- The same experimental design and questionnaire
- n = 408, much lower response rate
- Additional debriefing questions eliciting respondents' motives
  - Can be categorized into selfish benefit (SB), social pressures (SP) and moral duties (MD)
    - *Trouble* – Sorting waste at home is troublesome (SB, -)
    - *Satisfaction* – Sorting waste myself will give me satisfaction (SB, +)
    - *Bills* – Sorting waste at home will allow me to (eventually) decrease waste collection bills (SB, +)
    - *N-judge* – My neighbours (would) judge me badly if I do not sort at home (SP, +)
    - *I-judge* – I (would) judge people badly who do not sort at home (SP, +)
    - *Sh-self* – Sorting waste is something everyone should do himself (MD, +)
    - *Moral* – Sorting waste is my moral / ethical duty (MD, +)
  - Additionally –Likert-scale data on whether people thought that
    - Home sorting was more effective than sorting at a central facility (Better)
    - How *Careful* people were in (if) home sorting
    - They were well-informed about how to sort waste into the correct categories (*Know*).

Econometric framework: Hybrid mixed logit



Results – measurement component

	Latent variable 1	Latent variable 2	Latent variable 3	Threshold 1	Threshold 2	Threshold 3	Threshold 4
better	-0.08	0.27**	-0.54***	-1.69***	-1.13***	-0.29	0.76***
troublesome	-0.04	-0.29**	0.44***	-0.99***	-0.16	0.28**	1.17***
satisfying	0.21	0.57**	-1.01***	-1.73***	-1.16***	-0.35	1.05***
careful	0.11	0.76***	-1.35***	-3.09***	-2.62***	-1.63***	0.10
know	-0.12	0.54***	-0.88***	-2.39***	-2.09***	-1.31***	0.12
moral-duty	0.25	0.50	-1.83***	-3.03***	-2.18***	-1.37***	0.52
neighbours-judge	0.66***	-0.54***	-0.62***	-1.42***	-0.78***	0.93**	1.67***
i-judge	1.53***	-0.62	-1.52***	-2.29***	-1.42***	-0.48	1.47
everyone-should	0.63***	0.37	-1.85***	-3.21***	-2.61***	-1.52***	0.54
cost-saving	0.19	0.11	-0.72***	-1.64***	-1.22***	-0.50**	0.33

– LV1 – social pressures

– LV2 – internalized motivation (but not necessarily moral duty)

– LV3 – no social / moral pressures, not better, troublesomeness

Results – structural component

	LV 1 (social pressures)	LV 2 (internalized motivation)	LV 3 (trouble, no pressures)
male	-0.08	-0.08	0.08
age	0.01	-0.21**	-0.13
household size	-0.04	0.22**	0.17**
income	0.57***	0.29	0.12
satisfied city	-0.53***	-0.29	-0.27**
clean city	0.29***	0.21	0.08
ever cleaned	-0.22**	-0.09	-0.12
currently sort	0.21**	0.14	-0.23***
compost	-0.39***	-0.10	-0.15**

Results – discrete choice component

	Main effects		Interactions		
	Means	Standard deviations	LV 1 (social pressures)	LV 2 (internalized motivation)	LV 3 (trouble, no pressures)
Sort in 2 categories (vs. 1)	1.10***	0.01	0.36	0.60**	-0.37
Sort in 5 categories (vs. 1)	1.42***	1.77***	0.30	0.87**	-1.19***
Collect 2 times per month (vs. 1)	0.51***	0.01	1.33***	0.29	0.78***
Collect 4 times per month (vs. 1)	0.14	1.08**	1.56***	0.77***	0.63***
- Monthly cost per household (EUR)	-0.08***	0.05***	-0.01	0.01	0.01**

Results – summary

- We were able to identify 3 major factors (latent variables) which:
  - Explain the variation in respondents' attitudinal responses
  - Can be linked with respondents' socio-demographic characteristics
  - Can be associated with significant differences in respondents' preferences
- LV1 and LV2 both indicate the presence of norm-based motives inconsistent with *homo oeconomicus*
  - LV1 picks up social approval-driven motives to sort ($b > 0$, $g^{**} > 0$)
  - LV2 indicates a mainly moral or intrinsic motivation to sort ($a > 0$, $g^{*} > 0$)
    - Morally ideal contribution g^{*}, is increasing in contributions' perceived social value – nicely consistent with LV2 being associated with believing that sorting at home is satisfying / better than central sorting
- LV3 reflects a motivation *not* to sort at home which can be due either to *homo oeconomicus* preferences, or to a belief that home sorting is neither morally nor socially superior
- Caution: associations are not causal

Conclusions

- Many people “want to sort”, preferring to sort their own household waste even when there was a free alternative of getting a central facility to sort for them
- We observe the effects of the underlying norm-based motivation, which fit our conceptual model
  - Moral norms matter
  - The importance of social norms less evident

Current work (study #3) – investigate the importance of social norms further

- We re-run a similar choice experiment with the following treatments:
  - Vary the social norm in terms of the level of ambition
    „In 2012 *y* % of households in Poland / your city recycled"
    varying *y* across treatments
  - Vary the social norm in terms of how local it is: (Poland vs. your city vs. both)
- 3 main cities, over 1800 respondents
- Work in progress