

# The Fading Path to Academia:

## A Data-Driven Analysis of Gender Disparities in Spanish Universities

Pilar Moreno

IE University

José Miguel Moreno

Universidad Carlos III de Madrid

# Gender equality is a challenge



**Goal 5** of the **2030 Agenda**  
for Sustainable Development



**52% of undergraduates** are **women**,  
yet **declines** as moving up the academic ladder

<https://www.un.org/sustainabledevelopment/gender-equality/>

<https://unesdoc.unesco.org/ark:/48223/pf0000380987>

<https://unesdoc.unesco.org/ark:/48223/pf0000386876>



<https://www.ciencia.gob.es/InfoGeneralPortal/documento/f4f6bb28-cae5-4da2-85f4-067508c410eb>

## RESEARCH QUESTION

**How does the  
representation of women  
evolve across key stages  
of the academic career**

broken down by institution

# Methodology

**1. Get datasets**

**2. Process data**

**3. Analysis**

# Datasets

- Official publicly available data from 2020/2021
- **Graduates** by gender & university [1]
- **Doctorates** by gender & university [2]
- Research **personnel** [3]

**datos.gob.es**  
reutiliza la información pública



MINISTERIO  
DE CIENCIA, INNOVACIÓN  
Y UNIVERSIDADES

[1] <https://datos.gob.es/es/catalogo/e05073401-egresados-por-sexo-grupo-de-edad-y-campo-de-estudio>

[2] <https://datos.gob.es/es/catalogo/e05073401-egresados-por-tipo-de-centro-sexo-grupo-de-edad-y-ambito-de-estudio>

[3] <https://datos.gob.es/es/catalogo/e05073401-pi-total-y-proporcion-de-pi-por-tipo-de-centro-tipo-de-personal-y-sexo>

# Data Processing

- Manually **parse XLSX sheets**

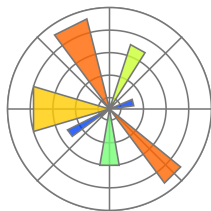
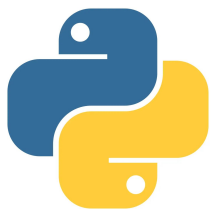
To filter out irrelevant information

- We **exclude private universities**

No positions for civil servants

	PI		Proporción de PI									
	2021-2022		2021-2022									
university	graduates_men	graduates_women	graduates_ratio	doctores_men	doctores_women	doctores_ratio	workers_men	workers_women	workers_ratio	servants_men	servants_women	servants_ratio
A Coruña	1014	1267	0.555458	65	66	0.503817	141	142	0.501767	407	240	0.370943
Alcalá	959	1751	0.646125	92	96	0.510638	141	156	0.525253	417	260	0.384047
Alicante	1369	2393	0.636098	110	94	0.460784	173	180	0.509915	582	338	0.367391
Almería	683	1097	0.616292	50	49	0.494949	69	80	0.536913	313	204	0.394584
Autónoma de Barcelona	2323	3789	0.619928	403	428	0.515042	389	328	0.457462	541	322	0.373167
Autónoma de Madrid	1686	2916	0.633638	263	284	0.519196	484	510	0.513078	603	412	0.400000
Barcelona	2965	5218	0.637663	327	423	0.564000	615	602	0.494659	751	475	0.360000
Burgos	396	717	0.644205	24	30	0.555556	70	73	0.510490	159	116	0.421818
Cantabria	648	810	0.555556	29	32	0.524590	125	137	0.522901	313	144	0.315098
Carlos III de Madrid	1728	1450	0.456262	74	49	0.398374	178	111	0.384083	418	222	0.346875
Castilla-La Mancha	1401	2315	0.622982	92	83	0.474286	227	253	0.527083	653	385	0.370906
Complutense de Madrid	3596	6691	0.650433	371	438	0.541409	827	964	0.538247	1274	1039	0.449200
Cádiz	1173	1873	0.614905	72	50	0.409836	148	165	0.527157	429	233	0.351964
Córdoba	950	1465	0.606625	87	79	0.475904	154	150	0.493421	418	228	0.352941
Extremadura	1023	1750	0.631085	38	43	0.530864	181	171	0.485795	536	268	0.333333
Girona	1021	1505	0.595804	46	56	0.549020	124	99	0.443946	191	104	0.352542
Granada	2883	4923	0.630669	233	196	0.456876	387	373	0.490789	1334	828	0.382979
Huelva	520	1018	0.661899	36	31	0.462687	55	48	0.466019	263	142	0.350617
Illes Balears (Les)	561	1114	0.665075	59	59	0.500000	153	149	0.493377	284	162	0.363229
Jaume I de Castellón	717	1123	0.610326	37	55	0.597826	79	108	0.577540	307	204	0.399217

