Subjective Well-Being and Social Media

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The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

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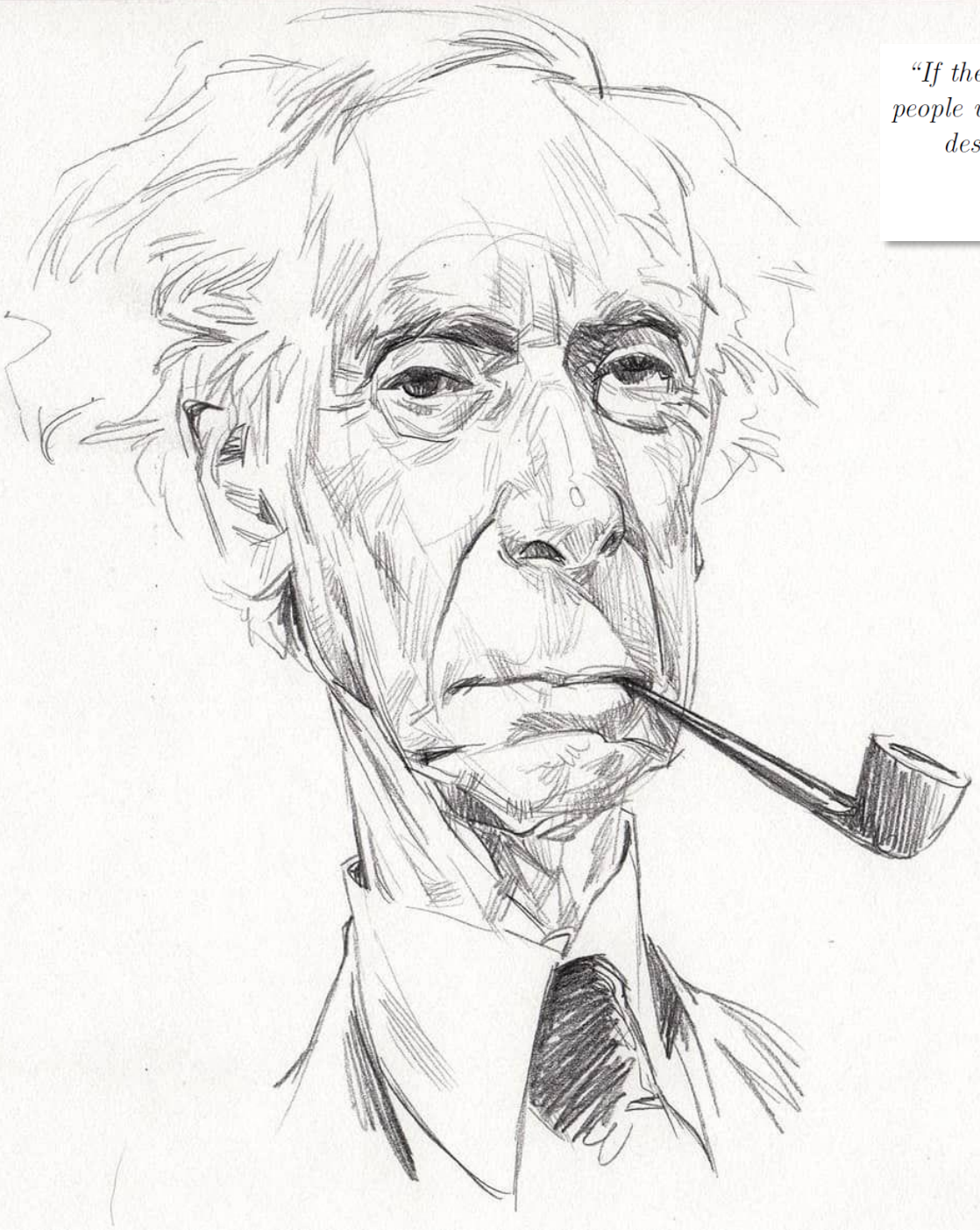

"If there were in the world today any large number of people who desired their own happiness more than they desired the unhappiness of others, we could have a paradise in a few years."

Bertrand Russell

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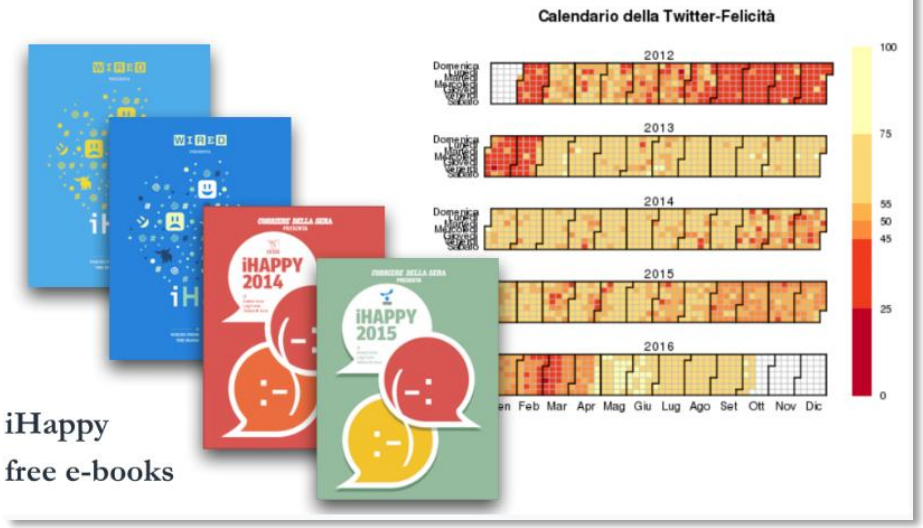
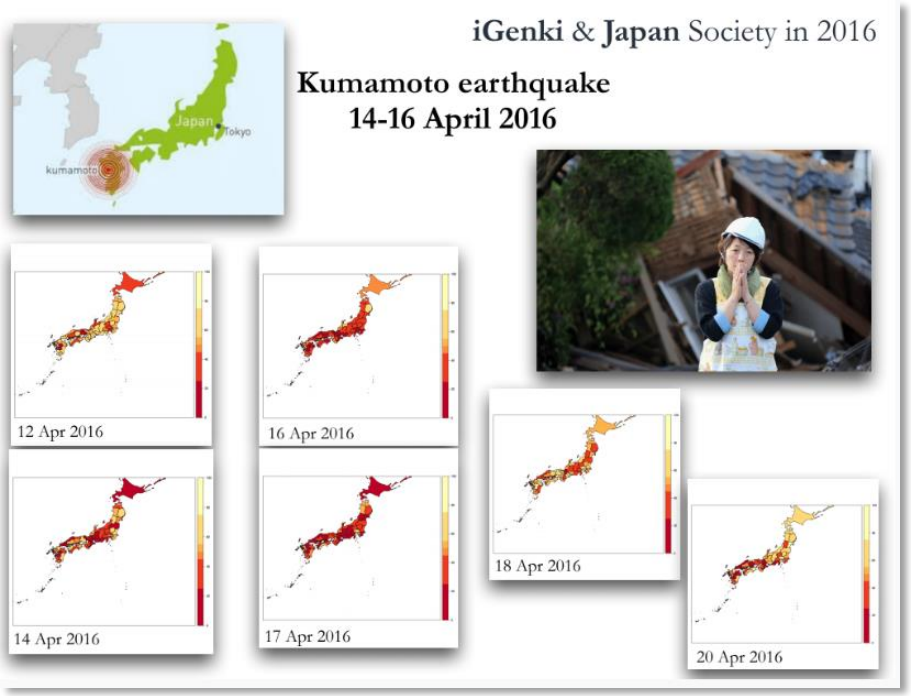
It started in 2012 in Italy, then moved to Japan in 2015,…

SM data and **happiness**: Twitter has been previously used to build a social media happiness indicator known as **iHappy** (Curini et al. 2015) and similarly for Japan: **iGenki** (Iacus & Yoshida, 2015)





…then moved from "happiness" to "well-being"

Western	Eastern	Emoji	Meaning
:-)	(^_^)		Happiness
:-(	(; ω ;)		Sadness
>:(	(#° Д °)		Anger
>:O	(¯□¯ ;)		Surprise

University of Milan · University of Insubria · Tokyo University · Waseda University

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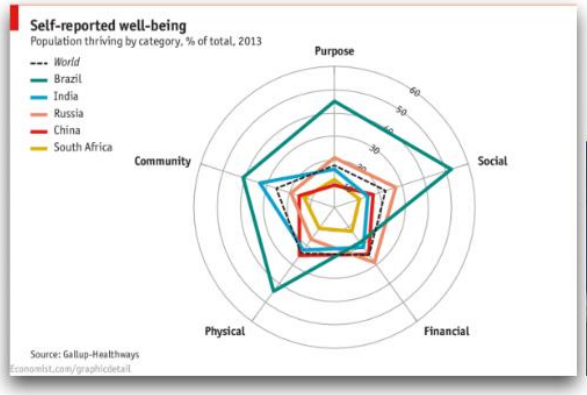
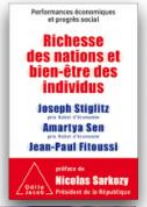
To ask or not to ask ?

★If you want to have a complete and reliable measure of well-being, you have **to ask** people for a self-evaluation of their own well-being conditions (**from "objective" measurement to survey approach**: Kahneman and Krueger (2006), Stiglitz Commission (2009), etc.)





★If you want to have an unbiased estimate of well-being, you have **not to ask** people about their own well-being conditions (drawbacks of survey approach: Deaton (2012), Kahneman et al. (2004), etc.)

Listen !

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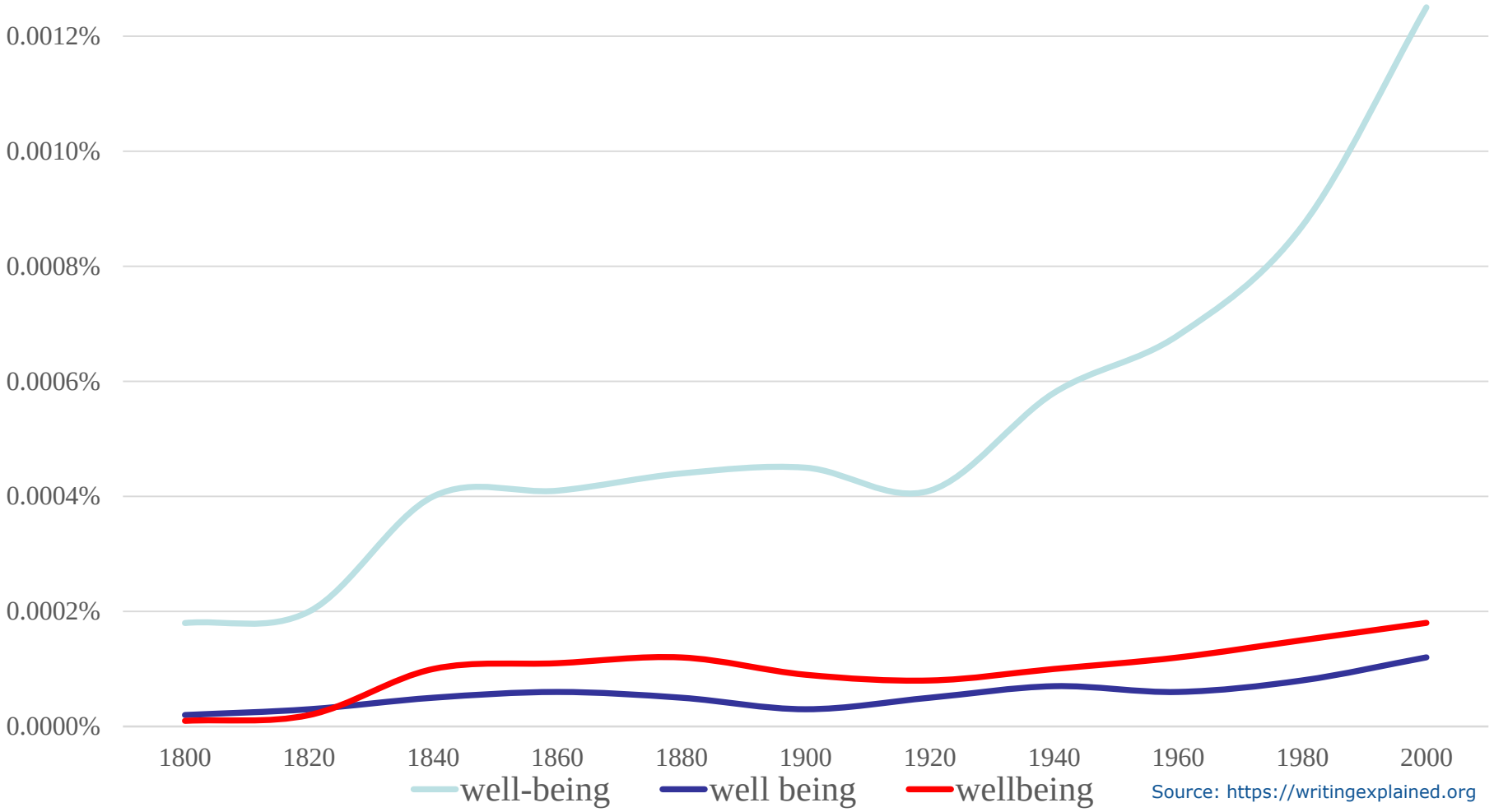
Wellbeing, well being or well-being?



