

**СЧАСТЬЕ
В
БОЛЬШОМ ГОРОДЕ**

Daniel Kahneman: Individual utility, traditionally thought by economists to be immeasurable and hence proxies by income, can be measured directly

Aristotle: politics should aim at producing eudaimonia or happiness

Richard Layard:
the great societies should be judged by the happiness of its people

Gross National Happiness - a commitment to building an economy that would serve Bhutan's culture based on Buddhist spiritual values instead of western material development gauged by gross domestic product /GDP/

Easterlin paradox: happiness at a national level does not increase with wealth once basic needs are fulfilled. once basic needs are met, policy should focus not on economic growth or GDP, but rather on increasing life satisfaction.



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Perm Workshop on Applied Economic Modeling

Residents' perception of the city: the interaction between city and life satisfaction

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Motivation and Purpose

- City managers need to become “residents’ – centric”, as residents retention and resource attraction becomes the major problems of Russia cities;
- City quality-of-life, which could be considered through the estimation of the residents’ satisfaction with the quality of different urban services, becomes an important performance indicator. Thus the issue of its effective measurement and monitoring becomes an urgent task.

We propose and apply an assessment method designed to measure city satisfaction in relation with the subjective perception of individual well-being. It is designed to provide local policy-makers with a more refined tool for decision making in urban policy.

- Overall satisfaction with a community can be decomposed into a variety of sub-domains, each of which contributes to their overall feelings about the community (Sirgy et al., 2000).
- Residents' satisfaction is largely determined by the variety of life domains, namely life satisfaction, happiness, job and income satisfaction (Diener et al., 1999; Cummins and Cahill, 2001; Kelly, 2003).
- City quality-of-life could be considered as the individual's subjective experience of dealing with different urban services (Diener and Suh, 1997; Kahneman and Kruger, 2006)
- Marketing perspective of residents satisfaction (Insch and Florek, 2008; Zenker et al., 2013)
- Subjective versus objective city quality-of-life approach (Tesfazghi, 2010; Obulicz – Kozaryn, 2013)

1. Linear Regression Model

$M1$

$$CitySat = \alpha_0 + \varepsilon +$$

$$\alpha_1 Cult + \alpha_2 Edu + \alpha_3 Env + \alpha_4 HC + \alpha_5 SocSec + \alpha_6 Saf + \alpha_7 Sport +$$

$M2 = M1 +$

$$\beta_1 LifeSat +$$

$M3 = M2 +$

$$\gamma_1 Happiness +$$

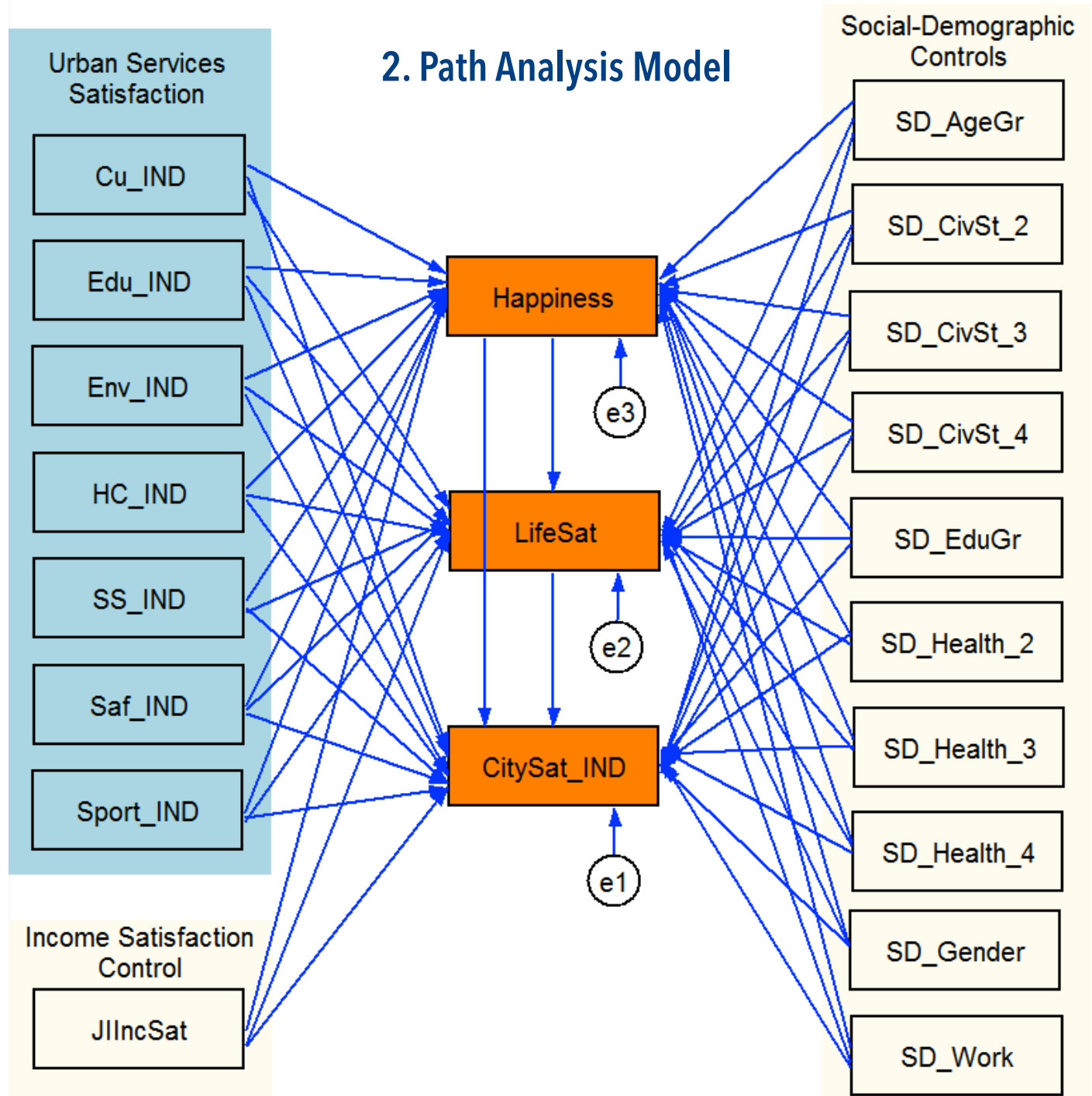
$M4 = M3 +$

$$\delta_1 IncSat + \delta_2 Age + \delta_3 CivStat + \delta_4 Edu + \delta_5 Health + \delta_6 Gender + \delta_7 Work$$

