

Is It Possible to Raise National Happiness?

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CESS3

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Measuring Happiness

H. Cantril (1965) The Pattern of Human Concerns

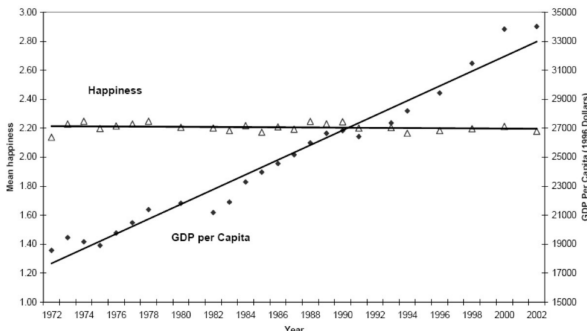
Here is a picture of a ladder. Suppose we say that the top of the ladder represents the best possible life for you and the bottom represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time?

10 <input type="checkbox"/>	10 Best possible life
9 <input type="checkbox"/>	9
8 <input type="checkbox"/>	8
7 <input type="checkbox"/>	7
6 <input type="checkbox"/>	6
5 <input type="checkbox"/>	5
4 <input type="checkbox"/>	4
3 <input type="checkbox"/>	3
2 <input type="checkbox"/>	2
1 <input type="checkbox"/>	1
0 <input type="checkbox"/>	0 Worst possible life

One main puzzle of happiness research

1. Easterlin paradox (1974):

- ▶ Over the long term, LS does not raise with GDP per capita.
 - ⇒ But, at a point in time, richer countries are more satisfied.
 - ⇒ And, within a country, richer people are more satisfied.
- ▶ Also true for other objective measures like the HDI.



Source: Easterlin (2003)

Another puzzle

2. **Easterlin paradox** (2001):

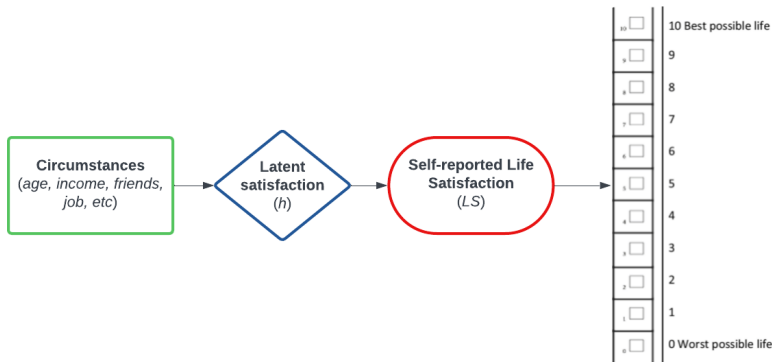
- ▶ **... we have another paradox to explain:** why people typically think that they were worse off in the past ... although their reports on present happiness remain constant over time". (Easterlin, 2001, p 471-472).

Easterlin's interpretation

- ▶ **Hedonic Treadmill** = hedonic adaptation = preference drift
 - ▶ *“Material aspirations increase commensurately with income, and as a result, one gets no nearer to or farther away from the attainment of one’s material goals, and well-being is unchanged”* (Easterlin, 2003).
- ▶ When thinking **about the past**, people neglect the adaptation process; they judge their past situation with their actual level of aspirations.
⇒ Increasing the incomes of all will **not** increase the happiness of all (1974).
- ▶ Hedonic treadmill applies to more than income (Clark et al., 2008). People adapt to most changes.

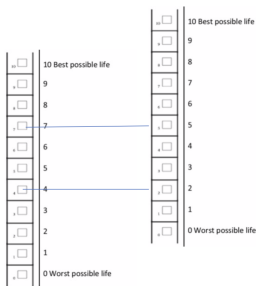
But what can we expect from a bounded scale?

H. Cantril (1965) *Here is a picture of a ladder. Suppose we say that the top of the ladder represents the best possible life for you and the bottom represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time?*



The Rescaling Hypothesis

- ▶ *“The ‘best possible life for you’ is a shifting standard that will move upwards with rising living standards...”*



- ▶ *According to this view, average national life satisfaction will be a useful measure in the cross-section, but not over time.” (Deaton, 2008, pp.12-13).*

Two interpretations

- **Hedonic treadmill** → Latent experienced happiness is relative to a shifting benchmark. If the benchmark changes, latent happiness does too automatically.
- **Rescaling** → Even when latent experienced happiness increases, this is not reflected on the Life Satisfaction scale because the meaning of the 0-10 scale has changed.

formal definition

- ▶ The question is whether the bounded scale is **intrinsic** or just a **reporting constraint**.