Wellbeing, Well Being and Well-Being used in the titles of books published in English since 1800 till the year 2000.

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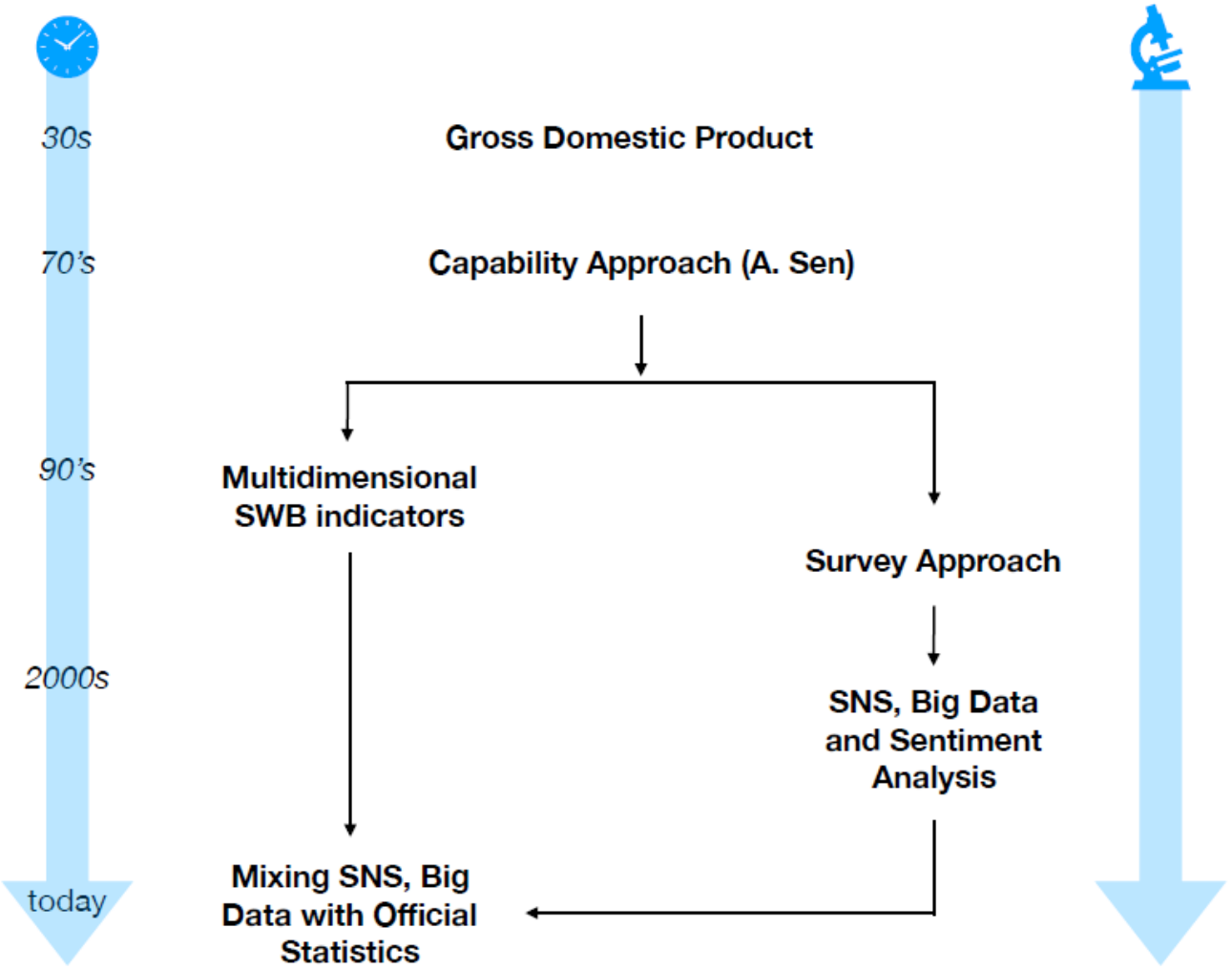
How to define "subjective" well-being

According to the OECD (2013) guidelines, **subjective well-being**, can be defined looking at different aspects:

- **hedonic or affective**: the focus is on a person's feeling or **emotion**, typically in a given moment in time
- **eudaimonic:** the type of happiness or contentment that is achieved through **self-actualization** and having meaningful purpose in one's life.
- **life evaluation**: an assessment of life "as a whole" and requires a **judgment by the individual***, rather than a description of a temporary emotional state.

* *How people remember their experiences that differs significantly from how they actually experienced them.*



2021: New book!

No, it's not about Buthan

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The **Subject Well-Being** (**SWB**) index that we will present today tries to replicate the *Comprehensive Psychological Well-Being* (CPWB) by the New Economic Foundation (2012)

I. **personal** well-being:

1. **emotional** (**emo**) well-being: *do you express positive feelings?* [the overall balance between the frequency of experiencing positive and negative emotions, with higher scores showing that positive emotions are felt more often than negative ones]
2. **satisfying life** (**sat**): *are you satisfied about your life?* [having positive evaluation of one's life overall]
3. **vitality** (**vit**): *do you feel healthy?* [having energy, feeling well-rested and healthy, and being physically active]
4. **resilience and self-esteem** (**res**): *are you optimistic about you and your condition?* [a measure of individual psychological resources, optimism and ability to deal with life difficulties]
5. **positive functioning** (**fun**): *can you make it?* [feeling free to choose and having the opportunity to do it; being able to make use of personal abilities and feeling absorbed and gratified in activities]

II. **social** well-being:

6. **trust and belonging** (**tru**): *do you trust or express gratitude toward the others?* [trusting other people, feeling to be treated fairly and respectfully and feeling sentiments of belonging]
7. **relationships** (**rel**): *do you feel alone?* [extent and quality of interactions in close relationships with family, friends and others who provide support]

III. well-being *at* **work:**

8. **quality of job** (**wor**): *are you satisfied in your daily work?* [feeling job satisfaction, satisfaction with work-life balance, evaluating the emotional experiences of work and work conditions]

21 countries
Italy missing

SWB-I and SWB-J are simple averages of the 8 indicators.
More on this later on…

Why Buthan ?

In the 60s, the King of Buthan introduced an index called **Gross National Happiness** (GNH)

It is one of the first attempts to define the task of the government action in terms of individual and collective well-being

GNH, in fact, has been officially included in the Constitution of Buthan enacted in 2008, that stipulates:

"The State shall strive to promote those conditions that will enable the pursuit of Gross National Happiness"

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From tweets to subjective well-being

Textual analysis approach

How do we extract SWB ?

Target of Estimation	*Type of Learning Algorithm*	
	Unsupervised	**Supervised**
Individual estimation	Corpora approach, NLP, WordFish, topic models, word2vec, clustering methods, etc	SVM, Random Forests, Artificial Neural Network, Deep Learning, WordScores, LLS, etc
Aggregated estimation	aggregation of the above	ReadMe, iSA

Document-term matrix

"What is it?"
"That is a dolphine."
"No, it is a killer whale!"

Document/Term	what	is	it	that	a	dolphine	no	killer	whale
document 1	1	1	1	0	0	0	0	0	0
document 2	0	1	0	1	1	1	0	0	0
document 3	0	1	1	0	1	0	1	1	1

$$s_1 = (1, 1, 1, 0, 0, 0, 0, 0, 0)$$
$$s_2 = (0, 0, 0, 1, 1, 1, 0, 0, 0)$$
$$s_3 = (0, 1, 1, 0, 1, 0, 1, 1, 1)$$

<= Vectors of stems

Document-term matrix

$$s_1 = (1, 1, 1, 0, 0, 0, 0, 0, 0)$$
$$s_2 = (0, 0, 0, 1, 1, 1, 0, 0, 0)$$
$$s_3 = (0, 1, 1, 0, 1, 0, 1, 1, 1)$$

S_i = unique vector of stems

We want to classify text into *M* categories represented by set *D*, e.g.,

$$D = \{D_0 = \text{OffTopic}, D_1 = \text{positive}, D_2 = \text{neutral}, D_M = \text{negative}\}$$

Statistical problem

the target distribution of categories

$$\underset{M\times 1}{P(D)} = \underset{M\times \bar{K}}{P(D|S)}\,\underset{\bar{K}\times 1}{P(S)}$$

law of total probabilities

$$D = \{D_0 = \text{OffTopic}, D_1 = \text{positive}, D_2 = \text{neutral}, D_M = \text{negative}\}$$

$$S = vector\ of\ stem/words$$

$$P(D|S) = any\ machine\ learning\ algorithm, e.g. E(Y|X)!$$

instead of $\underset{M\times 1}{P(D)} = \underset{M\times \bar{K}}{P(D|S)}\underset{\bar{K}\times 1}{P(S)}$ we focus on $\underset{\bar{K}\times 1}{P(S)} = \underset{\bar{K}\times M}{P(S|D)}\underset{M\times 1}{P(D)}$

$P(S = S_k|D = D_i) =$ probability of feature vector S_k to appear in a text that expresses opinion D_i

The inverse problem

$$\underset{M\times 1}{P(D)} = \underset{M\times M}{[P(S|D)^T P(S|D)]^{-1}}\underset{M\times \bar{K}}{P(S|D)^T}\underset{\bar{K}\times 1}{P(S)}$$

[hint: $\hat{\beta} = (X^T X)^{-1} X^T Y$]

