Niños furbito y niñas lo que sea

The gender gap in science and the consequences for the scientific knowledge that is created

Art by @oddrabid

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1. Who am I?
2. What do I do?
3. What am I doing here?

Who am I?

International Relations

History of Politics and Society Master

RRII + Scientometrics fellowship

PhD Scientometrics

Who am I?

Not a mathematician

International Relations

History of Politics and Society Master

RRII + Scientometrics fellowship

PhD Scientometrics

What do I do?

PhD Scientometrics

He did his postdoc with Tina!

Nicolás Robinson-García (Universidad de Granada)

Diversity in careers

Zaida Chinchilla-Rodríguez (IPP-CSIC)

Responsible metrics

What do I

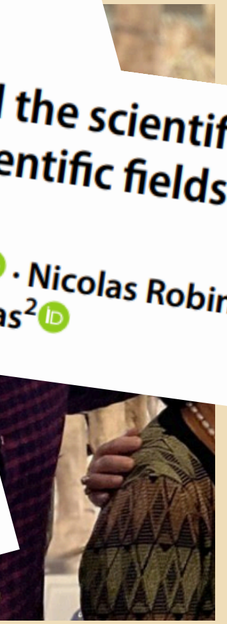
Predicting the age of researchers using bibliometric data ☆

Gabriela F. Nane [a], Vincent Larivière [b], Rodrigo Costas [c]

COVID-19 and the scientific publishing system: growth, open access and scientific fields

Gabriela F... e[1] · Nicolas Robinson-Garcia[2] · François van Schalkwyk[3] ·

...linas[2]



Meta-Research: Task specialization across research careers

Nicolas Robinson-Garcia, Rodrigo Costas, Cassidy ... Vincent Larivière, Gabriela F Nane

with

Valuation regimes in academia: Researchers' attitudes towards their diversity of activities and academic performance

Get access

Nicolas Robinson-Garcia, Rodrigo Costas, Gabriela F Nane, Thed N van Leeuwen

What do I do?

Scientometrics (bibliometrics, informetrics): Study of science literature

Mostly **quantitative**, but lately incorporating **qualitative** methodology

CWTS
Meaningful metrics

Centre for Science and Technology Studies (CWTS) at Leiden University

Henk Moed

Scopus®

OpenAlex

arXiv

Emily Petley
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2021, VOL. 12, NO. 4, 332–344
https://doi.org/10.1080/19419899.2020.1729844

Routledge
Taylor & Francis Group

OPEN ACCESS Check for updates

What is gender, anyway: a review of the options for operationalising gender

Anna Lindqvist [a,b], Marie Gustafsson Sendén [b] and Emma A. Renström [c]

[a]Department of Psychology, Lund University, Lund, Sweden; [b]Department of Psychology, Stockholm University, Stockholm, Sweden; [c]Department of Psychology, University of Gothenburg, Gothenburg, Sweden

ABSTRACT

In the social sciences, many quantitative research findings as well as presentations of demographics are related to participants' gender. Most often, gender is represented by a dichotomous variable with the possible responses of woman/man or female/male, although gender is not a binary variable. It is, however, rarely defined what is meant by gender. In this article, we deconstruct the concept 'gender' as consisting of several facets, and argue that the researcher needs to identify relevant aspects of gender in relation to their research question. We make a thorough exposition of considerations that the researcher should bear in mind when formulating questions about each facet, in order to exemplify how complex this construct is. We also remind the researcher that gender is not a binary category and discuss challenges in the balance between taking existing gender diversity into account and yet sorting participants into gender categorisations that function in statistical analyzes. To aid in this process, we provide an empirical example on how gender identity may be categorised when using a free-text response. Lastly, we suggest that other measurements than participants' gender might be better predictors of the outcome variable.

ARTICLE HISTORY
Received 1 March 2019
Accepted 10 February 2020

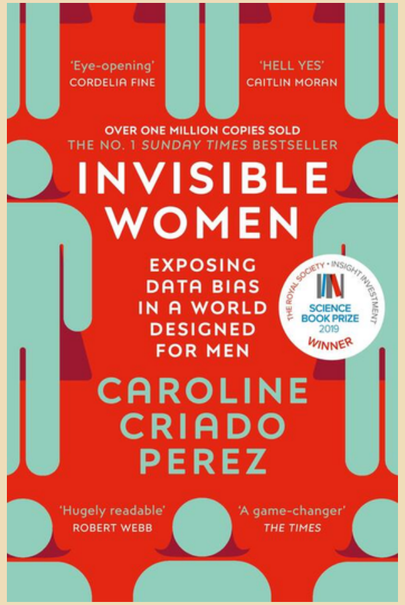
KEYWORDS
Gender; gender identity; transgender; research methods; cisnormativity