- Look for the effect of different urban services satisfaction on the overall city satisfaction
- From M1 to M4 include control variables to «purify» the effects
- Measure only direct effects

2. Path Analysis Model

Measure direct and indirect effects



- Door-to-door poll of more than 2000 inhabitants of Perm city (Russia). City population is around 1 million people.
- Sample is representative over
 - Gender
 - Age
 - City districts (7 areas)
- Questionnaire contained 35 composite questions covering satisfaction and attitude to different aspects of life in the city (i.e. education, safety, etc.) and overall city satisfaction, happiness and well-being.
- Survey (sponsored by local authorities) was conducted in August-September, 2012

12. Оцените Вашу удовлетворенность по шкале от 1 до 7 (где 1 – крайне неудовлетворительно, 7 – в высшей степени удовлетворительно) по следующим параметрам относительно г. Перми:

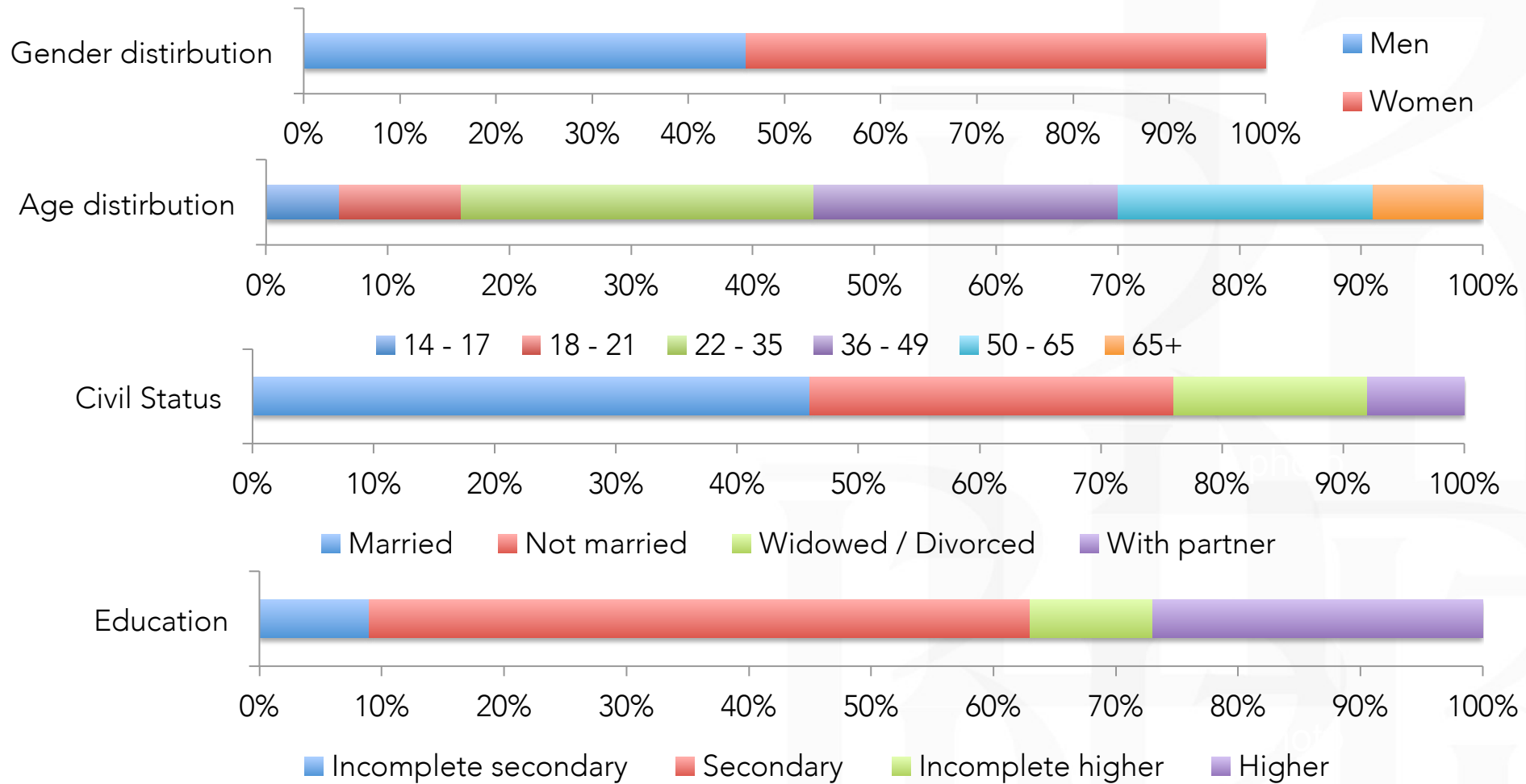
g12_1	Уровень обеспеченности детскими садами	1	2	3	4	5	6	7	3/0
g12_2	Качество и современность дошкольного воспитания и образования	1	2	3	4	5	6	7	3/0
g12_3	Уровень обеспеченности школьными образовательными учреждениями	1	2	3	4	5	6	7	3/0
g12_4	Качество и современность школьного образования	1	2	3	4	5	6	7	3/0
g12_5	Уровень обеспеченности качественным образованием после школы (высшее,	1	2	3	4	5	6	7	3/0
g12_6	Качество и современность высшего образования	1	2	3	4	5	6	7	3/0
g12_7	Уровень обеспеченности дополнительным образованием (повышение квалификации, курсы профессиональной переподготовки)	1	2	3	4	5	6	7	3/0
g12_8	Качество и современность дополнительного образования	1	2	3	4	5	6	7	3/0
g12_9	Уровень финансовой доступности школьного образования	1	2	3	4	5	6	7	3/0
g12_10	Уровень финансовой доступности высшего образования	1	2	3	4	5	6	7	3/0
g12_11	Уровень финансовой доступности дополнительного образования	1	2	3	4	5	6	7	3/0
g12_12	Возможность найти работу своей квалификации и с	1	2	3	4	5	6	7	3/0