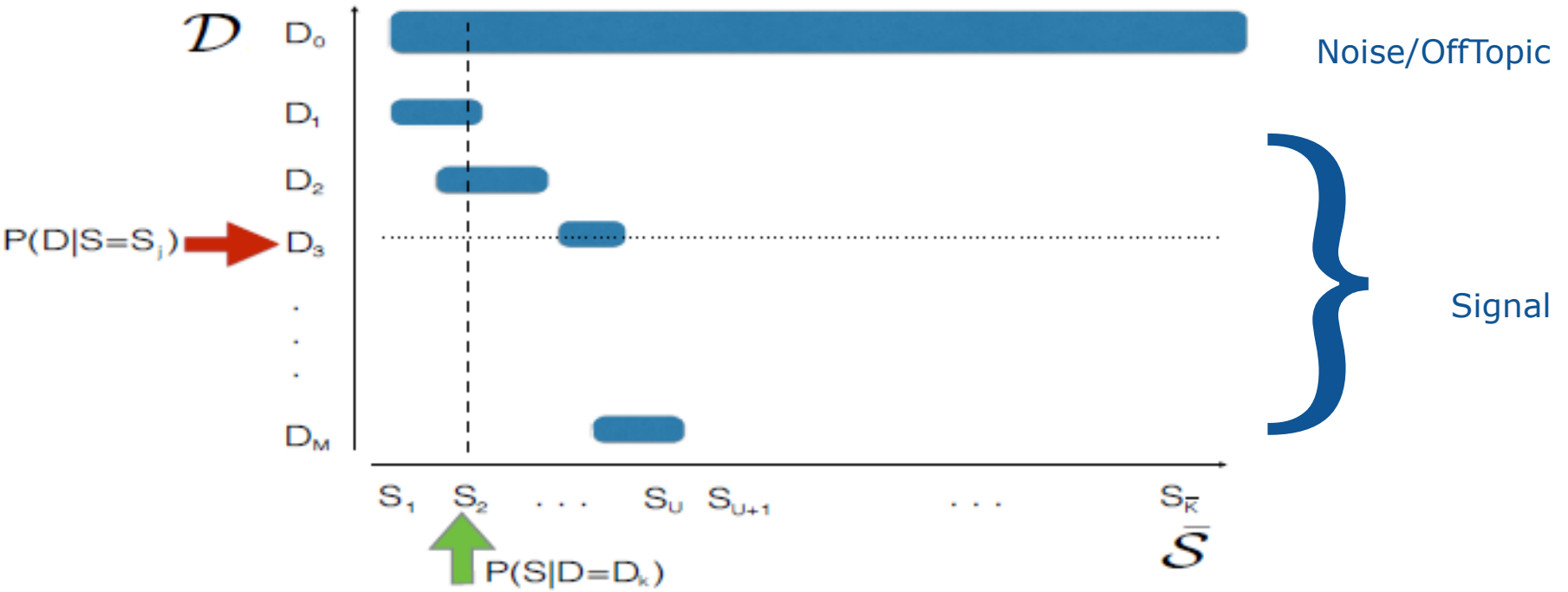
ReadMe: Hopkins & King (2010, 2013)

iSA: Curini, Ceron, Iacus (2016)

instead of $\underset{M\times 1}{P(D)} = \underset{M\times\bar{K}}{P(D|S)}\,\underset{\bar{K}\times 1}{P(S)}$ we focus on $\underset{\bar{K}\times 1}{P(S)} = \underset{\bar{K}\times M}{P(S|D)}\,\underset{M\times 1}{P(D)}$

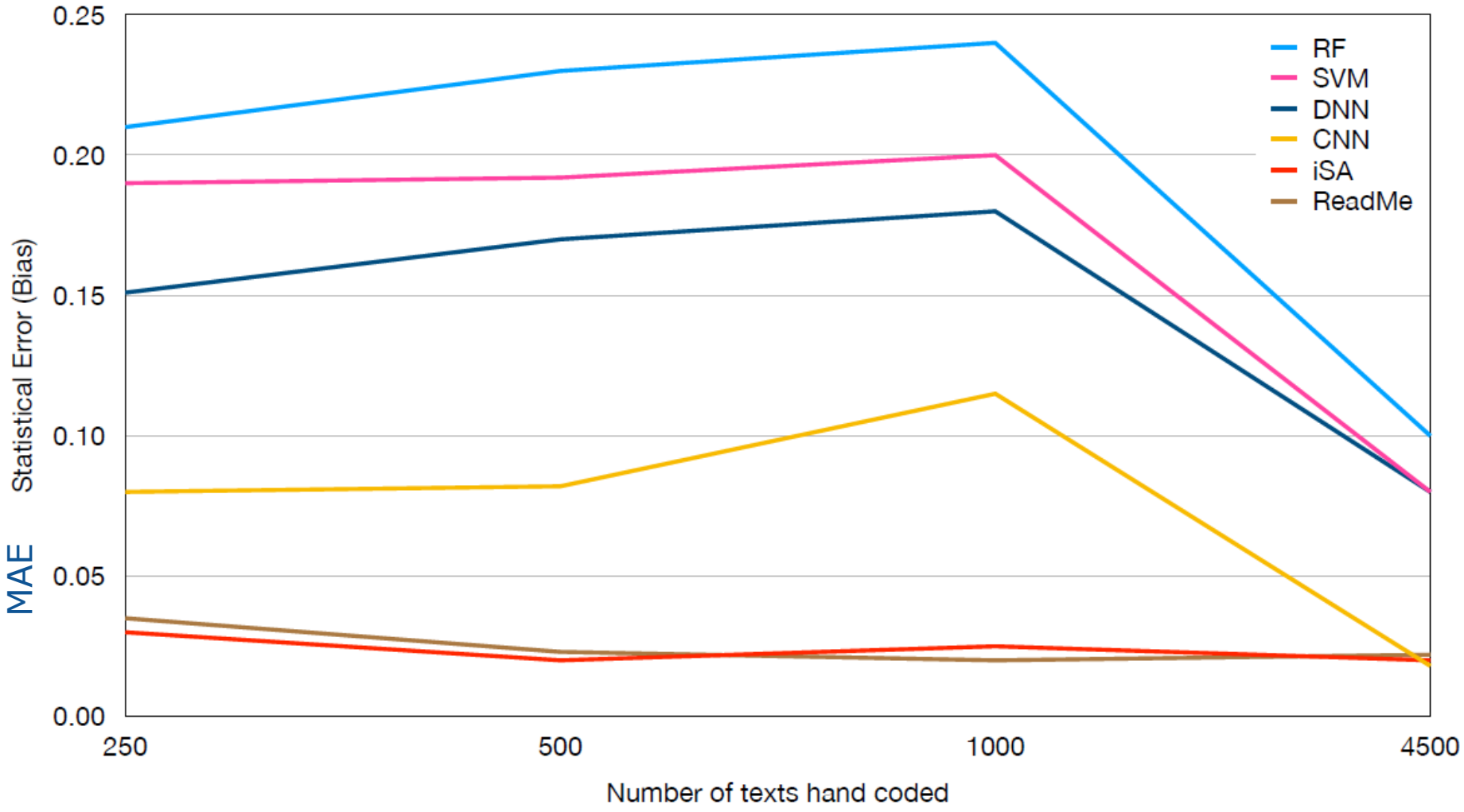
The inverse problem

$$\underset{M\times 1}{P(D)} = \left[\underset{M\times M}{P(S|D)^T P(S|D)}\right]^{-1} \underset{M\times\bar{K}}{P(S|D)^T}\,\underset{\bar{K}\times 1}{P(S)}$$



The space *S x D*. When the noise category D_0 is dominant, the estimation of *P*(*S*|*D*) is reasonably more accurate than the estimation of counterpart *P*(*D*|*S*).

Statistically efficient



Fast learner (20x)

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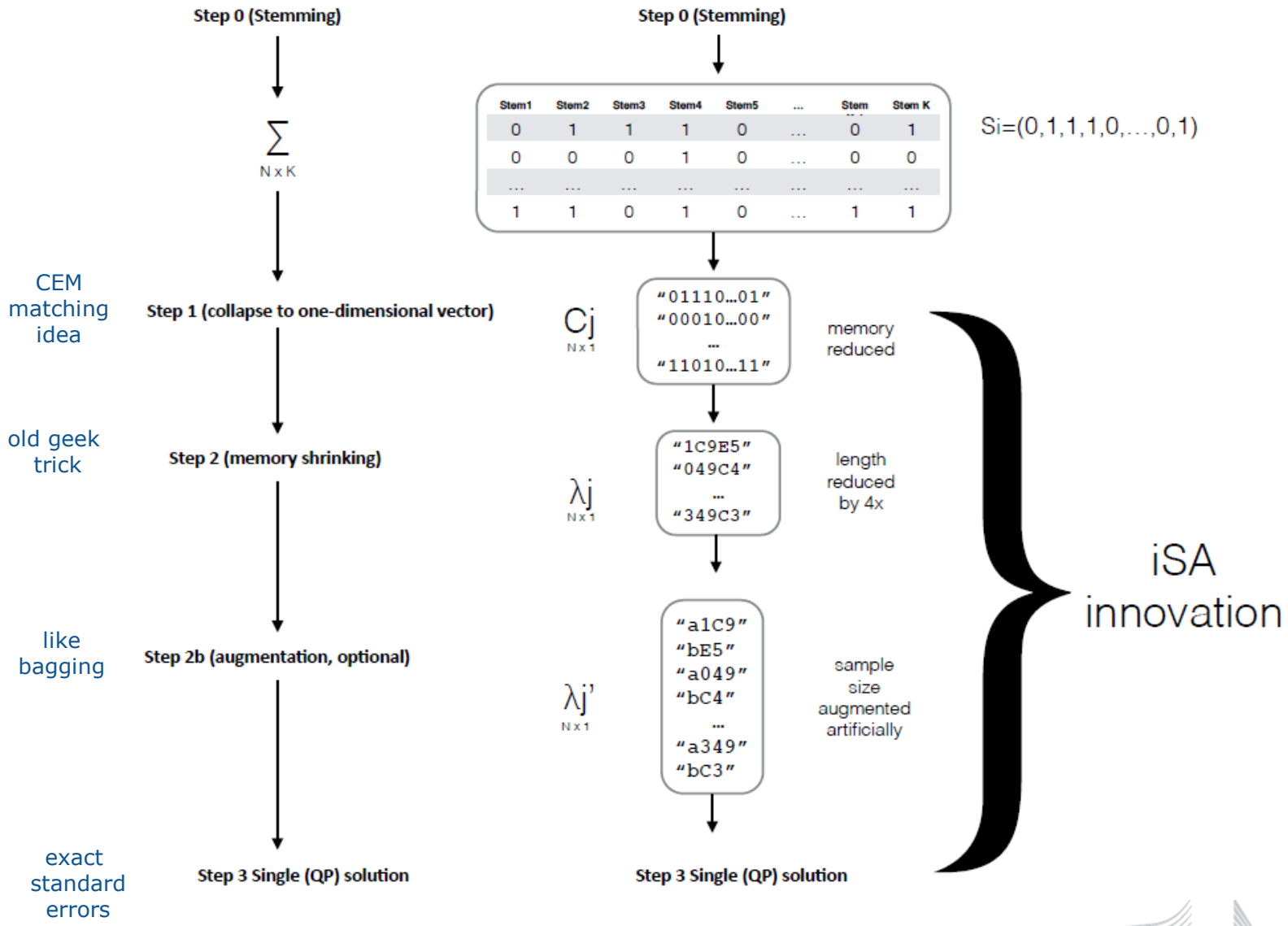
iSA is a fast and extended version of ReadMe



iSA compared to ReadMe

- works with high number of categories D
- uses very little memory
- replaces bagging with data augmentation in a single run => lower variance of estimates
- provides exact standard errors
- unbiased as ReadMe
- is blazing fast

$n = 25,000$	RF	SVM	ReadMe	iSA	iSAX
MAE	0.059	0.099	0.044	0.002	0.014
χ^2	0.116	0.329	0.120	0.000	0.010
Time	798.3s	4640.9s	105s	2.6s	5.7s

From tweets to SWB index

How to code then these dimensions?

