

**Impact of varying local and
national social norm
information on respondents'
preferences for waste sorting
at household level**

Katarzyna Zagórska

University of Warsaw, Faculty of Economic Sciences

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**
- **Later research shows that although fees are effective in several societies, they may not work in others**
- **Changes in information can change preferences**
- **A price intervention may be efficiently replaced by a non-price, behavioral intervention**
- **Individuals' choices positively depend on a perception of what is commonly done in a local community**
- **Descriptive norm assures a standard from which they do not want to deviate**

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 have a powerful influence on behavior
- **Descriptive norm** – presents what is typically done in a social group, i.e. common actions actually performed; often expressed as quantity or frequency

RESEARCH ON AWARENESS RAISING PROGRAMS ABOUT SOCIAL NORMS

Literature review

| Reference | Research context | Program | Conclusion |
|--|---------------------|---|--|
| Nolan et al. 2008 | Energy conservation | normative message based on four reasons (environmental protection, benefits to society, saving money, descriptive norm) urging to conserve energy | information highlighting that majority of neighbors conserve energy , was followed by the greatest improvement in resident's conservative behavior |
| Allcott 2011; Ayres, Raseman et al. 2012 | Energy conservation | mailed peer feedback to residential utility consumers; each Home Energy Report contained a social comparison (last month neighborhood comparison: "last month you used 15% less electricity than your neighbors ") | the average household reduced energy consumption by 2 percent , which corresponds to a short-run price increase in the range of 11 to 20 percent |
| Ferraro, Miranda et al. 2011 | Water conservation | letters with normative, pro-social appeals, social comparison, technical advice | water use was significantly reduced in a treatment group that received letters with social comparison , while technical advice only negligibly affected the behavior |
| Schultz 1999 | Curbside recycling | descriptive norms | the frequency of participation and amount of reusable materials appeared to be positively correlated with individual and group normative feedback |
| Cialdini 2003 | Recycling | public service announcement – a mass media ad that communicates social norm: to present recycling as the most obvious and general social norm | the commercial message depicted a social norm of recycling; fear of being ostracized |

Social norm information is expected to influence respondents' choices.

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. The sign asked guests to respect nature, instructed them in steps to participate and presented fellow guests behavior (Goldstein, Cialdini et al. 2008)

- **Rates of reuse significantly higher amongst guests whose towel hanger card conveyed descriptive norm**
 - **The card informing that the vast majority of hotel guests (75 percent) reused towels yielded a 44 percent participation rate**

Social norm adherence depends on the extend of perceived similarity between a target individual and a group of people he refers to.

- **Reference groups: situational similarities & the relevant social group (i.e. connected by gender, citizenship, environmentalism)**
 - **Message about the behavior of guests who previously stayed in the same room yields the highest compliance rate of 49 percent**

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

EVIDENCE FROM POLAND

Literature review

Recycling in Poland (Czajkowski, Kądziela & Hanley, 2014)

- members of the municipality of **Podkowa Leśna**, a town in Warsaw agglomeration
- discrete choice experiment
- respondents prefer to sort waste at the household level (into higher number of categories) rather than at specialized sorting facilities
- **home sorting may be a source of utility**

DETERMINANTS OF SELF-SORTING

Literature review

costs-and-benefits calculation supports a decision to recycle at household level

- **direct – price paid for waste disposal**
 - **although fees are effective in several societies, they may not work in others (Kipperberg, 2007)**
- **indirect – inconvenience factors (space, effort, time)**
 - **space (multiple recycle bins instead of one with mixed-up rubbish)**
 - **time cost - the frequency of waste collection**
 - **disposal to landfills increases in the frequency of waste collection, for recyclabl materials consequences are reversed (Kuo & Perrings, 2010)**

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 Assisted Web Interview
 - introduction to the topic of a survey
 - warm-up questions about the current method for sorting waste at respondents' homes
 - key aspects of scenarios, **screen of the social norm**, preference elicitation on the possible methods of waste management
 - 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**
- **In 2014**

REGIONS SELECTION AND APPLICABLE SOCIAL NORMS

Research description

National norms

- **Low national norm**
In 2011, **10%** of all municipal waste collected from households in **Poland** was collected separately.
- **Medium national norm**
In 2012, **44%** of households in **Poland** stated that they sort waste regularly.
- **High national standard**
In 2012, **69%** of households in **Poland** declared that they sort waste.

Local norms

- **Low local norm**
In 2011, **15/11/6%** of all municipal waste collected from households in **Cracow/Warsaw/Bialystok** was collected separately.
- **High local norm**
In 2011, **72/65/58%** of households in **Cracow/Warsaw/Bialystok** declared that they sort waste.

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

Both norms

- **Low norms**
In 2011, **15/11/6%** of all municipal waste collected from households in **Cracow/Warsaw/Bialystok** was collected separately.
The average for **Poland** is **10%** .
- **High norms**
In 2011, **72/65/58%** of households in **Cracow/Warsaw/Bialystok** declared that they sort waste.
The average for Poland **69%** .

