SDGs-related research and scientists' relational involvement with non-academic actors

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Two main HOT topics:

1. The increasing awareness of tackling the **grand societal challenges**, e.g., Sustainable Development Goals, by multiple societal actors, including the universities.

2. The relevance of choosing the proper **science-society interactions**, among multiple instruments, for the socioeconomic development of regions.

Two main objectives:

1. To identify of **groups** (clusters) of social sciences and humanities **(SSH) scientists** according to the extent to which they engage in **the SDGs' inspired research.**
   - ✓ by characterizing and describing scientists in terms of diverse personal and professional characteristics

2. To explore whether **the inclusion of SDGs in research** by SSH scientists is related to **specific ways of academic engagement**.
   - ✓ by distinguishing between different forms of science-society interactions.

Sustainable Development Goals in the Higher Education Context

- Sustainable development as a complex challenge
- Important implications for multiple institutions (e.g. **Universities**, NPOs, public administration, business firms, civil society…)
- SDGs as a common framework (2015) agreed by 193 countries
- 2030 Agenda = 17 SDGs = 5 key areas = People, Planet, Prosperity, Peace and Partnerships

(e.g. Morton et al., 2017)

- Existing research on SDGs and the role of university has focused their analyses on the macro-level (e.g.: regional or institutional)

(e.g. Brissett & Radhika, 2017; Swain, 2018; Heleta & Togiera, 2021; Jon & Yoo, 2021)

So, the exploration of the individual level makes sense, since it is understudied!!

From macro policies to academics' research agendas settings

- Need to understand the way in which the SDGs shapes the research mission of HEIs through their scientists' research agendas.
- A research agenda is conceptualized as a combination of strategic problem-solving frameworks and the operationalization of actions to pursue research goals (Santos and Horta, 2018).
- A research agenda is primarily an individual endeavour but embedded within the institutional setting where scientist work: universities.
- SDG challenges clearly represent a collective agreement concerning common societal challenges, and thus a reference point for scientists when setting up their research priorities (Schneider et al., 2019).

So, not all scientists will equally adapt their research agendas towards the SDGs!!

Research agenda setting and academic engagement

- Collaboration between academic and non-academic actors is increasingly important for both economic development and societal impact.
- Multiple interaction mechanisms can be divided into two types of involvement:

INVOLVEMENT	
Transactional	Relational
Transactional Involvement (TI) activities are largely based on market-mediated agreements.	**Relational Involvement** (RI) activities are more interpersonal interactions between academic and non-academic partners
Examples: academic entrepreneurship and IP licensing (D'Este et al., 2019; Perkmann and Walsh, 2007)	Examples: consulting, collaborative research, ad-hoc advice or personnel mobility (e.g., D'Este and Patel, 2007; Perkmann and Walsh, 2009, Hughes et al., 2016)

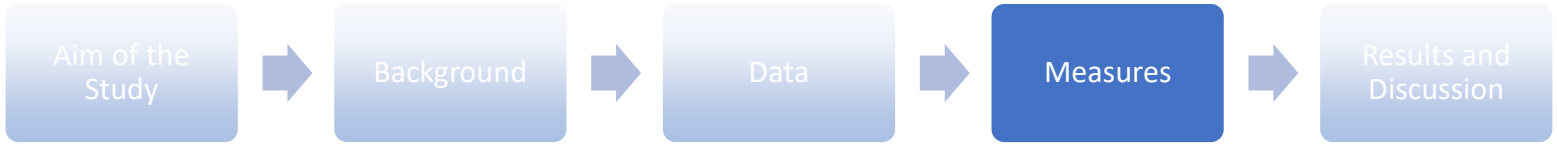
Based on our literature review we propose to test…

- ***Hypothesis 1:*** *Scientists with high levels of SDG-related research will exhibit greater relational involvement with non-academics, as compared to scientists with low levels of SDG-related research.*

- ***Hypothesis 2:*** *Scientists with high levels of SDG-related research will exhibit greater engagement in personnel mobility, as compared to research services.*

…by using an own elaboration database

- Population of study: 2959 SSH scientists
- Context: four Valencian public universities
- Data gathered through an online survey (between Dec-2019 and Mar-2020)
- Questions related to research practices and university-society interactions
- Final Sample: 614 scientists
- Response Rate: 20.7%
- The sample is representative of the population.