The paper in one slide

- ▶ Typically, hedonic adaptation is assumed.
- ▶ Here, we assume rescaling and:
 1. Propose a solution to measure latent life satisfaction over the long term;
 2. Collect a mix of new data;
 3. Show that accounting for rescaling solves several happiness puzzles.

NB: *both* hedonic adaptation and rescaling are very likely to happen in reality.

Outline

- 1 Model
- 2 Results
- 3 Validation
- 4 Conclusions

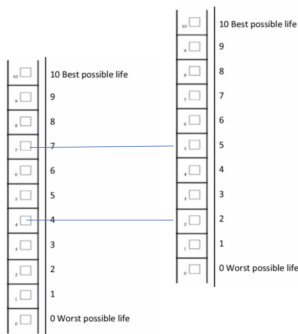
Rescaling

- ▶ If a person report $LS_t = LS_{t-1}$ we cannot say if latent satisfaction has not changed or if the scale has changed.

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Two types of rescaling:

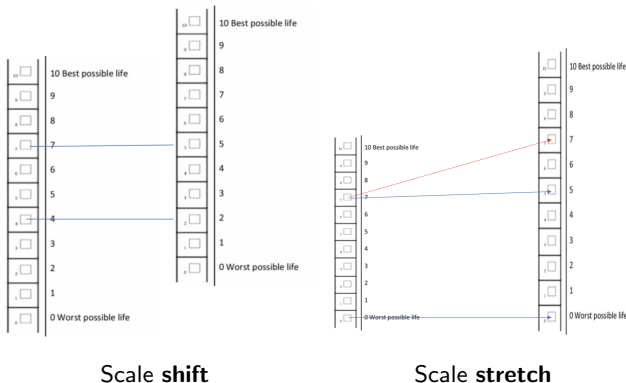


Scale **shift**

Rescaling

- ▶ If a person report $LS_t = LS_{t-1}$ we cannot say if latent satisfaction has not changed or if the scale has changed.

Two types of rescaling:



Scale **shift**

Scale **stretch**

Retrospective life satisfaction

- ▶ To quantify rescaling, we would need the same latent satisfaction to be reported on two scales (in t and in $t+1$).
- ▶ Retrospective life satisfaction (RLS) can help.
- ▶ $RLS =$ “Where on the ladder would you say you stood five years ago?” (Cantril, 1965) or “How satisfied with your life would you say you were 1/5 years ago?”
- ▶ By comparing RLS and LS_{t-1} we can learn about rescaling.
- ▶ But, memory biases can undermine the accuracy of RLS...

Memory bias calibration

- ▶ Identifying assumption: **law of recency**.
 - $m_{t,t-n} \sim \mathcal{D}(\bar{m}, v_n)$, where \mathcal{D} is a symm. prob. distribution.
 - the variance of the memory error m increases with the time interval n , but the average memory error \bar{m} is independent from it.
- ▶ Over a short time span, rescaling is negligible, but memory bias is not.
- ▶ To estimate the recall bias \bar{m} , we set up an online longitudinal survey using Prolific.com, where we interview a representative sample of the American population (N=1,647) twice, two weeks apart.
- ▶ We provide a precise estimate of $\bar{m} = 0.11$ LS scale points.
- ▶ Similar results on a different dataset (Anvari et al., 2023).

Model wrap up

- ▶ We have two equations:
 - ▶ $LS = f(\text{latent satisfaction, stretching, shifting})$
 - ▶ $RLS = f(\text{latent satisfaction, stretching, shifting, memory bias})$
- ▶ We cannot estimate three parameters from two equations.
- ▶ We therefore estimate latent satisfaction and consider **two scenarios**:
 - i. no stretching
 - ii. no shifting
- ▶ The no-shift and no-stretch scenarios are a lower- and upper-bound under some plausible conditions. conditions

The M-LINE

- ▶ We obtain two recursive forms to express latent satisfaction h at any time t . [details](#)
- ▶ If **no stretch**:

$$h_t = LS_t + \sum_{n=1}^t (LS_{n-1} - RLS_{n,n-1}) - t\bar{m}. \quad (1)$$

- ▶ If **no shift**:

$$h_t = LS_t \times \prod_{n=1}^t \frac{LS_{n-1}}{RLS_{n,n-1} + \bar{m}} \quad (2)$$

