The valuation of benefits from health risk reduction in three-generation households – the role of reciprocity.

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Objective

- Investigate people's preference for family resource allocation on health in thee-generation families,

- Examine whether reciprocity attitudes influence preferences and willingness to pay (WTP) for lifetime health risk reduction.

Background

- Empirical findings from non-market valuation suggest that adults value the improvement in their children's health more than their own,
- Often explained by altruism,
- But what it there are hiden motivations? For example, expecting some sort of repay in future.

Method

- Choice experiment (CE) valuation survey
- 500 respondents
- Middle generation members of three-generation households from Poland
- Elicit preferences for the lifetime risk reduction of coronary artery disease (CAD)
- Eisenberger scale used to elicit one's positive reciprocity attitudes
- Hybrid mixed logit model

I care, therefore I am selfless?

There is a possibility that care-giving decisions are made at least partially for the sake of decision maker (Bartlett et al. 2012).

From early infancy onwards, humans are motivated to engage reciprocally during dyadic interactions (Apicella et al. 2013)

Homo Reciprocans (Bowles et al. 1997)

- Our main objective is to examine whether reciprocity attitudes influence parental preferences and willingness to pay (WTP) for the lifetime health risk reduction for family members.
- To the best of our knowledge this is the first non-market valuation study that focus on the impact of reciprocity attitudes on health benefits estimations among the family members.
- Eisenberger et al. (2004) 10-item scale for positive reciprocity norms

Study

- Developed and tested using in-depth interviews
- Main survey took place in January 2018
- 500 face-to-face interviews conducted by a professional pooling agancy
- Computer-assisted personal interviewing (CAPI)
- Respondents: parents, at least one biological child aged 3 to 15 years, living in the same household. Additionally one elderly parent younger than 80 years old in the same household
- For respondents with 2 or more eligible childern one child was randomly selected and designated to be the sample child.
- We ensure that none of the individual family members had been previously diagnosed with the CAD

Reciprocity norm scale

4-point Likert type scale

We denote individual *i* answer to the *n*'th item on the 4-point Likert scale by I_i^n. We then assume that there exist unobserved variable $\tilde{I}_i^n$ such that

$$\tilde{I}_i^n = \lambda_n LV_i + \eta_i^n$$

and

$$\begin{cases} I_i^n = 1 & \text{if} \quad \tilde{I}_i^n \le \gamma_1^n \\ I_i^n = 2 & \text{if} \quad \gamma_1^n \le \tilde{I}_i^n \le \gamma_2^n \\ I_i^n = 3 & \text{if} \quad \gamma_2^n \le \tilde{I}_i^n \le \gamma_3^n \\ I_i^n = 4 & \text{if} \quad \gamma_3^n \le \tilde{I}_i^n \end{cases}$$

Items	Mean	Correlation
1) If someone does me a favour, I feel obligated to repay them in some way.	3.36	0.66
2) If someone does something for me, I feel required to do something for them.	3.35	0.73
3) If someone gives me a gift, I feel obligated to get them a gift.	3.09	0.76
4) I always repay someone who has done me a favour.	3.22	0.67
4) I feel uncomfortable when someone does me a favour that I know I won't be able to return.	3.14	0.65
6) If someone sends me a card on my birthday, I feel required to do the same.	2.96	0.70
7) When someone does something for me, I often find myself thinking about what I have done for them.	2.99	0.63
8) If someone says something pleasant to you, you should say something pleasant back.	3.27	0.67
9) I usually do not forget if I owe someone a favour, or if someone owes me a favour.	3.16	0.60
10) If someone treats you well, you should treat that person well in return.	3.56	0.59
Cronbach's alpha		0.862

Experiment design

Based on the survey of Adamowicz et al. (2017) concerning risk perception and parent's marginal WTP for heart disease risk reduction

Graphical representaion of risk level

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

- Choice experiment (CE) valuation survey
- Extendent design towards respondents child and parent

