

Supplementary Information

Heiko Rüger, Stefanie Hoherz, Norbert F. Schneider, Herbert Fliege, Maria M. Bellinger, and Brenton M. Wiernik: The Effects of Urban Living Conditions on Subjective Well-being: The Case of German Foreign Service Employees. Applied Research in Quality of Life.

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Table S1

Single aspects of subjective living conditions (LC) compared with their Mercer equivalent: Correlations, OLS regressions on SWB for each living condition

Bivariate correlations				Linear regression models for													
Living conditions (subjective /objective indicator) ²	subj. LC with SWB	obj. LC with SWB	subj. LC with obj. LC	each subj. LC on SWB separately; not controlled for objective LC (Mercer) equivalent ¹					each subj. LC on SWB separately; + objective LC (Mercer) equivalent controlled for ¹								N ³
				Subjective LC coeff.					Subjective LC coeff.				Objective LC coeff.				
				B	B SE	P> t	R	R ²	B	B SE	P> t	B	B SE	P> t	R	R ²	
political stability/inner stability	0.302	0.257	0.624	0.139	0.016	< 0.001	0.091	0.090	0.107	0.020	< 0.001	0.055	0.021	0.010	0.099	0.097	794
crime, corruption/crime	0.342	0.257	0.571	0.144	0.014	< 0.001	0.117	0.116	0.122	0.017	< 0.001	0.052	0.024	0.032	0.123	0.120	758
public order/public order, police	0.395	0.288	0.591	0.171	0.014	< 0.001	0.156	0.155	0.149	0.017	< 0.001	0.046	0.022	0.037	0.161	0.158	797
possibilities to communicate	0.269	0.123	0.537	0.111	0.014	< 0.001	0.072	0.071	0.118	0.017	< 0.001	-0.019	0.023	0.403	0.073	0.071	805
medical care, hospitals/hospitals	0.411	0.249	0.520	0.214	0.018	< 0.001	0.169	0.168	0.201	0.021	< 0.001	0.026	0.022	0.251	0.171	0.168	719
quality of water	0.423	0.285	0.603	0.163	0.012	< 0.001	0.179	0.178	0.152	0.016	< 0.001	0.017	0.014	0.223	0.181	0.179	782
waste disposal and sewage system/waste disposal	0.420	0.286	0.598	0.160	0.012	< 0.001	0.177	0.175	0.148	0.015	< 0.001	0.035	0.026	0.181	0.178	0.176	782
waste disposal and sewage system/sewage system	0.420	0.289	0.584	0.160	0.012	< 0.001	0.177	0.175	0.146	0.015	< 0.001	0.040	0.025	0.108	0.179	0.177	782
air quality/air pollution	0.439	0.225	0.568	0.177	0.013	< 0.001	0.193	0.192	0.185	0.016	< 0.001	-0.023	0.023	0.331	0.194	0.192	803
public transport	0.356	0.260	0.704	0.130	0.012	< 0.001	0.127	0.126	0.124	0.017	< 0.001	0.011	0.026	0.662	0.127	0.125	784

(Table S1 continued)		Bivariate correlations		Linear regression models for													
				each subj. LC on SWB separately; not controlled for objective LC (Mercer) equivalent ¹					each subj. LC on SWB separately; + objective LC (Mercer) equivalent controlled for ¹								
				Subjective LC coeff.					Subjective LC coeff.			Objective LC coeff.					
Living conditions (subjective /objective indicator) ²	subj. LC with SWB	obj. LC with SWB	subj. LC with obj. LC	B	B SE	P> t	R	R ²	B	B SE	P> t	B	B SE	P> t	R	R ²	N ³
traffic congestion	0.306	0.162	0.432	0.145	0.016	< 0.001	0.094	0.092	0.138	0.018	< 0.001	0.029	0.030	0.344	0.095	0.092	802
sports opportunities/ sports opportunities and clubs	0.421	0.198	0.316	0.200	0.015	< 0.001	0.177	0.176	0.189	0.016	< 0.001	0.050	0.022	0.026	0.182	0.180	786
selection and quality of housing	0.294	0.153	0.107	0.164	0.019	< 0.001	0.087	0.085	0.156	0.019	< 0.001	0.101	0.029	< 0.001	0.101	0.099	744
housing maintenance and repair	0.360	0.252	0.103	0.170	0.016	< 0.001	0.130	0.129	0.160	0.015	< 0.001	0.112	0.017	< 0.001	0.178	0.176	781

Note. B = unstandardized regression coefficient. B SE = standard error of unstandardized regression coefficient.