- ▶ We denote this construct as **M-LINE** (Memory corrected - Life satisfaction Noetic Evaluation)

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Application 1: The Easterlin Paradox

- ▶ Unfortunately, no long-term available dataset has information on:
 - ▶ Life satisfaction (0-10)
 - ▶ Retrospective life satisfaction (0-10)

Application 1: The Easterlin Paradox

- ▶ Unfortunately, no long-term available dataset has information on:
 - ▶ Life satisfaction (0-10)
 - ▶ Retrospective life satisfaction (0-10)
- ▶ Or so we thought.
- ▶ Cornell University archives do. The first poll was run by Cantril himself in 1959, and continued by Gallup inc. up to today.
- ▶ We retrieve the digitalized data, and calculate the M-LINE for the USA from 1959 to 2008.
- ▶ Thanks Isaac Parkes for making this data usable!

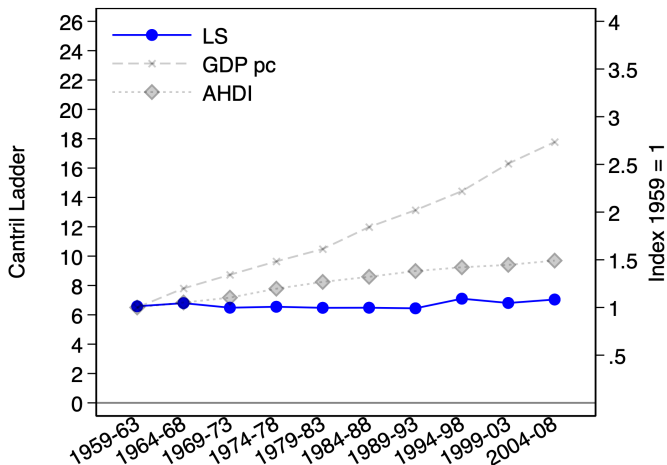
Source	Year	LS		RLS		LS-RLS		N
		mean	st.err.	mean	st.err.	mean	st.err.	
Cantril	1959	6.59	0.06	5.89	0.07	0.70	0.11	1489
U.S. Polls	1964	6.80	0.05	5.91	0.06	0.89	0.06	1544
U.S. Polls	1971	6.56	0.05	5.76	0.06	0.80	0.07	1537
U.S. Polls	1972	6.42	0.06	5.48	0.07	0.93	0.08	1232
U.S. Polls	1974	6.44	0.07	5.43	0.08	1.01	0.08	1172
U.S. Polls	1976	6.66	0.07	5.65	0.08	1.01	0.08	1046
U.S. Polls	1979	6.48	0.05	5.72	0.06	0.76	0.07	1560
U.S. Polls	1985	6.43	0.05	5.75	0.06	0.68	0.06	1540
U.S. Polls	1987	6.54	0.03	5.79	0.04	0.75	0.04	4195
U.S. Polls	1989	6.44	0.04	5.96	0.05	0.49	0.05	2025
U.S. Polls*	1998	7.10		5.70		0.40		
U.S. Soc. Ser.	2001	6.96	0.06	5.95	0.07	1.01	0.08	987
U.S. Soc. Ser.	2002	6.70	0.06	6.16	0.07	0.54	0.07	1001
U.S. Soc. Ser.	2003	6.76	0.06	6.14	0.07	0.62	0.08	984
U.S. Soc. Ser.	2004	6.60	0.06	6.11	0.07	0.49	0.08	994
U.S. Soc. Ser.	2005	6.64	0.06	6.24	0.07	0.40	0.07	986
World Poll	2006	7.18	0.06	6.15	0.08	1.03	0.08	995
World Poll	2007	7.51	0.05	6.58	0.06	0.93	0.06	1212
World Poll	2008	7.28	0.06	6.77	0.06	0.51	0.07	994

