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**Implications of population aging and resulting multiple social responsibilities  
on health outcomes of the workforce**

Häusler, Nadine Sara

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## **Chapter II**

# **Which Life Domains Impact Most on Self-Rated Health? A Cross-Cultural Study of Switzerland and its Neighbors**

Nadine Häusler, Oliver Hämmig, Matthias Bopp

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## **ABSTRACT**

General life satisfaction (GLS) is a strong health correlate and can be conceptualized as an aggregate of satisfactions in different life domains and as a proxy for quality of life. Little is known about which life domains – measured as domain satisfactions – contribute most to GLS and are the best predictors of self-rated health (SRH) and whether these associations differ between countries and/or language areas. We used stepwise logistic regression models to investigate how domain satisfactions, GLS and SRH are interrelated and compared German-speaking and French/Italian-speaking Switzerland with the corresponding neighboring countries of Germany, Austria, France and Italy. The associations of domain satisfactions with GLS and SRH varied significantly in magnitude and between countries and language areas. GLS was strongly related to self-rated health in all populations, but more so in the German-speaking than the French/Italian-speaking regions. Adjusted for all domain satisfactions, satisfaction with one's financial situation and job satisfaction showed independent effects on SRH and were the most important predictors of GLS, although no clear geographical pattern emerged. Domain-specific satisfactions were similarly associated with GLS and SRH, but the strength of the association varied between German-, French- and Italian-speaking populations. Any similarity between Swiss language areas and neighboring countries was limited to German-speaking populations. Country- and language-specific life domain satisfactions may provide useful pointers for targeting policies in the respective domains.

**Keywords:** Self-rated health, life satisfaction, domain satisfaction, life domains, Switzerland

## INTRODUCTION

The extensive literature on the social determinants of health highlights the importance of the residential, occupational and social environments [1]. It has been shown that the subjective perception and evaluation of life domains is a reliable and valid approach to investigating well-being [2,3] because individually perceived situations are at least as relevant as objective living conditions [3]. General life satisfaction (GLS) is an overall appraisal of a person's life as a whole [4] and is often used as a proxy for quality of life [5,6]. Similarly, domain satisfaction variables represent proxy variables of life domains incorporating a broad appraisal of the targeted life domain [4]. Thus job satisfaction has been repeatedly shown – particularly among health professionals – to be an immediate outcome of working conditions [7] or to play a mediating role between the work environment and associated health or stress- and work-related outcomes [8]. Job satisfaction can therefore be considered to be a subjective measure of objective (working) conditions. Satisfaction with one's accommodation, living conditions as well as green and recreational areas are subjective indicators for the residential environment while job satisfaction and satisfaction with one's financial situation and with the commuting times represent a subjective appraisal of the occupational environment. Subjective indicators for the social environment are satisfaction with one's personal relationships and use of time.

Two theoretical concepts of GLS diverge in their causal assumptions [9]: the “top-down” perspective assumes that stable traits, i.e., personality or culture, determine GLS [10,11], whereas the “bottom-up” perspective suggests that GLS results from satisfaction with various life domains [12]. The “bottom-up” perspective consequently postulates that domain satisfactions mediate the effect of life domains on GLS [9]. Although these concepts are not mutually exclusive [13], for this study we conceptualize GLS as an aggregate construct of domain satisfactions, as we aim to assess the importance of life domains for SRH. Whereas a consensus exists about the contribution made by satisfaction in domains such as finance, social relationships, leisure time, family and work to GLS, the roles and contributions of these individual domain satisfactions to the aggregate construct of GLS remain unclear [9,12]. It has been shown that cultural affiliation influences the perception and

evaluation of life domains across Europe [14], and culture consequently affects the weighting of life domains for GLS [15,16].

Similarly to the association between domain satisfactions and GLS, the association between GLS and self-rated health (SRH) is well established [17] as a valid and reliable indicator of morbidity [18] and mortality [19]. There are controversial opinions about the direction of this association. However, the relationship is likely to be bidirectional [20]. While evidence for the associations between domain satisfactions and GLS [12] as well as between GLS and SRH [17] is compelling, the impact of domain satisfactions in the residential, occupational and social environments on health has been less fully investigated. However, significant positive associations with SRH have been found for the following domain satisfactions: satisfaction with accommodation [21], job satisfaction [22], satisfaction with one's financial situation [23,24] and satisfaction with personal relationships [25]. As these studies have been carried out with populations from different countries that appraise life domains differently [15,16], these associations may not hold true across countries and cultural regions. However, there is a lack of studies which directly compare the importance of these life domains for SRH across countries and cultural regions.

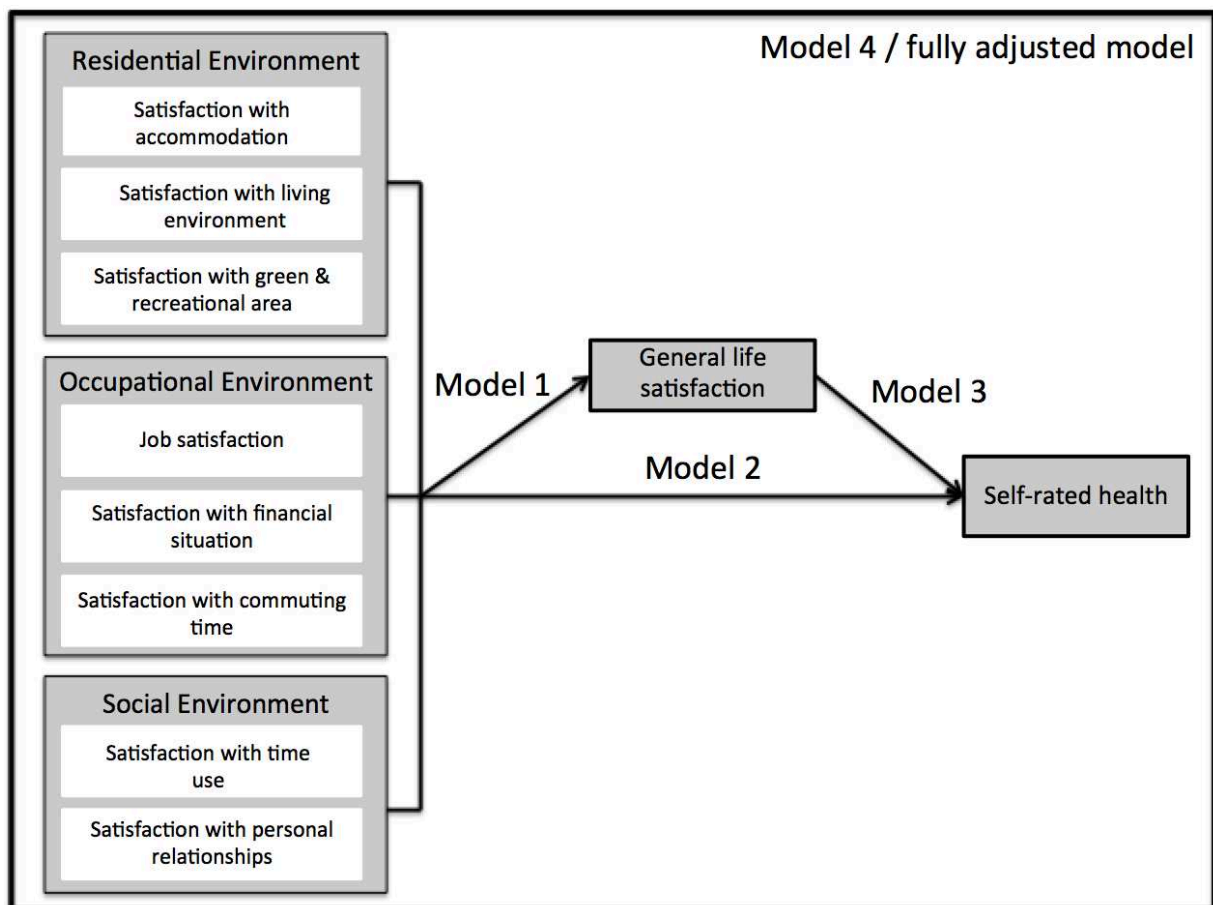
Switzerland is divided into three main cultural regions defined by languages shared with the surrounding countries [26]. The cultural differences within Switzerland defined by language borders are mainly between the German-speaking region and the rest of the country [27]. These cultural differences between the German and French/Italian-speaking regions are also reflected in different health behaviors and outcomes between these regions [28,29] and often correspond to those between Germany and France [30] or Italy [26]. Comparisons of the language areas of Switzerland with the corresponding neighboring countries, i.e. Germany/Austria and France/Italy therefore offer a unique opportunity to study whether the importance of life domains for SRH differs at a national or cultural level, which we define by language affiliation.

In this study, we examine the association of domain satisfactions in the residential, occupational and social environments with GLS and SRH. Second, we investigate whether the impact of satisfaction

measures on SRH varies more across countries or between language areas (German vs. French/Italian). Further, we study how domain satisfaction, GLS and SRH are interrelated. We therefore aim to answer the following research questions:

1. Do domain satisfactions have different impacts on GLS and SRH?
2. Does the impact of GLS and domain satisfactions on SRH differ primarily between countries or rather between language areas (German vs. French/Italian)?
3. Are domain satisfactions associated with SRH directly, or indirectly via GLS?