I. **personal** well-being:

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Hypothetical world

Example (En)	Example (JP)	Classification
how lucky I am !	ラッキだ！	positive
what a beautiful day :)	美しく晴れ渡った日	positive
finally I passed the exam!	やっと合格した。	positive
there are good and bad people	いい人と悪い人がいる。	neutral
tonight I have a date with my girlfriend <3	今晩彼女とデートする予定<3。	positive
my girlfriend quit me last night	昨晩彼女に振られちゃった。	negative
I feel sick and I have headache	風邪を引いて、頭が痛いんだ。	negative

TABLE 3.2
Example of classification rule from fictitious texts with the aim of classifying the *emotional* (`emo`) component of the *personal* well-being.

Real world

can be classified as *positive* for the components **`emo`** and **`res`** and *negative* for the component **`vit`** of the index

For each day *d* and SWB component (`emo`, `tru`, `res`, etc) iSA is run using the four categories (`OffTopic`, `positive`, `neutral` and `negative`) and each index is calculated as the following ratio (e.g., for `emo`):

$$\texttt{emo}_d := \frac{\%\texttt{positive}}{\%\texttt{positive} + \%\texttt{negative}} \in [0, 1]$$

SWB is the simple average of the 8 components.

Data and coding strategy

- For **Italy 250.4M** of tweets, period 01-02-2012/21/0/2018; For **Japan, 60.8M** of tweets, period 24-08-2015/31-12-2018.
- We later collected data from 01-11-2019 till 11-10-2020 for Italy (13M tweets) and 20-09-2020 for Japan (14M tweets) at a rate of 50K per day.
- We trained iSA with 3069 fully hand coded tweets for the Japanese set and 2952 for the Italian set.
- Coders: mother language. Strategy: Delphi method.
- We validated the analysis looking at MAE, mean error (0.5%-2.5%).

Dimension	Min	Q1	Median	Mean	Q3	Max	sub-training set size
emo	0.14	1.50	2.14	2.23	2.88	6.63	30%
fun	0.10	0.94	1.37	1.50	1.92	5.17	
rel	0.12	0.81	1.17	1.32	1.73	3.99	
res	0.09	0.76	1.11	1.26	1.60	6.70	
sat	0.13	0.87	1.32	1.42	1.77	5.34	
tru	0.01	0.91	1.39	1.57	2.07	5.58	
vit	0.01	0.96	1.45	1.58	2.06	5.33	
wor	0.12	0.89	1.25	1.35	1.70	4.05	
emo	0.22	1.10	1.53	1.60	2.01	4.45	50%
fun	0.08	0.72	1.06	1.12	1.44	3.71	
rel	0.03	0.66	0.93	0.99	1.28	2.95	
res	0.08	0.62	0.91	1.02	1.31	4.90	
sat	0.11	0.70	1.07	1.12	1.47	4.07	
tru	0.11	0.72	1.09	1.18	1.54	3.85	
vit	0.09	0.70	1.06	1.15	1.54	4.26	
wor	0.14	0.73	1.02	1.09	1.38	3.14	
emo	0.11	0.60	0.85	0.88	1.12	2.26	80%
fun	0.04	0.42	0.61	0.65	0.86	2.00	
rel	0.04	0.40	0.57	0.61	0.79	1.86	
res	0.05	0.37	0.56	0.61	0.79	2.09	
sat	0.04	0.41	0.61	0.66	0.87	2.06	
tru	0.05	0.41	0.62	0.66	0.85	1.93	
vit	0.03	0.40	0.60	0.63	0.81	1.83	
wor	0.04	0.39	0.58	0.61	0.78	1.74	

1000 runs cv results

Comparison with other indexes

Year	SWB-I	WHR life ladder	WHR healthy life exp. at birth	WHR positive affect	BES life satisfaction	BES work satisfaction	BES job insecurity
2005							
2006							
2007		6.57	72.26	0.72			
2008		6.78	72.44	0.64			
2009		6.33	72.62	0.78		7.30	
2010		6.35	72.80	0.60	43.40		
2011		6.06	72.84	0.66	45.90		
2012	48.90	5.84	72.88	0.67	35.30		
2013	52.20	6.01	72.92	0.78	35.00	7.20	12.60
2014	49.70	6.03	72.96	0.72	35.40	7.20	10.20
2015	48.70	5.85	73.00	0.69	35.10	7.30	8.60
2016	50.50	5.95	73.20	0.69	41.00	7.30	7.40
2017	57.70	6.20	73.40	0.66	39.60	7.40	6.60
2018	55.70	6.52	73.60	0.65	41.40	7.40	6.00
2019	54.10	6.45	73.80	0.63	43.20	7.50	5.70
2020	42.40	6.49	74.00	0.67			

Year	SWB-J	WHR life ladder	WHR healthy life exp. at birth	WHR positive affect	JIJI life satisfaction	JIJI economic performance	JIJI better life
2006							
2007		6.24	73.44	0.73			
2008		5.91	73.56	0.78			
2009		5.84	73.68	0.78			
2010		6.06	73.80	0.83			
2011		6.26	73.98	0.78			
2012		5.97	74.16	0.78			
2013		5.96	74.34	0.79			
2014		5.92	74.52	0.74			
2015	54.42	5.88	74.70	0.77	0.14	0.18	0.28
2016	53.64	5.95	74.80	0.76	0.17	0.20	0.22
2017	53.23	5.91	74.90	0.74	0.19	0.22	0.30
2018	52.53	5.79	75.00	0.70	0.21	0.22	0.28
2019	35.30	5.91	75.10	0.74	0.20	0.19	0.14
2020	27.00	6.12	75.20	0.74	0.19	0.17	0.08

BES: Benessere Equo e Solidale, based on National Institute of Statistics data and survey data, Italy.

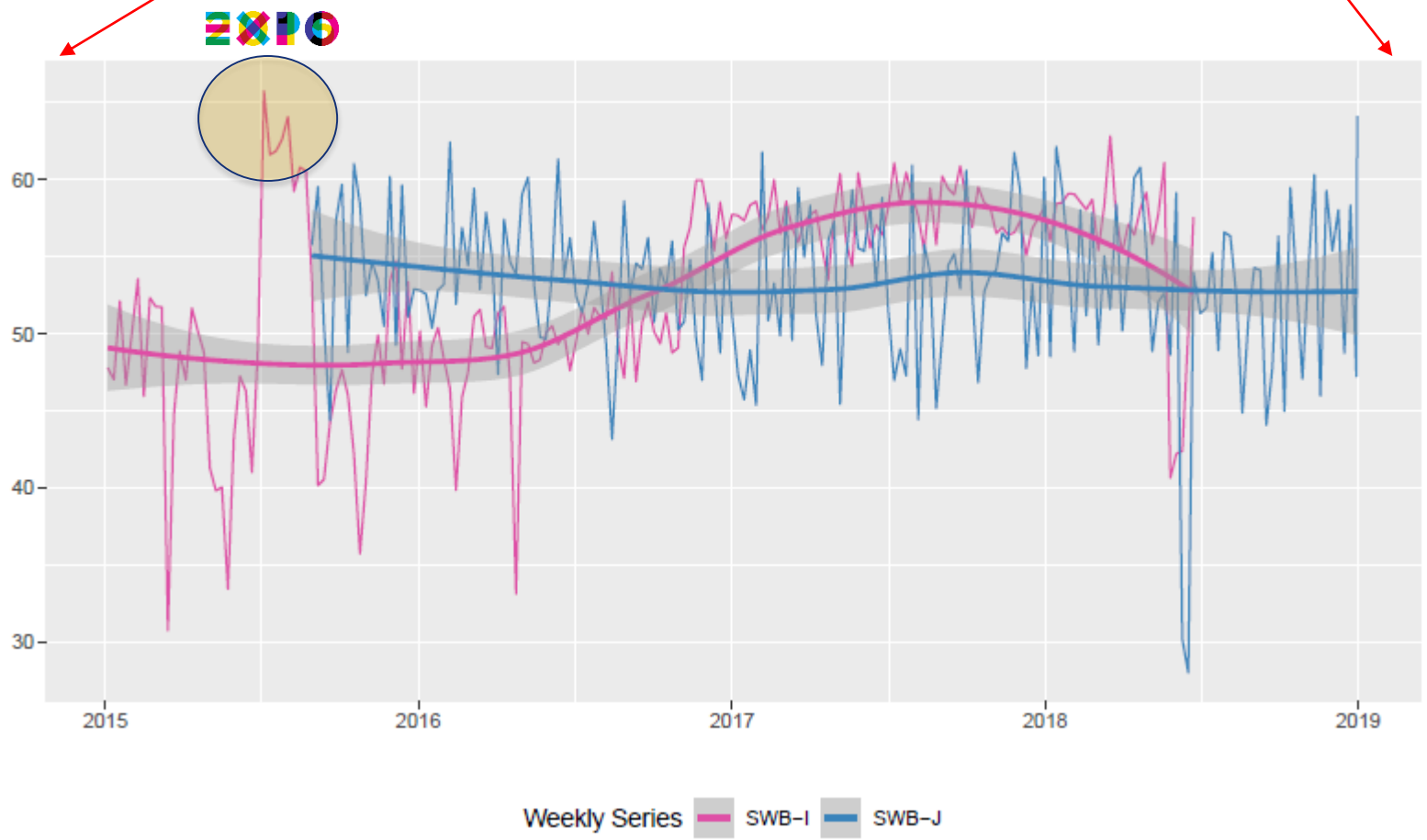
JIJI: Periodic survey from Jiji Press in Japan.

WHR: Word Happiness Report

	SWB-I	SWB-J
WHR: life ladder	0.15	-0.73
WHR: healthy life exp. at birth	-0.05	-0.87
WHR: positive affect	-0.18	0.10
BES: life satisfaction	0.64	
BES: work satisfaction	0.65	
BES: job insecurity	-0.52	
JIJI: life satisfaction		-0.37
JIJI: economic performance		0.64
JIJI: better life		0.95

Cross-country comparison

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	Nov-Dec 2019 vs 2020
SWB-I	48.9	52.2	49.7	48.7	50.5	57.7	55.7	54.1	42.4	-11.7
	(4.2)	(3.8)	(4.9)	(9.8)	(7.5)	(4.5)	(7.1)	(5.6)	(6.4)	–
SWB-J	–	–	–	54.4	53.6	53.2	52.5	35.3	27.0	-8.3
	–	–	–	(13.4)	(11.1)	(13.1)	(12.7)	(15.2)	(5.5)	–