→ Perceived improvement (LS - RLS) not matched by increased in current LS

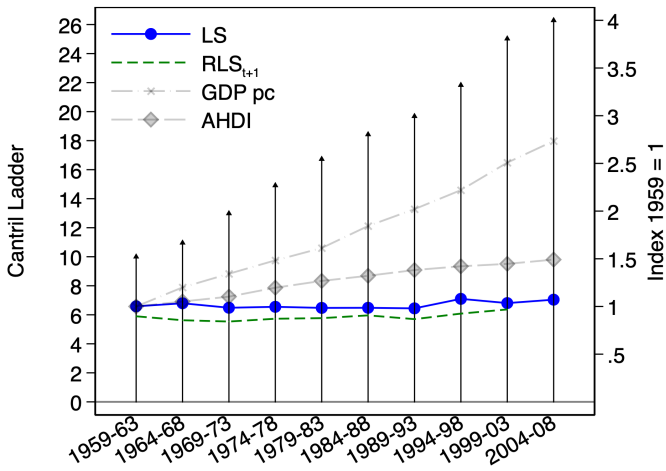
Constructing the M-LINE

- ▶ We aggregate the data into 5-year periods (i.e., from 1959-1963 to 2004-2008)
- ▶ Assuming uniform distribution within each period (so that the average LS of a period is the average of the observed years).
- ▶ We obtain a 10-period dataset
- ▶ For each period t , we observe nominal satisfaction LS_t and retrospective satisfaction for the previous period, $RLS_{t,t-1}$.
- ▶ We calibrate the M-LINE on a constant memory bias $\hat{m} = 0.11$.

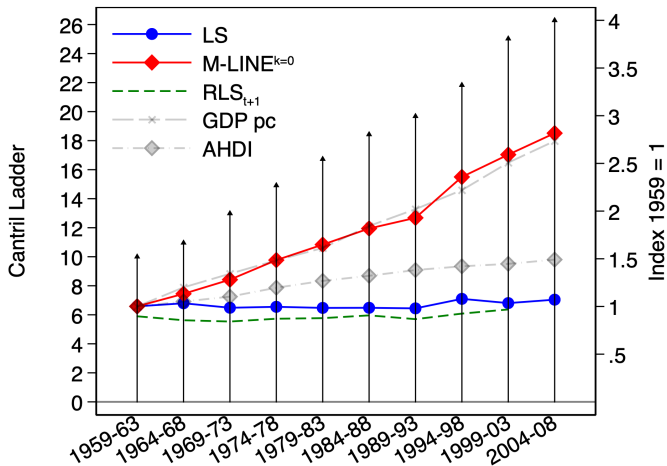
LS and objective wellbeing



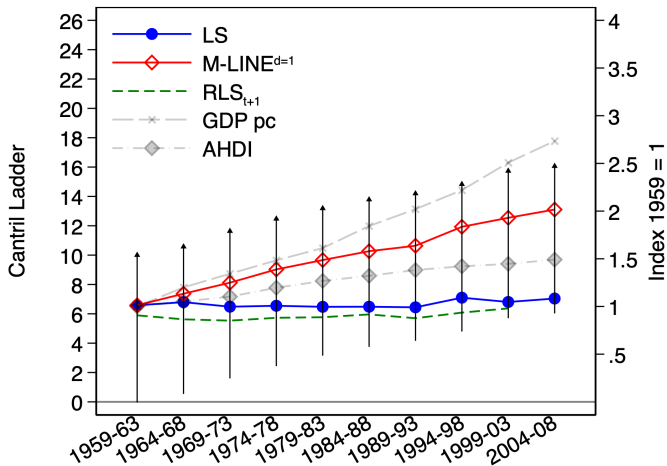
Estimated rescaling if no shift



The M-LINE if no shift



The M-LINE if no stretch



The upward trend in M-LINE - USA 1959-2008

- ▶ If the scale did not shift: latent satisfaction increased by **about 2.5 times** between 1959 and 2008.
- ▶ If the scale did not stretch: latent satisfaction roughly **doubled** between 1959 and 2008.

Application 2: The Pandemic in Europe

- ▶ Is the M-LINE always above nominal satisfaction or can it be below?
- ▶ We study the evolution of the latent scale during the pandemic.
- ▶ In 2020-21, little or no penalty in life satisfaction around the world. The 2022 World Happiness Report summarizes that *“subjective well-being continues to be resilient in the face of COVID-19 (p.33)”*.
- ▶ Is it a rescaling issue?