Treatment	CEs - risk reduction recipient			Number of respondents
	Parent (P)	Child (K)	Elderly parent (G)	
Treatment K&P	CE_P	CE_K	-	250
Treatment G&P	CE_P	-	CE_G	250

- Experiment was composed of 6 parts:
  - Information on family structure
  - Testing respondnet's risk comprehension
  - Respondents were provided information about CAD (risk included, e.g. UK 25%, QRISK-lifetime cardiovascular risk calculator)
  - Elicit stated preferences for a set of vaccinations to reduce risk of CAD using interactive grid
  - Psychometric scale (positive reciprocity norm)
  - Socio-demographic survey

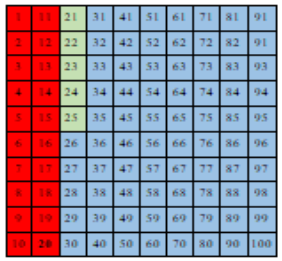
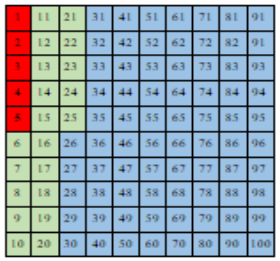
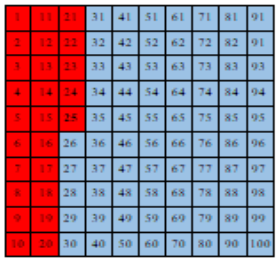
Attributes

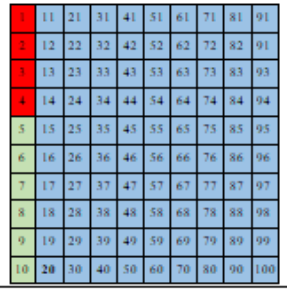
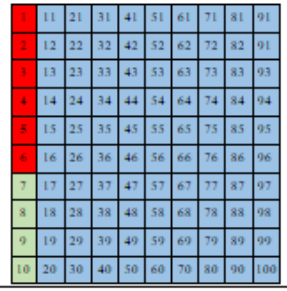
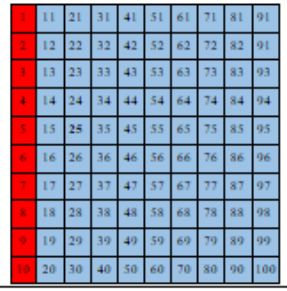
- Each CE included two attributes
  - the perceived lifetime risk of CAD
  - annual cost of vaccination

CE	Attribute	Attribute label	Attribute level
CE_P	Reduction in lifetime CAD risk for a respondent	Risk_P	0% (SQ); 20%; 40%, 60%, 80%
CE_K	Reduction in lifetime CAD risk a respondent's child	Risk_K	0% (SQ); 20%; 40%, 60%, 80%
CE_G	Reduction in lifetime CAD risk for a respondent's parent	Risk_G	0% (SQ); 20%; 40%, 60%, 80%
All	Annual cost of vaccination in zł	Cost	0 (SQ); 10; 20; 50; 100; 150, 200

Attributes

- Each choce was between 3 alternatives

	Vaccination A	Vaccination D	No vaccination
YOUR risk reduction	by 20% 	by 80% 	by 0% 
Annual cost	50zł	200zł	0zł
Your choice	☐	☐	☐

	Vaccination A	Vaccination D	No vaccination
Your CHILD's risk reduction	by 60% 	by 40% 	by 0% 
Annual cost	150zł	50zł	0zł
Your choice	☐	☐	☐

Descriptive statistics

	Share	Mean	Median	Min	Max
Female	51%				
Age (years)		40	40	21	64
Highest educational attainment					
- Primary	4%				
- Secondary	61%				
- High	36%				
Net monthly household income (€)		1517	1285	117	8177

Treatment	K's risk mean (st.dev.)	P's risk mean (st.dev.)	G's risk mean (st.dev.)	t-test (mean-comparison
Treatment K&P	20.40 (10.03)	30.03 (16.48)	-	10.7108
Treatment G&P	-	31.92 (15.71)	26.09 (14.51)	6.0553

- We found statistically significant differences between the respondents' own perceived lifetime risk and that for a child and an elderly parent. On average, respondents stated that they perceive the risk of CAD as higher for themselves than for a child and for an elderly parent with whom they lived.