All correlations between SWB and subjective and objective living conditions items are stat. significant ($p \leq 0.001$). 95% CIs for $r \pm .04$. 95% CIs for $B \pm .06$.

¹Each row depicts a regression model with only either the subjective LC controlled for or the subjective LC + the equivalent objective LC (Mercer).

²In cases where the label varies between subjective and objective indicator, each label is listed separated by a '/'.

³The analyses in each line are based on the same sample, and the observation numbers are thus identical (and reported once). The degrees of freedom are always 1 in models controlling only for the subjective LC, and 2 for models including the subjective and the objective LC.

Table S2

OLS Regression for SWB with 11 dimensions of subjective living conditions, with all 14 Mercer living condition items that have single item of subjective living conditions equivalents, Megacity, and HDI

[illegible]

(Table S2 continued)			Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Variable	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t		
<i>City size</i>																				
megacity							-0.231	0.078	0.003	0.014	0.076	0.856								
(ref.: non-megacity)																				
<i>HDI</i>																				
(continuous)													3.755	0.407	<0.001	-0.177	0.522	0.735		
N (degrees of freedom)	1219	(11)		816	(14)		1219	(1)		1219	(12)		652	(1)		652	(12)			
R ²	0.350			0.113			0.007			0.350			0.116			0.380				
Adj. R ²	0.344			0.097			0.006			0.344			0.114			0.369				

Note. B = unstandardized regression coefficient. B SE = standard error of unstandardized regression coefficient. 95% CIs for B $\pm$.79.

Table S3

OLS Regression for SWB with 11 dimensions of subjective living conditions and ‘quality of and access to nature’ as moderator

Variable	Model 1			Model 2		
	B	B SE	P> t	B	B SE	P> t
<i>Subjective living conditions</i>						
safety	0.019	0.019	0.327	-0.024	0.036	0.499
contact	0.045	0.015	0.002	0.068	0.028	0.017
medical care	0.015	0.016	0.359	0.026	0.029	0.376
quality of and access to nature	0.084	0.018	< 0.001	0.189	0.047	< 0.001
quality of water, air, food supply, sewage system	0.041	0.022	0.057	0.068	0.041	0.103
public transport/transit	-0.023	0.013	0.069	-0.025	0.027	0.357
congestion	0.027	0.020	0.185	0.078	0.039	0.045
noise	0.054	0.016	0.001	0.089	0.026	0.001
accessibility of airport	0.016	0.013	0.234	0.046	0.024	0.060
sports opportunities	0.030	0.015	0.047	0.005	0.027	0.854
housing	0.131	0.019	< 0.001	0.143	0.035	< 0.001
<i>Interaction with quality of and access to nature</i>						
safety				0.011	0.007	0.113
contact				-0.004	0.005	0.474
medical care				-0.002	0.005	0.678
quality of water, air, food supply, sewage system				-0.006	0.007	0.400
public transport/transit				0.001	0.005	0.837
congestion				-0.011	0.007	0.086
noise				-0.008	0.004	0.044
accessibility of airport				-0.006	0.005	0.177
sports opportunities				0.007	0.005	0.226
housing				-0.003	0.007	0.602
N (degrees of freedom)	1219	(11)		1219	(21)	
R ²	0.350			0.363		
Adj. R ²	0.344			0.352		

Note. B = unstandardized regression coefficient. B SE = standard error of unstandardized regression coefficient. 95% CIs for B $\pm$.09.