In order to study the impact of various domain satisfactions as important predictors of SRH, we postulate two causal pathways, the first from domain satisfactions to SRH (direct path) and the second as an overarching construct mediated by GLS (indirect path). This four-step approach to testing for mediation in cross-sectional data results in four different regression models (Fig. 1) [31].



**Fig. 1** Theoretical and empirical path model

As we assume GLS to be the aggregate construct of domain satisfaction, it is expected to mediate the associations between domain satisfactions and SRH. When adding GLS in the fully adjusted model to M2, we will see whether the associations between domain satisfactions and SRH persist. If they remain similarly strong, we can assume no mediation of GLS. Conversely, if the strength of the associations disappears, we conclude that the effect of the domain satisfaction on SRH is mediated by GLS.

## **METHODS**

### **Data**

Data were taken from the European Survey on Income and Living Conditions (EU-SILC) [32] in 2013 and consist of nationally representative probability samples of the resident populations aged 16 years and older living in private households. As this is an observational study with survey data collected on a voluntary and anonymous basis, no approval by an ethics committee was required.

We limited our study population to Switzerland (CH) and its four neighboring countries of Germany (DE), Austria (AT), France (FR) and Italy (IT). Due to the small number of participants in Italian-speaking Switzerland, we were obliged to analyze the Italian and French-speaking parts of Switzerland together which is reasonable in light of the cultural closeness of these two language areas [27]. Switzerland, Germany and Austria used a simple stratified random-sampling design, while Italy and France applied a multi-stage systematic stratified sampling method. Data were gathered at individual and household level through telephone interviews. We restricted our analyses to the workforce in order to assure a valid assessment of domain satisfactions concerning the occupational environment. Moreover, we limited the age range of the participants to 25-64 years, i.e. after the career entry phase, to ensure a similar assessment of domain satisfaction associated with the occupational environment. We also excluded all participants with missing values on variables of interest (see Appendix I).

## Measurements

Self-rated health was measured on a 5-point Lickert scale and was dichotomized by collapsing the answer categories “very bad”, “bad” and “fair” into “less than good SRH” and likewise “good” and “very good” into “good SRH”. This was necessary because the proportional odds assumption was violated for almost all models when performing ordinal logistic regression. Similarly, consensual unions were dichotomized by answering “Yes” and “No” to the question of whether respondents were living in a partnership, regardless of its civil status. Educational level is based on the highest ISCED level achieved and was categorized into the three levels of primary (0-2), secondary (3-4) and tertiary education (5-6) in accordance with Eurostat’s educational attainment classification [33]. Satisfaction variables were measured on an 11-point Lickert scale ranging from 0 “Not at all satisfied” to 10 “Completely satisfied”, referring to the current situation (Table 1).

**Table 1** Domain satisfaction and GLS: Questions, variable names and life domains

Question	Satisfaction measures	Area of life
Overall, how satisfied are you with...?		
- your accommodation	Satisfaction with accommodation	Residential environment
- the quality of your living environment - the recreational or green areas in the place where you live	Satisfaction with living environment Satisfaction with green and recreational areas	
- your present work - the financial situation of your household - your commuting time	Job satisfaction Satisfaction with financial situation Satisfaction with commuting time	Occupational environment
- the amount of time you have to do things you like doing - your personal relationships	Satisfaction with time use Satisfaction with personal relationships	Social environment
- your life these days	General life satisfaction (GLS)	Life in general

Due to the skewed distribution of the answer categories, as well as for semantic reasons, all variables were grouped into three degrees of satisfaction, namely “Low” (0-5), “Medium” (6-8) and “High” (9-10); this is in line with Eurostat’s classification criteria of a 20:60:20 distribution rule at European level [34]. When using GLS as the dependent variable (Model 1 in Fig. 1), we collapsed the two



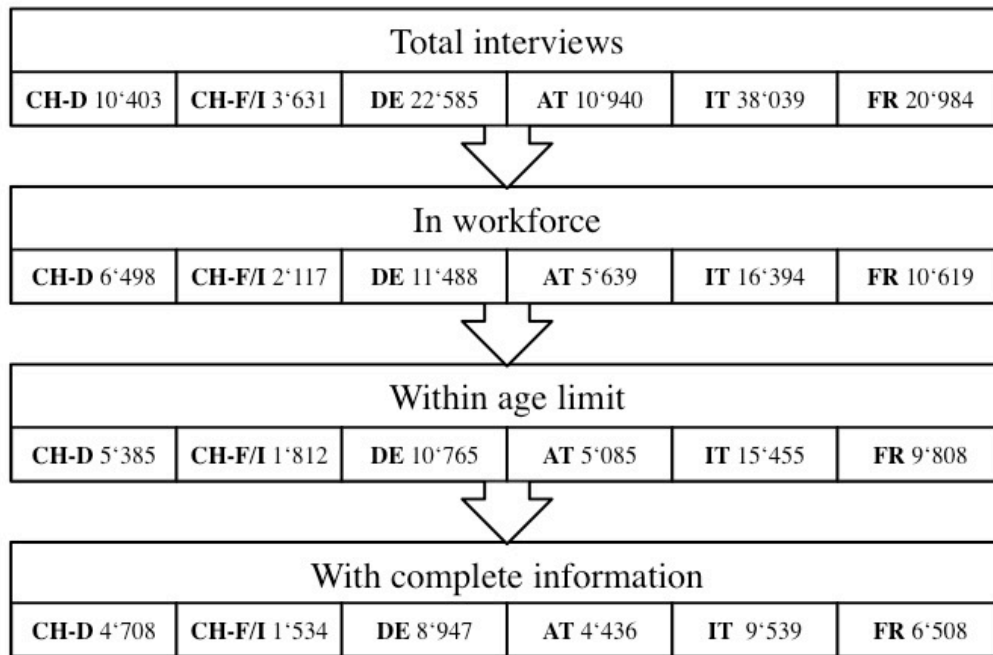
categories of “Medium” and “High” GLS into “Medium/High” (6-10) while retaining the answer category “Low” (0-5).

### **Statistical analysis**

Spearman’s rank correlation coefficients were calculated to evaluate independence across domain satisfaction variables and between SRH. In order to cover the broadest range of life domains, we included all satisfaction variables available for all countries and performed stepwise logistic regression analyses while consulting the Akaike Information Criterion and the Bayesian Information Criterion for the best model fit: this was ensured by including all eight domain satisfaction variables and GLS. We studied the combined impact of domain satisfactions on GLS (Model 1 in Fig. 1) and on SRH (Model 2 in Fig. 1). In Model 3 (in Fig. 1), the effect of GLS on SRH was examined. In the fully adjusted model (Model 4 in Fig. 1) the impact of all satisfaction measures (including GLS) on SRH was analyzed. In order to identify significant differences between language areas and countries, we conducted logistic regression analyses with interaction terms for the most influential predictors separately for both language areas. STATA Version 13.1 [35] was used to conduct all the analyses with weighted data to ensure the representative nature of the national workforces.

### **RESULTS**

Between 29% (CH) and 57% (IT) of the initial survey population were excluded due to non-participation in the workforce (Fig. 2). We further excluded respondents not in the selected age range or with missing values for variables of interest; the answer „I don’t know“ was subsumed within the missing category (see Appendix I).



**Fig. 2** Number of eligible and final participants in 2013, by country.

The largest age group across all countries/language areas was 45-54 years, and the mean age ranged from 43.81 years in France to 46.36 years in Germany. Except in Germany and France, more men participated in the study and most participants were in a partnership in all countries/language areas. Across all countries/language areas it is most common to have completed secondary education, except in the French/Italian-speaking regions of Switzerland (see Appendix III). The lowest proportion of people rating their health as less than good was reported in German-speaking Switzerland and the highest in France and Germany (see Appendix II). Similarly, the lowest proportion of people rating their GLS as low was also found in Switzerland, especially in the German-speaking part, while the highest proportions were reported in Italy, followed by Germany and France (see Appendix II). Swiss respondents rated their domain satisfactions and GLS highest compared to the other nationalities (see Appendix III).

Spearman's rank correlation coefficients do not show particularly strong inter-correlations between all the included domain satisfactions and GLS (all correlation coefficients smaller than 0.71), which would indicate multi-collinearity and suggest their exclusion from the analysis (see Appendix IV).

### **Associations with satisfaction measures**

In general, we observe that the more satisfied people are in specific life domains, the higher they rate their GLS and SRH. Satisfaction with their financial situation shows by far the strongest positive association with GLS, with ORs ranging from 7.32 in German-speaking Switzerland to 14.2 in Italy for the least satisfied group compared to the most satisfied group. Other strong associations are found for satisfaction with personal relationships with GLS (ORs ranging from 1.73 in Austria to 6.94 in German-speaking Switzerland), and job satisfaction with GLS (ORs ranging from 2.31 in France to 8.21 in German-speaking Switzerland) (Model 1 in Table 2). In Italian/French-speaking populations, satisfaction with one's financial situation had a higher impact on GLS than in German-speaking populations. Conversely, satisfaction with one's financial situation shows stronger associations with SRH in German-speaking than French/Italian-speaking populations (Model 2 in Table 2). Generally, the associations of domain satisfactions with GLS (ORs up to 14.2) are stronger than with SRH (ORs up to 3.43). More domain satisfactions are associated with GLS than with SRH in French/Italian-speaking populations whereas the number of significant domain satisfactions per outcome is more balanced in German-speaking populations.

