Impact of local and national social norm information on respondents' choices regarding waste sorting at household level

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INTRODUCTION

- **Aim: analyze the impact of provided social norms information on Poles' declared self-sorting preferences**
- **Environmental law regulations** in Poland: Act of 1 July **2011** on maintaining cleanliness and order in municipalities introduced the **pay as you throw** system
- **Lower fees** for source-sorted waste than for commingled materials
- Research shows that although fees are effective in several societies, they **may not work** in others (Kipperberg 2007) (especially for necessary goods/services because of low price elasticity of demand (Treich & Croson 2014))

THEORETICAL BACKGROUND

Strategies that use social comparisons to incite change of private behaviors with public consequences were developed upon…

- **Social comparison theory** – individuals self-evaluate an action or a thought based on comparisons to others (Festinger 1954)
- **Social norms** – individual's beliefs about popular and accepted behavior in a specific situation
- **Descriptive norm** – presents what is typically done in a social group, i.e. common actions actually performed; often expressed as quantity or frequency
- **Green nudges** – a small change in a context that greatly influences decision making process (without changing economic incentives)

ECONOMIC JUSTIFICATION

Observations that support economic validity of the research…

- From behavioral economics we know that **changes in information can change choices** and the impact of information on consumers' preferences is **persistent** (changes in the long-run) (Ferraro, Miranda & Price 2011; Allcott & Rogers 2012)
- Environmental goods = public goods;
  - actions which contribute towards higher environmental quality are **subject to a threshold**; total efforts must be sufficient to ensure that the threshold is exceeded (Bush et al. 2013), othewise all efforts are, to a degree, wasted (Ferraro 2008; Kuhfuss et al. 2015)
- Well-being does depend on how we compare ourselves **relative** to others, and how we perceive **our position in the social group** (Thaler & Sunstein 2008)

LITERATURE REVIEW

Summary

- **Social norm information influences respondents' environmental choices.** Individuals' choices positively depend on a perception of what is commonly done in a local community. **Descriptive norm** assures a **standard** from which people do not want to deviate. (Nolan et al. 2008)
- A price intervention may be efficiently replaced by a **non-price, behavioral intervention.**
- Evidence from Poland: some respondents prefer to sort waste at the household level (into higher number of categories) rather that at specialized sorting facilities - **home sorting may be a source of utility** (Czajkowski, Kądziela & Hanley, 2014)

CONCEPTUAL FOUNDATION

Literature review

Hotel chains invited guests to participate in their conservation programs. A card informing about the **towel reuse program** was placed in the washing room and **presented fellow guests behavior** (Goldstein, Cialdini et al. 2008)

- **Rates of reuse** significantly **higher** amongst guests whose towel hanger card conveyed **descriptive norm**
- Social norm adherence depends on the extend of perceived **similarity** between a target individual and a group of people he refers to.
- **Situational similarities** yield the highest compliance rate amongst all reference groups.

The immediate surroundings' provincial norm has greater cogency to the global norm

HYPOTHESES

1. social norms are expected to be positively correlated with willingness to pay for sorting at household level
2. a local norm (for the city of residence) has a greater effect on individual's recycling behavior than a corresponding national norm

RESEARCH DESCRIPTION

Data collection procedure & Survey design

- **Discrete choice experiment**
- a survey in a form of **CAWI** – Computer Asssited Web Interview
- Adminstrated by MillwardBrown SMG/KRC
  - introduction to the topic of a survey (indicating that its results may contribute to the future policy, confidentiality and anonymity ensured)
  - warm-up questions about the current method for sorting waste at respondents' homes
  - key aspects of scenarios (direct and indirect cost reminder), **screen of the social norm**, preference elicitation
  - attitude towards waste segregation & socio-demographic characteristics
- **8 information treatments** (presenting varying social norms)
- A representative sample of **1,853** citizens of three major Polish cities: **Warsaw, Cracow, Bialystok**
- **Representative** with respect to gender, age, education, household size. In Warsaw and Cracow it also represents characteristics of individual districts.
- In **2014**

new element: the presence of varying local and national norm

REGIONS SELECTION AND APPLICABLE SOCIAL NORMS

Research description

	National norms	Local norms	Both norms
Low	**10%**	Cracow – **15%** Warsaw – **11%** Bialystok – **6%**	Cracow/Warsaw/Bialystok – **15/11/6%** & Poland – **10%**
Medium	**44%**		
High	**69%**	Cracow – **72%** Warsaw – **65%** Bialystok – **58%**	Cracow/Warsaw/Bialystok – **72/65/58%** & Poland – **69%**

- **Cracow** = green city
- **Białystok** = the least environmental friendly
- **Warsaw** = representing national average