Table S4*Exploratory factor analysis for 31 subjectively assessed living conditions items*

Variables	safety	quality of and access to nature	noise	housing	contact	congestion	quality of water, air, food supply, sewage system
offer/ selection of apartments				0.626			-0.264
quality of the housing estate		0.193		0.672			
quality of the apartment				0.874			
maintenance and repair services in the household	0.122			0.658			0.159
green spaces: presence, accessibility		0.948					
green spaces: quality		0.898					
nature: presence, accessibility, quality		0.697				0.159	
<i>sports opportunities</i>							
outdoor activities		0.683				0.110	0.172
<i>medical care, hospitals</i>		0.174	0.253		0.246	0.363	-0.141
drinking water quality	0.127	0.227		0.101	0.109		0.551
food safety	0.116	0.179		0.165	0.147		0.515
air quality		0.255	0.162			0.288	0.373
waste and sewage disposal	0.212	0.270					0.384
<i>public transportation</i>		0.301			-0.124	0.290	
traffic density, traffic jams	0.151	0.117	0.159		-0.194	0.474	0.165
<i>flight connections, accessibility of the airport</i>		0.252					0.148
general noise			0.570		-0.127	0.366	
noise in the living environment			0.987				
nightly noise			0.906				
possibilities to communicate	0.111				0.623		0.109
ability to learn the national language					0.745		
contact possibilities with locals					0.732	0.116	-0.107
social density, tightness					0.334	0.654	
congestion, queues						0.649	
political stability	0.592				0.229		0.243
reliability of public order	0.699	0.122			0.130		0.160
social tensions	0.703				0.110		0.114
burglary security at home	0.678			0.121	-0.110		-0.165
security in public space	0.842				-0.124		-0.197
other crime, corruption	0.717						0.146
Cronbach's α	0.880	0.873	0.886	0.887	0.895	0.882	0.871
Number of cases	2056	2152	2125	2124	1894	2007	2113

Note. Values below .1 are not shown. Items grouped together are bold faced. Four single items (sports opportunities; public transportation; medical care, hospitals; flight connections, access of the airport) that could not be grouped together into indices are in italics. Cronbach's α was calculated for indices. The factor analysis is a "pre-analysis" and is thus based on the full sample with employees located both in Germany and abroad.

Table S5

Single aspects of subjective living conditions (LC) compared with their Mercer equivalent: OLS regression on SWB for each living condition + controls

Bivariate correlations				Linear regression models for													
Living conditions (subjective /objective indicator) ²				each subj. LC on SWB separately; not controlled for objective LC (Mercer) equivalent ¹					each subj. LC on SWB separately; + objective LC (Mercer) equivalent controlled for ¹								
				Subjective LC coeff.					Subjective LC coeff.				Objective LC coeff.				
				B	B SE	P> t	R	R ²	B	B SE	P> t	B	B SE	P> t	R	R ²	N ³
political stability/inner stability	0.319	0.261	0.651	0.145	0.017	< 0.001	0.128	0.117	0.109	0.022	< 0.001	0.060	0.023	0.066	0.149	0.127	683
crime, corruption/crime	0.323	0.259	0.585	0.147	0.015	< 0.001	0.137	0.126	0.124	0.019	< 0.001	0.056	0.026	0.147	0.174	0.153	653
public order/public order, police	0.389	0.284	0.618	0.180	0.015	< 0.001	0.180	0.170	0.163	0.019	< 0.001	0.035	0.023	0.237	0.218	0.198	685
possibilities to communicate	0.248	0.117	0.565	0.105	0.015	< 0.001	0.089	0.078	0.107	0.018	< 0.001	-0.004	0.025	0.656	0.092	0.070	692
medical care, hospitals/hospitals	0.376	0.255	0.535	0.225	0.019	< 0.001	0.170	0.160	0.217	0.023	< 0.001	0.016	0.024	0.468	0.218	0.198	625
quality of water	0.405	0.277	0.636	0.157	0.013	< 0.001	0.193	0.183	0.144	0.017	< 0.001	0.020	0.016	0.362	0.208	0.187	673
waste disposal and sewage system/waste disposal	0.392	0.325	0.644	0.165	0.013	< 0.001	0.187	0.177	0.151	0.017	< 0.001	0.038	0.028	0.201	0.228	0.208	675
waste disposal and sewage system/sewage system	0.392	0.309	0.632	0.165	0.013	< 0.001	0.187	0.177	0.150	0.016	< 0.001	0.040	0.026	0.270	0.228	0.208	675
air quality/air pollution	0.426	0.245	0.584	0.177	0.014	< 0.001	0.212	0.202	0.187	0.017	< 0.001	-0.025	0.025	0.555	0.239	0.220	690
public transport	0.337	0.267	0.730	0.139	0.013	< 0.001	0.150	0.139	0.130	0.019	< 0.001	0.017	0.029	0.832	0.176	0.155	673
traffic congestion	0.294	0.177	0.464	0.147	0.017	< 0.001	0.116	0.105	0.138	0.019	< 0.001	0.034	0.032	0.327	0.137	0.115	691
sports opportunities/ sports opportunities and clubs	0.408	0.208	0.320	0.205	0.016	< 0.001	0.197	0.188	0.191	0.017	< 0.001	0.059	0.024	0.021	0.217	0.197	675