EXAMPLE OF CHOICE CARD

Research description

| Situation 1. | Option 1 | Option 2 | Option 3 | |
|---------------------------------|--------------------------|---------------------------|---------------------------|----------------------------------|
| Method of sorting in household | No sorting at source | Sorting into 5 categories | Sorting into 5 categories | Current method of waste disposal |
| Frequency of waste collection | Once a week | Once every 4 weeks | Once a week | |
| Monthly cost for your household | 25 PLN | 50 PLN | 75 PLN | |
| Your choice: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |

MODEL SPECIFICATION

Multinomial logit model

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

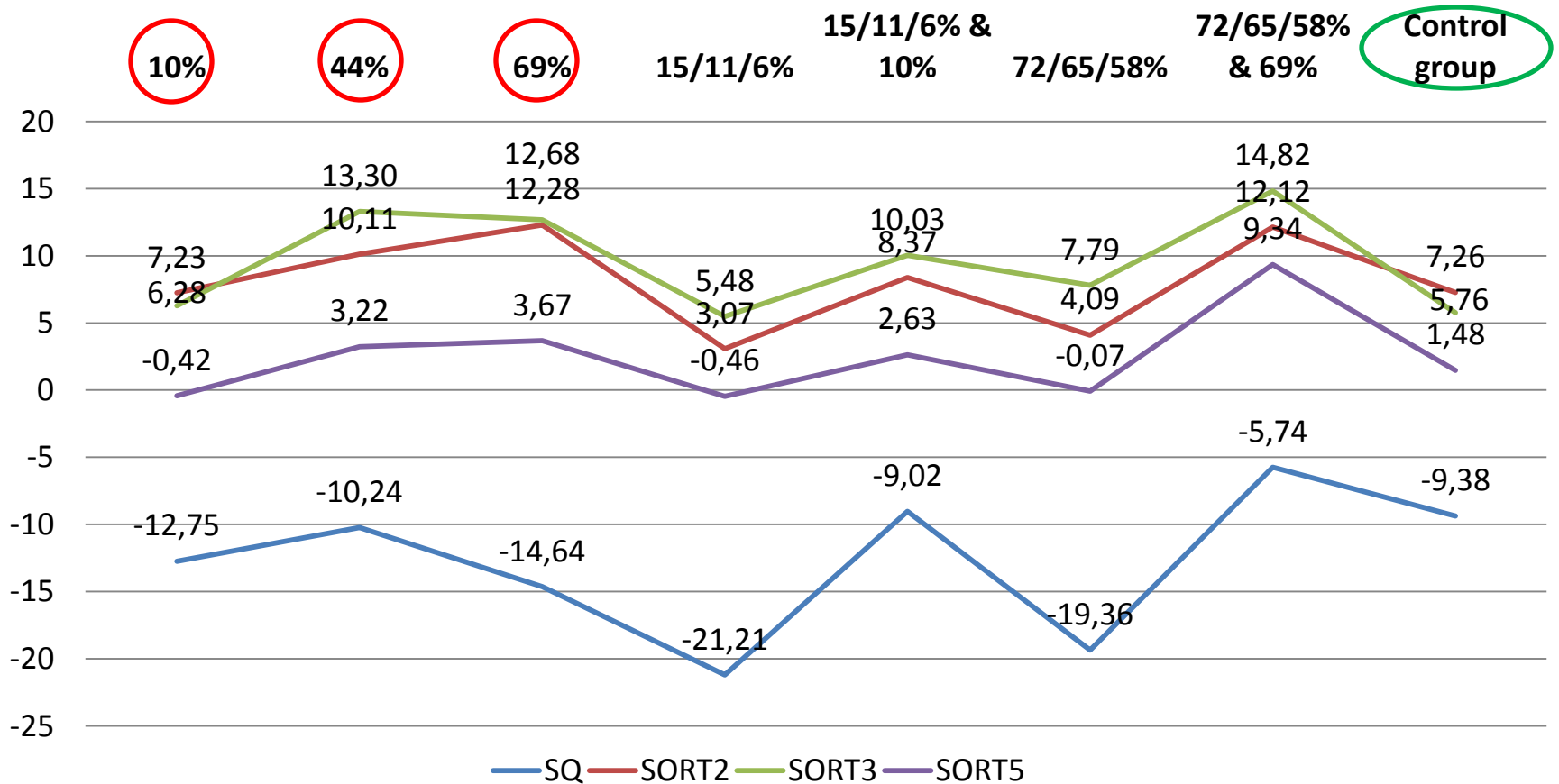
- **SQ** – a dummy for 'Current method of waste disposal';
- **SORT2, SORT3, SORT5** – dummies for the number waste categories (2, 3 or 5 categories, no sorting as a reference level);
- **TIME1, TIME2, TIME3, TIME7** – dummies for frequency of waste collection per week (1, 2, 3 or 7, 0.5 – once every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

