

## Appendix to the contribution in the first chapter (in English only):

Kuhn, Ursina; Raphael Lalive, Oliver Lipps and Rainer Winkelmann (2016). What makes you satisfied with life? Market Goods vs Social Goods. In: Ehrler et al., Swiss Social Report 2016: Wellbeing, Zürich: Seismo.

### Tables, Figures, and Questions

Conceptual framework in detail: This box discusses the conceptual framework of our study. We are inspired by the classical microeconomic framework that studies the choice between consumption and leisure. Suppose individuals derive utility from the consumption of two types of goods: market goods and leisure. Market goods are purchased on the market, and  $C$  stands for the total amount of those goods consumed by an individual. Individuals also value leisure time, and  $L$  represents the number of hours of leisure time available to the individual. We suppose that  $C$  and  $L$  enhance a person's utility. We summarise this using a utility function  $U(C,L)$ , where both  $C$  and  $L$  increase  $U$  at a decreasing rate.

We introduce one key difference to the otherwise standard framework. We argue that the number of hours of leisure is an imperfect proxy for what individuals really care about. We value leisure mainly because we use it to spend time with other people. In our framework, we argue that social goods  $S$ , rather than pure hours of leisure  $L$ , generate utility. Social goods depend on leisure in a positive manner,  $S(L)$ , and at a decreasing rate. Note that here we suppose that social goods are consumed outside the work place. This assumption is certainly somewhat at odds with reality because many workers socialise with co-workers. But socialising often takes place in the off-work hours (going for a beer). Socialising in the workplace is often part of the actual work process itself.

Kahneman et al. (2004)<sup>1</sup> provide measurements of the amount of which different types of activities or interactions contribute to instantaneous wellbeing. Participants in their study were asked to rate their emotions during all activities during their days, using the so-called 'Day Reconstruction Method'. Activities, which produce the most positive emotions, are intimate relations, socialising, or relaxing, while activities, which produce the least positive emotions, are housework, working, and commuting. The study also looks at emotions during interactions with partners or when alone. Most positive interactions are those with friends, relatives, spouses, or children. Worst interactions are those with oneself (being alone), one's boss, or co-workers. In addition, the study shows that the situational context bears a good deal of the variance.

Individuals seek to find the optimal amount of market goods  $C$  and social goods  $S$  but their choices are constrained. We can only spend our income to purchase market goods. Our assumption is that people spend all their income on market goods. Yet people might also save some of their income to accumulate

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<sup>1</sup> Kahneman, D. , Krueger, A. B. Schkade, D. A. Schwarz, N. and A. A. Stone (2004), A Survey Method for Characterizing Daily Life Experience: The Day Reconstruction Method, Science, 306 (5702), 1776-1780.

wealth and insure against shocks, or give part of their income to other individuals. Both activities might also affect life-satisfaction. However most individuals hold no or very small amounts of wealth, and giving to others occurs but not to a quantitatively important extent. The hourly wage rate is  $w$ , and  $H$  is the number of hours worked per week. The budget constraint dictates that  $C$  be less than income,  $wH$ . We assume that the individual spends all her income on market goods so  $C=wH$ .

Consumption of social goods is also constrained by the available amount of leisure to socialise with friends. Suppose  $T$  is the total amount of time available to the individual (after the time needed for personal care, sleep, etc.). Leisure time is therefore no larger than  $T-H$ . We assume again that individuals use all their leisure time available to consume social goods so  $S=S(T-H)$ .

Individuals maximise utility  $U(C,S(L))$  with respect to  $C$  and  $L$  under the budget constraint and the time constraint just discussed. As a result of this process, individuals end up with an optimal amount of market goods  $C^*$  and an optimal amount of leisure time  $L^*$ . The optimal  $C^*$  and  $L^*$  will depend on the wage rate paid to the individual,  $w$ . In particular, the optimal amount of market goods will be  $C^*=wH^*(w)$ . The optimal amount of social goods is  $S^*(T-H^*(w))$ . The optimal amount of market goods depends positively on income,  $wH^*(w)$ , the optimal amount of social goods depends negatively on hours of work. Engel (1857)<sup>2</sup> studied first how consumption of market goods varies with income. The resulting income expansion curves were called “Engel” curves, a term we will also adopt in our empirical analysis. How consumption of social goods varies with hours of work has received much less attention in the field of economics. Due to the lack of precursors, we will also call the hours of work expansion curves for market goods “Engel” curves. Knowing the optimal choices of  $C$  and  $L$ , we can insert them back into the utility function. This provides an expression for optimal utility  $U(wH^*(w),S(T-H^*(w)))$ , and shows that optimal utility has two arguments: income  $wH$ , and work hours,  $H$ . Optimal utility is also called indirect utility.