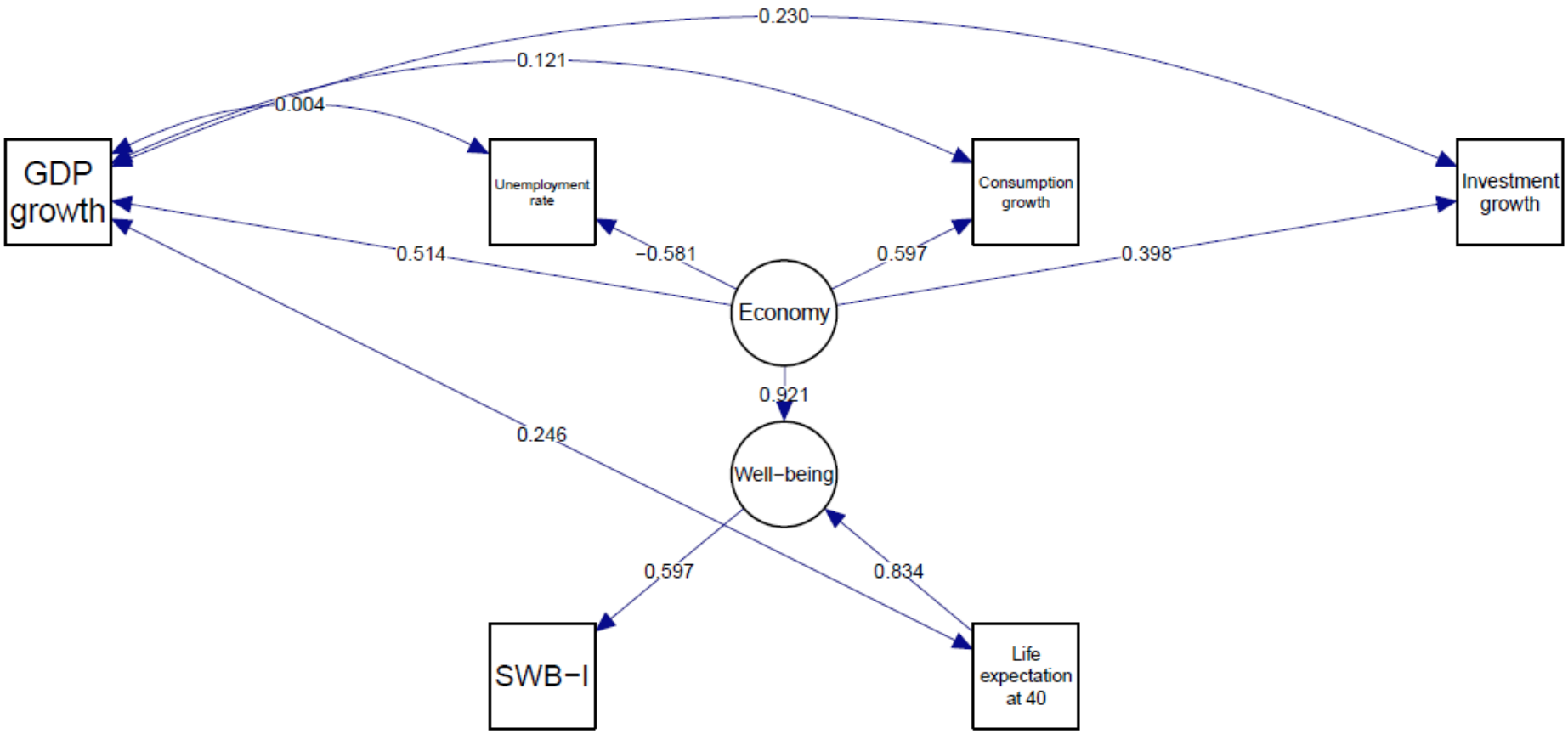


Structural Equation Modelling (SEM, quarterly data)

$$\text{Economy} \mapsto \text{GDP growth} + \text{Consumption growth} + \text{Investment growth} + \text{Unemployment rate}$$

$$\text{Well-being} \leftrightarrow \text{Economy} + \text{Life Expectancy at 40}$$

$$\text{SWB-I/SWB-J} \leftrightarrow \text{Well-being}$$



and similarly for Japan

Economy $\mapsto$ GDP growth + Consumption growth + Investment growth + Unemployment rate

Well-being $\leftarrow\!\shortmid$ Economy + Life Expectancy at 40

SWB-I/SWB-J $\leftarrow\!\shortmid$ Well-being

Relationship			Coefficient	Std.Err.
Japan 2015-2018				
Well-being	$\mapsto$	SWB-J	0.940^{***}	0.101
Economy	$\mapsto$	Economic growth	0.406	0.497
Economy	$\mapsto$	Unemployment rate	-0.377^{**}	0.148
Economy	$\mapsto$	Consumption growth	1.173^{***}	0.159
Economy	$\mapsto$	Investment growth	0.730^{***}	0.155
Well-being	$\leftarrow\!\shortmid$	Economy	0.178	0.123
Well-being	$\leftarrow\!\shortmid$	Life expectation at 40	-0.362^{**}	0.159
Economic growth	cov	Life expectation at 40	-0.743^{***}	0.174
Economic growth	cov	Consumption growth	0.404	0.525
Economic growth	cov	Investment growth	0.597^{*}	0.358
Economic growth	cov	Unemployment rate	-0.440^{**}	0.195
Italy 2015-2018				
Well-being	$\mapsto$	SWB-I	0.597^{***}	0.113
Economy	$\mapsto$	Economic growth	0.514^{***}	0.190
Economy	$\mapsto$	Unemployment rate	-0.581^{***}	0.178
Economy	$\mapsto$	Consumption growth	0.597^{***}	0.178
Economy	$\mapsto$	Investment growth	0.398^{**}	0.179
Well-being	$\leftarrow\!\shortmid$	Economy	0.921^{**}	0.375
Well-being	$\leftarrow\!\shortmid$	Life expectation at 40	0.834^{***}	0.242
Economic.growth	cov	Life expectation at 40	0.246^{**}	0.123
Economic.growth	cov	Consumption growth	0.121	0.137
Economic.growth	cov	Investment growth	0.230	0.134^{*}
Economic.growth	cov	Unemployment rate	0.004	0.121

Note: *p<0.1; **p<0.05; ***p<0.01

Controlling bias

(come back to this later if time left)

Controlling bias: Small Area Estimation (SAE) approach

$\mu_{dt} = \boldsymbol{x}'\boldsymbol{\beta} + u_d + v_{dt} =$ **unobservable** variable (true well-being) for region d at time t

$\boldsymbol{x} =$ vector of covariates/official statistics

$u_d \sim N(0, \sigma_1^2) =$ region d specific variability [AR(1) with parameter ρ_1]

$v_{dt} \sim N(0, \sigma_2^2) =$ spatio-temporal variability [SAR(1) with parameter ρ_2]

$\hat{y}_{dt} = \mu_{dt} + e_{dt}$ **observable** variable (SNS indicator) for region d at time t, biased/unrealiable

$e_{dt} \sim N(0, \sigma_{\hat{y}_{dt}}^2)$

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Controlling bias: Small Area Estimation (SAE) approach

$$\mu_{dt} = \boldsymbol{x}'\boldsymbol{\beta} + u_d + v_{dt} \quad + \quad \hat{y}_{dt} = \mu_{dt} + e_{dt}$$

$$\hat{y}_{dt} = \boldsymbol{x}'\boldsymbol{\beta} + u_d + v_{dt} + e_{dt}$$ statistical model

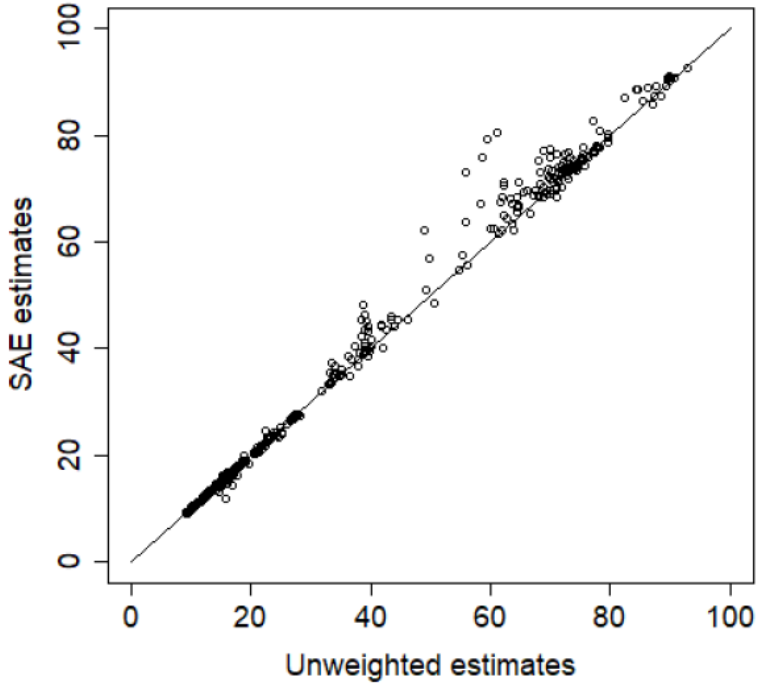
$$\boldsymbol{\theta} = (\sigma_1^2, \sigma_2^2\rho_1, \rho_2, \boldsymbol{\beta})$$

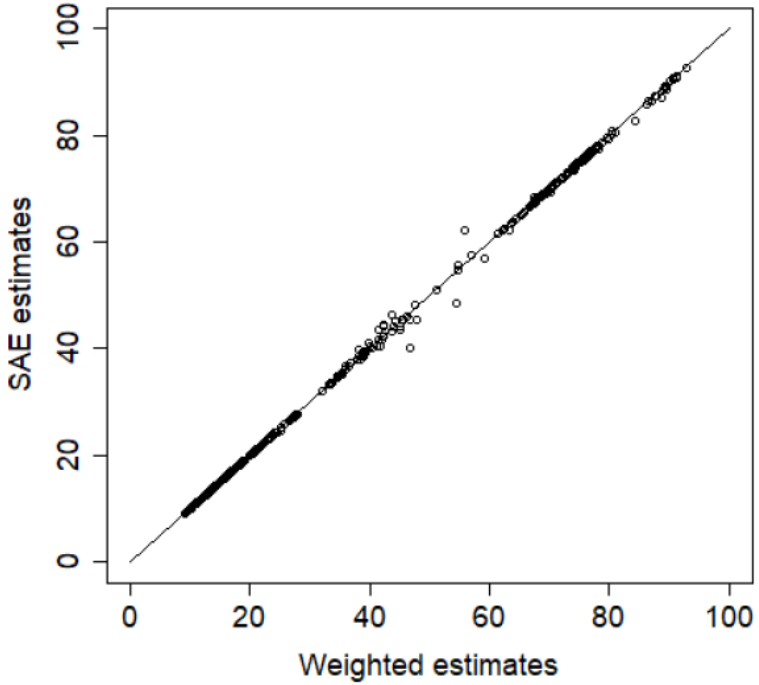
$$\boldsymbol{\theta} \rightarrow \hat{\boldsymbol{\theta}} \qquad \hat{\mu}_{dt} = \boldsymbol{x}'\hat{\boldsymbol{\beta}} + \widehat{u_d} + \widehat{v_{dt}}$$

It can be proved that $\hat{\mu}_{dt}$ is an unbiased estimator of μ_{dt}

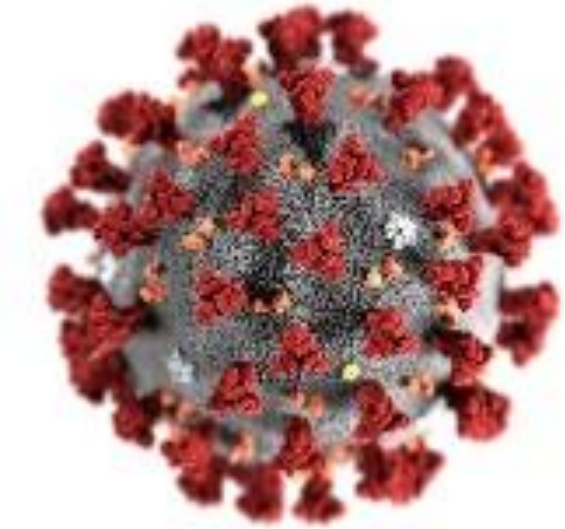
Weighting by Twitter penetration rate stabilize estimates

$$\hat{y}_{dt}^{w} = \frac{1}{\sum_{i=1}^{n_{dt}} w_{idt}} \sum_{i=1}^{n_{dt}} y_{idt} w_{idt}$$