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

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

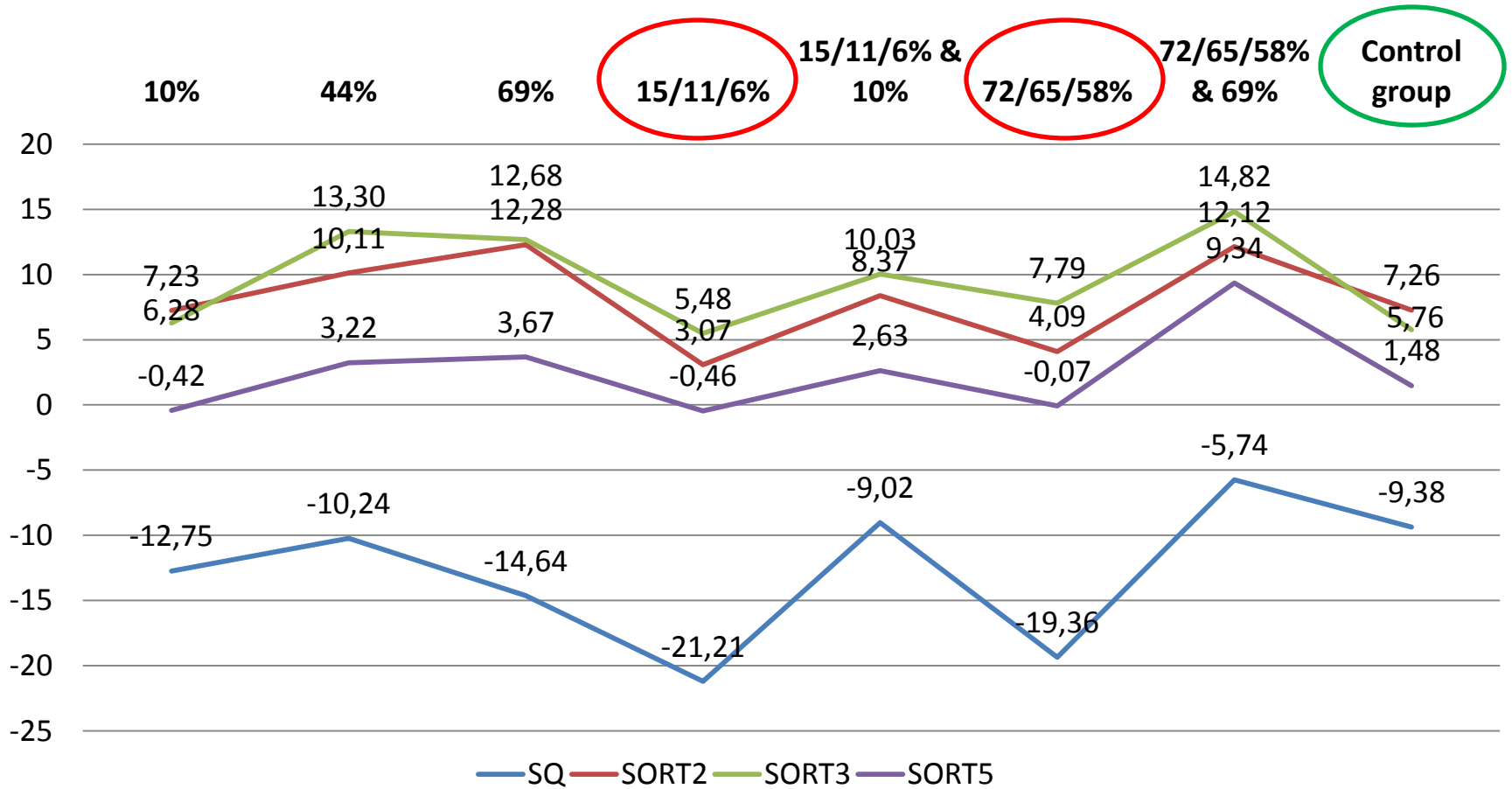
Group-specific results for the MNL model calculated jointly for Cracow, Warsaw and Bialystok