(Table S5 continued)				Bivariate correlations			Linear regression models for													
Living conditions (subjective /objective indicator) ²				each subj. LC on SWB separately; not controlled for objective LC (Mercer) equivalent ¹					each subj. LC on SWB separately; + objective LC (Mercer) equivalent controlled for ¹											
				Subjective LC coeff.					Subjective LC coeff.				Objective LC coeff.							
				B	B SE	P> t	R	R ²	B	B SE	P> t	B	B SE	P> t	R	R ²	N ³			
selection and quality of housing				0.302	0.200	0.160	0.161	0.021	< 0.001	0.118	0.107	0.150	0.021	< 0.001	0.113	0.031	0.001	0.152	0.129	658
housing maintenance and repair				0.360	0.263	0.134	0.175	0.017	< 0.001	0.161	0.151	0.162	0.017	< 0.001	0.119	0.018	0.000	0.226	0.206	671

Note. B = unstandardized regression coefficient. B SE = standard error of unstandardized regression coefficient. All correlations between SWB and subjective and objective living conditions items are stat. significant ($p \leq 0.001$).

¹Each row depicts a regression model with only either the subjective LC controlled for or the subjective LC + the equivalent objective LC (Mercer).

²In cases where the label varies between subjective and objective indicator, each label is listed separated by a '/'.

³The analyses in each line are based on the same sample, and the observation numbers are thus identical (and reported once). The degrees of freedom are always 13 in models controlling only for the subjective LC, and 14 for models including the subjective and the objective LC.

This table is identical to Table S1, except all 28 models include control variables: gender, age group, civil service group, family status, Big 5 personality dimensions 'extraversion' and 'neuroticism'. The coefficients of the control variables are not included in the table for clarity.

Table S6

OLS Regression for SWB with 11 dimensions of subjective living conditions, with all Mercer living condition items that have single item of subjective living conditions equivalents, Megacity, HDI, + control variables

[illegible]