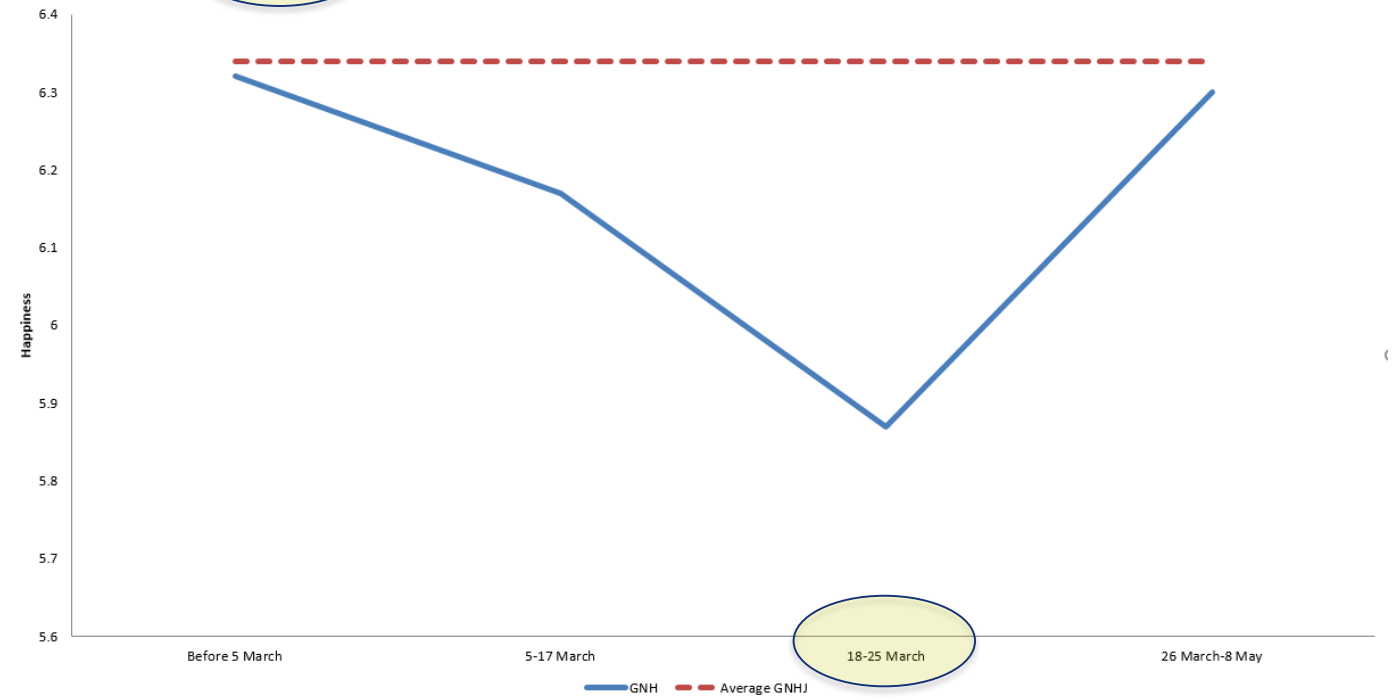
Subjective Well-Being social media indicators and COVID-19



Hedonometer (Spain/Spanish)

hedonometer.org

(based on supervised word scoring)

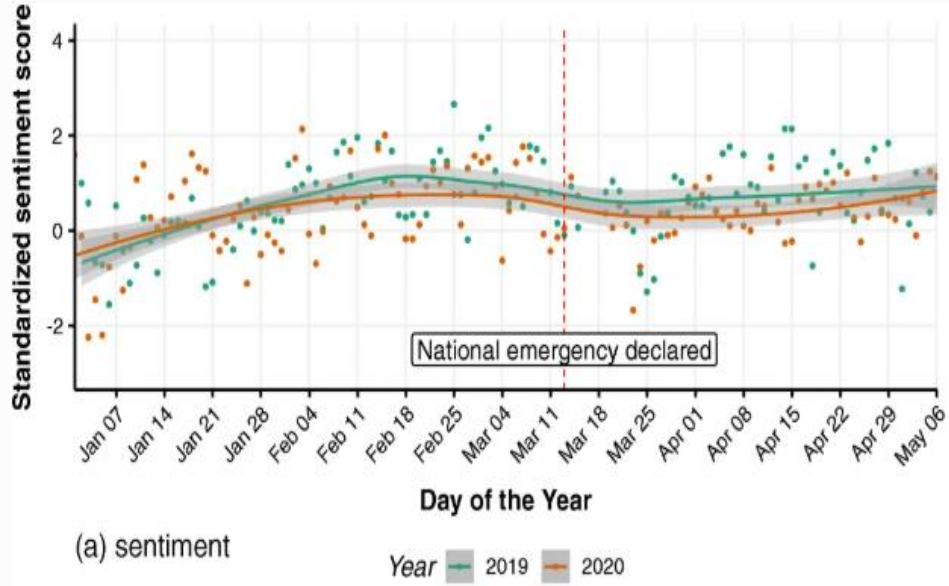


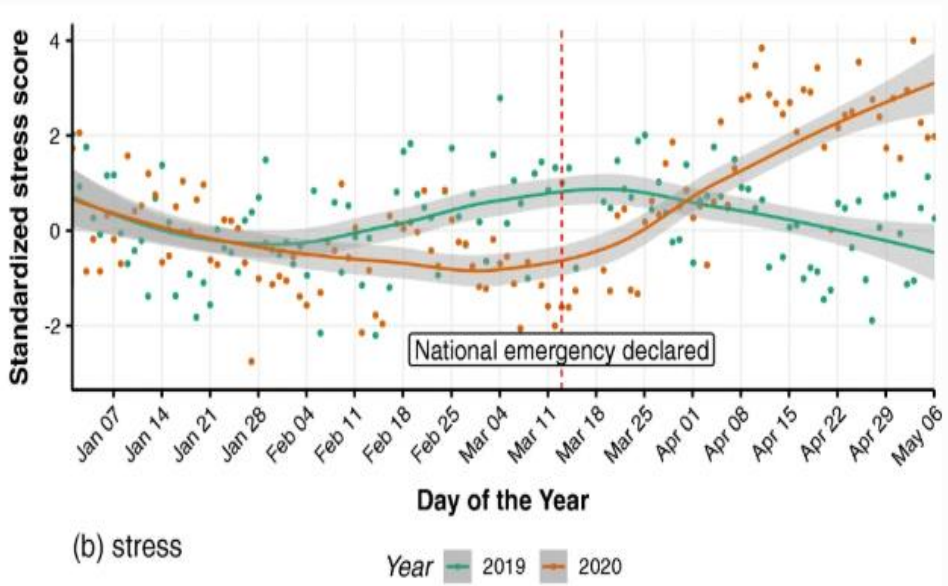
GNH (Australia, NZ, South Africa)

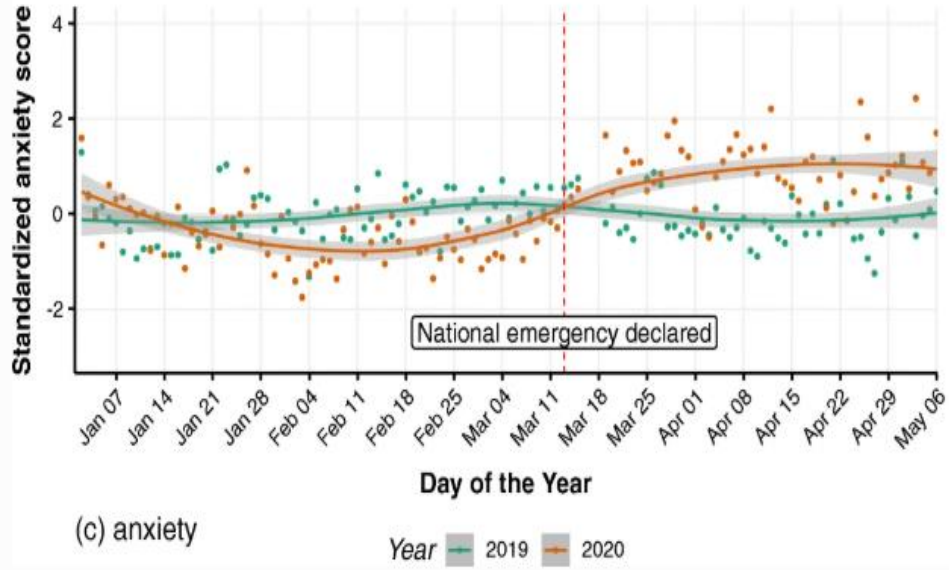
Greyling, Rossouw, and Adhikari (2020).

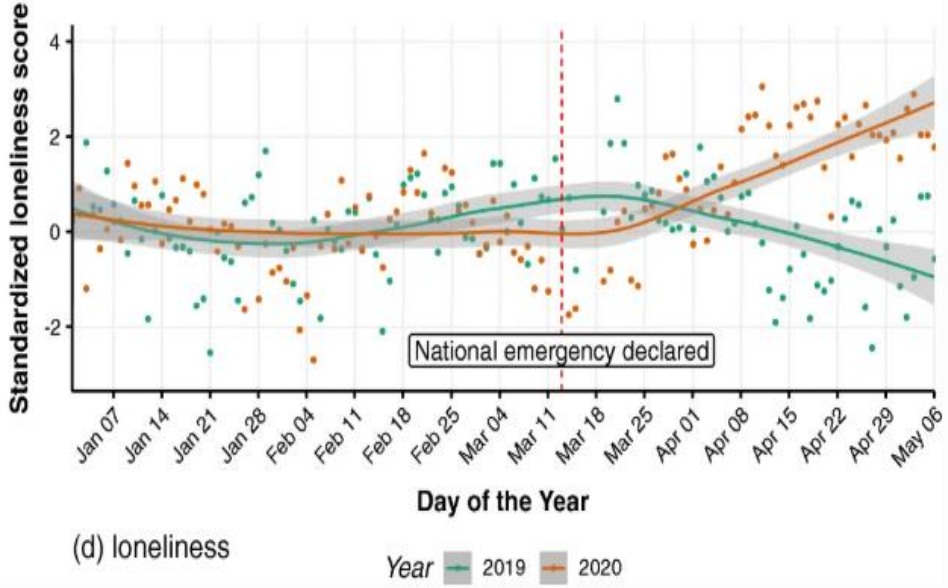
(based on supervised sentiment coding + word emotion lexicon)

World Well-Being Project (USA): Guntuku et al. (2020). Based on sentiment + LIWC + LDA.