**Table 2** Associations of domain satisfactions with low GLS (Model 1) and with less-than-good SRH (Model 2) by language area and country

	Germany		Austria		German-speaking Switzerland		French/Italian-speaking Switzerland		Italy		France													
	Model 1 (GLS)	Model 2 (SRH)	Model 1 (GLS)	Model 2 (SRH)	Model 1 (GLS)	Model 2 (SRH)	Model 1 (GLS)	Model 2 (SRH)	Model 1 (GLS)	Model 2 (SRH)	Model 1 (GLS)	Model 2 (SRH)												
	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)										
<b>Residential environment</b>																								
Satisfaction w/ accommodation																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	<b>1.35</b>	1.04-1.75	1.13	0.97-1.32	1.35	0.95-1.91	1.01	0.81-1.26	1.26	0.84-1.89	0.99	0.78-1.25	<b>1.89</b>	1.03-3.44	0.94	0.66-1.33	1.25	0.94-1.64	1.17	0.95-1.45	1.22	0.85-1.75	0.96	0.77-1.20
Low	<b>2.41</b>	1.79-3.24	1.22	0.98-1.52	<b>2.32</b>	1.52-3.54	<b>1.43</b>	1.03-1.99	<b>4.14</b>	2.29-7.50	<b>1.83</b>	1.21-2.78	<b>2.57</b>	1.12-5.88	1.20	0.65-2.22	<b>2.96</b>	2.14-4.10	<b>1.35</b>	1.01-1.81	<b>1.87</b>	1.21-2.91	1.08	0.78-1.49
Satisfaction w/ living environment																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	0.98	0.76-1.27	<b>1.24</b>	1.04-1.48	1.19	0.83-1.70	1.00	0.78-1.28	0.89	0.60-1.33	0.92	0.73-1.15	<b>0.38</b>	0.19-0.73	0.84	0.58-1.21	0.97	0.70-1.36	1.20	0.88-1.62	1.33	0.86-2.06	1.25	0.97-1.61
Low	<b>1.60</b>	1.12-2.28	<b>1.45</b>	1.11-1.90	1.33	0.77-2.28	1.05	0.69-1.59	1.37	0.78-2.41	1.28	0.92-1.79	1.23	0.64-2.36	1.50	0.95-2.36	1.04	0.73-1.49	1.09	0.79-1.50	<b>3.17</b>	1.88-5.33	1.39	0.95-2.05
Satisfaction w/ green & recreational areas																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	0.80	0.62-1.02	0.85	0.71-1.01	0.77	0.53-1.10	0.95	0.74-1.22	1.38	0.92-2.08	0.85	0.68-1.07	0.82	0.46-1.47	1.08	0.76-1.54	1.17	0.85-1.61	0.99	0.76-1.27	0.89	0.59-1.32	<b>0.78</b>	0.61-0.99
Low	0.68	0.48-0.97	0.86	0.67-1.10	0.89	0.56-1.41	1.14	0.80-1.62	<b>2.00</b>	1.10-3.63	0.96	0.61-1.53	1.30	0.61-2.78	1.06	0.60-1.86	<b>1.65</b>	1.19-2.30	1.24	0.94-1.63	0.76	0.49-1.17	<b>0.73</b>	0.54-0.98
<b>Occupational environment</b>																								
Job satisfaction																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	0.95	0.72-1.26	<b>1.26</b>	1.06-1.50	0.91	0.65-1.28	<b>1.60</b>	1.29-1.99	1.04	0.78-2.10	1.00	0.79-1.28	0.89	0.48-1.67	0.83	0.58-1.19	1.00	0.74-1.35	0.85	0.68-1.06	0.97	0.69-1.37	<b>1.51</b>	1.20-1.90
Low	<b>2.55</b>	1.92-3.39	<b>2.16</b>	1.76-2.64	<b>2.93</b>	1.92-4.47	<b>3.43</b>	2.50-4.72	<b>8.21</b>	4.14-12.9	<b>2.27</b>	1.57-3.28	<b>2.60</b>	1.22-5.52	0.90	0.51-1.57	<b>2.42</b>	1.63-3.09	1.05	0.80-1.39	<b>2.31</b>	1.58-3.39	<b>2.63</b>	2.00-3.46
Satisfaction w/ financial situation																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	1.51	1.00-2.29	<b>1.64</b>	1.33-2.02	1.17	0.67-2.06	<b>1.58</b>	1.22-2.04	1.28	0.63-1.74	<b>1.45</b>	1.12-1.88	1.73	0.68-4.42	1.19	0.78-1.82	1.51	0.68-3.37	0.86	0.60-1.25	1.43	0.69-1.37	<b>1.39</b>	1.04-1.85
Low	<b>10.0</b>	6.68-15.0	<b>2.65</b>	2.11-3.32	<b>11.3</b>	6.58-19.5	<b>2.38</b>	1.76-3.22	<b>7.32</b>	4.90-13.8	<b>2.56</b>	1.81-3.60	<b>12.2</b>	4.64-32.0	<b>1.96</b>	1.16-3.32	<b>14.2</b>	6.41-31.5	<b>1.75</b>	1.19-2.57	<b>12.9</b>	5.74-29.0	<b>2.31</b>	1.68-3.17
Satisfaction w/ commuting time																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	1.08	0.87-1.34	0.91	0.78-1.05	1.15	0.83-1.59	1.14	0.92-1.41	0.66	0.43-1.01	1.05	0.83-1.32	1.24	0.64-2.38	1.12	0.79-1.57	0.96	0.74-1.25	1.04	0.85-1.29	0.82	0.62-1.09	1.08	0.91-1.29
Low	1.19	0.94-1.51	0.88	0.74-1.04	1.19	0.81-1.76	1.07	0.82-1.39	0.97	0.54-1.74	1.12	0.79-1.58	1.05	0.52-2.16	1.01	0.62-1.64	0.82	0.61-1.11	1.03	0.81-1.31	1.15	0.83-1.59	1.07	0.85-1.43
<b>Social environment</b>																								
Satisfaction w/ time use																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	1.25	0.89-1.76	1.18	0.95-1.46	1.26	0.80-1.98	1.16	0.90-1.51	0.73	0.39-1.37	1.06	0.77-1.46	0.97	0.36-2.62	1.57	0.93-2.65	1.15	0.76-1.74	0.88	0.63-1.22	0.98	0.63-1.54	0.99	0.77-1.28
Low	<b>1.75</b>	1.24-2.48	<b>1.55</b>	1.24-1.94	1.42	0.88-2.28	<b>1.48</b>	1.11-1.96	1.08	0.57-2.05	1.27	0.90-1.80	1.26	0.48-3.36	1.55	0.92-2.63	<b>2.15</b>	1.42-3.27	1.11	0.79-1.55	<b>2.13</b>	1.35-3.38	1.29	0.98-1.71
Satisfaction w/ personal relationships																								
High	1	1	1	1	1	1	1	1	1	1	1	1												
Medium	<b>1.66</b>	1.33-2.09	1.07	0.92-1.24	1.28	0.91-1.80	1.05	0.85-1.29	<b>2.55</b>	1.65-3.95	<b>1.69</b>	1.34-2.14	1.35	0.72-2.55	1.16	0.83-1.61	1.15	0.87-1.50	1.13	0.90-1.41	1.27	0.94-1.72	1.07	0.88-1.29
Low	<b>4.62</b>	3.54-6.04	<b>1.60</b>	1.30-1.97	<b>1.73</b>	1.09-2.75	1.34	0.95-1.90	<b>6.94</b>	3.18-15.2	<b>2.89</b>	1.71-4.87	<b>5.96</b>	2.33-15.4	2.05	0.92-4.60	<b>2.99</b>	2.12-4.21	<b>1.51</b>	1.11-2.06	<b>3.20</b>	2.12-4.83	1.30	0.93-1.83

„Low reliability

Adjusted for age, sex, educational level and partnership status. Abbreviations: OR, odds ratio; CI, confidence intervals

Data source: EUROSTAT and SFISO: EU-SILC

### Differences between countries/language areas

The positive association between GLS and SRH is generally significant, but is stronger in German-speaking populations, with correlation coefficients of up to 11.5 in Austria compared to French/Italian-speaking populations, with correlation coefficients of up to 5.38 in France (Model 3 in Table 3). In Model 4 (Table 4), only GLS is significantly associated with SRH in all countries/language areas. Domain satisfactions show either occasional associations or have no effect on SRH in any country. Over all investigated countries, domain satisfactions in the occupational environment are more frequently associated with SRH than those relating to the residential and social environments. No domain satisfaction measure is significantly associated with SRH in Italy. Stepwise logistic regression analyses revealed that – depending on domain satisfaction – most of the effect is mediated by GLS.