Questionnaire Design

Section	Model Parameter	Number of statements (questions)
1	Culture (Cu_IND) section	7
2	Education (Edu_IND) section	11
3	Environment (Env_IND) section	7
4	Healthcare (HC_IND) section	5
5	Social security (SS_IND) section	6
6	Safety (Saf_IND) section	6
7	Sport (Sport_IND) section	6
8	Subjective Well-Being	
	Life Level Satisfaction	1
	Happiness	1
	Income Satisfaction	1
9	City Satisfaction	5

- Drop out observations with many (more than 2/3 in parcel) missings (controlled for systematic bias).
- Implemented parcel approach (Coffman, MacCallum, 2005) to convert different measures of a construct into one index.
- Imputed missings in parcels as a prediction on the basis of linear regression, where dependent variables include other questions from the same parcel and social-demographic variables.
- Generating parcel scores (indexes) as weighted sum of variables with equal weights.
- 1 636 questionnaires fully and correctly filled in were included into analysis.

Sample Description



Descriptive Statistics

Variable	Description	# of indicators	Type, Scale	# obs	Mean	S.d.	Min	Max
Personal happiness/satisfaction								
CitySat_IND	City satisfaction	5	Likert (1...7)	1636	5.1	1.4	1.0	7.0
LifeSat	Life satisfaction	1	Likert (1...7)	1636	3.9	1.3	1.0	7.0
Happiness	Happiness	1	Likert (1...7)	1636	5.6	1.5	1.0	7.0
JlIncSat	Income satisfaction	1	Likert (1...7)	1636	3.6	1.5	1.0	7.0
Urban services satisfaction indexes								
Cu_IND	Culture satisfaction index	7	Likert (1...7)	1636	5.0	1.1	1.0	7.0
Edu_IND	Education satisfaction index	11	Likert (1...7)	1636	4.3	1.0	1.0	7.0
Env_IND	Environment satisfaction index	7	Likert (1...7)	1636	3.6	1.0	1.0	6.9
HC_IND	Health care satisfaction index	5	Likert (1...7)	1636	3.5	1.2	0.9	7.0
SS_IND	Social security satisfaction index	6	Likert (1...7)	1636	3.5	0.9	1.0	6.5
Saf_IND	Safety satisfaction index	6	Likert (1...7)	1636	4.0	1.1	1.0	7.0
Sport_IND	Sport satisfaction index	6	Likert (1...7)	1636	3.4	1.1	0.8	5.8

Data Description - 2

Variable	Description	# of indicators	Type, Scale	# obs	Mean	S.d.	Min	Max
<i>Social-demographic characteristics</i>								
SD_AgeGr	Age group	-	Ordered (6 groups)	1781	3.7	1.3	1.0	6.0
SD_AgeGr_1	14-17 years	-	Dummy	1781	0.1	0.2	0.0	1.0
SD_AgeGr_2	18-21 years	-	Dummy	1781	0.1	0.3	0.0	1.0
SD_AgeGr_3	22-35 years	-	Dummy	1781	0.3	0.5	0.0	1.0
SD_AgeGr_4	36-49 years	-	Dummy	1781	0.3	0.4	0.0	1.0
SD_AgeGr_5	50-65 years	-	Dummy	1781	0.2	0.4	0.0	1.0
SD_AgeGr_6	65+ years	-	Dummy	1781	0.1	0.3	0.0	1.0
SD_CivSt	Civil status	-	Categorical (4 groups)	1738	1.9	1.0	1.0	4.0
SD_CivSt_1	Married	-	Dummy	1738	0.5	0.5	0.0	1.0
SD_CivSt_2	Not married	-	Dummy	1738	0.3	0.5	0.0	1.0
SD_CivSt_3	Widowed/Divorced	-	Dummy	1738	0.2	0.4	0.0	1.0
SD_CivSt_4	With partner	-	Dummy	1738	0.1	0.3	0.0	1.0

Data Description - 3

Variable	Description	# of indicators	Type, Scale	# obs	Mean	S.d.	Min	Max
<i>Social-demographic characteristics</i>								
SD_EduGr	Education group	-	Ordered (5 groups)	1765	3.3	1.3	1.0	5.0
SD_EduGr_1	Incomplete second. edu	-	Dummy	1765	0.1	0.3	0.0	1.0
SD_EduGr_2	Second. edu	-	Dummy	1765	0.2	0.4	0.0	1.0
SD_EduGr_3	Second. prof. edu	-	Dummy	1765	0.3	0.5	0.0	1.0
SD_EduGr_4	Incomplete higher edu	-	Dummy	1765	0.1	0.3	0.0	1.0
SD_EduGr_5	Higher edu	-	Dummy	1765	0.3	0.4	0.0	1.0
SD_Health	Health group	-	Ordered (4 groups)	1751	1.7	0.9	1.0	4.0
SD_Health_1	No restrictions	-	Dummy	1751	0.5	0.5	0.0	1.0
SD_Health_2	Few restrictions	-	Dummy	1751	0.3	0.4	0.0	1.0
SD_Health_3	Signif. restrictions	-	Dummy	1751	0.1	0.3	0.0	1.0
SD_Health_4	Strong restrictions	-	Dummy	1751	0.1	0.2	0.0	1.0
SD_Gender	Gender	-	Dummy	1781	0.5	0.5	0.0	1.0
SD_Work	Working status	-	Dummy	1781	0.6	0.5	0.0	1.0