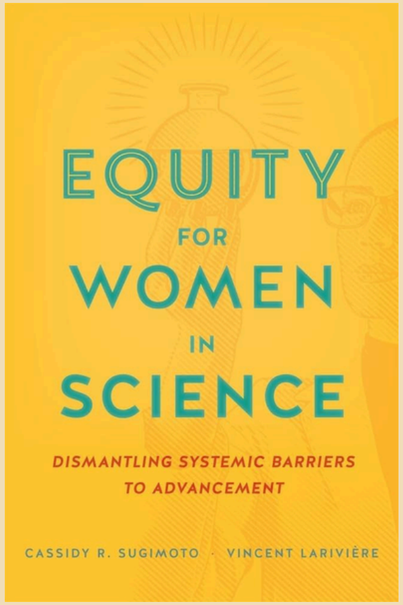
My interests

Interested in gender dynamics in science

It matters who gets to do the science (*Situated knowledge*, Donna Haraway)

With metadata on authors names, we can infer gender and do cool things





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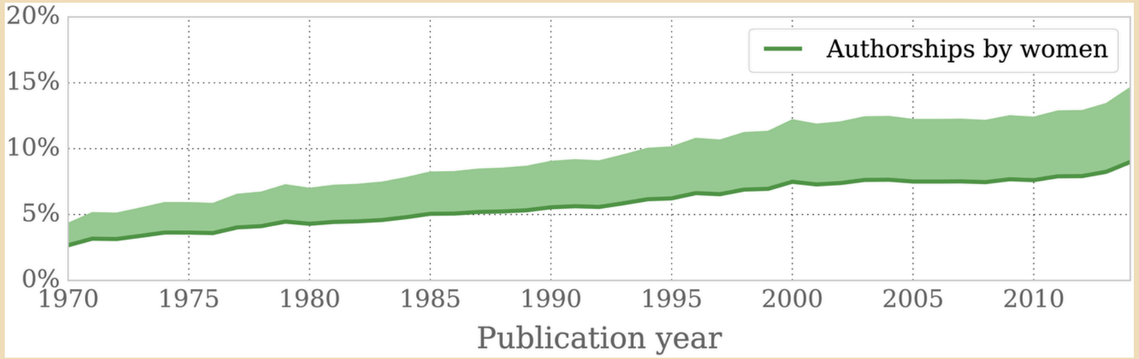
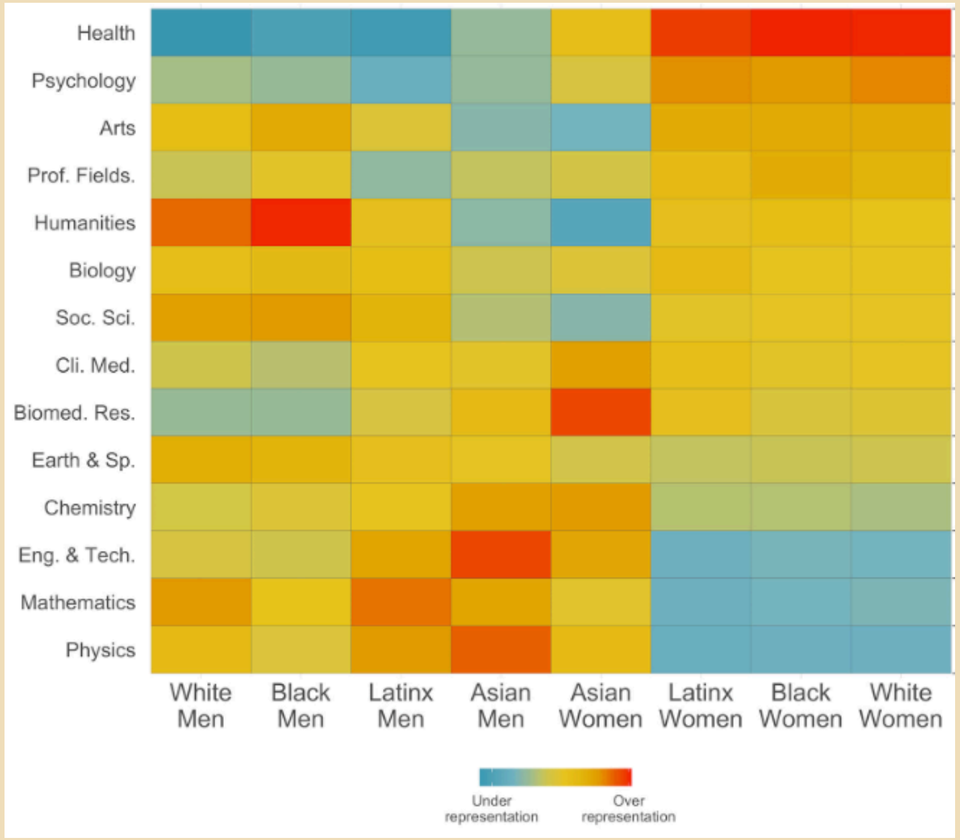