SDG-related research:

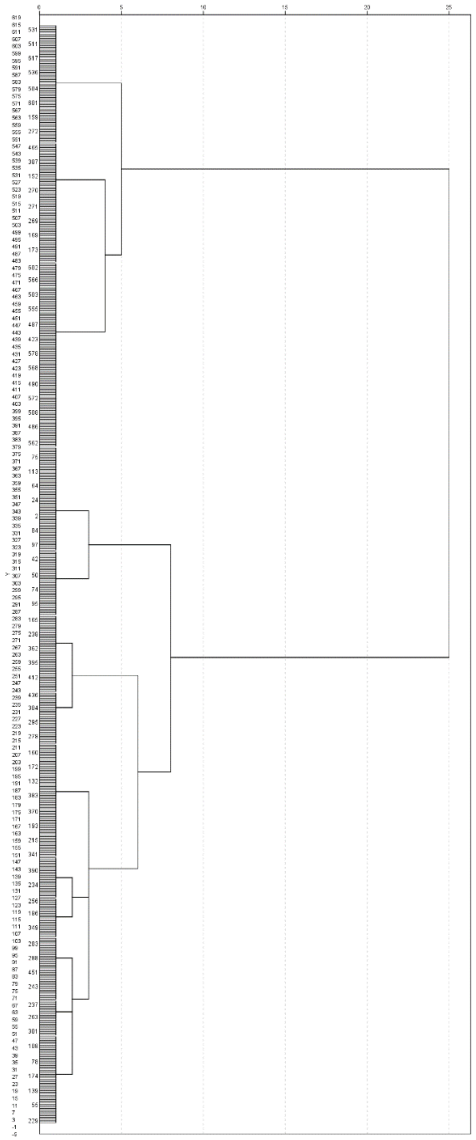
- To what extent their research agenda addresses SDGs by each of the following categories associated to them: Prosperity, People, Peace, Planet and Partnerships.
- 7 points Likert scale

Relational involvement with non-academic actors:

- 11 items to assess scientists' participation frequency in a range of different forms of academic engagement activities.
- 5 points frequency scale
- Two factors were extracted
  - Research services (e.g. involvement in contract research or academic consulting)
  - Personnel mobility (e.g. research stays in non-academic institutions or practitioners' hosting in academic institutions).

Control variables:

- Gender
- Large field of science: humanities or social sciences.
- Hierarchical position: Full professor, Associate professor, Assistant professor (I & II) and PhD student.
- Affiliation: university, department, field.
- PhD Year
- Professional experience
- Type of research, following Stokes (1997): Bohr, Edison, Pasteur or Unestablished.



Cluster analysis and results

Figure 1: Dendrogram for SDG-related research

- A two-stage procedure approach implemented, using the centroids obtained from a hierarchical method as seed points for the non-hierarchical method. (Milligan and Sokol, 1980):

  1) We conducted a hierarchical agglomerative analysis based on the Ward's method using squared Euclidean distances, adequate for studies with **no outliers** (Hair et al., 2013; Ketchen and Shook, 1996). To decide the number of clusters to retain, we relied upon the **dendrogram** which shows that two-group solution was optimal.

  2) Then, we used the clusters centroids obtained from the previous hierarchical analysis to establish the initial seed to start a non-hierarchical analysis using k-means (Steinley, 2006).

Notes: N=614. Method: Ward's method using squared Euclidean distances

Cluster analysis and results

- The two-cluster solution converged after five iterations.
- Two clusters were identified:
  1. Scientists with **low SDG-related research** (C1=Low-SDG, n=338)
  2. Scientists with **high SDG-related research** (C2 = High-SDG, n=276).

