

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

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# We want to sort!



- Czajkowski, Kadziela, Hanley 2014: most prefer sorting **at home**

- ***BUT WHY?***

- Bruvoll, Halvorsen & Nyborg 2002: most prefer **central facility** sorting
- **Here:** CKH 2014 + motivation questions



# Moral, social, economic motives



$$W = c + pg$$

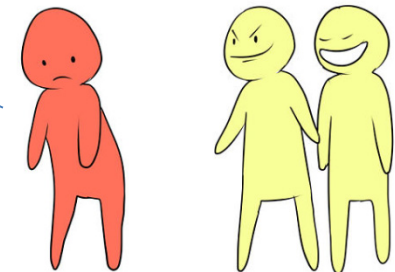


$$U = u(c, G) + S + J,$$

$$S = -a(g - g^*)^2$$



$$J = -b(g - g^{**})^2$$

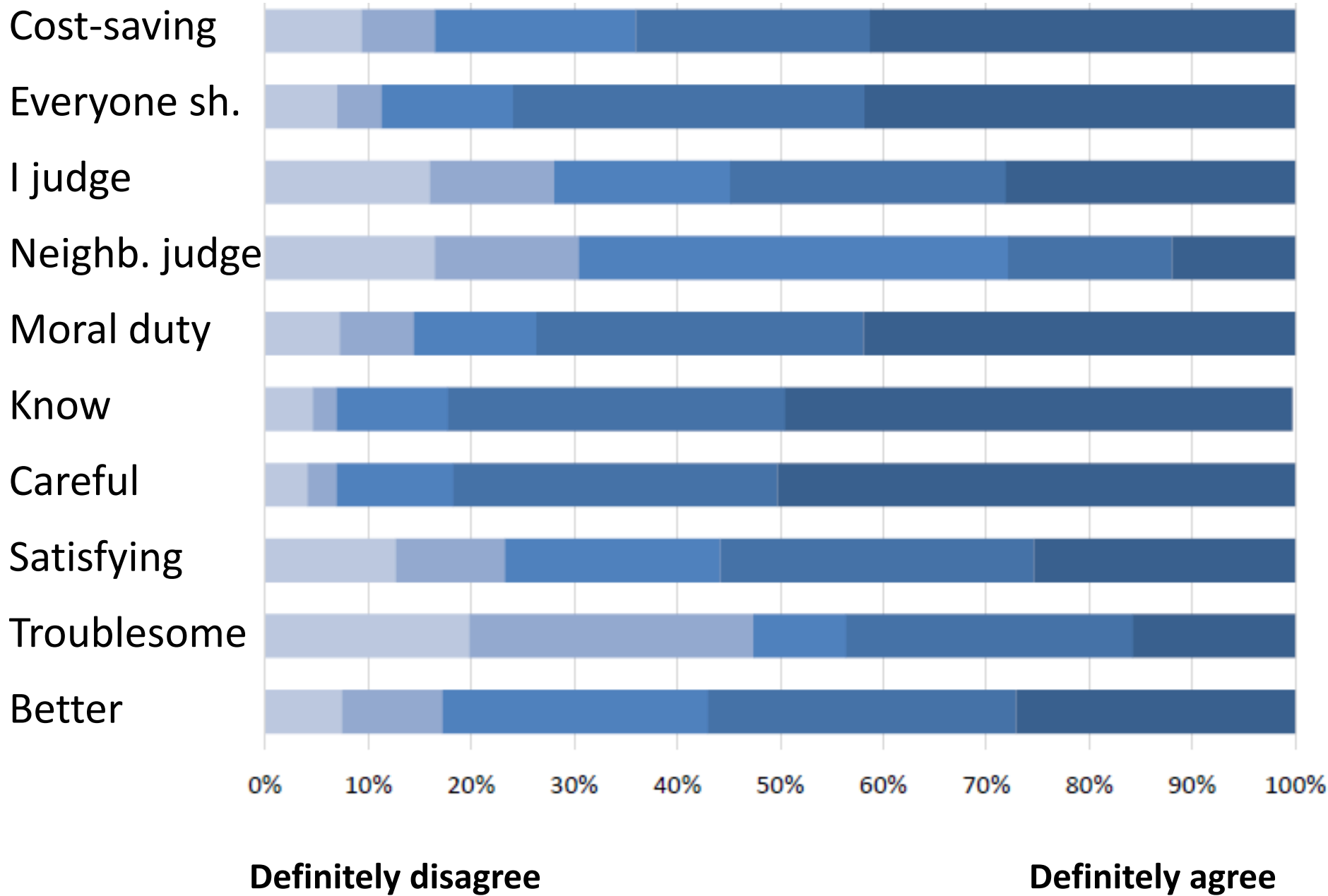


$$g = \frac{ag^* + bg^{**} - 2pu'_c}{a + b}$$

# The survey

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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Polish law: sorting required (home or central)
- Discrete Choice Experiment: waste handling contracts
- In *every* case: central screening & sorting
- Attitudinal questions
- Two Polish towns (Józefów and Hrubieszów). Mail-out survey, n=418. Low response rate!



# Econometric approach

- Hybrid Multinomial Logit (HMNL) and Hybrid Mixed Logit (HMXL) models
  - Attitudinal responses: indicators of latent psychological factors
  - Simultaneous estimation: attitudes – socio-demographics – latent factors – recycling contract choices
  - HMXL: accounts for unobserved preference heterogeneity

# We want to sort!



- On average: respondents prefer home sorting
  - 70% prefer 5 categories to no sorting
  - BHN 2002: 72 % prefer central sorting