Linear Regression Models – OLS Estimation (we report B - standardized β)

Factors	Model1	Model2	Model3	Model4
<i>Personal happiness/satisfaction</i>				
LifeSat		0.12*** (0.03)	0.02 (0.03)	0.05 (0.03)
Happ			0.24*** (0.02)	0.27*** (0.02)
JlIncSat				0.05** (0.03)
<i>Urban services satisfaction indexes</i>				
Cu_IND	0.17*** (0.04)	0.17*** (0.04)	0.13*** (0.03)	0.10*** (0.03)
Edu_IND	0.16*** (0.04)	0.15*** (0.04)	0.14*** (0.04)	0.11*** (0.04)
Env_IND	-0.02 (0.04)	-0.02 (0.04)	0.01 (0.04)	0.00 (0.04)
HC_IND	0.13*** (0.04)	0.10*** (0.04)	0.08** (0.03)	0.10*** (0.03)
SS_IND	-0.04 (0.05)	-0.07 (0.05)	-0.03 (0.04)	-0.02 (0.04)
Saf_IND	0.22*** (0.04)	0.21*** (0.04)	0.20*** (0.04)	0.16*** (0.04)
Sport_IND	0.05 (0.04)	0.04 (0.04)	0.02 (0.04)	0.07** (0.03)

**Linear Regression
Models - OLS
Estimation
(continuation)**

Factors	Model1	Model2	Model3	Model4
<i>Social-demographic characteristics</i>				
SD_AgeGr				0.27*** (0.03)
SD_CivSt_2				-0.04 (0.08)
SD_CivSt_3				-0.05 (0.09)
SD_CivSt_4				0.12 (0.12)
SD_EduGr				-0.21*** (0.02)
SD_Health_2				-0.03 (0.07)
SD_Health_3				0.12 (0.10)
SD_Health_4				-0.01 (0.13)
SD_Gender				-0.01 (0.06)
SD_Work				-0.15** (0.07)
_cons	2.24*** (0.20)	2.12*** (0.20)	1.35*** (0.21)	0.86*** (0.27)
Number of obs	1636	1636	1636	1636
R-square	0.15	0.15	0.21	0.28

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Path Analysis Model. DIRECT EFFECTS - ML Estimation (we report B - standardized β)

Factors	CitySat_IND	LifeSat	Happiness
<i>Personal happiness/satisfaction</i>			
LifeSat	0.05 (0.03)		
Happiness	0.27*** (0.02)	0.19*** (0.02)	
JlIncSat	0.05** (0.03)	0.42*** (0.02)	0.17*** (0.03)
<i>Urban services satisfaction indexes</i>			
Cu_IND	0.10*** (0.03)	0.05** (0.03)	0.19*** (0.04)
Edu_IND	0.11*** (0.04)	0.00 (0.03)	0.07 (0.04)
Env_IND	0.00 (0.04)	0.04 (0.03)	-0.09** (0.04)
HC_IND	0.10*** (0.03)	0.07*** (0.03)	0.08** (0.04)
SS_IND	-0.02 (0.04)	0.17*** (0.03)	-0.10** (0.05)
Saf_IND	0.16*** (0.04)	0.04 (0.03)	0.10** (0.04)
Sport_IND	0.07** (0.03)	0.01 (0.03)	0.06 (0.04)

Factors	CitySat_IND	LifeSat	Happiness
<i>Social-demographic characteristics</i>			
SD_AgeGr	0.27*** (0.03)	-0.05* (0.02)	-0.18*** (0.04)
SD_CivSt_2	-0.04 (0.08)	0.09 (0.06)	-0.41*** (0.09)
SD_CivSt_3	-0.05 (0.09)	-0.12* (0.07)	-0.32*** (0.10)
SD_CivSt_4	0.12 (0.12)	-0.08 (0.09)	-0.20 (0.13)
SD_EduGr	-0.21*** (0.02)	0.05** (0.02)	0.04 (0.03)
SD_Health_2	-0.03 (0.07)	-0.05 (0.06)	-0.32*** (0.08)
SD_Health_3	0.12 (0.10)	-0.23*** (0.08)	-0.31*** (0.11)
SD_Health_4	-0.01 (0.13)	-0.15 (0.10)	-0.32** (0.15)
SD_Gender	-0.01 (0.06)	-0.02 (0.05)	-0.03 (0.07)
SD_Work	-0.15** (0.07)	-0.07 (0.05)	-0.21*** (0.08)
Number of obs	1636	1636	1636
R-squared	0.29	0.52	0.16

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

**Path Analysis
Model. DIRECT
EFFECTS - ML
Estimation
(continuation)**

Path Analysis Model. CitySat equation – ML Estimation (we report B - standardized β)

Factors	DIRECT	INDIRECT	TOTAL
<i>Personal happiness/satisfaction</i>			
LifeSat	0.05 (0.03)	(no path)	0.05 (0.03)
Happiness	0.27*** (0.02)	0.01*** (0.00)	0.28*** (0.02)
JlIncSat	0.05** (0.03)	0.07*** (0.02)	0.12*** (0.02)
<i>Urban services satisfaction indexes</i>			
Cu_IND	0.10*** (0.03)	0.05*** (0.01)	0.16*** (0.04)
Edu_IND	0.11*** (0.04)	0.02 (0.01)	0.13*** (0.04)
Env_IND	0.00 (0.04)	-0.02* (0.01)	-0.03 (0.04)
HC_IND	0.10*** (0.03)	0.03** (0.01)	0.12*** (0.03)
SS_IND	-0.02 (0.04)	-0.02 (0.01)	-0.04 (0.04)
Saf_IND	0.16*** (0.04)	0.03** (0.01)	0.19*** (0.04)
Sport_IND	0.07** (0.03)	0.02 (0.01)	0.08** (0.04)