Our approach aims to quantitatively assess how indirect utility varies with income and work hours. The life-satisfaction literature typically adopts an empirical specification that is inspired by indirect utility. We aim to complement these approaches in three simple ways. First we provide estimates of the direct utility function to assess whether market goods and social goods matter. We then provide evidence of the “Engel” curves associated with market goods and social goods with respect to income and work hours. Our final step is to decompose the effect of income and work-hours in the indirect utility function into a component due to market or social goods, and into a component due to other aspects.

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<sup>2</sup> Engel, E. (1857), Die Productions- und Consumtionsverhältnisse des Königreichs Sachsen". Zeitschrift des statistischen Bureaus des Königlich Sächsischen Ministerium des Inneren 8–9: 28–29.

**Table 1: Descriptive Statistics**

	Mean	SD between	SD within	Ratio
<i>A. Key variables</i>				
Life satisfaction	8.041	1.27	0.887	0.698
Income (in 10000 CHF)	5.158	2.715	2.104	0.775
Work Hours (per week)	35.448	18.186	10.651	0.585
<i>B. Market goods</i>				
house	0.538	0.473	0.188	0.397
car	0.876	0.313	0.135	0.431
TV	0.942	0.211	0.108	0.512
wash	0.712	0.403	0.248	0.615
dishwasher	0.779	0.394	0.179	0.454
holiday	0.827	0.326	0.24	0.736
<i>C. Social goods</i>				
club	0.527	0.427	0.294	0.689
volunt	0.343	0.39	0.285	0.731
nb_neigh	3.199	3.457	2.809	0.813
cont_neigh	6.9	6.854	6.108	0.891
nb_rel	6.776	5.477	4.197	0.766
cont_rel	6.297	5.976	5.106	0.854
nb_friends	5.637	4.68	3.206	0.685
cont_friends	7.267	7.436	4.919	0.662
invite_friends	0.711	0.376	0.295	0.785
physactivity	2.094	1.658	1.474	0.889
Observations	67999			
Individuals	14102			

Notes: This table shows descriptive statistics of the estimation sample.  
Ratio is the ratio of the within standard deviation to the between standard deviation.

Source: Own calculations, SHP data 2000-2010, n=67'999 (14'104 individuals)

**Table 2: Goods and Satisfaction: Regression of satisfaction with life, without income**

	(1)	(2)		
	Between	Fixed		
house	0.0925**	(3.61)	0.0848**	(3.86)
car	0.1436**	(4.17)	0.0344	(1.20)
tele	-0.2859**	(-6.31)	-	(-2.93)
wash	0.0744**	(2.62)	0.1027**	(1.37)
dishwasher	0.0131	(0.48)	0.0217	(0.32)
holiday	0.0070	(0.32)	0.1237**	(7.86)
club	0.3026**	(9.71)	0.0494**	(3.37)
volunt	0.0244	(0.72)	0.0037	(0.25)
nb_neigh	0.0596	(1.60)	0.0001	(0.04)
cont_neigh	0.0100**	(3.11)	0.0014*	(2.18)
nb_rel	0.0019	(1.25)	0.0043**	(4.77)
cont_rel	0.0120**	(6.44)	0.0009	(1.22)
nb_friends	0.0062**	(3.74)	0.0033**	(2.77)
cont_friends	0.0111**	(5.07)	-0.0011	(-1.45)
invite_friends	0.0012	(0.66)	0.0528**	(4.15)
physactivity	0.1981**	(7.47)	0.0046	(1.80)
Constant	0.0211**	(3.54)	8.5951**	(63.30)
R-squared	5.8066**	(41.54)	0.041	
F-values model	0.252		67.30	
F-values MG	135.3		15.63	
F-values SG	34.90		8.362	

T-statistics in parentheses, \*\* p<0.01, \* p<0.05, coefficients of market goods (MG) and social goods (SG) are shaded. Models are controlled for employed (y/n), age (linear and squared), education (low, mid, high), sex, urban (y/n), language region (Swiss-German, other), partnership (w/o partner, living together), household size (linear), marital status (separated, widowed, other), health (soso, well, very well, other), nationality (CH, EU15, EU rest, other). Data: SHP 2000-2010, n=67'999 (14'104 individuals), observations with missing values are listwise deleted.

**Table 3: “Engel” Curves for Market and Social Goods, Between and Within**

Dependent variable	Income (ln)		Working hours	
	Between		Within	
(1)	(2)	(3)	(4)	(5)
house	0.076**	-0.002**	0.007**	-0.001**
car	0.073**	0.001**	0.011**	-0.000
television	0.010**	-0.000*	0.002*	-0.000*
washing machine	0.050**	-0.001**	0.006**	-0.000**
dishwasher	0.097**	0.001**	0.012**	-0.000*
holiday	0.096**	0.000	0.000	0.000
club	0.038**	0.000	-0.001	-0.001**
volunt	0.024**	0.002**	-0.001	-0.000
neighbours: number	-0.047	-0.001	0.017	-0.005**
neighbours: contact	-0.539**	-0.032**	-0.016	-0.025**
relatives: number	-0.126	0.018**	-0.011	-0.000
relative: contact	-0.181*	0.021**	-0.010	0.003
friends: number	0.358**	-0.011**	-0.014	-0.003*
friends: contact	0.189**	-0.117**	0.001	-0.027**
friends: invite	0.055**	0.000	-0.003	-0.000
Physical activity	0.128**	-0.007**	0.016	-0.004**

Remarks: Each “line” refers to two different regression models (between and within individuals) with income and hours of work as independent variables. Income refers to disposable equivalised household income.