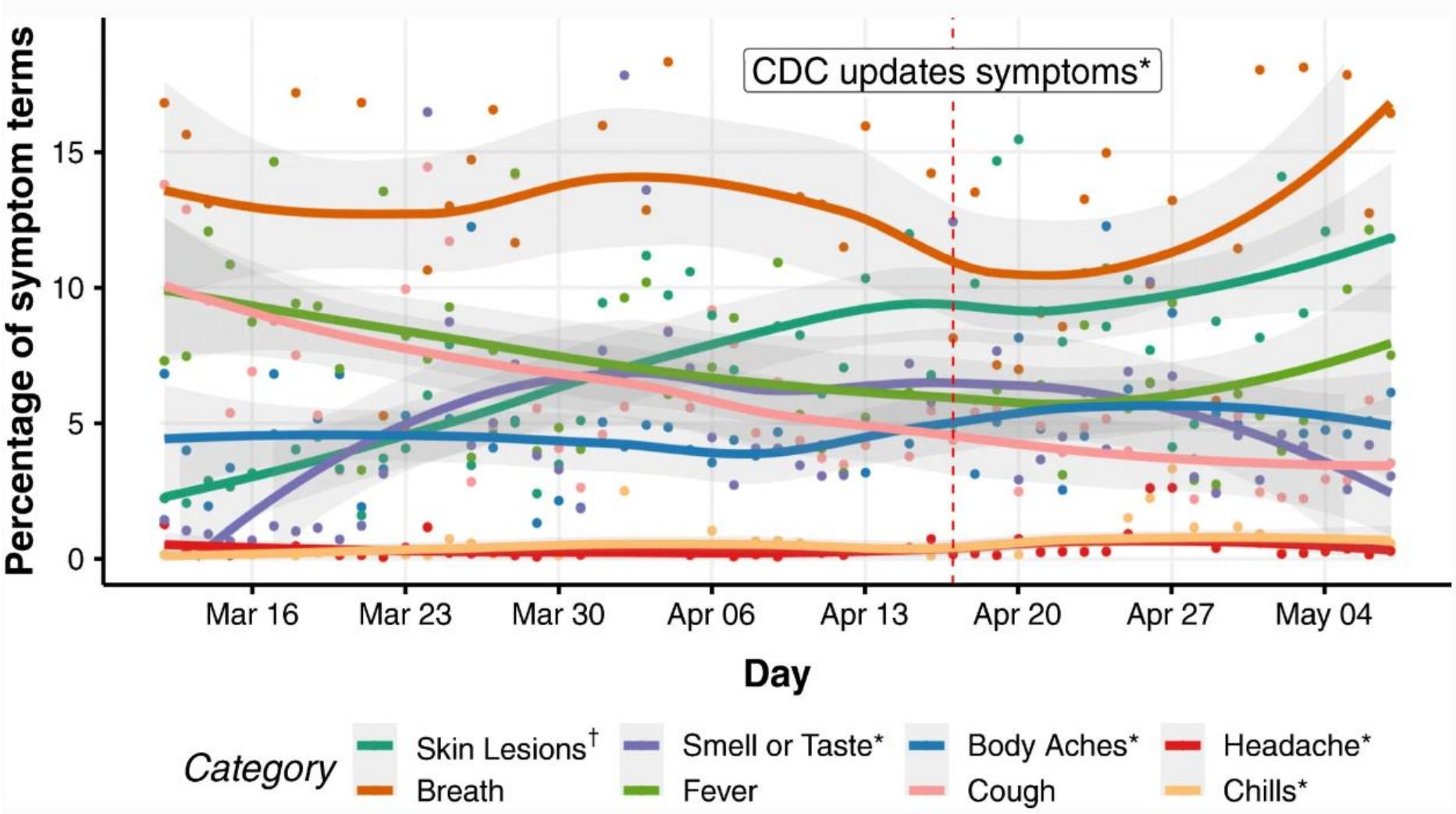




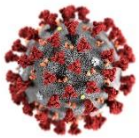


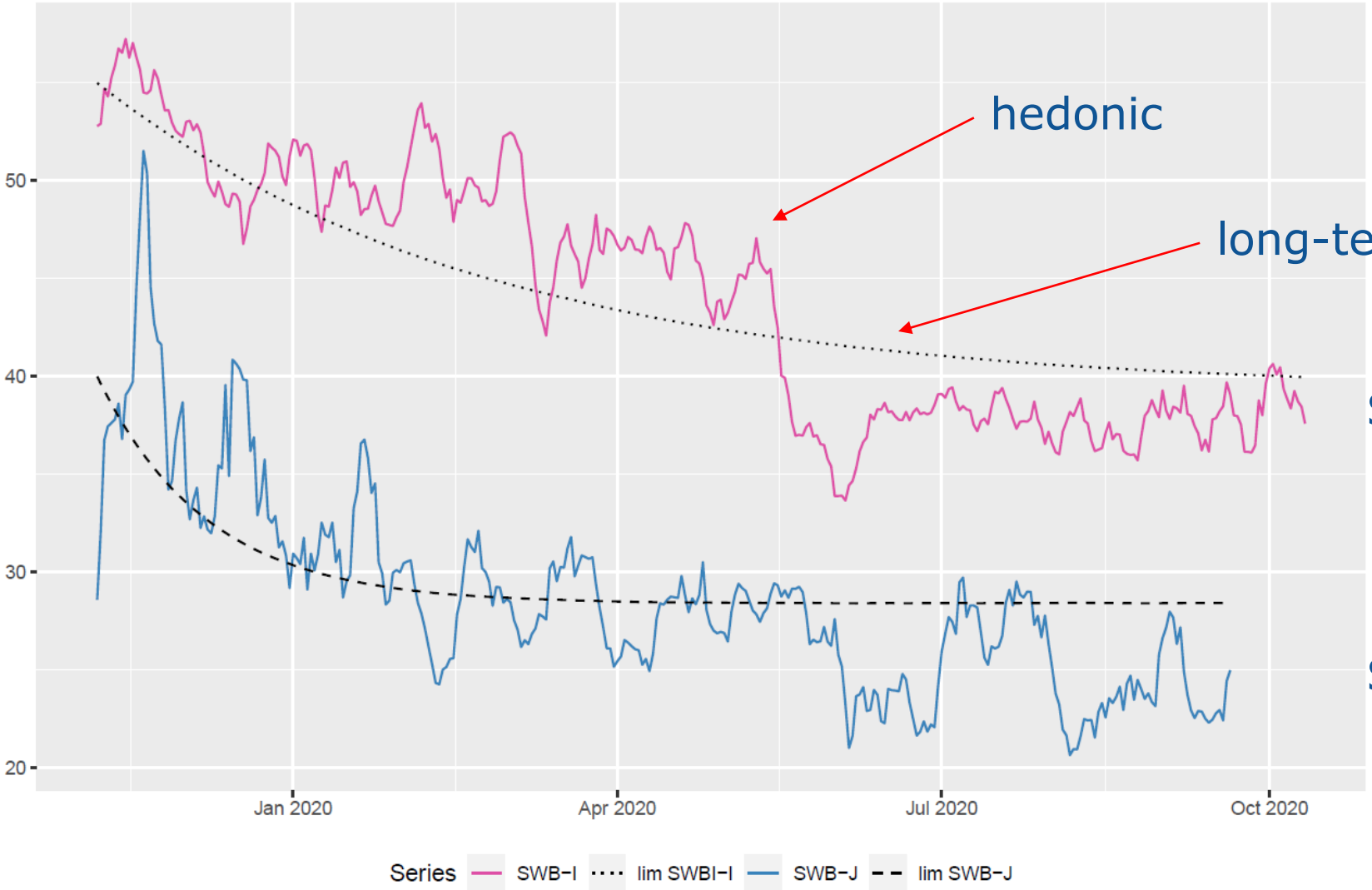


World Well-Being Project (USA): Guntuku et al. (2020). Based on sentiment + LIWC + LDA.



Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2019 vs 2020
SWB-I	48.9	52.2	49.7	48.7	50.5	57.7	55.7	54.1	42.4	-11.7
SWB-J	–	–	–	54.4	53.6	53.2	52.5	35.3	27.0	-8.3





limiting trend: $\mathrm{d}X_t = \alpha(\beta - X_t)\mathrm{d}t + \sigma X_t^{\gamma}\mathrm{d}W_t, \quad X_0 = x_0$

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Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2019 vs 2020
SWB-I	48.9	52.2	49.7	48.7	50.5	57.7	55.7	54.1	42.4	-11.7
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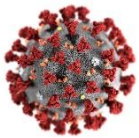

Index	α	β	σ	γ	Model	AIC
SWB-I	3.16	38.99	14.7		VAS	787.0
	(2.41)	(6.22)	(0.56)			
	3.57	39.54	0.33		GBM	782.9
	(2.46)	(4.60)	(0.01)			
	3.34	39.28	2.20		CIR	781.9
	(2.42)	(5.35)	(0.08)			
	3.42	39.37	1.12	0.68	CKLS	783.6
	(2.44)	(5.08)	(·)	(·)		
SWB-J	12.92	28.44	26.25		VAS	1090.0
	(5.52)	(2.19)	(1.05)			
	11.46	28.43	0.83		GBM	1027.4
	(5.71)	(2.23)	(0.03)			
	11.98	28.42	4.62		CIR	1055.1
	(5.61)	(2.21)	(0.19)			
	11.64	28.41	0.05	1.84	CKLS	1010.7
	(5.93)	(2.22)	(0.01)	(0.08)		

SDE model calibrated on weekly data

limiting trend: $\mathrm{d}X_t = \alpha(\beta - X_t)\mathrm{d}t + \sigma X_t^{\gamma}\mathrm{d}W_t, \quad X_0 = x_0$

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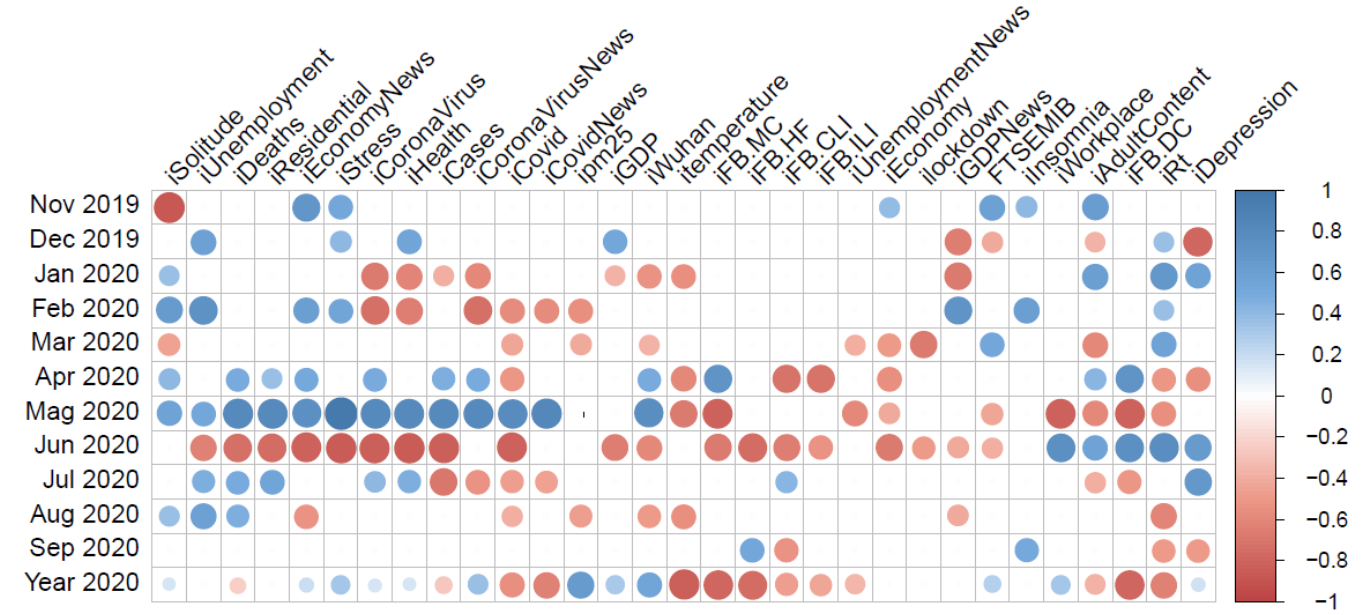
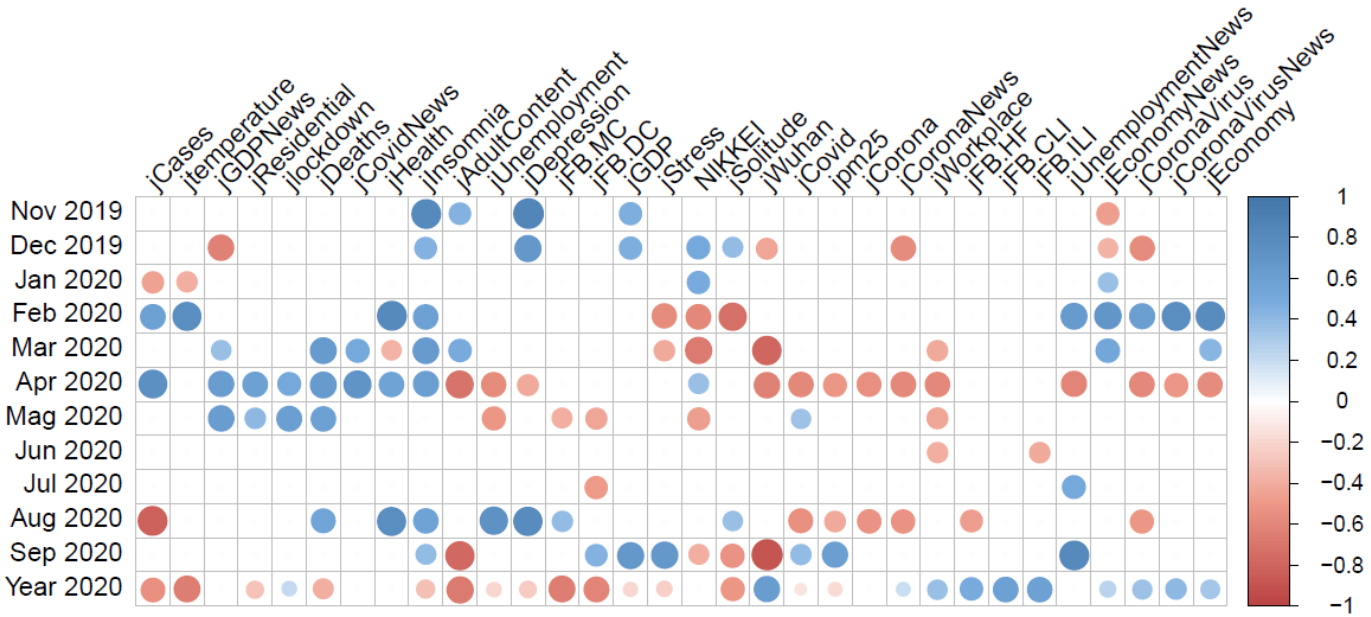
Explaining the dropdown of SWB using external potential factors