**Path Analysis
Model. CitySat
equation - ML
Estimation

(continuation)**

Factors	DIRECT	INDIRECT	TOTAL
<i>Social-demographic characteristics</i>			
SD_AgeGr	0.27*** (0.03)	-0.05*** (0.01)	0.21*** (0.03)
SD_CivSt_2	-0.04 (0.08)	-0.11*** (0.03)	-0.15* (0.09)
SD_CivSt_3	-0.05 (0.09)	-0.10*** (0.03)	-0.14 (0.10)
SD_CivSt_4	0.12 (0.12)	-0.06 (0.04)	0.06 (0.12)
SD_EduGr	-0.21*** (0.02)	0.01* (0.01)	-0.19*** (0.03)
SD_Health_2	-0.03 (0.07)	-0.09*** (0.02)	-0.12 (0.08)
SD_Health_3	0.12 (0.10)	-0.10*** (0.03)	0.02 (0.10)
SD_Health_4	-0.01 (0.13)	-0.10** (0.04)	-0.10 (0.14)
SD_Gender	-0.01 (0.06)	-0.01 (0.02)	-0.02 (0.07)
SD_Work	-0.15** (0.07)	-0.06*** (0.02)	-0.21*** (0.07)
Number of obs	1636		
R-squared	0.29		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Subjective Well-Being and City Satisfaction: Causality Identification

- We suppose simultaneity between Happiness, LifeSat and CitySat (e.g. increasing the satisfaction with the city makes inhabitants feel happier)
- We suggest instrumental variable strategy to manage this issue
- Find instruments
 - Valid – not correlated with error term in the equation for CitySat
 - Relevant – correlated with endogenous variables (Happiness and LifeSat)
- Socio-demographic characteristics Health and Civil (marital) Status are the candidates
- Use general method of moments estimation
 - Test for validity and relevance
 - Test for weak instruments
 - Hausman specification test

OLS v.s. IV results

Factors	OLS	IV
<i>Personal happiness/satisfaction</i>		
LifSat	0.05 (0.03)	-0.39 (0.35)
Happ	0.27*** (0.02)	0.46** (0.18)
JllncSat	0.05** (0.03)	0.22 (0.14)
<i>City attributes indexes</i>		
Cu_IND	0.11*** (0.03)	0.11** (0.05)
Edu_IND	0.11*** (0.04)	0.10** (0.04)
Env_IND	0.00 (0.04)	0.02 (0.05)
HC_IND	0.10*** (0.03)	0.12*** (0.04)
SS_IND	-0.02 (0.04)	0.07 (0.08)
Saf_IND	0.16*** (0.04)	0.17*** (0.04)
Sport_IND	0.07** (0.03)	0.07* (0.04)

Hausman test:

Ho: difference in coefficients is not systematic

$$\chi^2(14) = 3.16$$

$$\text{Prob} > \chi^2 = 0.9988$$



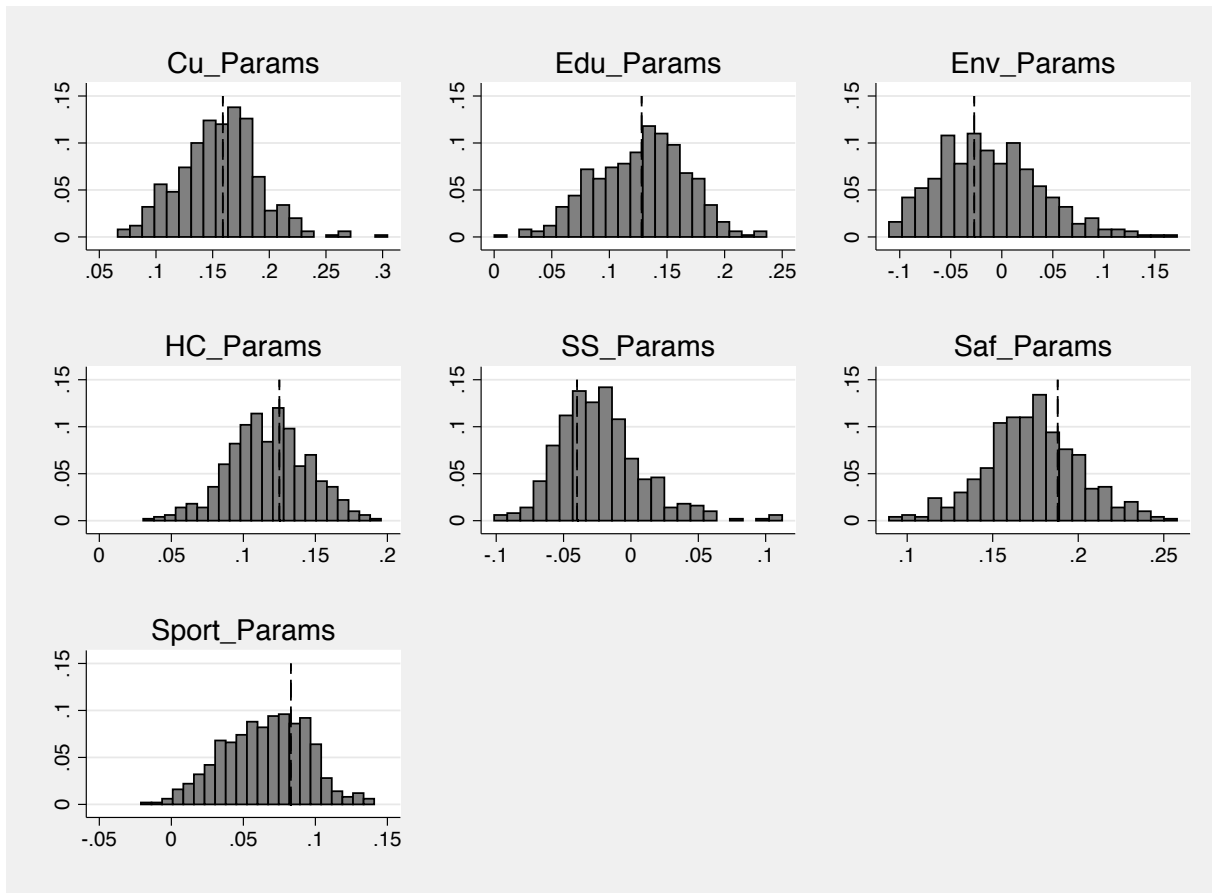
Can use more efficient OLS (path model ML estimates)