Mihaljević-Brandt, H., Santamaría, L., & Tullney, M. (2016). The Effect of Gender in the Publication Patterns in Mathematics. PLOS ONE, 11(10), e0165367. https://doi.org/10.1371/journal.pone.0165367

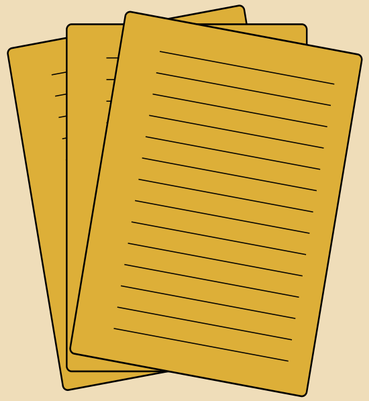
Strumia case!

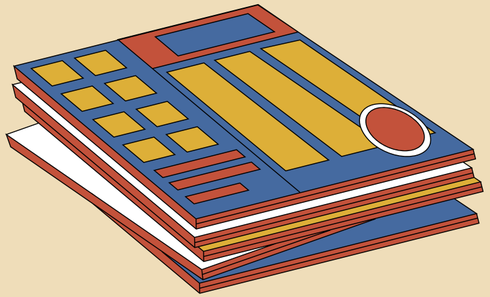
among both *M* and *F* authors. This suggests extending my considerations from possible sociological issues to possible biological issues.

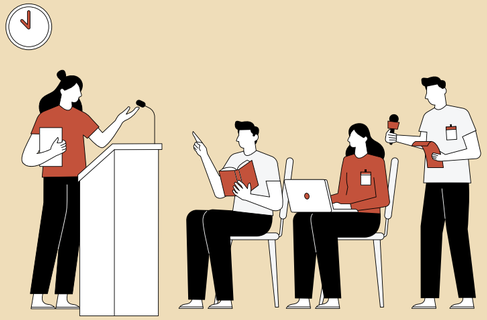


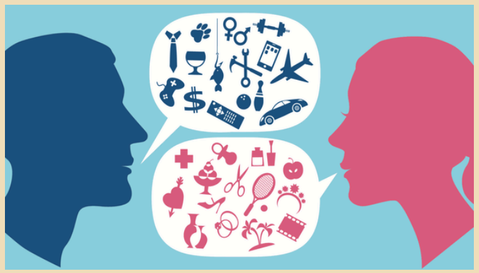
Kozlowski, D., Larivière, V., Sugimoto, C. R., & Monroe-White, T. (2022). Intersectional inequalities in science. Proceedings of the National Academy of Sciences, 119(2), e2113067119. https://doi.org/10.1073/pnas.2113067119

- Differences
- Authorship
- Collaboration
- Citations
- Number of publications
- Academic status
- Journals
- Conferences



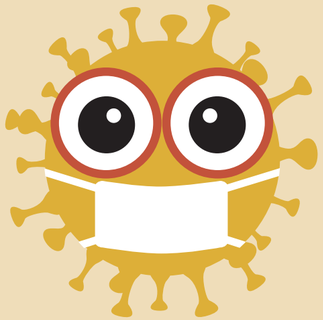






Factors

- Networking
- Discrimination
- Stereotypes
- Evaluations
- Families
- Mobility
- Coronavirus



Consequences

- Women's careers
- Diversity
- Research topics/knowledge that is generated

Research question

How do gender differences in science impact the kind of knowledge that is generated?