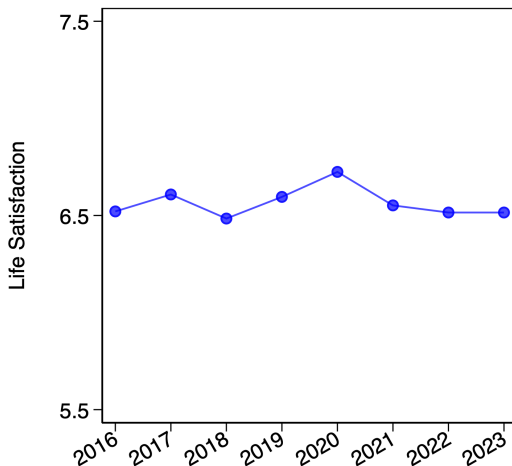
Two short-run times-series

- ▶ **1) Wellbeing module of the French Consumer Confidence Survey: CAMME**
- ▶ Representative dataset of the French population, run by INSEE since June 2016.

Cross-section → CAMME asks every quarter about:

- ▶ LS (“Overall, how satisfied are you with the life you currently lead?” [0-10]);
- ▶ RLS (“And when you think about last year, how did you place on a scale of 0 to 10?” [0-10]).

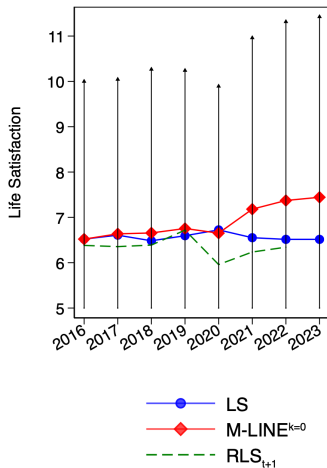
LS (France, 2016-2021)



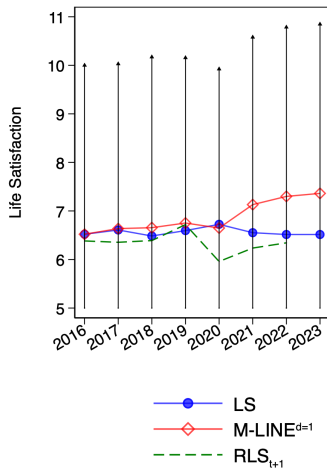
Source: INSEE, Quarterly survey of French population.

M-LINE (France, 2016-2021)

(a) No shift



(b) No stretch

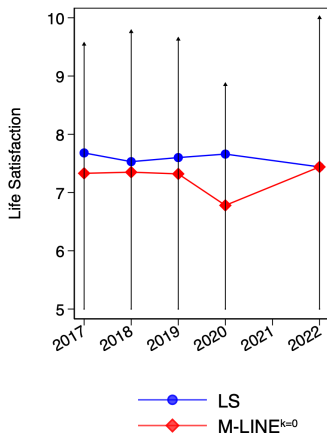


Two short-run times-series

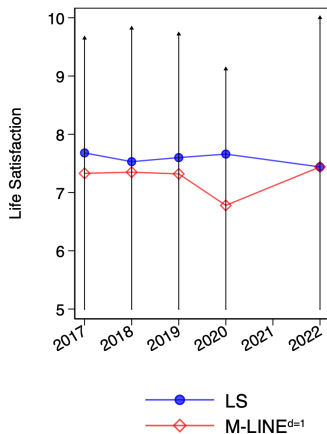
- ▶ **2) SOEP-IS 2022**
- ▶ Question introduced in 2022 in the SOEP-IS: “All things considered, how satisfied with your life were you in each of the last five years?” [0;10]: 2017, 2018, 2019, 2020 and 2021.
- ▶ Panel → compare their retrospective answers ($RLS_{2022,t}$) with the chronicle of LS_t