(Table S6 continued)			Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Variable	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t	B	B SE	P> t		
City size																				
megacity (ref.: non-megacity)							-0.246	0.084	0.003	-0.032	0.081	0.695								
HDI (continuous)																				
													3.784	0.436	<0,001	-0.306	0.556	0.582		
Gender																				
female (ref.: male)	0.052	0.077	0.502	-0.006	0.104	0.957	0.157	0.095	0.099	0.052	0.077	0.502	0.006	0.118	0.957	-0.068	0.100	0.493		
Age group																				
40-49	-0.026	0.090	0.773	-0.194	0.125	0.120	-0.046	0.111	0.680	-0.026	0.090	0.770	-0.163	0.138	0.240	-0.071	0.117	0.545		
50-59	0.035	0.083	0.676	0.089	0.114	0.436	0.042	0.101	0.680	0.035	0.083	0.675	0.157	0.127	0.215	0.187	0.108	0.084		
60+ years old (ref.: <40 years old)	0.112	0.118	0.344	-0.075	0.162	0.644	0.097	0.143	0.498	0.111	0.118	0.350	0.029	0.182	0.873	0.188	0.156	0.229		
Civil service grade																				
ordinary/intermediate	-0.063	0.118	0.596	0.170	0.165	0.304	-0.044	0.146	0.762	-0.061	0.119	0.606	0.002	0.183	0.993	-0.027	0.154	0.862		
higher intermediate	-0.042	0.108	0.697	0.240	0.149	0.109	0.128	0.132	0.333	-0.041	0.108	0.707	0.145	0.164	0.378	-0.019	0.140	0.890		
higher (ref.: secretarial pool)	0.110	0.128	0.390	0.426	0.169	0.012	0.391	0.156	0.012	0.114	0.128	0.372	0.297	0.188	0.115	0.056	0.161	0.730		
Family status																				
partner + no children	-0.099	0.078	0.207	-0.147	0.109	0.179	-.0219	0.096	0.024	-0.102	0.079	0.197	-0.115	0.119	0.333	-0.107	0.101	0.289		
no partner + min. 1 child	0.050	0.181	0.781	-0.272	0.245	0.267	-0.041	0.223	0.853	0.050	0.181	0.782	0.024	0.260	0.927	-0.015	0.220	0.947		
single (ref.: partner + min. 1 child)	0.004	0.105	0.969	0.083	0.138	0.546	0.000	0.128	0.999	0.002	0.105	0.984	0.117	0.159	0.460	-0.002	0.135	0.988		
Big 5 personality dimensions																				
Neuroticism (continuous)	-0.008	0.002	0.000	-0.006	0.002	0.008	-0.008	0.002	<0,001	-0.008	0.002	<0,001	-0.007	0.003	0.008	-0.007	0.002	0.003		
Extraversion (continuous)	0.001	0.002	0.561	0.004	0.003	0.181	-0.001	0.003	0.782	0.001	0.002	0.559	0.004	0.003	0.214	0.003	0.003	0.285		
N (degrees of freedom)	1068	(23)		700	(26)		1068	(13)		1068	(24)		568	(13)		568	(24)			
R ²	0.383			0.152			0.041			0.383			0.150			0.419				
Adj. R ²	0.369			0.119			0.029			0.369			0.130			0.394				

Note. B = unstandardized regression coefficient. B SE = standard error of unstandardized regression coefficient. This table is identical to Table S2, except all models include control variables.

Table S7

OLS Regression for SWB with 11 dimensions of subjective living conditions and ‘quality of and access to nature’ as moderator + controls

Variable	Model 1			Model 2		
	B	B SE	P> t	B	B SE	P> t
<i>Subjective living conditions</i>						
safety	0.017	0.021	0.424	-0.019	0.039	0.619
contact	0.039	0.016	0.014	0.081	0.030	0.007
medical care	0.019	0.017	0.267	0.020	0.031	0.551
quality of and access to nature	0.099	0.019	<0.001	0.220	0.048	0.000
quality of water, air, food supply, sewage system	0.026	0.023	0.252	0.059	0.043	0.142
public transport/transit	-0.016	0.014	0.237	-0.017	0.028	0.581
congestion	0.013	0.022	0.543	0.055	0.041	0.299
noise	0.057	0.017	0.001	0.105	0.027	0.000
accessibility of airport	0.016	0.014	0.271	0.045	0.026	0.083
sports opportunities	0.030	0.016	0.059	-0.008	0.028	0.712
housing	0.129	0.021	<0.001	0.152	0.036	0.000
<i>Interaction with quality of and access to nature</i>						
safety				0.010	0.007	0.207
contact				-0.008	0.005	0.133
medical care				0.000	0.006	0.960
quality of water, air, food supply, sewage system				-0.008	0.008	0.338
public transport/transit				0.001	0.005	0.916
congestion				-0.009	0.007	0.401
noise				-0.010	0.004	0.024
accessibility of airport				-0.006	0.005	0.211
sports opportunities				0.010	0.006	0.069
housing				-0.006	-0.007	0.361
<i>Gender</i>						
female (ref.: male)	0.052	0.077	0.502	0.064	0.077	0.408
<i>Age group</i>						
40-49	-0.026	0.090	0.773	0.016	0.089	0.857
50-59	0.035	0.083	0.676	0.082	0.083	0.322
60+ years old (ref.: <40 years old)	0.112	0.118	0.344	0.157	0.118	0.186
<i>Civil service grade</i>						
ordinary/intermediate	-0.063	0.118	0.596	-0.057	0.118	0.627
higher intermediate	-0.042	0.108	0.697	-0.068	0.108	0.529
higher (ref.: secretarial pool)	0.110	0.128	0.390	0.089	0.127	0.482
<i>Family status</i>						
partner + no children	-0.099	0.078	0.207	-0.109	0.078	0.165
no partner + min. 1 child	0.050	0.181	0.781	0.040	0.181	0.825
single (ref.: partner + min. 1 child)	0.004	0.105	0.969	-0.003	0.105	0.977
<i>Big 5 personality dimensions</i>						
Neuroticism (continuous)	-0.008	0.002	0.000	-0.009	0.002	0.000
Extraversion (continuous)	0.001	0.002	0.561	0.002	0.002	0.378
N (degrees of freedom)	1068	(23)		1068	(33)	
R ²	0.383			0.401		
Adj. R ²	0.369			0.381		