Table 2: Cluster comparison for defining and associated variables

DEFINING VARIABLES	C1 (n=338) Low-SDG	C2 (n=276) High-SDG	
SDG-related research	Mean (SD)	Mean (SD)	t-test
• **SDG Prosperity**	2.77 (2.074)	5.47 (1.650)	-17.956***
• **SDG People**	3.99 (2.247)	6.26 (1.097)	-16.382***
• **SDG Peace**	2.13 (1.592)	5.18 (1.811)	-21.943***
• **SDG Planet**	1.62 (1.293)	3.89 (2.256)	-14.847***
• **SDG Partnership**	2.22 (1.639)	5.32 (1.573)	-23.763***

Notes: N = 614. Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Continue…

Source: own elaboration

Cluster analysis and results

Table 2 (continuation): Cluster comparison for defining and associated variables

DEFINING VARIABLES	C1 (n=338) Low-SDG	C2 (n=276) High-SDG	
Continuous variables	**Mean (SD)**	**Mean (SD)**	**t-test**
Time Distribution			
• **Teaching time**	35.57 (15.535)	33.95 (14.503)	1.328
• **Research time**	40.36 (18.008)	36.64 (14.307)	2.849***
• **Transfer time**	8.68 (8.400)	12.59 (9.376)	-5.390***
• **Management time**	15.38 (14.382)	16.68 (14.425)	-1.113
Years since PhD	15.80 (11.131)	17.01 (11.227)	-1.334

Notes: N = 614. Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Continue…

Source: own elaboration

Table 2 (continuation): Cluster comparison for defining and associated variables

Categorical variables	%	%	χ^2 (df)
University			**2.70(3)**
• University 1	53.3%	54.7%	0.13(1)
• University 2	25.7%	27.9%	0.36(1)
• University 3	13.6%	13.0%	0.04(1)
• University 4	7.4%	4.3%	2.49(1)
Department Field			**6.18(1)****
• Social Sciences	72.2%	80.8%	
Gender			**0.04(1)**
• Female	47.3%	48.2%	
Hierarchical Position			**7.00(4)**
• Full professor	20.1%	22.1%	0.36(1)
• Associate professor	37.0%	38.4%	0.13(1)
• Assistant professor (I)	11.8%	16.7%	2.95(1)*
• Assistant professor (II)	21.6%	14.9%	4.57(1)**
• PhD student	9.5%	8.0%	4.24(1)
Stokes Quadrant			**49.58(3)*****
• Bohr	30.5%	9.4%	40.58(1)***
• Edison	9.2%	13.0%	2.34(1)
• Pasteur	54.4%	75.4%	28.82(1)***
• Unestablished	5.9%	2.2%	5.25(1)**
Previous Experience			
• Academic experience	53.3%	53.3%	0.00(1)
• Private inst. experience	41.7%	42.4%	0.03(1)
• Public adm. experience	29.3%	42.4%	11.43(1)***

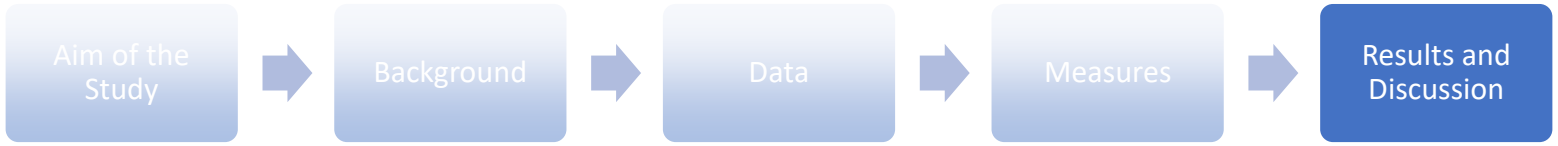
Notes: N = 614. Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Source: own elaboration