Parcel weighting – robustness check procedure

To track the subjective weights choice problem in the model we conducted the robustness check:

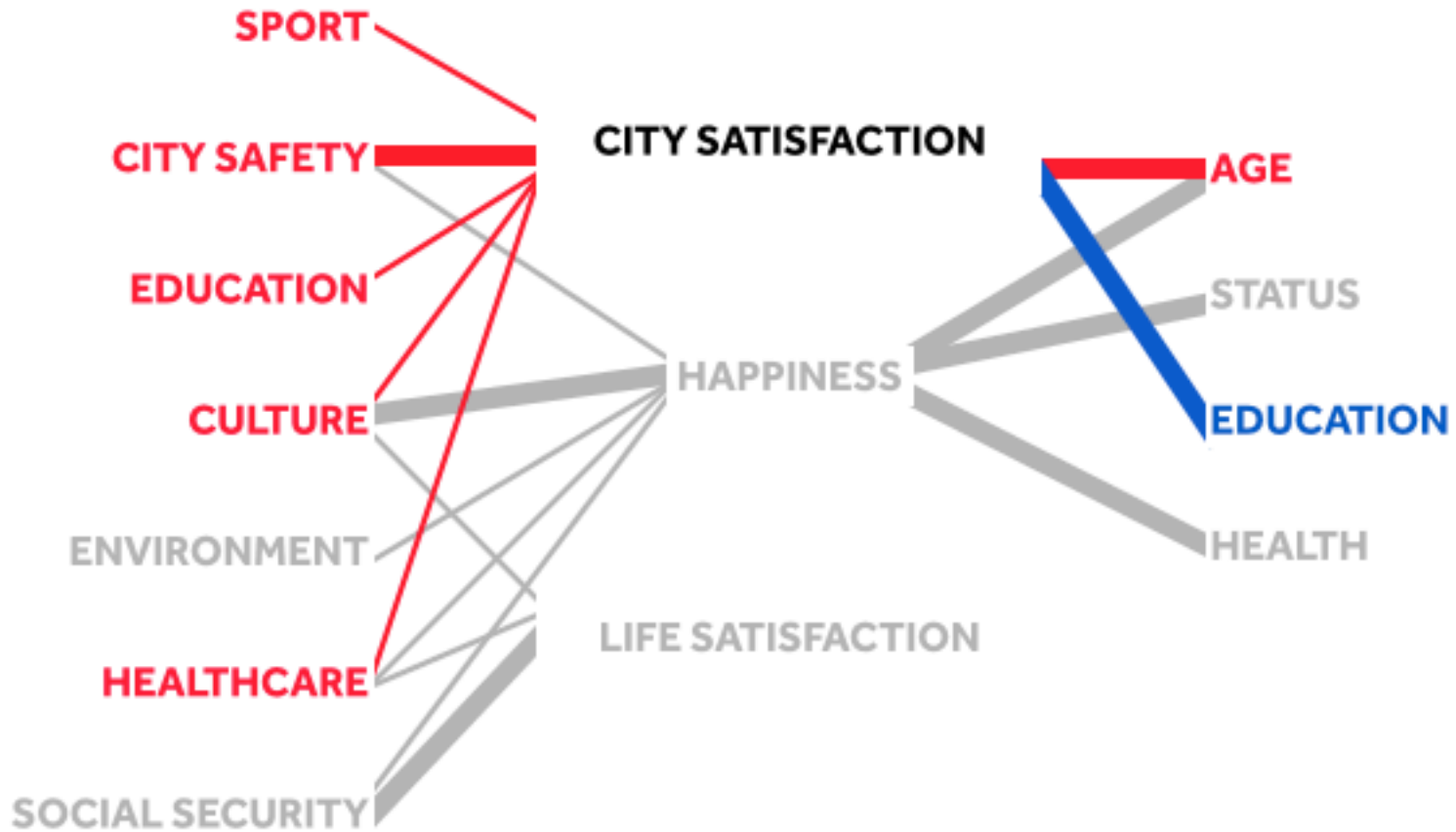
1. 500 times repeat the procedure:
 - for each indicator in each parcel take random independent draws from standard uniform distribution;
 - normalize this draws in each parcel to make their sum be equal to unity;
 - calculate new set of eight index variables with this weights;
 - estimate path model and stored total effects;
2. construct empirical distribution of this estimates.