Results

Model Treatment	Variable	Dist.	Mean coef.	St. dev. coef.	$LV_{RECIPROCITY}$
Model K&P	ASC_SQ_K	N	0.308	16.977***	-0.899*
	Risk/10_K	Ln	0.302**	1.814***	0.659***
	ASC_SQ_P	N	-1.435**	15.758***	-1.271**
	Risk/10_P	Ln	0.083	1.826***	0.365***
	Cost/10	Ln	-0.808***	2.158***	-0.263***
Model G&P	ASC_SQ_G	N	-1.875***	9.602***	-0.404
	Risk/10_G	Ln	0.725***	1.759***	0.518***
	ASC_SQ_P	N	-1.320	10.827***	-1.004**
	Risk/10_P	Ln	0.644***	1.826***	0.579***
	Cost/10	Ln	-0.436***	2.873***	-0.129**

Treatment	$LV_{RECIPROCITY}$	WTP for K (conf. inter.)	WTP for P (conf. inter.)	WTP for G (conf. inter.)
Treatment K&P	0*	7.61 (6.64-8.69)	6.12 (5.33-6.99)	-
	1	19.18 (16.42-22.23)	11.48 (9.83-13.31)	-
	2	48.41 (39.41-58.65)	21.60 (17.51-26.20)	-
Treatment G&P	0	-	7.36 (6.79-7.96)	7.99 (7.40-8.60)
	1	-	14.95 (13.90-16.40)	15.26 (13.99-16.64)

- WTP to reduce the lifetime risk of CAD to child exceedes the WTP to reduce the risk to parent (respondent).

Results

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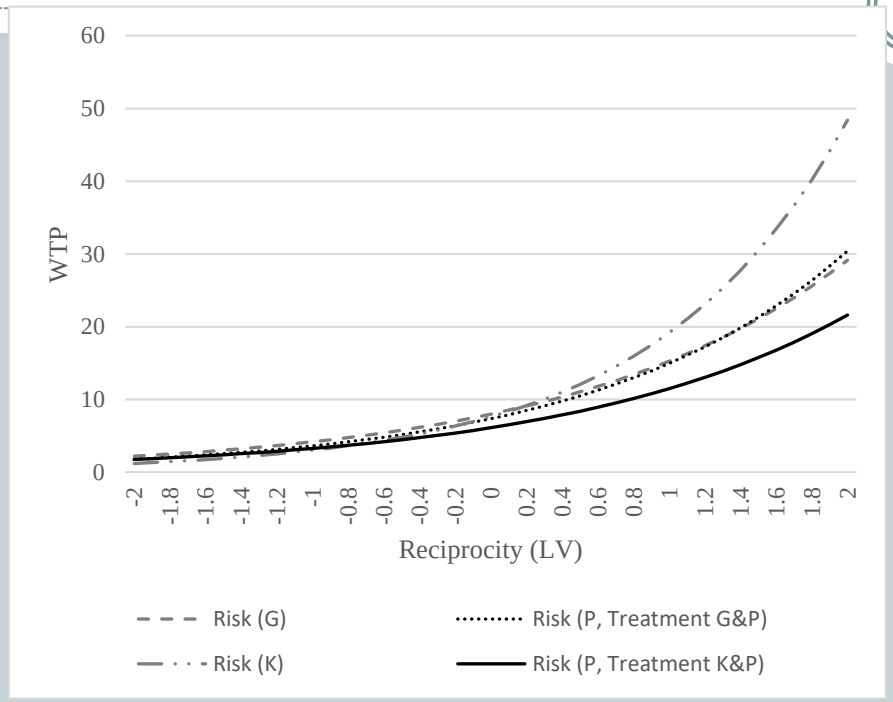
- WTP to reduce risk to elderly parent does not significantly differ from the WTP to reduce risk to parent (respondent).