	Research services		Personnel mobility	
	Coef.	SE	Coef.	SE
High-SDG	0.215***	(0.07)	0.741***	(0.11)
Female	-0.240***	(0.07)	-0.109	(0.10)
Social sciences	0.169*	(0.09)	-0.198	(0.13)
Teaching time	-0.007**	(0.00)	-0.006	(0.00)
Research time	-0.013***	(0.00)	-0.008*	(0.00)
Transfer time	0.040***	(0.00)	0.029***	(0.01)
Full professor	0.292	(0.22)	-0.688**	(0.32)
Associate professor	0.116	(0.18)	-0.626**	(0.26)
Assistant professor (I)	0.171	(0.18)	-0.398	(0.25)
Assistant professor (II)	0.335**	(0.16)	-0.127	(0.23)
Years since PhD	0.009	(0.01)	0.015*	(0.01)
Bohr	0.156	(0.19)	0.124	(0.30)
Edison	0.575***	(0.20)	0.681**	(0.31)
Pasteur	0.490***	(0.18)	0.409	(0.28)
Academic experience	0.138*	(0.07)	0.274**	(0.11)
Firm experience	0.180**	(0.07)	0.108	(0.11)
Public adm. experience	0.202***	(0.08)	0.029	(0.11)
University 1	0.087	(0.15)	0.091	(0.22)
University 2	0.009	(0.16)	0.281	(0.23)
University 3	-0.154	(0.17)	-0.231	(0.26)
Constant	0.427	(0.34)	-0.241	(0.50)
Pseudo Log-likelihood	-1.388.035			
Wald chi2	453.579			
df	40.000			
p-value	0.000			

Notes: N = 614. Multivariate Tobit/mixed model. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.
Rho-Parameter of Bi-Tobit (1): 0.286*** (0.048); Bi-Tobit (2): 0.278*** (0.044).
Robust standard errors in parenthesis.

Source: own elaboration



- ❑ This article identifies the incorporation of SDG goals within **individual** academics' research agenda.
  - SSH scientists are not equally orienting their research towards the **5 (SDGs) key areas**.
  - **Two patterns of scientists** have been identified, according to their level of engagement with the SDGs.
    - ✓ **SDG's discourse** has been **heterogeneously** included into the research agenda of our sample.
    - ✓ Despite of lack of formal incentives there are already a group of researchers that address SDGs in their research agenda.
  - High-SDG scientists spend less time for research, but more time for transferring knowledge, as compared to the cluster of low-SDG scientists.
  - A significant percentage of high-SDG scientists have previous working experience in the public administration, while this is not the case for low-SDG scientists.
  - 'Bohr' academics – those who perform basic research- do not seem to be interested in performing SDG-related research.
  - In contrast, 'Pasteur' academics –those who combine basic research with an interest in real-world application – are the most interested in performing SDG-oriented research.

- ❑ Scientists who incorporate SDG goals within their research agenda tend to show a higher relational involvement with non-academics
- ❑ **Positive** and significant relationship between **SDG-oriented research and academic engagement**
  - ✓ Stronger for **non-market activities: relational involvement > transactional involvement**
- ❑ **Therefore…** H1 & H2 SUPPORTED!!

This finding contributes to the literature on the

<u>individual antecedents of academic engagement</u>

(Ankrah et al. 2013; Bhullar et al. 2019; Alan Hughes et al. 2016; Meissner et al. 2022; Perkmann et al. 2021)

IMPLICATIONS OF THIS STUDY

- Open academic position for professionals with prior experience in other domains beyond academia (i.e. public administration), since it shows that this is clearly valuable for increasing their awareness towards SGD-related issues in their research agendas.
- Current recruitment process may be rethought since academia tends to prioritize academic achievement and experience, over other goals (i.e. experience in other domains beyond academia).

✓ So, why not to design temporary programs to promote academics' research stays, for instance, in public administration offices?

✓ Should we follow the same recruitment processes as always?

THANK YOU

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