- Representative?
  - Response rate, design

# Hybrid mixed logit model: Discrete choice

	Main effects		Interactions		
	Means	Standard deviations	Latent variable 1	Latent variable 2	Latent variable 3
sort2	1.1031***	0.0000	0.3603	<b>0.6012**</b>	-0.3724
sort5	1.4238***	1.7691***	0.2963	<b>0.8735**</b>	<b>-1.1883***</b>
time2	0.5070***	0.0000	1.3252***	0.2914	0.7786***
time4	0.1404	1.0813**	1.5616***	0.7680***	0.6271***
cost	-0.0776***	0.0521***	-0.0006	0.0026	0.0099**



# Hybrid mixed logit model: Measurement equations

	LV1	LV2	LV 3
<b>better</b>	-0.0767	<b>0.2742**</b>	<b>-0.5367***</b>
<b>troublesome</b>	-0.0430	<b>-0.2861**</b>	<b>0.4428***</b>
<b>satisfying</b>	0.2063	<b>0.5648**</b>	<b>-1.0151***</b>
<b>careful</b>	0.1052	<b>0.7632***</b>	<b>-1.3457***</b>
<b>know</b>	-0.1186	<b>0.5356***</b>	<b>-0.8824***</b>
<b>moral-duty</b>	0.2498	0.4953	<b>-1.8310***</b>
<b>neighbours-judge</b>	<b>0.6556***</b>	<b>-0.5354***</b>	<b>-0.6231***</b>
<b>i-judge</b>	<b>1.5256***</b>	-0.6229	<b>-1.5186***</b>
<b>everyone-should</b>	<b>0.6247***</b>	0.3685	<b>-1.8478***</b>
<b>cost-saving</b>	0.1924	0.1066	<b>-0.7166***</b>

# Conclusions



- LV1: Social motivation ( $b > 0$ ,  $g^{**} > 0$ )
- LV2: Moral/intrinsic motivation ( $a > 0$ ,  $g^* > 0$ )
- LV3: No motivation ( $a = b = 0$ , and/or  $g^* = g^{**} = 0$ )

Preference for home sorting: mostly linked to **moral/intrinsic motivation**, associated with **the belief that home sorting is better.**