No lie, just slightly different wording and norms from various data sources

ATTRIBUTES AND LEVELS

Research description

Attribute	Levels
number of self-sorting categories	1 (no sorting at source), 2 (recyclable materials and other) 3 cathegories (glass, other recyclables, non-recyclables) 5 (paper, glass, metals, plastic, other)
frequency of waste collection	presented weekly: once every two weeks; once, twice, thrice a week or on a daily basis
monthly cost (bill)	25, 50, 75, 100 PLN

- 3 options + status quo
- the most prefered

MODEL SPECIFICATION

Multinomial logit model

$$U_{ij} = \beta_{SORT2} * SORT2_j + \beta_{SORT3} * SORT3_j + \beta_{SORT5} * SORT5_j + \beta_{TIME1} * TIME1_j + \beta_{TIME2} * TIME2_j + \beta_{TIME3} * TIME3_j + \beta_{TIME7} * TIME7_j + \beta_{FEE} * FEE$$

- **SORT2, SORT3, SORT5** – dummies for the number waste categories (2, 3 or 5 categories, no sorting as a reference level);
- **TIME1, TIME2, TIME3, TIME7** – dummies for frequency of waste collection per week (1, 2, 3 or 7, 0.5 – once every two weeks was used as a reference level);
- **FEE** – the monthly waste disposal cost per household in PLN;
- The **status quo** option ('Current method of waste disposal') was also described using the above specified characteristics.

Willingness To Pay (WTP) – **implicit price of the attribute**

$$\mathbf{WTP} = \frac{\beta_{non-price\ attribute}}{-\beta_{FEE}}$$

RESULTS

National norms

	Control	10%	44%	69%
SORT 2	7.29***	7.097***	11.10***	10.65***
SORT 3	4.15**	10.43***	16.83***	18.25***
SORT 5	-6.82***	-3.26*	4.27**	0.63

- SORT5 is most often signed as an insignificant determinant of choice
- both 44% and 69% increases WTP for sorting compared to control group
- positive results in '44%' treatment suggest that presenting respondent with almost any, even a moderate, just not discouraging, social norm may positively affect his green behavior
- the willingness to pay amongst respondents who were presented with a low norm is not lower than in control group (no boomerang effect)
- the influence of high and low social norm is asymmetric