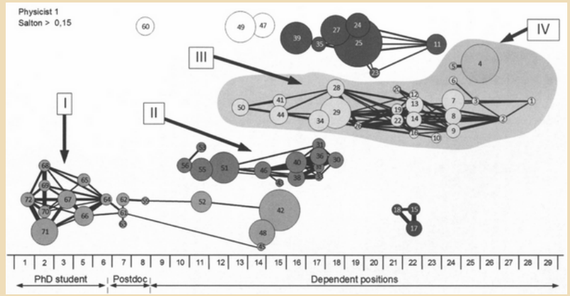
Objectives

Objective (1)
Map the differences

Gender parity:
By fields & topics
By countries

Objective (2)
Topic selection

Case study: How does gender affect the selection of a research topic?



Objective (3)
Funding

Are there differences in funding obtained for male-dominated and female-dominated topics? Do funding agencies perpetuate gender inequalities when funding male-dominated topics?

What am I doing here?

As part of objective 1

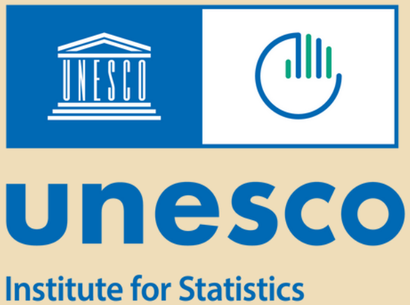
What leads to gender parity in a country?

Objective: **predicting parity** in science worldwide and by country and **identify national factors** influencing the increase or decrease of gender parity

What am I doing here?

Data 1990-2020

+



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6m researchers

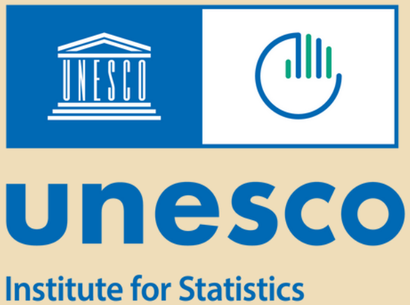
Educational variables
Social variables
Economic related variables

What am I doing here?