National norms

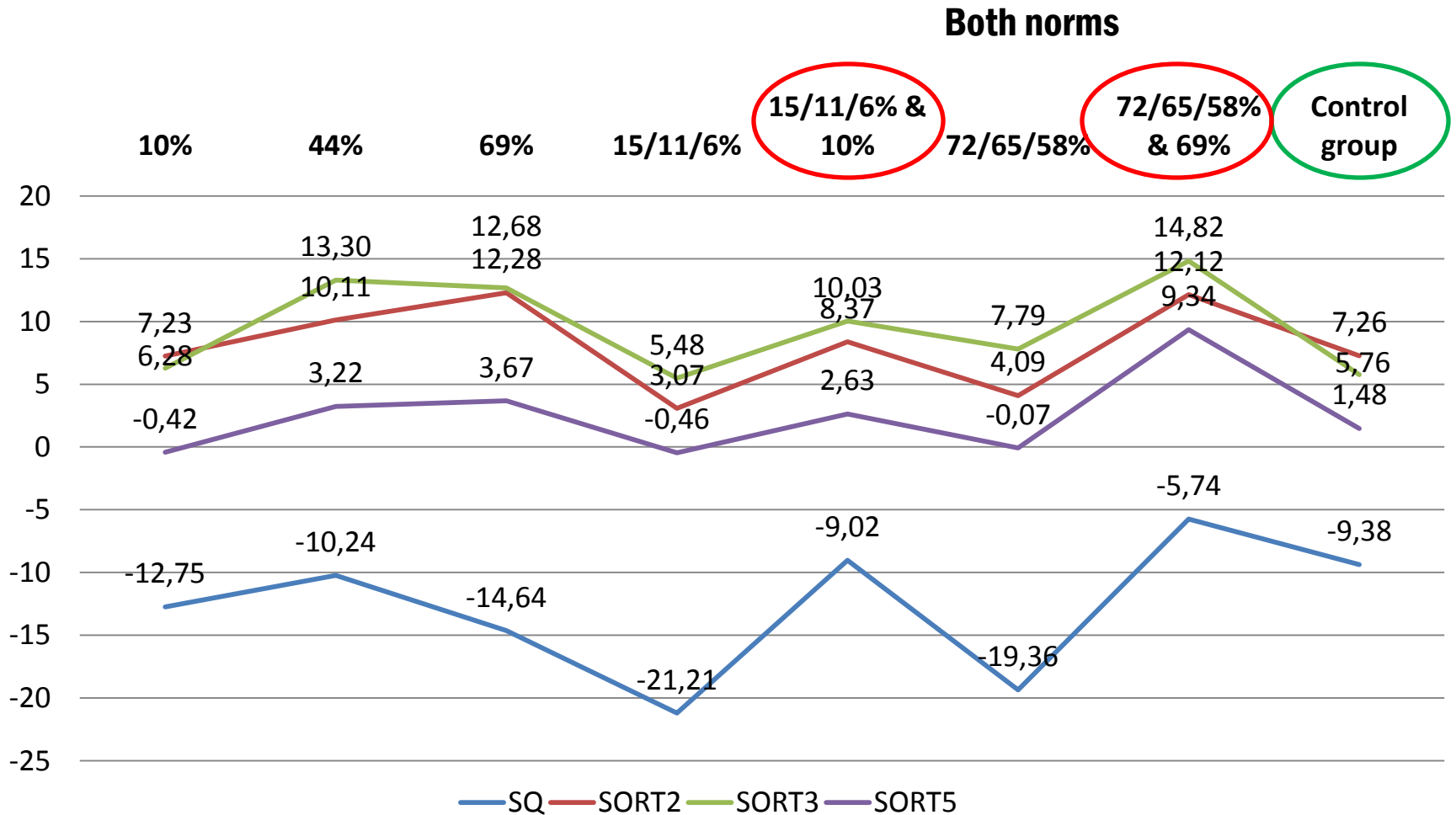


Group-specific results for the MNL model calculated jointly for Cracow, Warsaw and Bialystok

Local norms

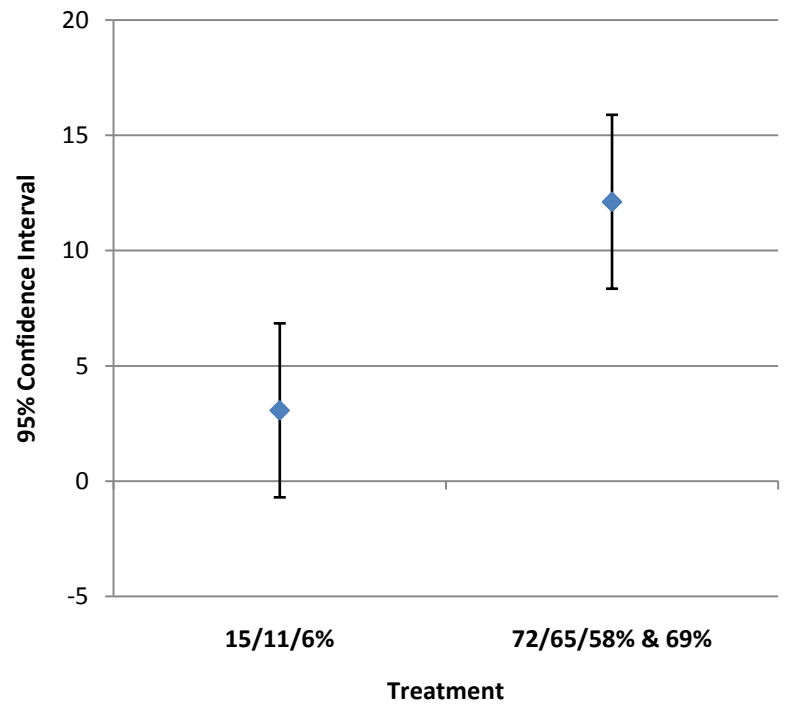


Group-specific results for the MNL model calculated jointly for Cracow, Warsaw and Bialystok