Data: SHP 1999-2010, n=67’999 (14’104 individuals), observations with missing values are listwise deleted.

**Table 4: Regression of satisfaction with life, excluding and including goods (MG and SG)**

	Between No goods	Between MG	Between MG+SG	Fixed No goods	Fixed MG	Fixed MG+SG
eqdisp	0.0519**	0.0253**	0.0256**	0.0073**	0.0064**	0.0064**
eqdisp2	-0.0003**	-0.0002**	-0.0002**	-0.0000**	-0.0000*	-0.0000*
totwork	-0.0065**	-0.0055**	-0.0047*	0.0008	0.0010	0.0012
totwork2	0.0001*	0.0001**	0.0001*	-0.0000	-0.0000	-0.0000
house		0.1100**	0.0781**		0.0785**	0.0765**
car		0.1182**	0.0975**		0.0619**	0.0595**
tele		-0.2705**	-0.2614**		-0.1064**	-0.1072**
wash		0.0755**	0.0685*		0.0213	0.0210
dishwash		0.0244	-0.0045		0.0059	0.0047
holiday		0.3245**	0.2626**		0.1215**	0.1168**
club			0.0247			0.0504**
volunt			0.0624			0.0036
nb_neigh			0.0108**			0.0002
cont_neigh			0.0029			0.0014*
nb_rel			0.0126**			0.0043**
cont_rel			0.0065**			0.0010
nb_friends			0.0102**			0.0033**
cont_friends			0.0001			-0.0012
invite_friends			0.1741**			0.0514**
physactivity			0.0193**			0.0047
Constant	5.9209**	6.0188**	5.7165**	8.7485**	8.6747**	8.5212**
R-squared	0.227	0.240	0.256	0.038	0.040	0.041
F-values model	179.6	153.7	124.1	96.23	80.02	61.26
F-values MG	.	41.38	26.42	.	19.85	18.48
F-values SG	.	.	29.28	.	.	8.426

T-statistics in parentheses, \*\* p<0.01, \* p<0.05, coefficients of market goods (MG) and social goods (SG) are shaded. Models are controlled for employed (y/n), age (linear and squared), education (low, mid, high), sex, urban (y/n), language region (Swiss-German, other), partnership (w/o partner, living together), household size (linear), marital status (separated, widowed, other), health (soso, well, very well, other), nationality (CH, EU15, EU rest, other).

Data: SHP 1999-2010, n=67'999 (14'104 individuals), observations with missing values are listwise deleted.

## Questions and response categories, and definition of income and working time

### Satisfaction with life:

„In general, how satisfied are you with your life if 0 means "not at all satisfied" and 10 means "completely satisfied"? 0 (not at all satisfied), 10 (completely satisfied)

### Equivalised disposable income:

Sum of total household income from labour earnings, private transfers, public transfers, social security pensions, imputed rental value and asset income minus total household taxes, household member's needs are equivalised according to the modified OECD scale: household head: 1, household members 15 years or older: 0.5, household members 14 years or younger: 0.3

### Total working time:

Sum of totally worked hours and housework per week

### Market Goods: (all coded yes/no)

House: „Households > one adult: Are you, or another person living in your household, a tenant or owner of the accommodation you currently live in?

Households = one adult: Are you tenant or owner of the accommodation you currently live in?“

Car: „Do you have a car?“

Television: “Do you have a colour TV?“

Washing machine: “Do you have a washing machine in your own accommodation or for your exclusive use?“

Dishwasher: “Do you have a dishwasher?“

Holiday: “Do you take one week's holidays away from home once a year?“

### Social Goods:

Club: “Do you take part in clubs' or other groups' activities (religious groups included)?“ (yes/no)

Volunteering: “Do you have honorary or voluntary activities within an association, an organisation or an institution?“ (yes/no)

Number of neighbours: “With how many of your neighbours are you on good terms and enjoy a close relationship?“

Frequency of contact with neighbours: “How frequent are your contacts with these neighbours?“ (incl. question about reference period)

Number of relatives “With how many relatives living outside of your household are you on good terms and enjoy a close relationship?“

Frequency of contact with relatives “How frequent are your contacts with these relatives?” (incl. question about reference period)

Number of friends: “How many good and close friends do you have?”

Frequency of contact with friends: “How frequent are your contacts with these friends?” (incl. question about reference period)

Invitation of friends “Do you invite friends round for a meal at least once a month?” (yes/no)

Physical activity: “At present, how many days a week do you practise for half an hour minimum a physical activity which makes you slightly breathless?”