# Data Plotting



```
$> python dataset.py
```

	university	graduates_ratio	doctorates_ratio	workers_ratio
0	A Coruña	0.555458	0.503817	0.50176
1	Alcalá	0.646125	0.510638	0.52525
2	Alicante	0.636098	0.460784	0.50991
3	Almería	0.616292	0.494949	0.53691
4	Autónoma de Barcelona	0.619928	0.515042	0.45746
5	Autónoma de Madrid	0.633638	0.519196	0.51307
6	Barcelona	0.637663	0.564000	0.49465
7	Burgos	0.644205	0.555556	0.51045
8	Cantabria	0.555556	0.524590	0.52290
9	Carlos III de Madrid	0.456262	0.398374	0.38400
10	Castilla-La Mancha	0.622982	0.474286	0.52700
11	Complutense de Madrid	0.650433	0.541409	0.53824
12	Cádiz	0.614905	0.409836	0.52715
13	Córdoba	0.606625	0.475904	0.49342
14	Extremadura	0.631085	0.530864	0.48579
15	Girona	0.595804	0.549020	0.44399
16	Granada	0.630669	0.456876	0.49078
17	Huelva	0.661899	0.462687	0.46601
18	Illes Balears (Les)	0.665075	0.500000	0.49337
19	Jaume I de Castellón	0.610326	0.597826	0.57754
20	Jaén	0.647489	0.391304	0.56172
21	La Laguna	0.644359	0.529412	0.51123
22	La Rioja	0.612519	0.533333	0.50000
23	Las Palmas de Gran Canaria	0.620065	0.520612	0.50465



# Final Dataset

- **48 Spanish** public universities
- 2 institutions are **absent**
- Including data from
  - Graduates
  - Doctorates
  - Public workers
  - Civil servants