RESULTS

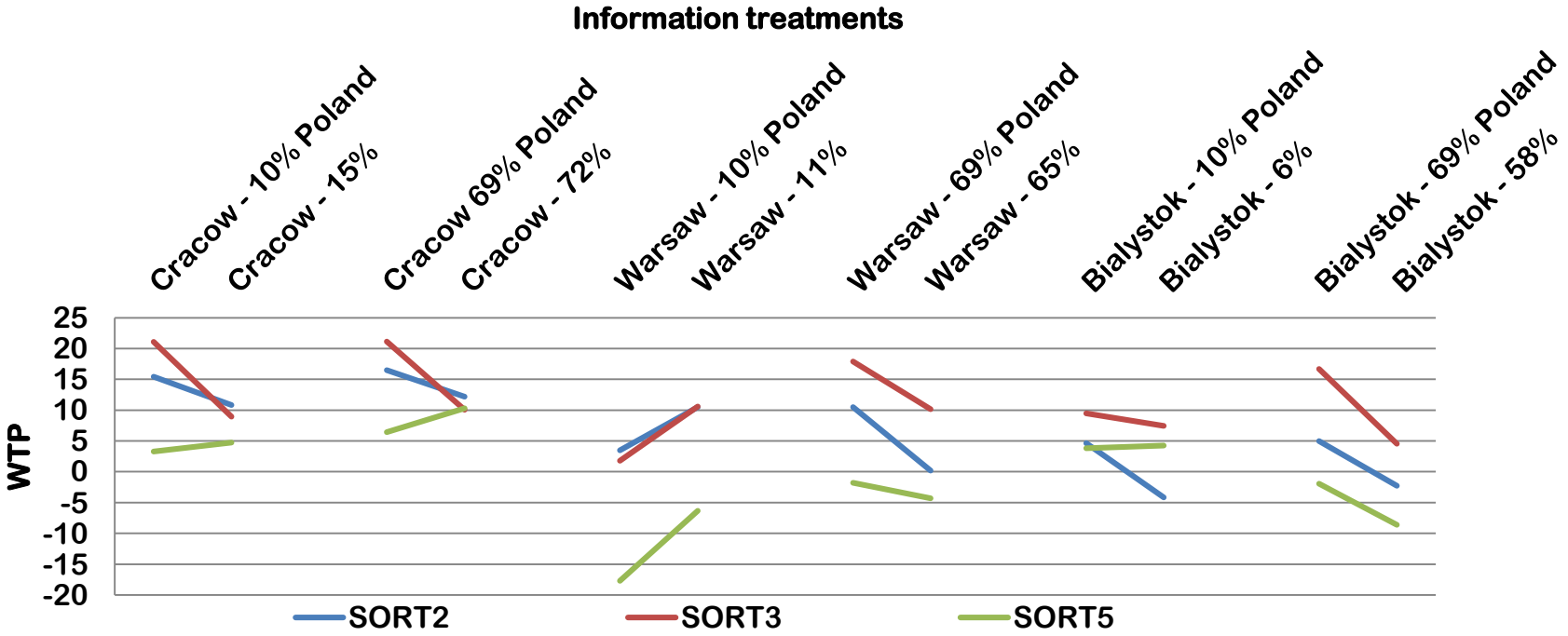
Local norms

	Control	Low (15/11/6 %)	High (72/65/58 %)
	CRACOW		
SORT 2	13.62***	10.81***	12.20**
SORT 3	6.66***	8.94***	10.08***
SORT 5	-10.34***	4.75	10.32***
	WARSAW		
SORT 2	2.62	10.51***	0.21
SORT 3	-5.25	10.57***	10.16***
SORT 5	-12.93***	-6.36*	-4.31
	BIALYSTOK		
SORT 2	2.64	-4.18	-2.27
SORT 3	7.19***	7.45**	4.55*
SORT 5	0.53	4.25	-8.59***

- results depend on a city, relevant to analyze it separately
- Cracow
  - WTP for SORT 2 & 3 relatively high even in a control group
  - Information about any norm (high or low) increases WTP for SORT5 and SORT3 - positive correlation between local information on recycling rate
- Warsaw
  - control group the WTP is either negative of statistically not different than zero
  - information about low and high social norm positively influence public support of the new environment friendly waste collection system (SORT 3)
- Bialystok
  - WTP for sorting is positive, though low
  - information about high social norm decreases WTP, which is a theory-challenging case

RESULTS

Comparison of local and national norms



- Low local norms close to low national norms, high local close to high national norms
- Expected that the low local norm should drag down the WTP more strongly than the national norm, likewise the high local norm should have greater motivational power than the high national norm
- low local norm results in lower WTP that low national norm for Cracow and Bialystok
- high national norm is more successful in motivating to sort that local norm

RESULTS

National norm (as a reference point)

	Control	High national (69%)	Two high norms (72/65/58 % & 69%)
	CRACOW		
SORT 2	13.62***	16.49***	17.11***
SORT 3	6.66***	21.14***	22.42***
SORT 5	-10.34***	6.43*	9.49***
	WARSAW		
SORT 2	2.62	10.48***	15.53***
SORT 3	-5.25	17.90***	9.45***
SORT 5	-12.93***	-1.80	2.83
	BIALYSTOK		
SORT 2	2.64	4.97	10.36***
SORT 3	7.19***	16.71***	21.87***
SORT 5	0.53	-1.94	16.32***

- Comparison between presenting one norm (either local or national) and experimental conditions that presented both local and national norms
- Highest WTP for sorting in treatments presenting two high norms
- Local norm is an extra motivator (WTP for sorting higher for both high norms than for national)
- Looking at two norms respondents adjust to the higher one (Providing national norm as a reference point is an additional motivator, independent of weather the national norm is higher or lower than the local norm)
- It might be a result of simple repetition on the screen, but it might be that respondents make comparison

SUMMARY & FURTHER RESEARCH

- **National norms** appeared to be **more effective** as motivators to sorting than local norms in all three cities (**no prominent proof** that a geographically closer reference group influences preferences more strongly than a national standard)
- It might be that in case of place of residents respondents include their **prior expectations towards the norm**. The national norm itself, at a 69% level, includes all regions of Poland that were not under the new waste sorting regulation, so it might be considered a high norm.
- the perceived norm amongst respondents could have been higher than the norm provided in local treatments
- research allowing to **elicit perceived norms amongst respondents priori to providing information** seems an important and interesting **further extension of the analysis**

FURTHER RESEARCH

Hypothesis 1:

Social norm information affects consumers' observed preferences for environmental goods. Preferences for environmental goods can be represented by willingness to pay for environmental goods.

Hypothesis 2:

Willingness to pay for environmental goods is increasing with social norm presented to consumers. Influence of social norm information depends on a difference between social norm presented to consumer and consumer's prior expectation about the norm.

Hypothesis 3:

Influence of high and low social norm information is asymmetric.

FURTHER RESEARCH

Hypothesis 4:

Influence of social norm information on consumers' preferences is heterogeneous.

Hypothesis 5:

Heterogeneous influence of social norm information on preferences can be explained by consumers' motivation types.

FURTHER RESEARCH

- show conditions under which social norm information should increase willingness to pay for environmental goods
- further use od DCE which allows to control for relevant variables and conditions:
  - consumer's priori belief about social norm,
  - perception of magnitude of consequences of own choices,
  - past environmental behavior,
  - follow-up question on potential motives of the respondents to contribute to environment protection.
  - Stated preference surveys always discuss the good or policy change being studied before the surveyor elicits willingness to pay estimates. Part of this discussion includes conveying relevant information about the consequences of individual choices and the predetermined good or policy, but may also present additional information.

THANK YOU FOR YOUR ATTENTION

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