Parcel weighting - robustness check results

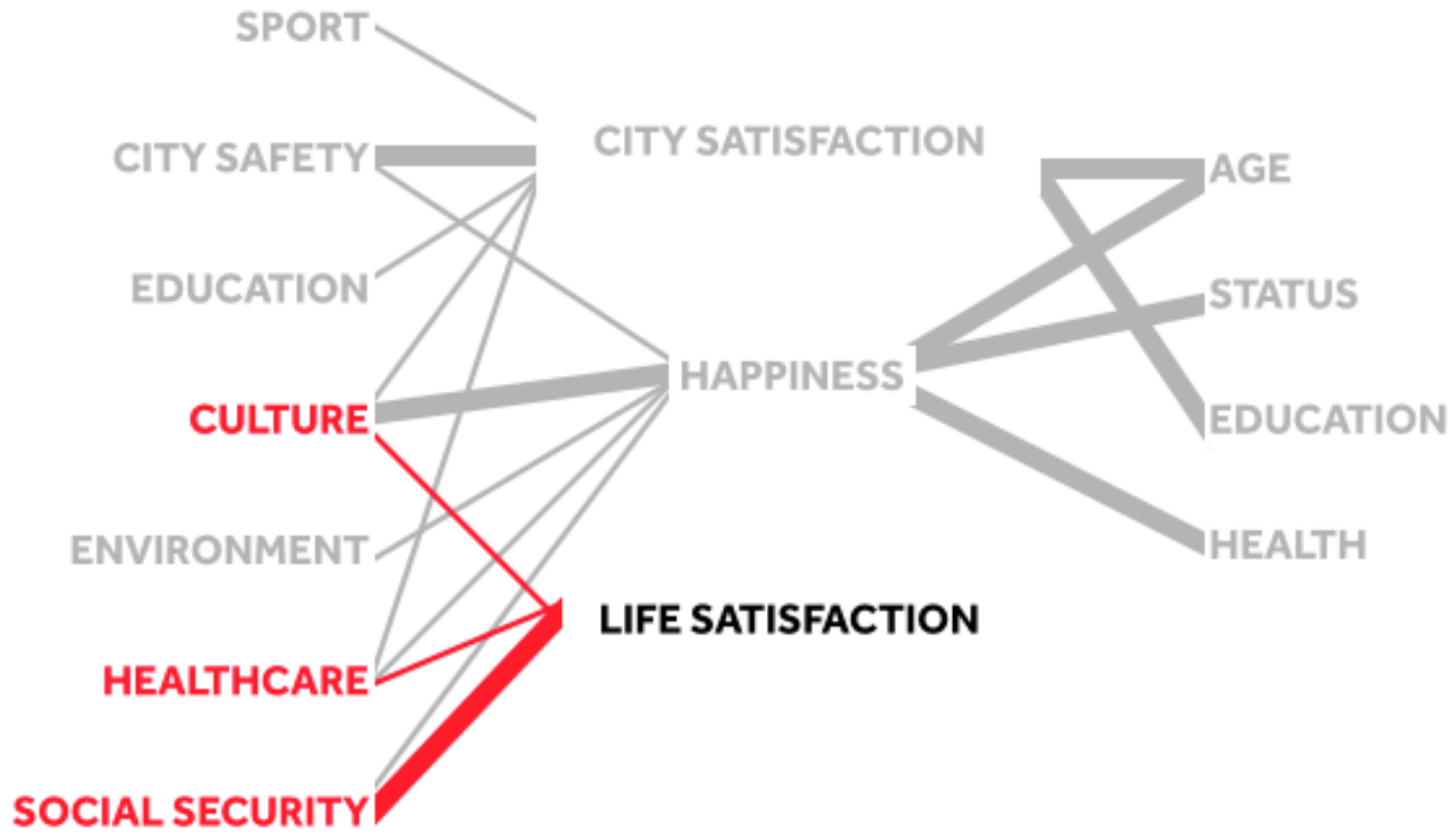


- Significant parameters keep appropriate sign in almost all 500 model replicas
- Parameters distributions are unimodal with quite narrow support