# The Fading Path to Academia

**59%**

Graduates

**49%**

Doctorates

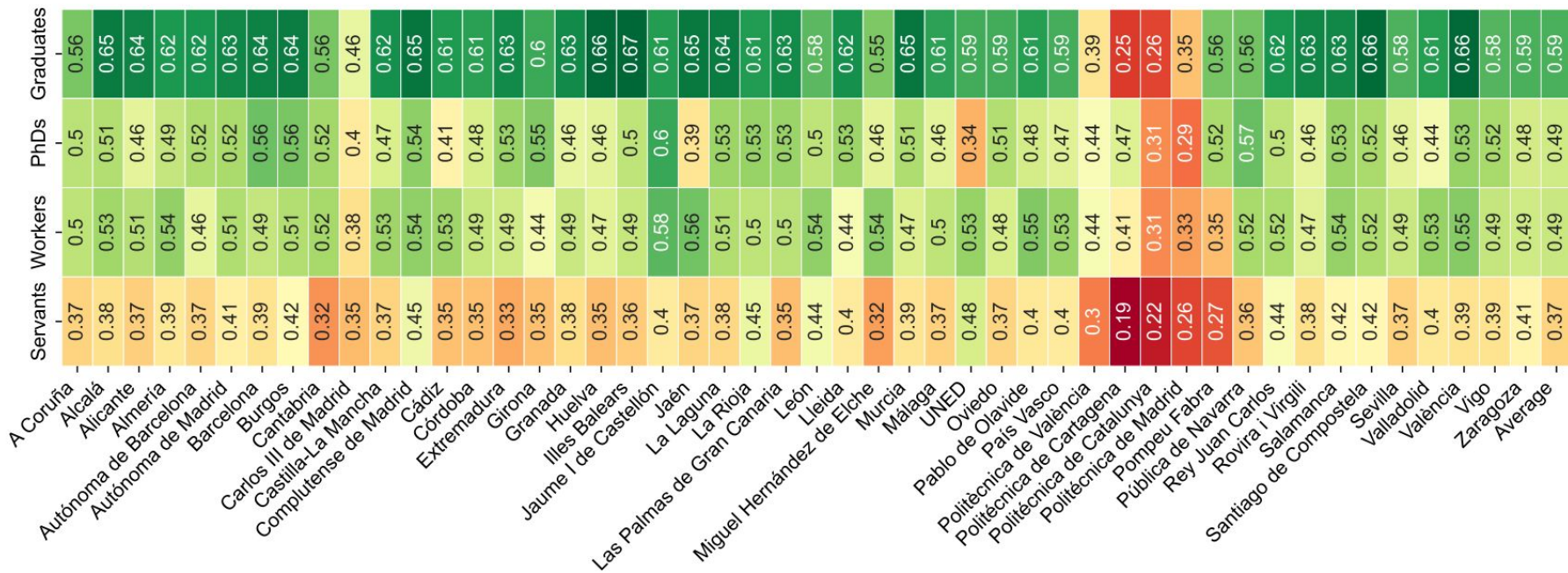
**49%**

Public  
workers

**37%**

Civil  
servants

# Gender Disparity by Institution



# Gender Disparity by Institution

## Top best ratios

Institution	Servants	Workers	PhDs	Graduates
A Coruña	0.37	0.5	0.5	0.56
Alicala	0.38	0.53	0.51	0.65
Almeria	0.37	0.51	0.46	0.64
Autónoma de Barcelona	0.39	0.54	0.49	0.62
Autónoma de Madrid	0.37	0.46	0.52	0.62
Barcelona	0.41	0.51	0.52	0.63
Burgos	0.39	0.49	0.56	0.64
Cantabria	0.42	0.51	0.56	0.64
Carlos III de Madrid	0.32	0.52	0.52	0.56
Castilla-La Mancha	0.35	0.38	0.4	0.46
Complutense de Madrid	0.37	0.53	0.47	0.62
Cádiz	0.45	0.54	0.54	0.65
Córdoba	0.35	0.53	0.41	0.61
Extremadura	0.35	0.49	0.48	0.61
Girona	0.33	0.49	0.53	0.63
Granada	0.35	0.44	0.55	0.6
Huelva	0.38	0.49	0.46	0.63
Illes Balears	0.35	0.47	0.46	0.66
Jaume I de Castellón	0.36	0.49	0.5	0.67
Jaén	0.4	0.58	0.6	0.61
La Laguna	0.37	0.56	0.39	0.65
La Rioja	0.38	0.51	0.53	0.64
Las Palmas de Gran Canaria	0.45	0.5	0.53	0.61
León	0.35	0.5	0.53	0.63
Lleida	0.44	0.54	0.5	0.58
Miguel Hernández de Elche	0.4	0.44	0.53	0.62
Murcia	0.32	0.54	0.46	0.55
Málaga	0.39	0.47	0.51	0.65
Málaga	0.37	0.5	0.46	0.61
UNED	0.48	0.53	0.34	0.59
Oviedo	0.37	0.48	0.51	0.59
Pablo de Olavide	0.4	0.55	0.48	0.61
País Vasco	0.4	0.53	0.47	0.59
Politécnica de Valencia	0.3	0.44	0.44	0.39
Politécnica de Cartagena	0.19	0.41	0.47	0.25
Politécnica de Catalunya	0.22	0.31	0.31	0.26
Pompeu Fabra	0.26	0.33	0.29	0.35
Rey Juan Carlos	0.27	0.35	0.52	0.56
Rovira i Virgili	0.36	0.52	0.57	0.56
Salamanca	0.44	0.52	0.5	0.62
Santiago de Compostela	0.38	0.47	0.46	0.63
Sevilla	0.42	0.54	0.53	0.63
Valladolid	0.42	0.52	0.52	0.66
Valencia	0.37	0.49	0.46	0.58
Valladolid	0.4	0.53	0.44	0.61
Valencia	0.39	0.55	0.53	0.66
Vigo	0.39	0.49	0.52	0.58
Zaragoza	0.41	0.49	0.48	0.59
Average	0.37	0.49	0.49	0.59