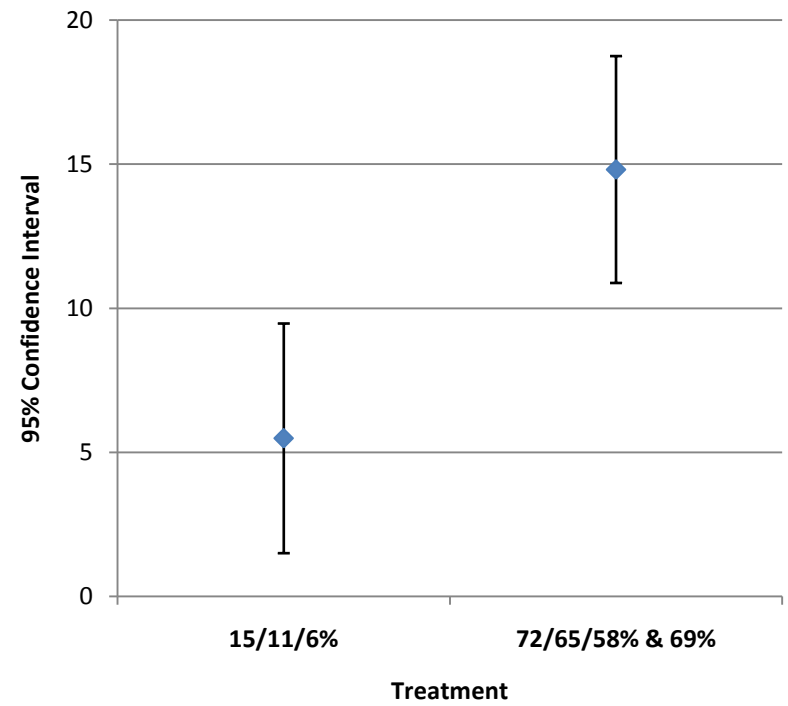


Mean WTP estimates with 95% Confidence Intervals

SORT 2



SORT 3

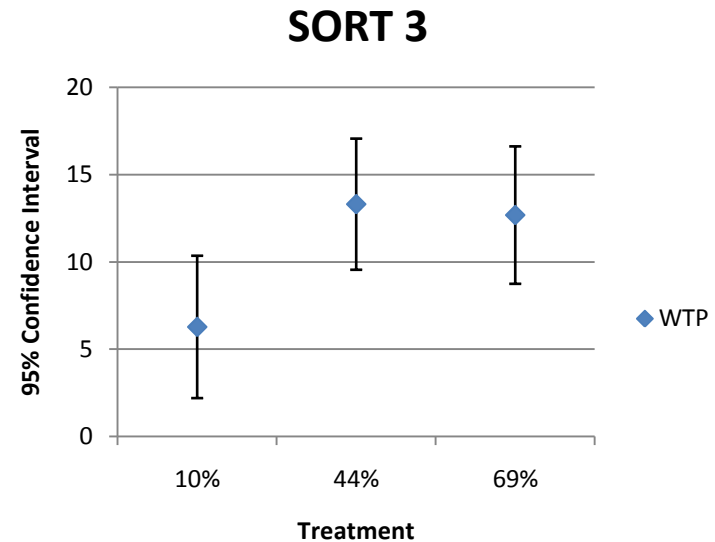
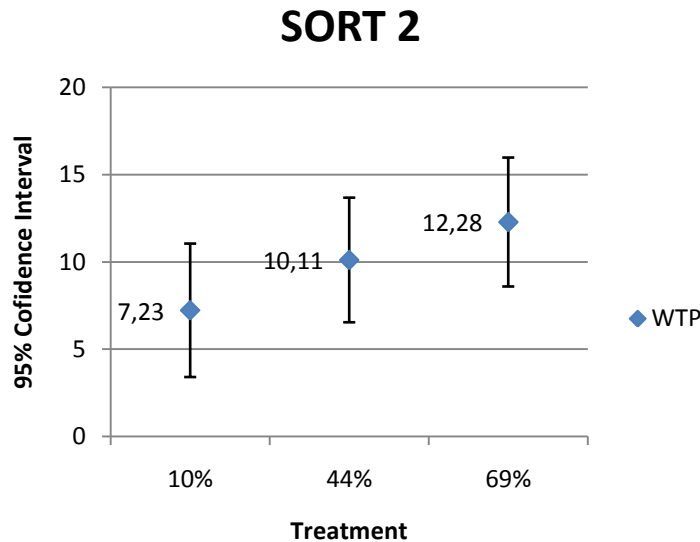


Wald Test

test jointly hypotheses on parameters SORT2, SORT3, SORT 5 in treatment with low national norma and treatment presenting high national norm
H0: differences between estimated parameters for SORT2, SORT3, SORT5 in these two treatments are statistically insignificant