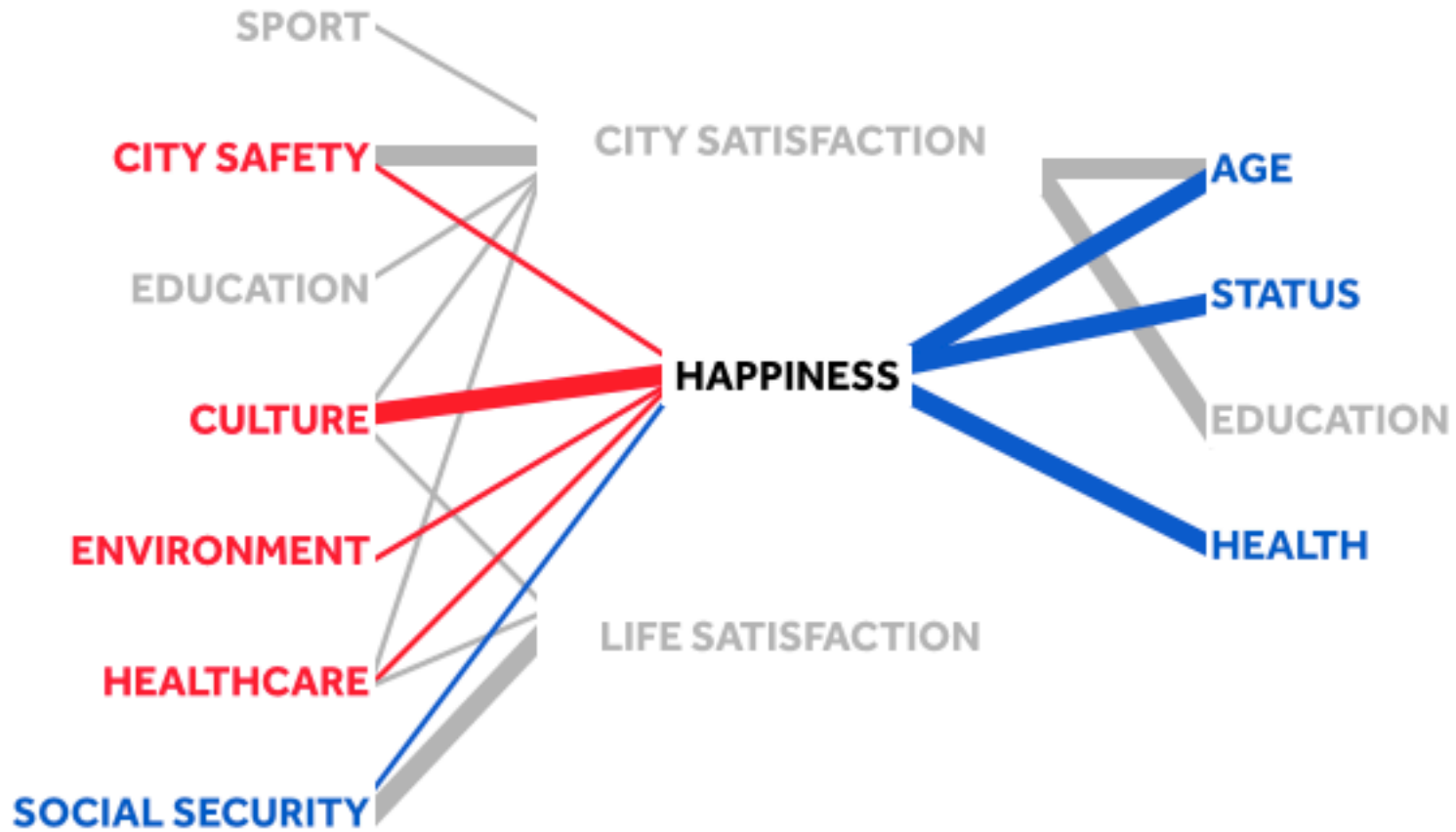
Visualization of the Results



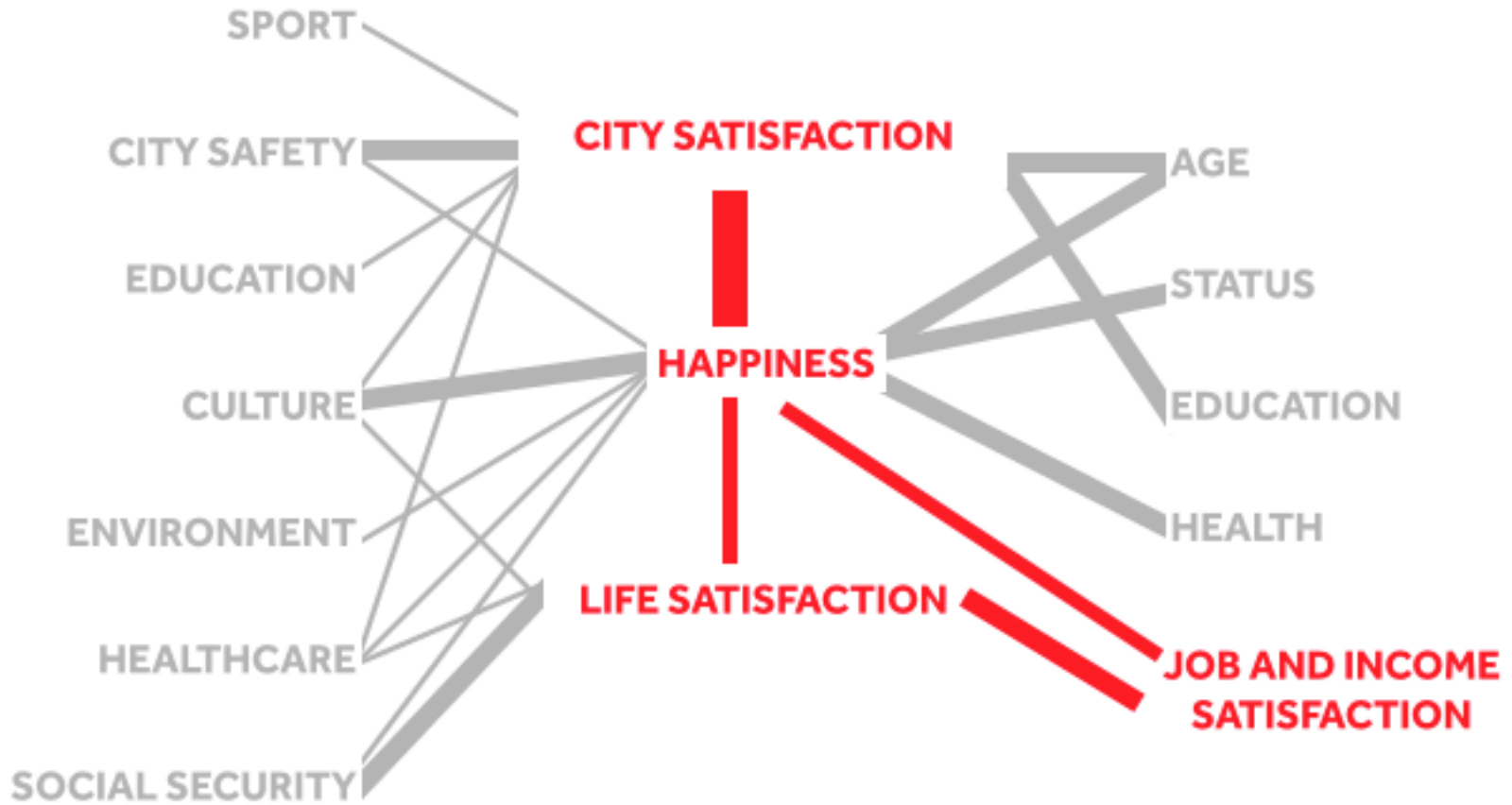
Visualization of the Results



Visualization of the Results



Visualization of the Results



Basic results

1. Considering that subjective well-being influence upon city satisfaction helps to increase substantially the accuracy of the tool, which we use to measure city satisfaction (adjusted R-square grows from 0.15 to 0.28).
2. Priorities of city management could be clearly defined (as health care has the lowest satisfaction estimation (3.5) and significantly influences city satisfaction, one could develop the health-care focused city policy, which could meet residents' needs and increase city satisfaction).
3. City satisfaction has both structural and cumulative 'nature'.
4. Path Analysis Model is more appropriate to identify influence of urban services on overall city satisfaction than Linear Regression Model, because we observe significant indirect effects.
5. There is an influence of Happiness on City Satisfaction but not vice versa.
6. Perm residents are happy people 😊

Limitations

- One city – one case
- Only urban services managed by local administration are taken into account
- Parcel approach

Further research

- Carry out group analysis (split sample on the basis of observed social-demographic variables and estimate the model for this groups)
- Identify homogeneous clusters and estimate the model for this clusters



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Thank you for your attention!

Questions and comments are welcome!