# Gender Disparity by Institution

## Top worst ratios

Institution	Servants	Workers	PhDs	Graduates
A Coruña	0.37	0.5	0.5	0.56
Alicala	0.38	0.53	0.51	0.65
Almeria	0.37	0.51	0.46	0.64
Autónoma de Barcelona	0.39	0.54	0.49	0.62
Autónoma de Madrid	0.37	0.46	0.52	0.62
Barcelona	0.41	0.51	0.52	0.63
Burgos	0.39	0.49	0.56	0.64
Cantabria	0.42	0.51	0.56	0.64
Carlos III de Madrid	0.32	0.52	0.52	0.56
Castilla-La Mancha	0.35	0.38	0.4	0.46
Complutense de Madrid	0.37	0.53	0.47	0.62
Cádiz	0.45	0.54	0.54	0.65
Córdoba	0.35	0.53	0.41	0.61
Extremadura	0.35	0.49	0.48	0.61
Girona	0.33	0.49	0.53	0.63
Granada	0.35	0.44	0.55	0.6
Huelva	0.38	0.49	0.46	0.63
Illes Balears	0.35	0.47	0.46	0.66
Jaume I de Castellón	0.36	0.49	0.5	0.67
Jaén	0.4	0.58	0.6	0.61
La Laguna	0.37	0.56	0.39	0.65
La Rioja	0.38	0.51	0.53	0.64
Las Palmas de Gran Canaria	0.45	0.5	0.53	0.61
León	0.35	0.5	0.53	0.63
Lleida	0.44	0.54	0.5	0.58
Miguel Hernández de Elche	0.4	0.44	0.53	0.62
Murcia	0.32	0.54	0.46	0.55
Málaga	0.39	0.47	0.51	0.65
Mallaga	0.37	0.5	0.46	0.61
UNED	0.48	0.53	0.34	0.59
Oviedo	0.37	0.48	0.51	0.59
Pablo de Olavide	0.4	0.55	0.48	0.61
País Vasco	0.4	0.53	0.47	0.59
Politécnica de Valencia	0.3	0.44	0.44	0.39
Politécnica de Cartagena	0.19	0.41	0.47	0.25
Politécnica de Catalunya	0.22	0.31	0.31	0.26
Politécnica de Madrid	0.26	0.33	0.29	0.35
Pompeu Fabra	0.27	0.35	0.52	0.56
Pública de Navarra	0.36	0.52	0.57	0.56
Rey Juan Carlos	0.44	0.52	0.5	0.62
Rovira i Virgili	0.38	0.47	0.46	0.63
Salamanca	0.42	0.54	0.53	0.63
Santiago de Compostela	0.42	0.52	0.52	0.66
Sevilla	0.37	0.49	0.46	0.58
Valladolid	0.4	0.53	0.44	0.61
Valencia	0.39	0.55	0.53	0.66
Vigo	0.39	0.49	0.52	0.58
Zaragoza	0.41	0.49	0.48	0.59
Average	0.37	0.49	0.49	0.59