**Table 3** Association of GLS with less-than-good SRH (Model 3) by language area and country

	Germany		Austria		German-speaking Switzerland		French/Italian-speaking Switzerland		Italy		France	
	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)
<b>Life in general</b>												
GLS												
<i>High</i>	1		1		1		1		1		1	
<i>Medium</i>	<b>2.95</b>	2.48-3.52	<b>3.38</b>	2.66-4.28	<b>2.18</b>	1.69-2.81	<b>1.60</b>	1.11-2.31	<b>1.37</b>	1.06-1.75	<b>2.01</b>	1.62-2.50
<i>Low</i>	<b>10.5</b>	8.50-12.9	<b>11.5</b>	8.18-16.2	<b>8.71</b>	5.91-12.8	<b>2.63</b>	1.47-4.73	<b>3.39</b>	2.57-4.48	<b>5.38</b>	4.12-7.02

Adjusted for age, sex, educational level and partnership status. Abbreviations: OR, odds ratio; CI, confidence intervals  
Data source: EUROSTAT and SFSO: EU-SILC

**Table 4** Associations of satisfaction measures with less-than-good SRH (Model 4) by language area and country

	Germany		Austria		German-speaking Switzerland		Italian/French-speaking Switzerland		Italy		France	
	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)
<b>Residential environment</b>												
Satisfaction w/ accommodation												
High	1		1		1		1		1		1	
Medium	1.04	0.89-1.21	0.91	0.73-1.14	0.94	0.74-1.19	0.90	0.64-1.28	1.13	0.91-1.40	0.91	0.73-1.14
Low	1.02	0.82-1.27	1.24	0.87-1.74	1.51	0.98-2.34	1.12	0.60-2.09	1.23	0.91-2.26	0.98	0.70-1.36
Satisfaction w/ living environment												
High	1		1		1		1		1		1	
Medium	<b>1.22</b>	1.02-1.46	0.96	0.74-1.23	0.92	0.73-1.16	0.84	0.58-1.22	1.19	0.88-1.62	1.19	0.92-1.53
Low	<b>1.36</b>	1.03-1.78	0.97	0.63-1.49	1.27	0.92-1.76	1.46	0.93-2.30	1.10	0.79-1.51	1.21	0.82-1.78
Satisfaction w/ green & recreational areas												
High	1		1		1		1		1		1	
Medium	0.85	0.71-1.01	0.97	0.75-1.25	0.81	0.65-1.03	1.07	0.75-1.51	0.98	0.77-1.26	0.79	0.62-1.00
Low	0.88	0.69-1.14	1.12	0.78-1.61	0.86	0.53-1.40	1.04	0.59-1.84	1.21	0.92-1.59	0.75	0.56-1.02
<b>Occupational environment</b>												
Job satisfaction												
High	1		1		1		1		1		1	
Medium	1.17	0.98-1.40	<b>1.43</b>	1.14-1.79	0.90	0.71-1.15	0.76	0.53-1.09	0.83	0.66-1.04	<b>1.46</b>	1.16-1.84
Low	<b>1.78</b>	1.45-2.18	<b>2.74</b>	1.96-3.82	<b>1.72</b>	1.15-2.57	0.81	0.46-1.44	0.98	0.74-1.30	<b>2.38</b>	1.80-3.15
Satisfaction w/ financial situation												
High	1		1		1		1		1		1	
Medium	<b>1.34</b>	1.07-1.67	1.21	0.92-1.60	<b>1.32</b>	1.01-1.71	1.11	0.72-1.70	0.78	0.52-1.16	1.20	0.90-1.61
Low	<b>1.68</b>	1.31-2.15	1.35	0.97-1.88	<b>1.86</b>	1.29-2.70	<b>1.74</b>	1.01-2.99	1.43	0.94-2.16	<b>1.67</b>	1.19-2.34
Satisfaction w/ commuting time												
High	1		1		1		1		1		1	
Medium	0.90	0.78-1.05	1.10	0.89-1.37	1.05	0.83-1.34	1.10	0.78-1.55	1.04	0.84-1.29	1.08	0.92-1.29
Low	0.86	0.73-1.02	1.02	0.78-1.34	1.09	0.76-1.55	1.01	0.62-1.65	1.03	0.81-1.32	1.05	0.84-1.32
<b>Social environment</b>												
Satisfaction w/ time use												
High	1		1		1		1		1		1	
Medium	1.12	0.91-1.40	1.06	0.81-1.38	1.03	0.74-1.44	1.51	0.89-2.57	0.86	0.62-1.20	0.97	0.75-1.25
Low	<b>1.42</b>	1.13-1.78	1.32	0.99-1.76	1.19	0.83-1.70	1.48	0.87-2.53	1.05	0.75-1.49	1.20	0.91-1.58
Satisfaction w/ personal relationships												
High	1		1		1		1		1		1	
Medium	0.95	0.81-1.10	0.93	0.75-1.15	<b>1.51</b>	1.20-1.91	1.12	0.80-1.55	1.09	0.87-1.38	1.02	0.84-1.23
Low	1.22	0.98-1.51	1.19	0.83-1.69	<b>2.20</b>	1.26-3.85	1.89 <sub>a</sub>	0.84-4.27	1.37	0.99-1.89	1.13	0.80-1.60
<b>Life in general</b>												
GLS												
High	1		1		1		1		1		1	
Medium	<b>2.11</b>	1.72-2.58	<b>2.57</b>	1.96-3.38	<b>1.73</b>	1.31-2.29	<b>1.50</b>	1.00-2.25	1.30	0.97-1.74	<b>1.57</b>	1.23-2.02
Low	<b>4.82</b>	3.69-6.29	<b>6.36</b>	4.29-9.42	<b>3.86</b>	2.39-6.23	1.64	0.85-3.14	<b>1.85</b>	1.31-2.60	<b>2.81</b>	2.01-3.94

<sup>a</sup>Low reliability

Adjusted for age, sex, educational level and partnership status. Abbreviations: OR, odds ratio; CI, confidence intervals  
Data source: EUROSTAT and SFSO: EU-SILC

Although there are differences between countries and within Switzerland as regards predictors of SRH, no clear language pattern can be observed except for the association between satisfaction with one's financial situation and SRH (Model 2 in Table 2) and for the association between GLS and SRH (Models 3 and 4 in Table 3 and 4). Both associations are stronger among German-speaking than French/Italian-speaking populations.

We performed interaction analyses for Model 4 with a combined dataset for all countries/language areas. These assessed significant differences between language regions and countries for job satisfaction, satisfaction with one's financial situation and GLS, as these satisfaction variables had proved to have the strongest impact on SRH in previous analyses. Most interaction terms show no clear language pattern (see Appendix V).

## **DISCUSSION**

This study was carried out to fill existing research gap and lack of evidence in this field and regarding the question of the true determinants and most important components of general life satisfaction and their direct and indirect impact on self-rated health. And although much is known about the associations between particular domain satisfactions and SRH, GLS and SRH, the question of which of these matter most in this regard has been little studied and remains unclear. To our knowledge, this is the first study to examine the impact of various life domains based on self-rated domain satisfactions on GLS and SRH in a cross-country comparison.

The results of our first research question show that not all domain satisfactions are equally strongly associated with GLS and SRH. Moreover, associations between domain satisfactions and GLS are stronger than associations between domain satisfaction and SRH. The strongest associations are found for satisfaction with one's financial situation, satisfaction with personal relationships, job satisfaction and satisfaction with accommodation on the one hand and GLS on the other. Likewise, these same domain satisfactions are also the strongest predictors of SRH.

As regards our second research question, namely whether the impacts of GLS and domain satisfactions on SRH differ across countries and between language areas, we found that – depending on the population – different life domains measured as domain satisfactions are important for SRH. This may be due to different perceptions of values across countries, as has been pointed out in previous studies [16,36]. GLS is the only satisfaction measure that is significantly related to SRH in all countries. Satisfaction with one’s financial situation and job satisfaction are important predictors for SRH in several countries. Satisfactions with personal relationships, with one’s living environment and with time use show significant associations with SRH in both Germany and German-speaking Switzerland. However, other investigated domain satisfactions are negligible with respect to SRH. Hence the previously documented associations for GLS [17], job satisfaction [22], satisfaction with personal relationships [25] as well as with one’s financial situation [23,24] with SRH were confirmed. Conversely, the association between satisfaction with one’s accommodation and SRH as reported by Gordon et al. [21] was not corroborated, whereas previously unreported significant relationships were found for satisfaction with one’s living environment and satisfaction with time use. As our study populations differ from those of previous studies investigating the relationship between satisfaction measures and SRH, these divergent results probably reflect the different attribution of values to life domains across countries: as Hofstede has pointed out [14], although Germany, Austria and Switzerland are individualistic societies, they are less so than Italy and France [37]. This lower level of individualistic values could explain why domain satisfactions with the social environment are only important for SRH in Germany and German-speaking Switzerland. However, Hofstede’s theory of cultural dimensions fails to explain our results regarding the associations between domain satisfactions from the occupational environment and SRH. One of the six cultural dimensions is that of masculinity, which represents the success orientation of a culture and hence indicates how important work is. There is a discrepancy between Hofstede’s reported values of a country and the life domains important for SRH. For example, Hofstede claims that the occupational environment should not be of great importance for France, which scores low on the masculinity scale [37]. Contrarily, we found that satisfaction with one’s financial situation and job satisfaction are significantly associated with SRH in France. Interestingly, domain satisfactions do not significantly impact on the SRH of Italians. The