M-LINE Germany 2017-2022

(a) No shift



(b) No stretch

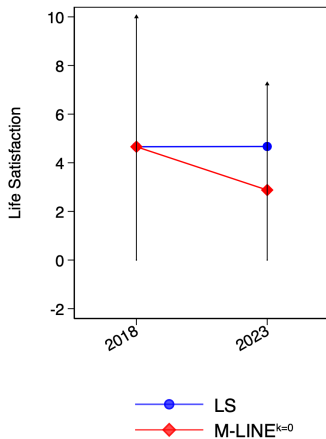


Application 3: The War in Ukraine

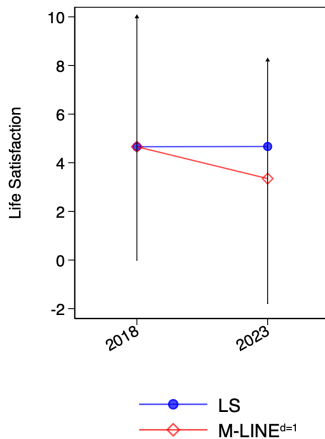
- ▶ In 2023, the Gallup World Poll accepted to collect data on retrospective life satisfaction 5 years ago around the world.
- ▶ This enable us to tackle another recent happiness puzzle.
- ▶ During the pandemic, LS in Ukraine *increased* by half a point, then returned to its pre-pandemic level after the Russian invasion.
- ▶ It would been that between 2018 and 2023, the combination of lockdowns and war had no average effect on Ukrainian citizens.
- ▶ Is it a rescaling issue?

M-LINE in Ukraine (2018-23)

(a) No shift



(b) No stretch



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Validation

- ▶ The soundness of our results depends on the quality of our new measure, the M-LINE.
- ▶ We run several tests aimed at assessing its psychometric validity and reliability.
- ▶ We use three micro-panel data:

Data Source	Country	Years	Type	Repres.	<i>N</i>
SOEP core	Germany	1984-1987	panel	✓	27,788
US online	USA	2024	panel	✓	3,256
UK online	UK	2023-2024	panel		2,010

- ▶ Herein, we present 3 of these tests.

Test 1. Does the M-LINE reflect changes in people's life?

- ▶ We assess the ability of observable life events (having a child, quitting a job, etc) to predict individual-level changes in latent satisfaction.
- ▶ First difference estimates with individual clustered st.err.:

$$(h_{it} - h_{it-1}) = (X_{it} - X_{it-1})'\beta + (\log(\text{income})_{it} - \log(\text{income})_{it-1})'\gamma + (\epsilon_{it} - \epsilon_{it-1})$$

where:

- ▶ $h_{it} - h_{it-1}$ is well-being change, measured either as ΔLS or $\Delta\text{M-LINE}$;
- ▶ X_{it} is a set of binary variables. $(x_{it} - x_{it-1})$ takes value 1 if the event x happened in the last year;
- ▶ $\epsilon_{it}, \epsilon_{it-1}$ are normally distributed error terms.

Test 1. UK online panel 2023-24

	ΔLS	$\Delta MLINE^{k=0}$	$\Delta MLINE^{d=1}$
income change (log)	3.24 (2.06)	11.83*** (2.59)	9.46*** (2.04)
childbirth	3.07 (3.00)	4.15 (2.70)	5.18*** (1.89)
new partner	6.17** (3.03)	6.59** (3.06)	6.09* (3.41)
new job	3.07* (1.77)	6.51*** (2.44)	4.25** (1.68)
bereavement/loss	-1.32 (1.23)	-0.40 (1.12)	-0.23 (1.00)
N	1,006	1,006	1,006
R^2	0.056	0.168	0.140

LS: "How satisfied are you with your life, all things considered?" [0-100]. RLS: "And how satisfied were you with your life about one year ago, all things considered?" [0-100]. Regressions include 25 additional events.

→ when rescaling is taken into account, observable life events explain about three times more of the total variance in individual life satisfaction.

Test 1. German SOEP, 1985-87

	ΔLS	$\Delta MLNE^{k=0}$	$\Delta MLNE^{d=1}$
income change (log)	0.28*** (0.04)	0.15*** (0.04)	0.18*** (0.03)
childbirth	-0.17*** (0.06)	0.19*** (0.06)	0.07* (0.04)
marriage	0.25** (0.10)	0.51*** (0.09)	0.38*** (0.07)
start employment	0.33*** (0.07)	0.83*** (0.09)	0.46*** (0.05)
start unemployment	-0.81*** (0.10)	-0.42*** (0.09)	-0.70*** (0.07)
N	27,788	27,788	27,788
R ²	0.009	0.015	0.020

LS question: "How satisfied are you at present with your life as a whole?" [0-10]. RLS question: "How satisfied were you a year ago with your life?" [0-10]. Additional controls: new disability and bereavement.

→ when rescaling is taken into account, childbirth flips sign.