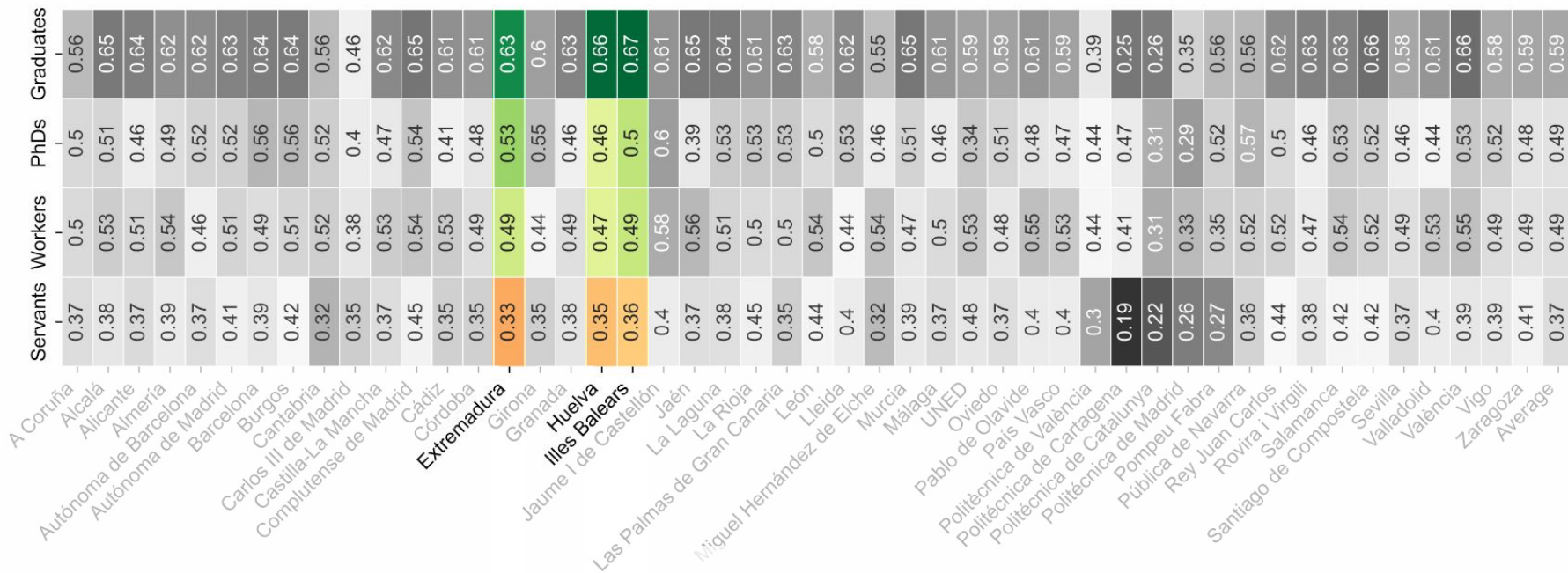
# Gender Disparity by Institution

## Institutes of Technology (+ UC3M)

Institution	Servants	Workers	PhDs	Graduates
A Coruña	0.37	0.5	0.5	0.56
Alicala	0.38	0.53	0.51	0.65
Almerite	0.37	0.51	0.46	0.64
Autónoma de Barcelona	0.39	0.54	0.49	0.62
Autónoma de Madrid	0.37	0.46	0.52	0.62
Barcelona	0.41	0.51	0.52	0.63
Burgos	0.39	0.49	0.56	0.64
Cantabria	0.42	0.51	0.56	0.64
Carlos III de Madrid	0.32	0.52	0.52	0.56
Castilla-La Mancha	0.35	0.38	0.4	0.46
Complutense de Madrid	0.37	0.53	0.47	0.62
Cádiz	0.45	0.54	0.54	0.65
Córdoba	0.35	0.53	0.41	0.61
Extremadura	0.35	0.49	0.48	0.61
Girona	0.33	0.49	0.53	0.63
Granada	0.35	0.44	0.55	0.6
Huelva	0.38	0.49	0.46	0.63
Illes Balears	0.35	0.47	0.46	0.66
Jaume I de Castellón	0.36	0.49	0.5	0.67
Jaén	0.4	0.58	0.6	0.61
La Laguna	0.37	0.56	0.39	0.65
La Rioja	0.38	0.51	0.53	0.64
Las Palmas de Gran Canaria	0.45	0.5	0.53	0.61
León	0.35	0.5	0.53	0.63
Lleida	0.44	0.54	0.5	0.58
Miguel Hernández de Elche	0.4	0.44	0.53	0.62
Murcia	0.32	0.54	0.46	0.55
Málaga	0.39	0.47	0.51	0.65
Mallaga	0.37	0.5	0.46	0.61
UNED	0.48	0.53	0.34	0.59
Oviedo	0.37	0.48	0.51	0.59
Pablo de Olavide	0.4	0.55	0.48	0.61
País Vasco	0.4	0.53	0.47	0.59
Politécnica de Valencia	0.3	0.44	0.44	0.39
Politécnica de Cartagena	0.19	0.41	0.47	0.25
Politécnica de Catalunya	0.22	0.31	0.31	0.26
Politécnica de Madrid	0.26	0.33	0.29	0.35
Pompeu Fabra	0.27	0.35	0.52	0.56
Pública de Navarra	0.36	0.52	0.57	0.56
Rey Juan Carlos	0.44	0.52	0.5	0.62
Rovira i Virgili	0.38	0.47	0.46	0.63
Salamanca	0.42	0.54	0.53	0.63
Santiago de Compostela	0.42	0.52	0.52	0.66
Sevilla	0.37	0.49	0.46	0.58
Valladolid	0.4	0.53	0.44	0.61
Valencia	0.39	0.55	0.53	0.66
Vigo	0.39	0.49	0.52	0.58
Zaragoza	0.41	0.49	0.48	0.59
Average	0.37	0.49	0.49	0.59

# Gender Disparity by Institution

## Steepest drops



# Conclusion

Women are **less represented** in **high positions**

Empirical evidence indicates drops at each stage

**Institutes of Technology** have a greater **gender gap**

Women are underrepresented from the start in STEM fields

**Lack** of up-to-date public **data**

Not very accessible either



# Thanks for listening

## Any questions?

Pilar Moreno and José Miguel Moreno. 2024. *The Fading Path to Academia: A Data-Driven Analysis of Gender Disparities in Spanish Universities*. Proceedings of the 1st Precarity and Instability in Academia Symposium.

<https://pias.cc/2024/proceedings/fading-path>