Organization for Economic Co-operation and Development (OECD) highlights the remarkable impact of the economic crisis on life satisfaction in Italy [38]. The percentage of Italians who reported high satisfaction with their lives dropped from almost 60% in 2007 to 40% in 2013. Assuming GLS to be the superposed construct of domain satisfactions, we also expected to observe a notable deterioration in domain satisfactions. As the percentage of Italians rating their health as “good” increased over this time period [39], this discrepancy between satisfaction measures and SRH might explain why these measures fail to predict SRH in Italy. Nevertheless, we have to question the underlying assumption of cultural closeness on the basis of language affiliation with respect to the relation between satisfaction measures and SRH as the only association between GLS and SRH that reveals a clear language pattern. Although several patterns in German-speaking Switzerland closely resemble those in Germany and to a lesser extent those in Austria (job satisfaction, satisfaction with one’s financial situation), they also resemble those in France, whereas French/Italian-speaking Switzerland does not seem to correspond with Italy and even less with France. Interestingly, satisfaction with one’s financial situation is more strongly related to GLS in French/Italian-speaking than German-speaking populations, and conversely the association with SRH is more compelling in German-speaking than French/Italian-speaking populations. These results suggest that GLS may be a stronger mediator in the relationship between satisfaction with one’s financial situation and SRH in French/Italian-speaking than German-speaking populations. The language pattern in the relationship between satisfaction with one’s financial situation and SRH (Model 2) can partly explain the language pattern in the association of GLS with SRH, as it disappears with the inclusion of GLS in the fully adjusted model. It should, however, be borne in mind that the satisfaction measure concerned the overall financial situation of the household and not just the satisfaction with an individual salary. The divergent results regarding the existence of a language pattern in the association between domain satisfactions and GLS with SRH could also be attributed to different degrees of conceptual relevance, i.e. rating a life domain versus rating life as a whole. Stable traits such as personality or culture influence the assessment of specific life domains less than when rating life as a whole as has been pointed out in a previous study [11]. Hence, as culture affects the rating of GLS more than the rating of domain satisfactions, we find a language pattern for the association of GLS with SRH. Conversely, the lack of a language pattern in

the association between domain satisfactions with SRH suggests that more specific aspects of life are valued differently across nations and are less influenced by culture.

Further, as regards our third research question, we found that few domain satisfactions are directly associated with SRH, while most of them are rather indirectly associated with SRH via GLS. The various models revealed GLS to be a highly significant predictor of SRH in all countries, even after additional inclusion of all domain satisfactions, whereas many domain satisfactions ceased to show a significant association with SRH after the inclusion of GLS. Strong associations remained mainly for satisfaction with one's financial situation and job satisfaction, thus indicating independent effects of these domain satisfactions on SRH, which were not fully mediated by GLS. Surprisingly, domain satisfactions linked to the residential and social environments played a rather minor role in predicting SRH, as most of them were insignificant in the fully adjusted model, although other studies did report such associations [21,25]. The few domain satisfaction variables remaining significant in the fully adjusted model suggest that many associations are mediated by GLS as the aggregate construct of domain satisfactions. This finding supports the underlying assumption of the "bottom-up" perspective [12]. However as some relationships between domain satisfactions and SRH remain significant after adjustment for GLS, the latter cannot be seen as the simple sum of diverse domain satisfactions. It consequently includes an additional stable trait, such as personality or culture that we did not measure. This finding is supported by previous studies that have included domain satisfactions as predictors as well as dispositional factors as distal predictors for GLS [13].

### **Strengths and limitations**

As our study is based on a large set of European survey data, our findings regarding satisfactions and SRH can be considered as representative for the workforce of the investigated countries. This is of broader interest since EU-SILC is a large database covering almost all European countries assessing population health as well as quality of life outcomes: it may consequently be applied to study social, political and economic policies as well as welfare regimes in relation to health [40]. EU-SILC has occasionally been used for studies on SRH [41], but not for analyzing the associations between

different domain satisfactions and SRH. The use of various domain satisfactions as indicators of different living conditions and as predictors of GLS and of SRH is also a novel approach, since to our knowledge this has not been done before in a similar way. Further, the stepwise logistic regression analyses enabled us to examine which associations of domain satisfaction with SRH are fully or partly mediated by the superposed construct of GLS and whether there are any independent effects of domain satisfactions on SRH.

There are several limitations of this study. Although we use GLS as a predictor of SRH in our models, the cross-sectional nature of the data did not allow us to study the direction of this relationship [20]. A reverse causality between GLS and SRH cannot therefore be ruled out. As we used data from the Survey on Living and Income Conditions, this provided limited data on well-being. We decided to keep the model simple and limit the explanatory variables to the full list of satisfaction measures collected as well as the control variables in order to avoid overadjustment of the models. Although we incorporated all satisfaction variables available in the analyses, the set of domain satisfactions does not cover the whole range of life domains and should be enlarged in future ad-hoc modules of EU-SILC. As we included the occupational environment as one life area, all analyses were subsequently restricted to the active workforce, excluding high percentages of the original sample – especially in Italy – and inducing the risk of a healthy-worker selection bias [42]. Moreover, we cannot rule out a selection bias due to the two different sampling designs entailing a higher percentage of missing values for the ad-hoc module relating to France and Italy. However, this elevated rate may also be ascribed to the exclusion of proxy questionnaires in Italy [43]. Chi-square tests revealed higher non-response rates for males (except in Germany), younger participants and participants in education/training [43] for this 2013 ad-hoc module on subjective well-being. This could lead to an overestimation of the mean satisfaction for the workforce, as males tend to score lower in satisfaction [43] and are under-represented in the final sample. Conversely, the restriction to the workforce may underestimate satisfaction in the whole population, since younger (under 25) and older people (65+) tend to report higher satisfaction scores than the middle-aged [43]. And not least, the dichotomization

of the independent and trichotomization of the dependent variables for reasons of clarity of interpretation involved a loss of explanatory power.

## **CONCLUSIONS**

If we return to our initial research question, namely which life domains matter most for SRH, we conclude that satisfaction with one's financial situation followed by one's working situation are the most influential life domains with respect to SRH. As GLS is the only satisfaction measure significantly related to SRH in all countries, we believe that this association may be objectively valid. Taking into account the incomplete coverage of life domains in our study and the controversial findings regarding which domain satisfactions are predictive for GLS [44,45], residual confounders may be presumed. Future studies could gain from more specifically assessing the different aspects of life satisfaction prevailing in various cultures [16] and from broadening the research focus to the associations of additional life domains with health relevance. In spite of the cross-sectional nature of our data that precludes testing for causality, the similar patterns among German-speaking populations as well as the clear differences between countries suggest a substantial potential to target health promotion programs and welfare policies in the life domains accordingly, i.e. by focusing on domains contributing most to predicting GLS and SRH.

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## **COMPLIANCE WITH ETHICAL STANDARDS**

### **Disclosure of potential conflicts of interest**

The authors declare no competing financial as well as non-financial interest.

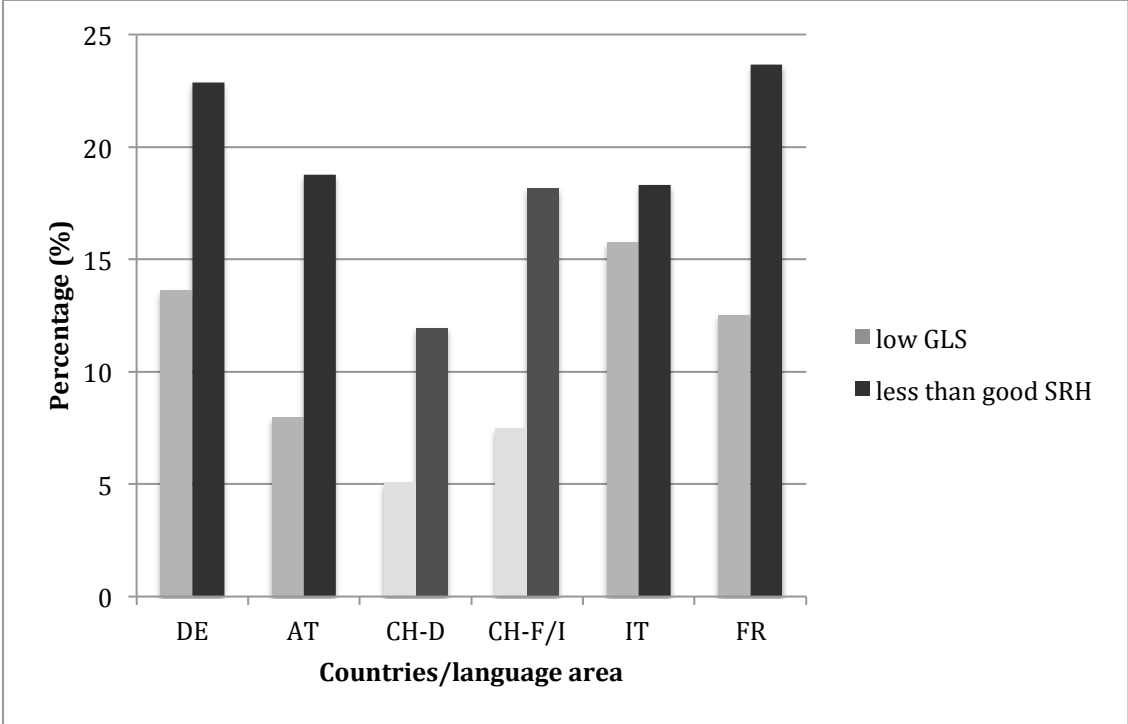
### **Research Involving Human Participants and/or Animals & Informed consent**

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. However this is an observational study based on survey data that were collected on a voluntary and anonymous basis, no approval by the ethics committee was required.