Test 2. Test-Retest of RLS

- ▶ If the memory bias is not time-dependent, then people should reconstruct LS of a past period $t - n$ similarly in different periods.
- ▶ We use the US online survey (via Prolific.com, $N=1,647$)
- ▶ We interview the same participants twice, and ask:
RLS **as of 5 years ago** using the Cantril ladder (scale 0-10).
- ▶ With 2-weeks interval, the answer should be the same, and it is.

	In week 1	In week 3	diff.	p-value	N
$RLS_{2024,2019}$	5.47	5.43	0.04	0.208	1,647

RLS question: "Where on the ladder would you say you stood 5 years ago?" [0-10].

→ RLS has good test-retest reliability.

Test 3. Do people perceive any rescaling?

- ▶ We asked participants of the US online survey:
- ▶ (i) **“How has your idea of the “best possible life” changed in different aspects compared to five years ago? Would you say that your idea of the “best possible life”, rated at 10/10, is higher, lower, or about the same as it was five years ago? For instance, if five years ago someone considered that an annual income of 200,000 USD was 10/10 for personal income, but today they consider that 250,000 USD is 10/10, then their best possible income is higher today than five years ago.”**
- ▶ (ii) **“Similarly, how has your idea of the “worst possible life” changed in different aspects compared to five years ago? Would you say that your idea of the “worst possible life”, rated at 0/10, is higher, lower, or about the same as it was five years ago?”**

Test 3. Do people perceive any rescaling?

- ▶ The modal perception is consistent with upward scale stretching but no scale shifting.
- ▶ 41% participants felt that the **top of the scale increased** over the last 5 years, and 38% felt that it did not change, while the remaining 20% perceived a decrease.
- ▶ Half of the participants responded that the **bottom of the scale had not changed**, while 31% perceived it as lower today than 5 years ago and 17% as higher (1% N/A).
- ▶ This suggests that **rescaling**, in particular at the top of the scale, is not only theoretically plausible, but also **subjectively perceived**.

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Conclusions

Rescaling view: LS is measured on a context-dependent scale. When correcting for rescaling:

- ▶ National happiness in the USA has mostly increased (is not flat) over the long run.
- ▶ During the pandemic, life satisfaction in Europe dropped (and was not flat).
- ▶ During the Russian invasion, life satisfaction in Ukraine is well below (and not same as) pre-pandemic levels.
- ▶ R squared are 1.5 to 3 times higher.
- ▶ People seem more satisfied with their life *after* than *before* having kids.

Conclusions

Which of the two time-series should one believe: LS or the M-LINE?

- ▶ LS: hedonic treadmill
- ▶ M-LINE: rescaling

Probably a mix of both:

- ▶ The more of rescaling, the greater the leverage for raising people's happiness.
- ▶ The more of hedonic treadmill, the lesser the hope of raising happiness.

Your favorite view?

Thank you for your attention

Appendix

Hedonic treadmill vs rescaling

According to **hedonic treadmill**, the flat trend in LS is due to an adaptation process, whereby:

$$LS_t = f(h(c_t, \bar{c}_t)) \quad (3)$$

where $f(.)$ is the reporting function of the feeling h into the nominal life satisfaction scale, and $h(.)$ depends on \bar{c}_t , i.e., the level of aspirations of the agent, which increases at a similar pace as c .

According to **rescaling**, aspirations \bar{c}_t impact the act of *reporting*, but not the latent satisfaction itself, i.e.:

$$LS_t = f(h(c_t), \bar{c}_t) \quad (4)$$

i.e., life circumstances are mapped into latent satisfaction first, and this latent satisfaction is subsequently reported according to the reference point \bar{c} . [back](#)

Model summary

- Given:

$$LS_t = \frac{h_t - k_t}{d_t} \quad (5)$$

$$RLS_{t,t-1} = \frac{h_{t-1} - k_t}{d_t} - \bar{m} \quad (6)$$

- Then:

$$h_t = h_{t-1} + (LS_t - RLS_{t,t-1} - \bar{m}) \times d_t \quad (7)$$

- If no shift (k=0):

$$h_t = h_{t-1} \cdot \frac{LS_t}{RLS_{t,t-1} - \bar{m}} \quad (8)$$

- If no stretch (d=1):

$$h_t = h_{t-1} + (LS_t - RLS_{t,t-1} - \bar{m}) \quad (9)$$

Boundary conditions

- (i) when people feel better than yesterday, their idea of best possible life must improve at least as fast as their idea of worst possible life;
- (ii) when people feel worse than yesterday, their idea of worst possible life must deteriorate at least as fast as their idea of best possible life.