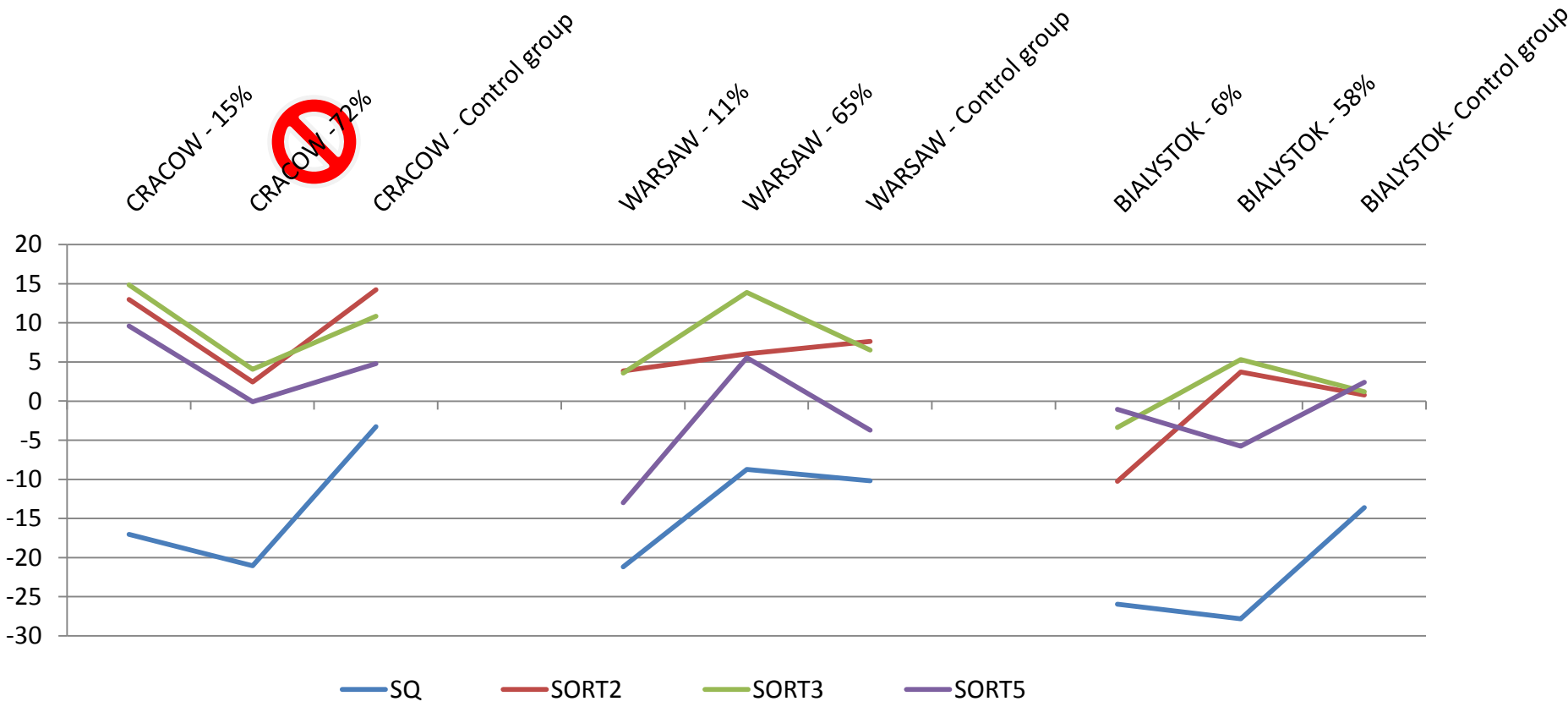
Wald Statistic = **10.57382**

P-value = **0.01427** → parametres differ significantly



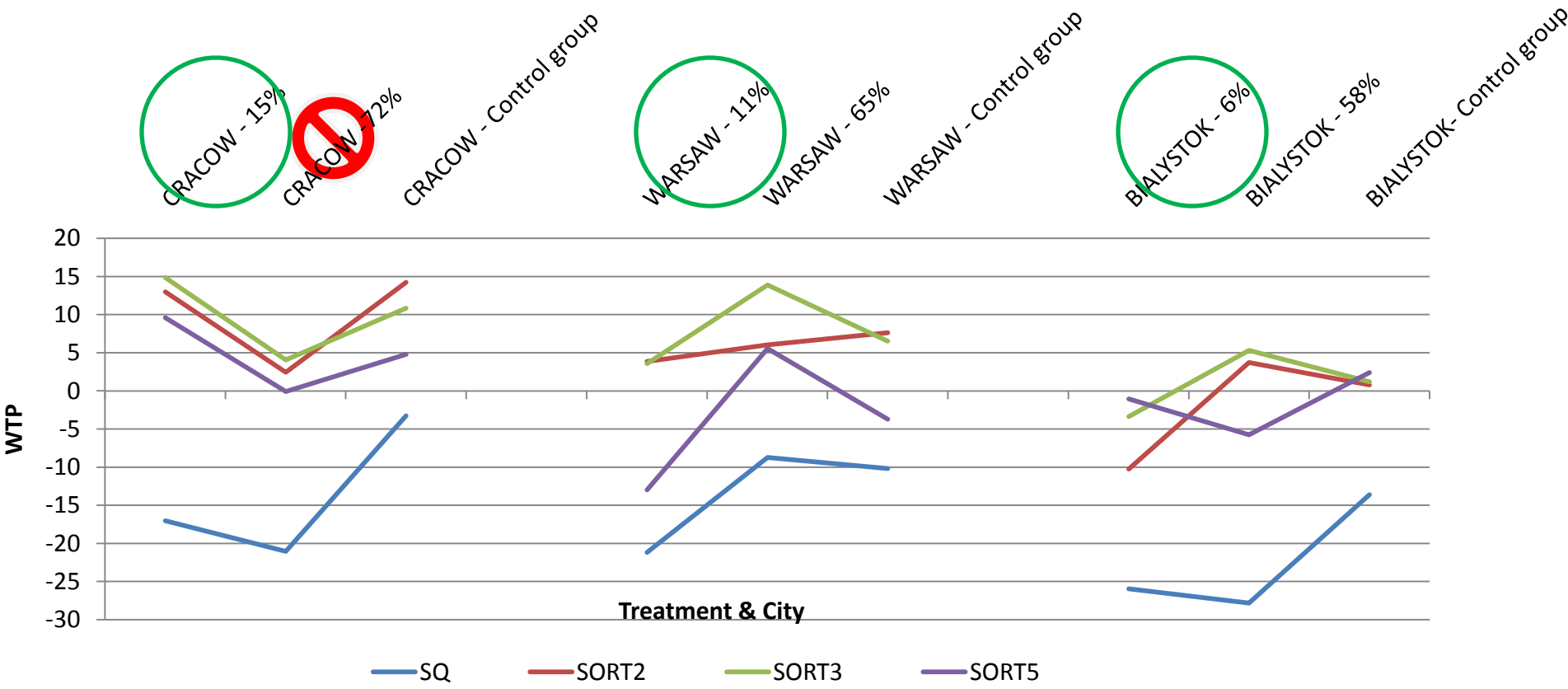
Local norm

The MNL results – group-specific for Cracow, Warsaw and Bialystok – T4, T6, T8



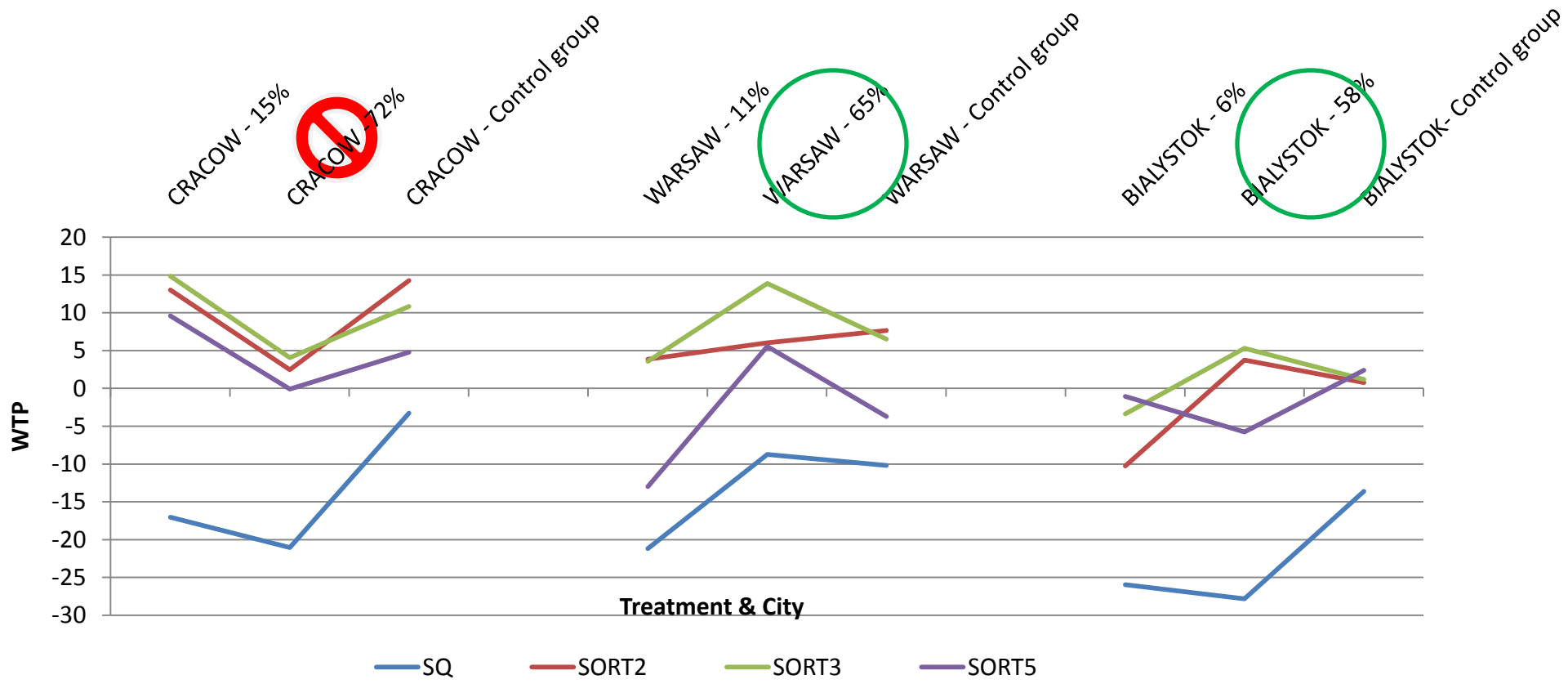
Local norm

The MNL results – group-specific for Cracow, Warsaw and Bialystok – T4, T6, T8



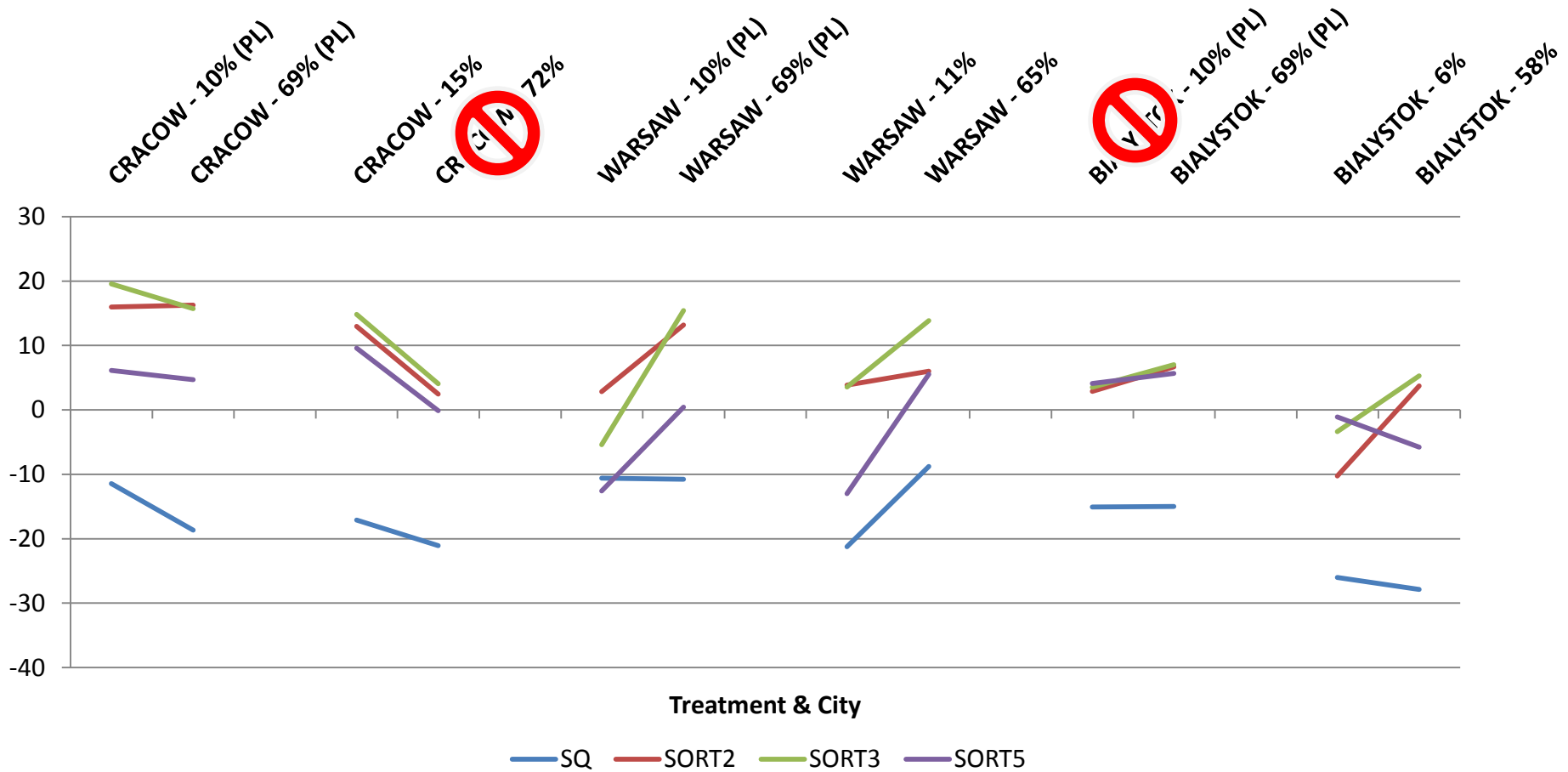
Local norm

The MNL results – group-specific for Cracow, Warsaw and Bialystok – T4, T6, T8



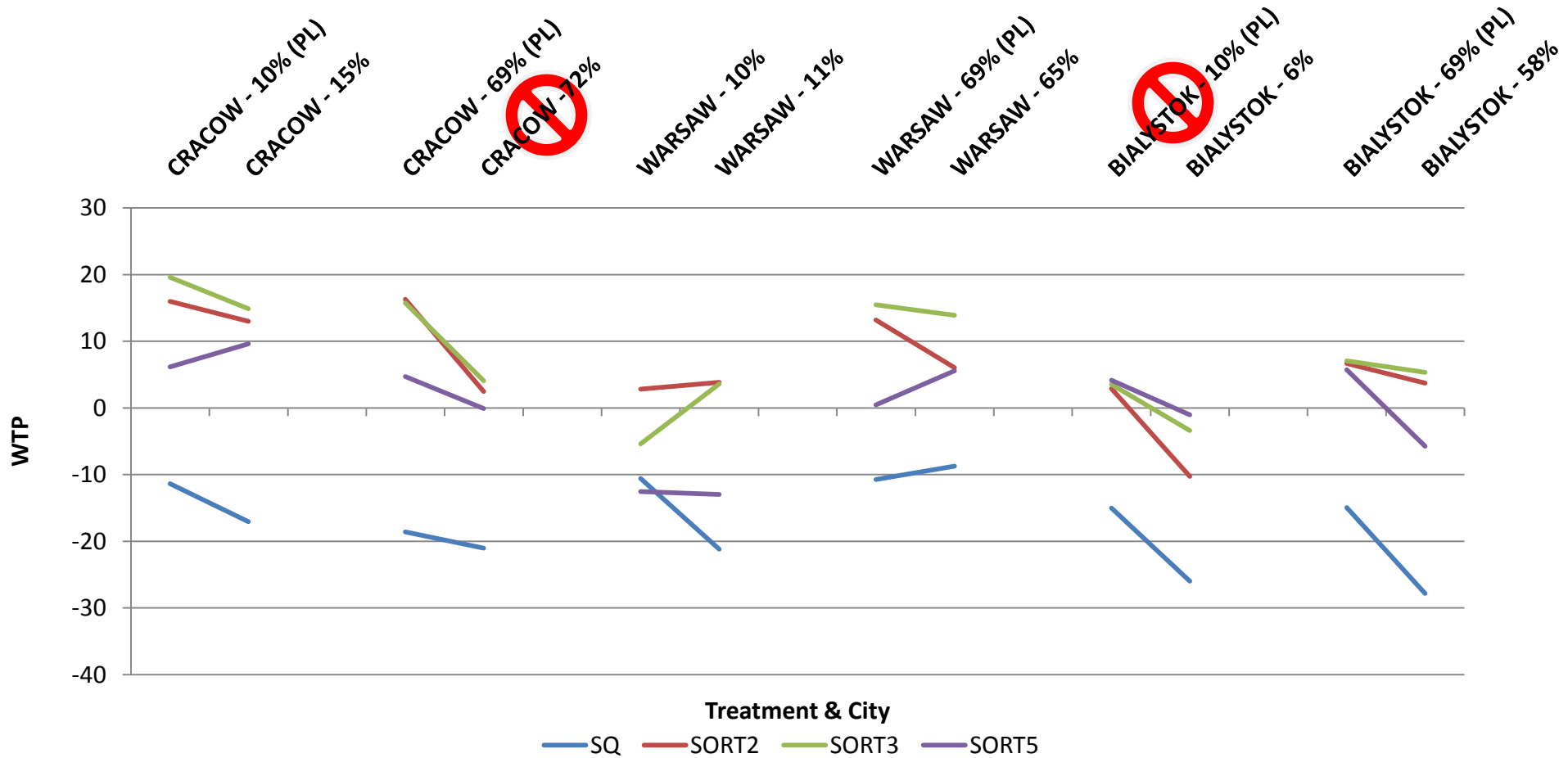
Local versus national norm

WTP for T1 versus T3, T4 versus T6



Local versus national norm

WTP for T1 versus T4, T3 versus T6



SUMMARY & CONCLUSIONS

- the paper investigated the effects of varying social norm information on recycling behavior
- the analysis adds to the literature on how non-price motives can affect consumer behavior
- **new element: the presence of varying local and national norm**
- **work in progress, preliminary results**
- a hypothesis that the descriptive norm information impacts individuals' choices is consistent with findings by Nolan et al. (2008), Allcott (2011), Ayres, Rasman and Shih (2009), Ferraro, Miranda and Price (2011)

SUMMARY & CONCLUSIONS

- **higher norm generally leads to higher willingness to sort and lower norm discourages from behaving proenvironmentally**
- **social norms to regulate behavior was proven to some degree on both national and local level**
- **respondents were expected to react more intensively to a change in a norm of their closer reference group than to a respective change in a national norm**
- **the results did not show a prominent proof that a geographically closer reference group influences consumer's recycling preferences more strongly than a national standard**

**THANK YOU FOR
YOUR ATTENTION**

Katarzyna Zagórska

University of Warsaw, Faculty of Economic Sciences

kzagorska@wne.uw.edu.pl