Missing data

Data 1990-2020

+



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THE WORLD BANK

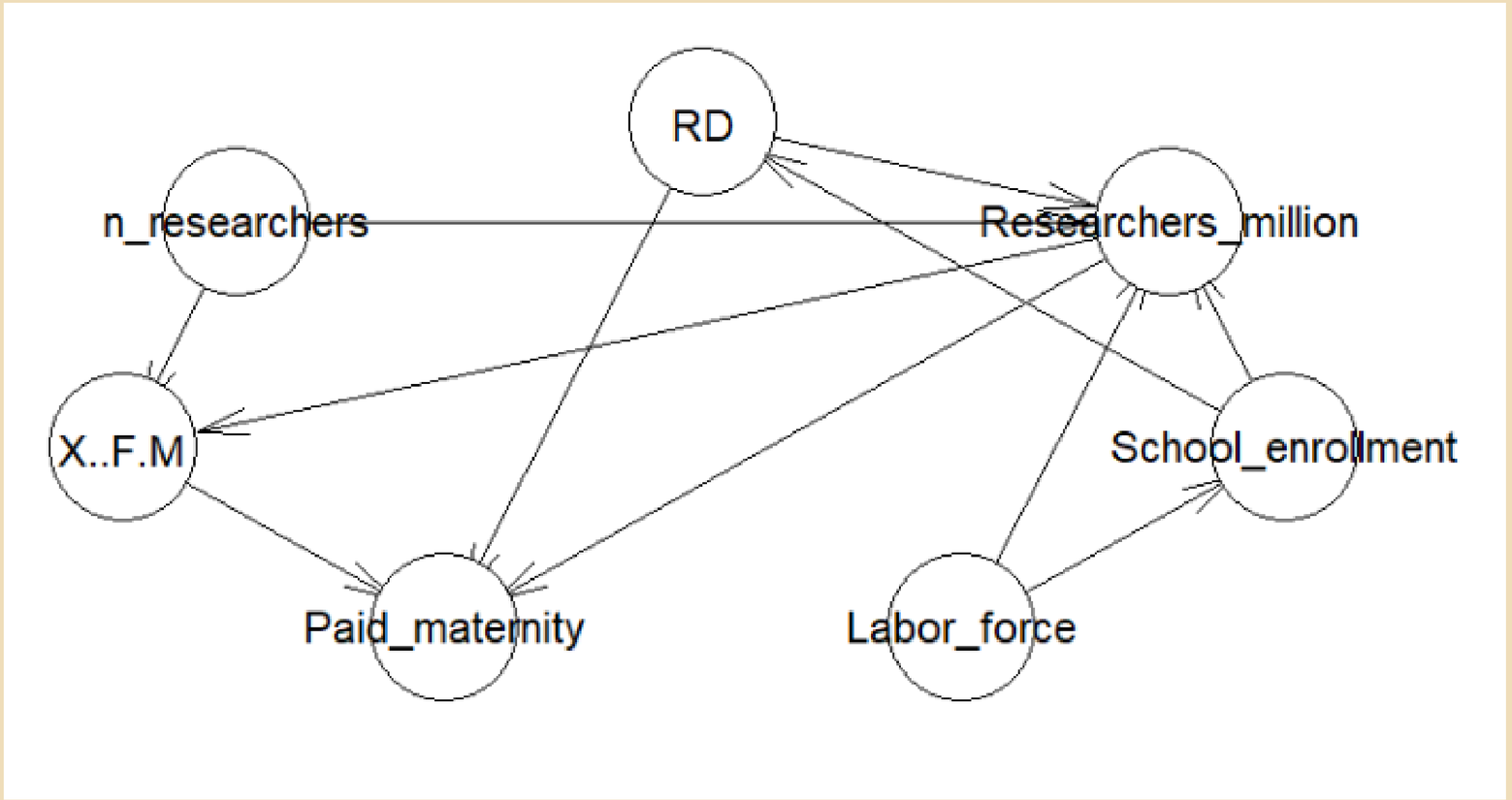
6m researchers

Educational variables
Social variables
Economic related variables

Country	Year	n_researche	% F/M	Region	Arts and Hur	Business, Ad	Agriculture,	share of grac	Education pr	Engineering,	Health and V	Information	Natural Scie	other fields t	Services pro	Social Scienc	unknown or	tion of time	of paid mate	Adolescents	Labor force p	Labor force p	School enrol	Researchers	Research and devel
NL	2021	11913	35,46423135	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,2300100029	70,482	60,569	..	..	..
NL	2020	12156	34,38544374	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,2217900008	70,119	59,887	0,9980400205	..		2,304500103
NL	2019	11084	33,16409423	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,1816799939	70,571	59,812	1,000079989	..		2,184350014
NL	2018	10507	32,06270804	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,2833199999	70,042	59,098	0,9990500212	..		2,138799906
NL	2017	9775	31,01690989	Europe & Central Asia	54,41782	47,33861	55,36863	29,29293	77,50786	23,05607	75,92968	14,47267	43,75199	61,40233	51,97792	68,17219	55,78947	..	112	0,2495899945	69,979	58,797	0,9998599887	..		2,178570032
NL	2016	9544	29,79611303	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,1832399964	69,496	58,682	1,000069976	..		2,150810003
NL	2015	8897	29,60122699	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,1675599962	69,709	58,803	0,9995800257	4548,1363		2,14605999
NL	2014	8888	28,4591195	Europe & Central Asia	57,55213	46,72029	54,58537	25,31658	78,82405	24,21043	74,26669	16,57212	40,91036	62,25248	55,42822	68,54609	44,81146	..	112	..	67,992	58,461	..	4519,15376		2,173300028
NL	2013	8432	27,34869929	Europe & Central Asia	58,12286	46,45354	54,43913	24,60695	79,62283	22,47698	74,46496	15,40704	43,80531	62,5964	55,25004	69,137	44,83477	..	112	..	70,341	59,255	..	4561,23136		2,15605998
NL	2012	7870	25,91405681	Europe & Central Asia	58,60656	..	54,47846	..	78,99863	22,12196	75,07266	..	..	..	52,97089	..	58,19113	14,72222	112	0,08731999993	71,084	59,298	0,999819994	4372,42304		1,916270018
NL	2011	7365	23,53217473	Europe & Central Asia	56,74179	..	54,9463	..	79,93029	21,08334	74,75713	..	..	..	53,63927	..	57,44921	..	112	0,1646099985	69,576	58,772	0,9992399812	3674,97708		1,881309986
NL	2010	6812	22,25614928	Europe & Central Asia	57,37858	46,81416	54,85036	20,92123	79,70776	20,45392	74,78968	10,92259	40,25157	62,78929	54,57393	67,71451	56,43564	..	112	..	68,954	58,715	0,9965599775	3228,97939		1,704040051
NL	2009	5996	20,95762873	Europe & Central Asia	56,70801	..	51,68472	..	81,11811	19,79924	75,24952	..	..	..	54,72113	..	..	..	112	..	69,926	58,805	0,9899399877	2833,03227		1,665699959
NL	2008	5265	18,80026081	Europe & Central Asia	56,54475	..	51,89504	..	81,35239	19,20088	75,45277	..	..	..	56,90989	..	56,36364	..	112	..	69,53	58,351	0,9852700233	3070,6673		1,622689962
NL	2007	4874	16,83613147	Europe & Central Asia	58,09515	..	50,10707	..	80,85389	19,10472	75,56936	..	..	..	57,36902	..	57,11207	..	112	..	68,901	57,412	0,9824799895	3101,31227		1,670300007