Note. B = unstandardized regression coefficient. B SE = standard error of unstandardized regression coefficient. This table is identical to Table S3, except all models include control variables.

Table S8*Overview of the cities included with name*

City	Country	Megacity ^b	HDI ^c	City	Country	Megacity ^b	HDI ^c
Africa				Europe			
Abuja	Nigeria	No	0.532	Athens	Greece	No	0.870
Addis Ababa	Ethiopia	No	0.463	Belgrade	Serbia	No	0.787
Algiers	Algeria	No	0.754	Bern	Switzerland	No	0.944
Cairo	Egypt	Yes	0.696	Brussels	Belgium	No	0.916
Lagos	Nigeria	Yes	0.532	Bucharest	Romania	No	0.811
Nairobi	Kenya	No	0.590	Geneva	Switzerland	No	0.944
Pretoria	South Africa	No	0.699	Kyiv	Ukraine	No	0.751
Rabat	Morocco	No	0.667	London	Great Britain	Yes	0.922
Tunis	Tunisia	No	0.735	Madrid	Spain	No	0.891
Asia				Minsk	Belarus	No	0.839
Amman	Jordan	No	0.735	Moscow	Russia	Yes	0.816
Ankara ^a	Turkey	No	0.791	Paris	France	Yes	0.901
Baghdad	Iraq	No	0.692	Pristina	Kosovo	No	0.787
Bangkok	Thailand	Yes	0.755	Rome	Italy	No	0.880
Beijing	China	Yes	0.752	Sofia	Bulgaria	No	0.813
Beirut	Lebanon	No	0.757	The Hague	Netherlands	No	0.931
Erbil	Iraq	No	0.685	Tirana	Albania	No	0.785
Hanoi	Vietnam	No	0.694	Vienna	Austria	No	0.908
Islamabad	Pakistan	No	0.562	Warsaw	Poland	No	0.865
Istanbul ^a	Turkey	Yes	0.791	Latin America			
Jakarta	Indonesia	Yes	0.694	Bogotá	Colombia	Yes	0.747
Kabul	Afghanistan	No	0.498	Brasília	Brazil	No	0.759
New Delhi	India	Yes	0.640	Buenos Aires	Argentina	Yes	0.825
Riyadh	Saudi Arabia	No	0.853	Mexico City ^a	Mexico	Yes	0.774
Shanghai	China	Yes	0.752	North America			
Singapore	Singapore	No	0.932	New York City	USA	Yes	0.924
Tehran	Iran	Yes	0.798	Washington, D.C.	USA	No	0.924
Tel Aviv-Yafo	Israel	No	0.903				
Tokyo	Japan	Yes	0.909				

^a According to the UN definition, which includes socio-cultural factors in addition to geographical location in the classification, Turkish cities are assigned to Asia. Mexico City, also following the UN, is categorized as Latin America on the basis of language and demographic factors (United Nations, 2018).

^b For the distinction between megacities and non-megacities we follow, with a small deviation, the UN definition (2019) that classifies cities with more than 10 million inhabitants as megacities. This distinction is sometimes based only on the city's population, sometimes on the urban agglomeration, and sometimes the metropolitan area is considered. For three cities (Seoul, Tehran, and London) with just below 10 million inhabitants, we departed from the UN definition and classified them as megacities.

^c The Human Development Index (HDI) is a summary measure of a country's average achievement in key dimensions of human development: life expectancy at birth, expected years of education, average years of education, and average gross national income per capita (United Nations Development Programme, 2018).