**Appendix I** Missing responses and answer category “I don’t know” per variable of interest by country

	CH		DE		AT		IT		FR	
	Missing	I do not know	Missing	I do not know	Missing	I do not know	Missing	I do not know	Missing	I do not know
Age	0	0	0	0	0	0	0	0	0	0
Sex	0	0	0	0	0	0	0	0	0	0
Partnership	0	0	0	0	1	0	0	0	0	0
Education	1	0	0	0	0	0	117	0	108	0
Accommodation	879	0	1291	27	414	1	5047	56	2872	8
Living environment	884	0	1292	28	414	0	5047	69	2873	13
Green & recreational areas	886	0	1287	95	415	5	5047	100	2874	62
Job	882	0	1369	40	415	2	5047	56	2874	12
Financial situation	886	0	1301	27	416	2	5047	60	2873	12
Commuting time	925	0	1487	35	634	2	5459	87	3146	41
Time use	883	0	1285	37	415	2	5047	67	2873	17
Personal relationship	884	0	1290	47	416	1	5047	68	2873	12
GLS	885	0	1292	78	416	1	5047	70	2872	12
SRH	881	0	17	0	1	0	569	0	199	0

**Appendix II** Percentage of people reporting low GLS and less than good SRH by country/language area



**Appendix III** Characteristics of study population by county/language region within Switzerland. Number of participants, percentage of participants reporting less than good SRH, means and standard deviation for continuous variables

	Germany				Austria				CH-D				CH-I/F				Italy				France					
	n	%	Mean	(SD)	n	%	Mean	(SD)	n	%	Mean	(SD)	n	%	Mean	(SD)	n	%	Mean	(SD)	n	%	Mean	(SD)		
<b>Sociodemographic &amp;-economic variables</b>																										
<b>Age</b>			46.36	(9.83)			44.04	(9.44)			46.33	(10.28)			45.45	(10.27)			45.61	(9.09)			43.81	(9.89)		
25-34	1357	11.72			882	8.50			782	7.16			278	12.95			1235	8.18			1374	11.64				
35-44	2211	15.83			1257	15.12			1098	9.56			406	14.78			3045	12.38			1986	21.60				
45-54	3239	24.08			1625	22.89			1636	12.47			505	18.81			3426	21.22			2036	28.44				
55-64	2140	35.42			672	29.02			1192	16.61			345	25.51			1833	29.57			1112	33.54				
<b>Sex</b>																										
Male	4283	22.09			2301	18.64			2514	10.74			791	18.46			5162	17.16			2824	21.18				
Female	4664	23.61			2135	18.88			2194	13.35			743	17.90			4377	19.67			3684	25.60				
<b>Partnership</b>																										
Yes	6490	22.02			3195	18.34			3611	10.72			1161	17.05			6389	17.48			4927	22.29				
No	2457	23.61			1241	19.82			1097	16.04			373	21.72			3150	20.00			1581	28.02				
<b>Education</b>																										
Tertiary	3941	17.48			1125	11.47			2150	9.44			756	15.34			2033	12.35			2713	17.10				
Secondary	4621	26.36			2883	18.83			2272	12.32			660	18.79			5031	16.68			2996	25.97				
Primary	385	36.36			428	37.38			286	27.97			118	33.05			2475	26.55			799	37.42				
<b>Residential environment</b>																										
Satisfaction with accommodation			7.64	(1.97)			8.28	(1.88)			8.41	(1.50)			8.23	(1.59)			7.39	(1.74)			7.60	(1.57)		
High (9-10)	3411	17.12			2378	14.97			2499	10.44			726	16.39			2239	15.32			1699	19.72				
Medium (6-8)	4226	23.47			1629	20.63			1968	11.99			704	19.32			6234	17.34			4179	23.45				
Low (0-5)	1310	35.95			429	32.63			241	27.39			104	23.08			1066	30.30			630	35.87				
Satisfaction with living environment			7.85	(1.96)			8.45	(1.84)			7.94	(1.81)			7.66	(1.95)			6.29	(2.21)			7.78	(1.50)		
High (9-10)	3883	17.92			2538	16.31			1910	11.88			528	17.23			1116	13.98			1930	20.21				
Medium (6-8)	3941	23.83			1545	19.81			2326	10.92			795	16.73			5590	16.30			4085	23.87				
Low (0-5)	1123	36.69			353	31.73			472	17.37			211	26.07			2833	24.00			493	35.70				
Satisfaction with green & recreational area			7.75	(2.09)			8.27	(2.07)			8.63	(1.50)			8.10	(1.86)			6.42	(2.32)			7.33	(1.99)		
High (9-10)	3822	18.92			2458	15.95			2777	11.13			688	17.01			1421	14.78			1712	22.49				
Medium (6-8)	3809	22.71			1440	19.79			1719	12.10			699	18.74			5393	16.45			3718	23.08				
Low (0-5)	1316	34.88			538	28.81			212	21.70			147	21.09			2725	23.85			1078	27.64				
<b>Occupational environment</b>																										
Job satisfaction			7.00	(2.17)			8.01	(1.76)			8.00	(1.60)			7.85	(1.73)			7.06	(1.96)			7.20	(1.77)		
High (9-10)	2250	14.18			1878	11.87			1735	9.80			546	17.77			1924	15.18			1268	16.88				
Medium (6-8)	4676	19.76			2129	20.15			2651	11.54			835	17.96			6017	16.19			4269	22.28				
Low (0-5)	2021	39.78			429	41.96			322	27.02			153	20.92			1598	30.10			971	38.72				
Satisfaction with financial situation of household			6.61	(2.28)			7.28	(2.03)			7.78	(1.80)			7.46	(1.92)			5.99	(2.06)			6.64	(1.81)		
High (9-10)	1730	11.73			1197	10.28			1596	8.21			425	14.59			634	11.99			714	14.15				
Medium (6-8)	4610	19.44			2385	17.65			2604	11.56			879	17.29			5736	13.23			4200	20.57				
Low (0-5)	2607	36.36			854	33.72			508	25.79			230	28.26			3169	28.78			1594	36.14				
Satisfaction with commuting time			7.55	(2.59)			8.09	(2.21)			8.36	(1.92)			8.15	(2.06)			7.04	(2.19)			7.52	(2.26)		
High (9-10)	4262	20.48			2347	15.94			2582	11.12			780	17.05			2476	16.07			2549	21.03				
Medium (6-8)	2746	21.89			1410	20.07			1674	12.07			567	19.40			5096	17.21			2733	24.70				
Low (0-5)	1939	29.55			679	25.77			452	16.37			187	19.25			1967	24.00			1226	26.92				
<b>Social environment</b>																										
Satisfaction with time use			5.90	(2.52)			6.74	(2.38)			6.58	(2.19)			5.95	(2.40)			6.14	(2.18)			6.25	(2.19)		
High (9-10)	1355	15.20			1072	12.78			732	10.25			176	14.20			978	13.91			832	19.83				
Medium (6-8)	3826	19.34			2009	17.17			2519	10.40			692	17.34			5467	15.66			3419	22.05				
Low (0-5)	3766	29.24			1355	25.83			1457	15.51			666	20.12			3094	24.40			2257	27.56				
Satisfaction with personal relationships			7.75	(1.98)			8.40	(1.68)			8.65	(1.24)			8.43	(1.33)			7.46	(1.60)			7.89	(1.47)		
High (9-10)	3706	17.65			2392	14.80			2633	9.00			725	16.00			2112	15.20			2077	19.74				
Medium (6-8)	4035	22.55			1709	20.83			1982	14.73			760	19.21			6598	17.32			3979	23.85				
Low (0-5)	1206	40.05			335	36.42			93	36.56			49 <sup>1</sup>	34.69 <sup>1</sup>			829	34.14			452	40.27				
<b>Life in general</b>																										
General life satisfaction (GLS)			7.50	(1.69)			8.07	(1.55)			8.17	(1.40)			7.97	(1.51)			7.00	(1.81)			7.35	(1.55)		
High (9-10)	2355	9.30			1775	7.10			1850	6.05			521	11.52			1499	11.41			1220	13.03				
Medium (6-8)	5371	22.16			2307	22.15			2619	13.21			898	20.27			6534	15.84			4472	22.56				
Low (0-5)	1221	52.25			354	55.08			239	43.93			115	32.17			1506	35.92			816	45.71				