	Shift Up ($k_t > 0$)	No Shift ($k_t = 0$)	Shift Down ($k_t < 0$)
Stretch ($d_t > 1$)	✓	✓	×
No Stretch ($d_t = 1$)	✓	✓	✓
Shrink ($d_t < 1$)	×	✓	✓

[back](#)

Number of recorded events - UK online panel 2023-24

Category	Nb of occurrences	N
Parenthood	28	1,005
New Partner	37	1,005
Fired	24	1,005
Quit Job	71	1,005
Start Debt	137	1,005
End Debt	182	1,005
New Diagnosis/Injury	173	1,005
New Job	142	1,005
Promoted	90	1,005
Bereavement/Loss	264	1,005
income change*	659	1,005

* There were 658 episodes of annual personal income changes. Income change is coded as $\Delta \log(\text{income})$. On average, the annual change was about +7%.

Number of recorded events - SOEP 1984-87

Category	Nb of occurrences	N
Marriage	436	27,788
Widowhood	72	27,788
Employment	1,299	27,788
Unemployment	697	27,788
Disability	355	27,788
Parenthood	940	27,788
Income change*	24,641	27,788

* There were 24,641 episodes of annual household income changes. Income change is coded as $\Delta \log(\text{income})$. On average, the annual change was about +3%.

Correlation matrix - online UK 2023-24

	ΔLS	$\Delta M-LINE^{d=1}$	$\Delta M-LINE^{k=0}$	Feeling better/worse
ΔLS	1.0000			
$\Delta M-LINE^{d=1}$	0.4553*	1.0000		
$\Delta M-LINE^{k=0}$	0.3273*	0.8499*	1.0000	
Feeling better/worse	0.3255*	0.6086*	0.4882*	1.0000

Feeling better/worse: “*Compared to one year ago, how satisfied with your life are you nowadays?*” (-100 to +100 scale).

First-Difference Regression - GSOEP 1984-87

	(1) ΔLS	(2) $\Delta MLNE^{k=0}$	(3) $\Delta MLNE^{d=1}$
income change (log)	0.28*** (0.04)	0.15*** (0.04)	0.18*** (0.03)
parenthood	-0.17*** (0.06)	0.19*** (0.06)	0.07* (0.04)
marriage	0.25** (0.10)	0.51*** (0.09)	0.38*** (0.07)
start employment	0.33*** (0.07)	0.83*** (0.09)	0.46*** (0.05)
start unemployment	-0.81*** (0.10)	-0.42*** (0.09)	-0.70*** (0.07)
disability	-0.19 (0.12)	0.06 (0.11)	-0.13* (0.08)
widowhood	-0.61** (0.29)	0.18 (0.48)	-0.63** (0.32)
N	27,788	27,788	27,788
R^2	0.009	0.015	0.020

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

First-Difference Regressions with M-LINE

- ▶ Parenthood rehabilitated
- ▶ Marriage, employment: bigger impact
- ▶ Much higher R^2

Subjective reliability: perceived accuracy of RLS

- ▶ UK online panel
- ▶ after asking RLS, we asked: “How certain are you that your life satisfaction was exactly $x/100$?” where x corresponds to *RLS*.
- ▶ The response was formulated as follows; “*I am certain that my life satisfaction was actually:*
At the very least: ...
At the very most: ...”

	Lower bound	Upper bound	Cognitive uncertainty	N
<i>LS</i>	56.1	73.0	16.9	890
<i>RLS</i>	53.4	69.8	16.4	890

The sample size is smaller because some responses failed the consistency check. Typically, they reported a lower-bound that is higher than the upper-bound, of vice-versa.

Current and Retrospective Life Satisfaction in Germany (2017-2020)

Source	$Year_t$	LS_t		$RLS_{2022,t}$		$LS_t - RLS_{2022,t}$		N
		mean	st.err.	mean	st.err.	mean	st.err.	
SOEP-IS	2017	7.68	0.05	7.22	0.06	0.46	0.07	1,047
SOEP-IS	2018	7.53	0.05	7.24	0.06	0.33	0.06	1,050
SOEP-IS	2019	7.60	0.05	7.21	0.06	0.39	0.06	1,049
SOEP-IS	2020	7.66	0.05	6.67	0.06	0.98	0.07	1,058