NL	2006	4593	16,34590711	Europe & Central Asia	58,01185	..	50,72222	..	80,07724	18,44679	75,32669	..	..	..	58,35146	..	56,5	16,94444	112	..	68,651	58,157	0,9790599942	3240,63531		1,740669966
NL	2005	4104	14,41235345	Europe & Central Asia	60,80508	..	46,58412	21,01221	79,55992	17,44505	75,52323	9,39548	42,13251	..	62,01991	..	48	..	112	1,552639961	66,849	55,643	0,9772199988	2930,13944		1,773880005
NL	2004	3513	13,22229776	Europe & Central Asia	59,27689	48,05857	48,44407	20,15734	79,21198	17,20814	76,3854	8,937	40,62311	63,34477	58,90789	59,16947	..	..	112	..	72,212	58,965	0,9747200012	2977,96208		1,789010048
NL	2003	2941	11,94942904	Europe & Central Asia	58,69379	49,11146	44,95777	..	78,32668	14,01154	76,20838	..	..	63,46206	55,12901	55,99241	..	15,13889	112	..	73,536	56,51	0,9764800072	2709,46121		1,783900023
NL	2002	2743	10,80839661	Europe & Central Asia	59,51304	47,52387	45,85663	18,49097	78,10438	14,01093	74,75574	13,1307	35,8931	62,67826	59,25714	55,4294	18,91892	..	112	1,049430013	73,287	55,919	0,9788299799	2729,1512		1,745429993
NL	2001	2523	9,777347531	Europe & Central Asia	58,66667	47,70912	40,25781	18,049	75,99532	13,53943	74,66773	13,75516	34,40708	61,75559	58,57226	53,29926	41,17647	15	112	..	72,928	55,141	0,9793199897	2852,72515		1,796090007
NL	2000	2367	10,36082474	Europe & Central Asia	60,2109	47,16808	37,6974	18,21409	75,91707	13,70866	74,31713	13,3792	33,91753	61,15951	58,2659	51,65582	..	..	112	..	71,384	54,178	0,978760004	2654,7098		1,789800048
NL	1999	2174	10,27088036	Europe & Central Asia	59,69214	44,24355	37,90576	17,89371	74,21384	14,06761	74,2205	11,96736	31,71704	59,46984	56,0477	51,70883	..	..	112	0,4465000033	68,558	53,09	0,9779099822	2644,62615		1,822819948
NL	1998	2094	9,484291642	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	..	65,431	51,515	0,9808700085	2485,81142		1,742059946
NL	1997	2108	10,03584229	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,982829988	62,275	50,688	0,9807500243	2433,6583		1,844769955
NL	1996	1882	8,41889117	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,8379300237	61,419	49,341	0,9809700251	2285,70186		1,840929985
NL	1995	1752	8,48985725	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	0,6140800118	62,328	48,351	0,9826999903	..		..
NL	1994	1590	7,508250825	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	..	60,117	47,744	0,9821000099	..		..
NL	1993	1566	7,038626609	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	11,53664017	60,252	46,587	1,030769944	..		..
NL	1992	1401	7,238095238	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	11,10616997	61,713	46,134	1,021080017	..		..
NL	1991	1177	5,638665132	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	2,890520096	60,663	44,82	1,031119943	..		..
NL	1990	1255	7,095343681	Europe & Central Asia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	2,80302	59,797	43,909	1,031260014	..		..

Bayesian Networks

BNs are graphical models which **capture dependencies between multiple variables**. The dependencies are first-hand modelled through **arcs** from **nodes** (which represent random variables) and the structure of the BNs can be **learned completely from data**. (Scutari & Denis, 2021)



Dynamic Bayesian Networks?

Thank you! Any questions?