<sup>1</sup> Low reliability

## Appendix IV Correlations between satisfaction measures and SRH by country/language area in 2013

### Spearman's rank correlation for Germany

Satisfaction with...	Accommodation	Living Environment	Green and recreational areas	Job	Financial situation	Commuting time	Time use	Personal relationships	GLS	SRH
Accommodation	1.00									
Living Environment	0.4434	1.00								
Green and recreational areas	0.3782	0.7094	1.00							
Job	0.3260	0.2610	0.2546	1.00						
Financial situation	0.4396	0.2669	0.2631	0.3311	1.00					
Commuting time	0.1820	0.2034	0.1984	0.2660	0.1542	1.00				
Time use	0.2210	0.2133	0.2501	0.2884	0.2525	0.3243	1.00			
Personal relationships	0.3221	0.3247	0.3489	0.3167	0.2593	0.2233	0.3588	1.00		
GLS	0.4230	0.3211	0.3049	0.4188	0.5298	0.1886	0.2970	0.4221	1.00	
SRH	0.1379	0.1294	0.1103	0.2060	0.2124	0.0737	0.1321	0.1458	0.2851	1.00

### Spearman's rank correlation for Austria

Satisfaction with...	Accommodation	Living Environment	Green and recreational areas	Job	Financial situation	Commuting time	Time use	Personal relationships	GLS	SRH
Accommodation	1.00									
Living Environment	0.4006	1.00								
Green and recreational areas	0.3248	0.6581	1.00							
Job	0.2874	0.2011	0.1995	1.00						
Financial situation	0.3404	0.2333	0.2269	0.2737	1.00					
Commuting time	0.1715	0.1794	0.1666	0.2635	0.1267	1.00				
Time use	0.1767	0.1903	0.2223	0.2687	0.2052	0.1788	1.00			
Personal relationships	0.2617	0.2650	0.2565	0.2901	0.2354	0.1899	0.3678	1.00		
GLS	0.3511	0.2608	0.2380	0.3785	0.4738	0.1867	0.2537	0.3509	1.00	
SRH	0.1222	0.0874	0.0952	0.1932	0.1939	0.0869	0.1261	0.1295	0.3002	1.00

### Spearman's rank correlation for German-speaking Switzerland

Satisfaction with...	Accommodation	Living Environment	Green and recreational areas	Job	Financial situation	Commuting time	Time use	Personal relationships	GLS	SRH
Accommodation	1.00									
Living Environment	0.1083	1.00								
Green and recreational areas	0.2549	0.1152	1.00							
Job	0.1675	0.1209	0.1548	1.00						
Financial situation	0.2446	0.1100	0.1648	0.2159	1.00					
Commuting time	0.1039	0.1561	0.1160	0.2216	0.1224	1.00				
Time use	0.1342	0.1163	0.1094	0.2277	0.1828	0.1239	1.00			
Personal relationships	0.2000	0.1328	0.1632	0.2445	0.1665	0.1658	0.2043	1.00		
GLS	0.2650	0.1012	0.2012	0.3570	0.3656	0.1671	0.2215	0.3086	1.00	
SRH	0.0686	0.0207	0.0401	0.0846	0.1273	0.0366	0.0658	0.1131	0.1943	1.00

### Spearman's rank correlation for French/Italian-speaking Switzerland

Satisfaction with...	Accommodation	Living Environment	Green and recreational areas	Job	Financial situation	Commuting time	Time use	Personal relationships	GLS	SRH
Accommodation	1.00									
Living Environment	0.1057	1.00								
Green and recreational areas	0.3305	0.1746	1.00							
Job	0.1795	0.1347	0.1316	1.00						
Financial situation	0.2767	0.1155	0.1917	0.2442	1.00					
Commuting time	0.0973	0.1655	0.1103	0.2071	.1824	1.00				
Time use	0.0755	0.1041	0.0579	0.1928	0.1615	0.1405	1.00			
Personal relationships	0.1920	0.1626	0.1640	0.2384	0.1376	0.1434	0.1777	1.00		
GLS	0.2973	0.1604	0.1978	0.3420	0.3846	0.1416	0.1802	0.2815	1.00	
SRH	0.0486	0.0493	0.0315	0.0157	0.0982	0.0284	0.0495	0.0653	0.1436	1.00

### Spearman's rank correlation for Italy

Satisfaction with...	Accommodation	Living Environment	Green and recreational areas	Job	Financial situation	Commuting time	Time use	Personal relationships	GLS	SRH
Accommodation	1.00									
Living Environment	0.1845	1.00								
Green and recreational areas	0.3003	0.3405	1.00							
Job	0.3088	0.1983	0.2362	1.00						
Financial situation	0.2942	0.2123	0.2076	0.3069	1.00					
Commuting time	0.2256	0.2271	0.1923	0.2856	0.1976	1.00				
Time use	0.2052	0.2314	0.2009	0.2608	0.2705	0.2813	1.00			
Personal relationships	0.2896	0.2606	0.1916	0.3044	0.1945	0.2384	0.3139	1.00		
GLS	0.3839	0.1930	0.2323	0.3601	0.4691	0.2027	0.2630	0.3317	1.00	
SRH	0.0879	0.0943	0.0867	0.1098	0.1829	0.0657	0.1056	0.0939	0.1781	1.00

### Spearman's rank correlation for France

Satisfaction with...	Accommodation	Living Environment	Green and recreational areas	Job	Financial situation	Commuting time	Time use	Personal relationships	GLS	SRH
Accommodation	1.00									
Living Environment	0.4635	1.00								
Green and recreational areas	0.3244	0.5937	1.00							
Job	0.2889	0.2491	0.1559	1.00						
Financial situation	0.3602	0.3056	0.1921	0.2629	1.00					
Commuting time	0.1417	0.1732	0.1405	0.2354	0.1217	1.00				
Time use	0.1617	0.2029	0.1699	0.1924	0.1808	0.2610	1.00			
Personal relationships	0.2872	0.3179	0.2401	0.2533	0.2001	0.1776	0.2727	1.00		
GLS	0.3707	0.3568	0.2103	0.3196	0.5016	0.1552	0.2344	0.3337	1.00	
SRH	0.0869	0.0761	0.0341	0.1422	0.1689	0.0534	0.0676	0.0926	0.1991	1.00

Data source: EUROSTAT and SFSO: EU-SILC

Appendix V Associations between satisfaction measures and SRH. Logistic regression with interaction terms for job satisfaction and country, satisfaction with one's financial situation and country as well as GLS and country in 2013