Results



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- Latent attitudes concerning reciprocity significantly impact the WTP for the health risk reduction for the child, the respondent and the elderly parent.

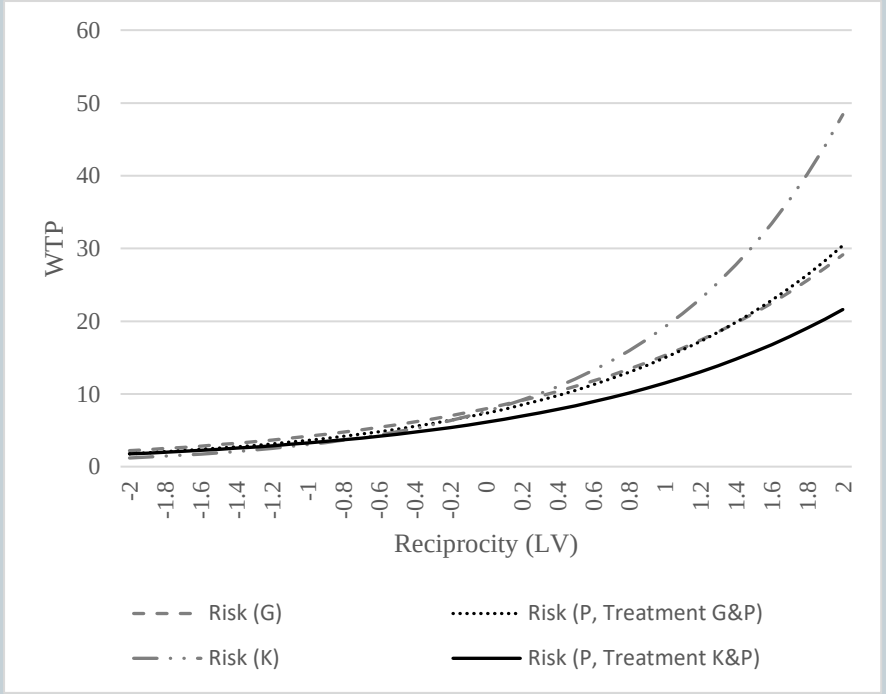
Results

Why reciprocity promotes caring for elderly parents?

- gratitude (see e.g., Silverstein 2002 or Simpson et al., 2018).
- expectations of receiving something in return. Findings e.g. by Grundy (2005) indicate that elderly parents who provided support to their child were twice as likely to do so than those who did not receive support from a child.
  Elderly parents have been found more likely to provide financial transfers for those children, who provided them earlier with their care (Leopold & Raab, 2011).
- an instrument of sharing norms with their children

Why reciprocity promotes caring for oneself?

- reduction of health risks increases the ability to reciprocate that can be limited by frailty and illness, particularly in older ages (see e.g., Stoller, 1985 or Offer, 2012).
- deteriorated health status of elderly parent naturally makes caregiving more absorbing, both in terms of time and costs.
  Parents' health status at an older age has been found as a factor that deteriorates the quality of life of informal caregivers, such as children of one (Thai et al. 2015, Vogler et al. 2013).



Conclusions

- Higher WTP for improving children's health is not solely driven by altruism
- It can be the result of strategic decisions related to reciprocal beliefs of a parent
- Reciprocity also affects the evaluation of health benefits from elderly parents and middle-aged respondents themselves
- Potential profoud implications as sandwich-generation can substitute the government in the area of health and social care for the elderly, particulary if life expectancy continues to increase

Thank you for your attention

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