Alternative data sources

Variable	area	Source
SWB-I, SWB-J	subjective well-being	Twitter
Solitude	well-being	Google Trends
Depression	well-being	Google Trends
Stress	well-being	Google Trends
Insomnia	well-being	Google Trends
Health	health/well-being	Google Trends
PM2.5	health/environment	WAQI
Temperature	environment	WAQI
Cases	pandemic	WHO
Deaths	pandemic	WHO
Coronavirus, CoronavirusNews	pandemic	Google Trends
(コロナ) Corona, CoronaNews	pandemic	Google Trends
Covid, CovidNews	pandemic	Google Trends
Rt	pandemic	Google Trends
Wuhan	pandemic	Google Trends
Unemployment, UnemploymentNews	economy	Google Trends
Economy, EconomyNews	economy	Google Trends
GDP, GDPNews	economy	Google Trends
FTSEMIB	economy	Yahoo! Finance
Nikkei	economy	Yahoo! Finance
AdultContent	leisure	Google Trends
FB.CLI	health/well-being	Facebook
FB.ILI	health/well-being	Facebook
FB.MC	behavioural	Facebook
FB.DC	behavioural	Facebook
FB.FH	well-being	Facebook

Correlation: well-being impacted by different factors through time





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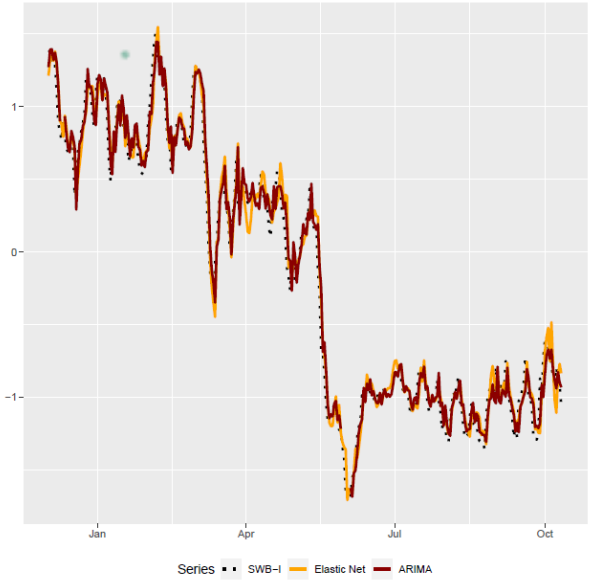
a bit of data science (Dynamic Elastic Net) to select factors

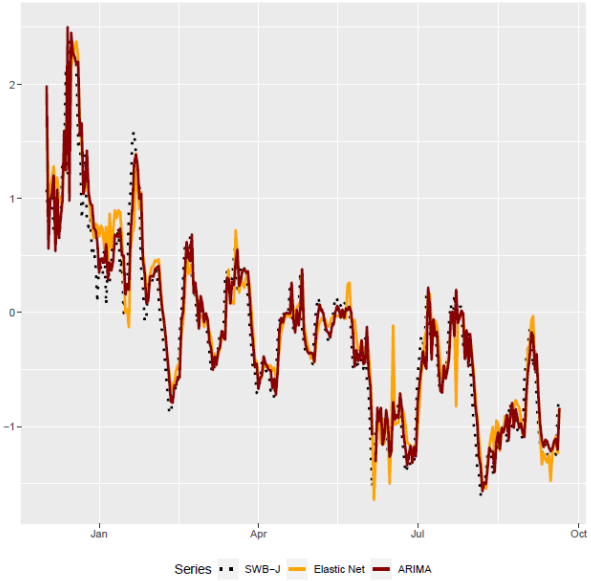
$$\underset{\beta}{\operatorname{argmin}} \left\{ \frac{1}{2 \cdot 30} \sum_{d=t-29}^{t} (y_d - x'_{d-1}\beta)^2 + \lambda_t \left(\frac{1-\alpha}{2} \sum_{j=1}^{k} \beta_j^2 + \alpha \sum_{j=1}^{k} |\beta_j| \right) \right\}$$

external factors + autro regressive component

SWB-I/SWB-J

daily data, *t* from 02-12-2020, moving window of 30 days;
λ_t determined dynamically via cross validation for each time window





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…and again SEM (no time for details)

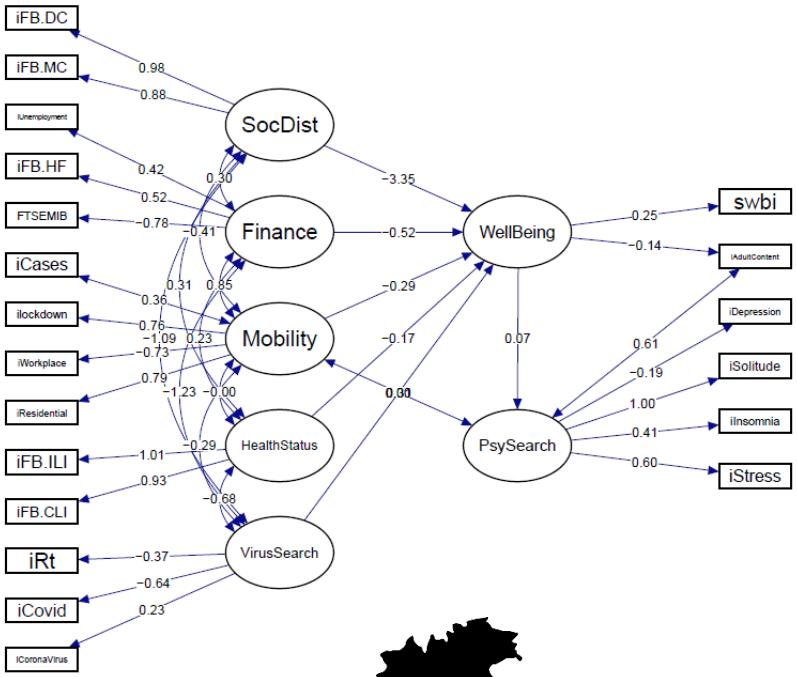
$$\text{WellBeing} \leftarrow \text{VirusSearch} + \text{HealthStatus} + \text{Mobility} + \text{Finance} + \text{SocDist}$$

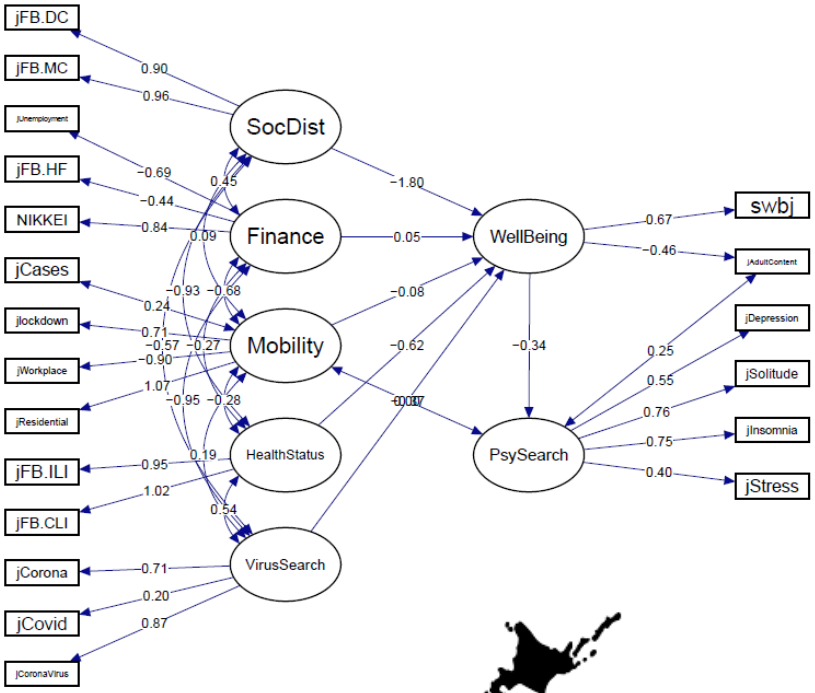
$$\text{PsySearch} \leftarrow \text{WellBeing}$$

$$\text{AdultContent} \leftarrow \text{WellBeing}$$

$$\text{SWB-I/SWB-J} \leftarrow \text{WellBeing}$$

…and again SEM (no time for details)





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Latent	Interpretation	Relationship
`VirusSearch`	*pandemic getting better, less fear of pandemic*	the higher its value, the better the well-being
`HealthStatus`	*experience or fear about symptoms*	the higher its value, the higher concerns about health and the lower the well-being
`Mobility`	*mobility restrictions*	the stricter the implementation, the harder to stand restrictions and the lower the well-being
`SocDist`	*social distancing practice*	the wider its use, the harder to stand distancing and the lower the well-being
`Finance`	*fear for own economic conditions*	the higher its value, the lower the well-being
`PsySearch`	*driven by the search for depression symptoms*	the higher these symptoms, the lower the well-being.

Summary of SEM results for both countries

Joint work(s) with

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Tiziana Carpi (Unimi)
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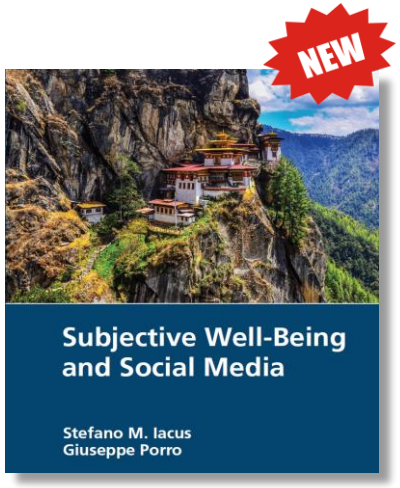

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