	Fully adjusted model (FAM)		FAM country*job satisfaction		FAM country*satisfaction with financial situation		FAM country*GLS		Fully adjusted model		FAM country*job satisfaction		FAM country*satisfaction with financial situation		FAM country*GLS	
	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)	OR	CI (95%)
<b>Residential conditions</b>																
Satisfaction with accommodation																
High	1		1		1		1		1		1		1		1	
Medium	1.01	0.92-1.12	1.01	0.91-1.12	1.02	0.92-1.12	1.01	0.92-1.12	1.01	0.92-1.12	1.01	0.91-1.12	1.02	0.92-1.12	1.01	0.92-1.12
Low	1.06	0.92-1.23	1.06	0.92-1.23	1.07	0.92-1.23	1.06	0.92-1.23	1.06	0.92-1.23	1.06	0.92-1.23	1.07	0.92-1.23	1.06	0.92-1.23
Satisfaction with living environment																
High	1		1		1		1		1		1		1		1	
Medium	<b>1.16</b>	1.04-1.30	<b>1.15</b>	1.03-1.29	<b>1.16</b>	1.04-1.30	<b>1.16</b>	1.03-1.30	<b>1.16</b>	1.04-1.12	<b>1.15</b>	1.03-1.29	<b>1.16</b>	1.04-1.30	<b>1.16</b>	1.03-1.30
Low	<b>1.20</b>	1.03-1.39	<b>1.19</b>	1.02-1.38	<b>1.20</b>	1.03-1.39	<b>1.19</b>	1.02-1.39	<b>1.20</b>	1.03-1.39	<b>1.19</b>	1.02-1.38	<b>1.20</b>	1.03-1.39	<b>1.19</b>	1.02-1.39
Satisfaction with green & recreational area																
High	1		1		1		1		1		1		1		1	
Medium	0.87	0.77-0.97	<b>0.87</b>	0.78-0.97	<b>0.86</b>	0.77-0.97	<b>0.86</b>	0.77-0.96	<b>0.87</b>	0.77-0.97	<b>0.87</b>	0.78-0.97	<b>0.86</b>	0.77-0.97	0.86	0.77-0.96
Low	0.93	0.81-1.07	0.94	0.82-1.08	0.93	0.81-1.07	0.93	0.81-1.07	<b>0.87</b>	0.77-0.97	0.94	0.82-1.08	<b>0.86</b>	0.77-0.97	0.93	0.81-1.07
<b>Occupational environment</b>																
Job satisfaction																
High	1		1		1		1		1		1		1		1	
Medium	<b>1.15</b>	1.03-1.28	0.94	0.75-1.18	<b>1.16</b>	1.04-1.29	<b>1.16</b>	1.04-1.29	<b>1.15</b>	1.03-1.28	0.75	0.53-1.06	<b>1.16</b>	1.04-1.29	<b>1.16</b>	1.04-1.29
Low	<b>1.73</b>	1.52-1.98	<b>2.12</b>	1.48-3.05	<b>1.74</b>	1.53-1.98	<b>1.73</b>	1.51-1.97	<b>1.73</b>	1.52-1.98	0.75	0.44-1.28	<b>1.74</b>	1.53-1.98	<b>1.73</b>	1.51-1.97
Satisfaction with financial situation of household																
High	1		1		1		1		1		1		1		1	
Medium	<b>1.24</b>	1.08-1.43	<b>1.23</b>	1.07-1.42	<b>1.30</b>	1.01-1.66	<b>1.21</b>	1.05-1.40	<b>1.24</b>	1.08-1.43	<b>1.23</b>	1.07-1.42	1.00	0.68-1.48	<b>1.21</b>	1.05-1.40
Low	<b>1.72</b>	1.47-2.02	<b>1.71</b>	1.46-2.00	<b>2.34</b>	1.70-3.22	<b>1.68</b>	1.43-1.97	<b>1.72</b>	1.47-2.02	<b>1.71</b>	1.46-2.00	1.31	0.80-2.16	<b>1.68</b>	1.43-1.97
Satisfaction with commuting time																
High	1		1		1		1		1		1		1		1	
Medium	1.00	0.91-1.09	1.00	0.91-1.09	1.00	0.91-1.09	1.00	0.91-1.09	1.00	0.91-1.09	1.00	0.91-1.09	1.00	0.91-1.09	1.00	0.91-1.09
Low	0.97	0.86-1.08	0.97	0.86-1.08	0.97	0.86-1.08	0.97	0.86-1.08	0.97	0.86-1.08	0.97	0.86-1.08	0.97	0.86-1.08	<b>1.21</b>	1.04-1.42
<b>Social environment</b>																
Satisfaction with time use																
High	1		1		1		1		1		1		1		1	
Medium	1.03	0.90-1.18	1.03	0.90-1.17	1.03	0.90-1.18	1.03	0.90-1.18	1.03	0.90-1.18	1.03	0.90-1.17	1.03	0.90-1.18	1.03	0.90-1.18
Low	<b>1.27</b>	1.11-1.47	<b>1.27</b>	1.10-1.46	<b>1.28</b>	1.11-1.47	<b>1.28</b>	1.11-1.47	<b>1.27</b>	1.11-1.47	<b>1.27</b>	1.10-1.46	<b>1.28</b>	1.11-1.47	<b>1.28</b>	1.11-1.42
Satisfaction with personal relationships																
High	1		1		1		1		1		1		1		1	
Medium	1.00	0.91-1.11	1.00	0.91-1.11	1.00	0.91-1.11	1.00	0.91-1.10	1.00	0.91-1.11	1.00	0.91-1.11	1.00	0.91-1.11	1.00	0.91-1.10
Low	<b>1.23</b>	1.06-1.44	<b>1.24</b>	1.06-1.44	1.23	1.06-1.44	1.21	1.04-1.42	<b>1.23</b>	1.06-1.44	1.24	1.06-1.44	1.23	1.06-1.44	1.21	1.04-1.42
<b>Life in general</b>																
GLS																
High	1		1		1		1		1		1		1		1	
Medium	<b>1.81</b>	1.60-2.05	<b>1.80</b>	1.59-2.04	<b>1.82</b>	1.01-1.66	<b>1.35</b>	1.43-2.38	<b>1.81</b>	1.60-2.05	<b>1.80</b>	1.59-2.04	<b>1.82</b>	1.60-2.06	1.41	0.96-2.05
Low	<b>3.48</b>	2.96-4.10	<b>3.49</b>	2.96-4.10	<b>3.50</b>	1.70-3.22	<b>1.81</b>	3.84-8.35	<b>3.48</b>	2.96-4.10	<b>3.49</b>	2.96-4.10	<b>3.50</b>	2.98-4.12	<b>1.90</b>	1.06-3.39
	<b>Reference category German-speaking Switzerland</b>								<b>Reference category French/Italian-speaking Switzerland</b>							
Country/Region																
German-speaking Switzerland	1		1		1		1		<b>0.67</b>	0.56-0.81	<b>0.53</b>	0.38-0.73	<b>0.51</b>	0.35-0.75	<b>0.49</b>	0.33-0.72
Latin-speaking Switzerland	<b>1.49</b>	1.23-1.80	<b>1.89</b>	1.36-2.63	<b>1.96</b>	1.34-2.86	<b>2.05</b>	1.40-3.02	1	-	1	-	1	-	1	-
Germany	<b>1.51</b>	1.34-1.71	<b>1.30</b>	1.04-1.64	<b>1.48</b>	1.13-1.93	<b>1.37</b>	1.05-1.79	1.02	0.85-1.21	<b>0.69</b>	0.50-0.94	0.76	0.52-1.09	<b>0.67</b>	0.47-0.96
Austria	<b>1.72</b>	1.50-1.97	1.26	0.99-1.60	<b>1.64</b>	1.23-2.18	1.33	0.99-1.79	1.16	0.96-1.39	<b>0.66</b>	0.48-0.91	0.84	0.57-1.22	<b>0.65</b>	0.44-0.95
Italy	0.99	0.86-1.14	<b>1.33</b>	1.02-1.74	<b>2.12</b>	1.42-3.18	<b>1.70</b>	1.24-2.35	<b>0.67</b>	0.56-0.80	<b>0.70</b>	0.50-0.98	1.08	0.67-1.75	0.83	0.56-1.23
France	<b>1.81</b>	1.59-2.07	<b>1.39</b>	1.06-1.83	<b>2.12</b>	1.54-2.12	<b>2.21</b>	1.64-2.98	<b>1.22</b>	1.02-1.46	0.73	0.52-1.03	1.08	0.72-1.63	1.08	0.74-1.57
<b>Interactions</b>																
Medium job satisfaction * Region of CH			0.80	0.53-1.20							1.25	0.83-1.89				
Medium job satisfaction * Germany			1.31	0.99-1.72							<b>1.64</b>	1.12-2.40				
Medium job satisfaction * Austria			<b>1.59</b>	1.18-2.15							<b>2.00</b>	1.34-2.98				
Medium job satisfaction * Italy			0.83	0.61-1.13							1.04	0.69-1.56				
Medium job satisfaction * France			<b>1.50</b>	1.09-2.06							<b>1.88</b>	1.24-2.84				
Low job satisfaction * Region of CH			<b>0.35</b>	0.19-0.67							<b>2.83</b>	1.49-5.38				
Low job satisfaction * Germany			0.89	0.60-1.33							<b>2.52</b>	1.44-4.43				
Low job satisfaction * Austria			1.44	0.91-2.27							<b>4.07</b>	2.22-7.44				
Low job satisfaction * Italy			<b>0.43</b>	0.28-0.67							1.23	0.68-2.22				
Low job satisfaction * France			1.06	0.68-1.67							<b>3.02</b>	1.66-5.49				
Medium satisfaction * Region of CH					0.77	0.49-1.22							1.30	0.82-2.04		
Medium satisfaction * Germany					1.10	0.80-1.49							1.42	0.92-2.19		
Medium satisfaction * Austria					1.14	0.81-1.60							1.48	0.94-2.33		
Medium satisfaction * Italy					<b>0.46</b>	0.30-0.71							0.59	0.35-1.01		
Medium satisfaction * France					0.90	0.63-1.29							1.16	0.73-1.86		
Low satisfaction * Region of CH					0.56	0.31-1.00							1.78	1.00-3.18		
Low satisfaction * Germany					0.82	0.56-1.18							1.45	0.86-2.47		
Low satisfaction * Austria					0.86	0.57-1.30							1.54	0.88-2.68		
Low satisfaction * Italy					<b>0.38</b>	0.23-0.62							0.68	0.37-1.25		
Low satisfaction * France					0.67	0.44-1.02							1.20	0.68-2.11		
Medium GLS * Region of CH							0.76	0.49-1.20							1.31	0.84-2.05
Medium GLS * Germany							1.16	0.86-1.58							<b>1.53</b>	1.01-2.31
Medium GLS * Austria							<b>1.44</b>	1.02-2.02							<b>1.88</b>	1.21-2.92
Medium GLS * Italy							<b>0.63</b>	0.44-0.90							0.82	0.52-1.29
Medium GLS * France							0.88	0.62-1.22							1.14	0.74-1.77
Low GLS * Region of CH							<b>0.34</b>	0.17-0.67							<b>2.98</b>	1.50-5.93
Low GLS * Germany							0.83	0.54-1.27							<b>2.46</b>	1.33-4.54
Low GLS * Austria							1.18	0.72-1.94							<b>3.52</b>	1.81-6.81
Low GLS * Italy							<b>0.32</b>	0.20-0.51							0.95	0.50-1.80
Low GLS * France							<b>0.51</b>	0.32-0.82							1.53	0.81-2.89