

Five decades of empirical research on the postdoc: a scoping review of the contribution of bibliometrics

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Introduction

- A scoping review of empirical evidence on “the postdoc”, as published over the past 5 decades (1970–2020)
 - Are systematic reviews **feasible**?
 - Volume & research design
 - The **contribution of bibliometrics** to that body of evidence
 - Postdocs are first are foremost researchers (or at least should be), thus their **research production** – before, during and after their position – should also be a central concern
 - ...the objective measurement of which is the *sine qua non* of **bibliometrics**
- Rationale
 - My interest in studying the postdoc
 - A variety of concerns with postdoc has been growing internationally



IT'S NATIONAL

POSTDOC APPRECIATION WEEK!

Celebrate
The Middleman of Academia™

POSTDOCS ARE:

MENTORS!

Don't become
a postdoc.



INDEPENDENT
SCHOLARS!

Write this
proposal for me.



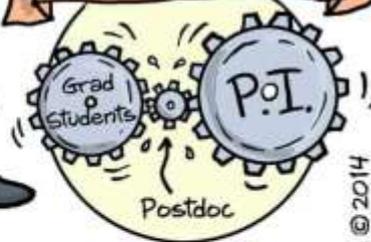
And this paper.
And this review.



GLAD TO HAVE
ANOTHER TWO
YEARS TO PUT
THEIR THESIS IN
PUBLISHABLE FORM!



ESSENTIAL COGS IN
THE GRANT SCHEME
OF ACADEMIA!



NEXT WEEK: BACK TO BEING UNDERAPPRECIATED!

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However, scoping/
systematic
reviews of
research on the
topic (5) have

- ...been **limited** to a single field and/or a particular concern
- ...not considered **publication performance** per se
- Arguably a central concern of the postdoc

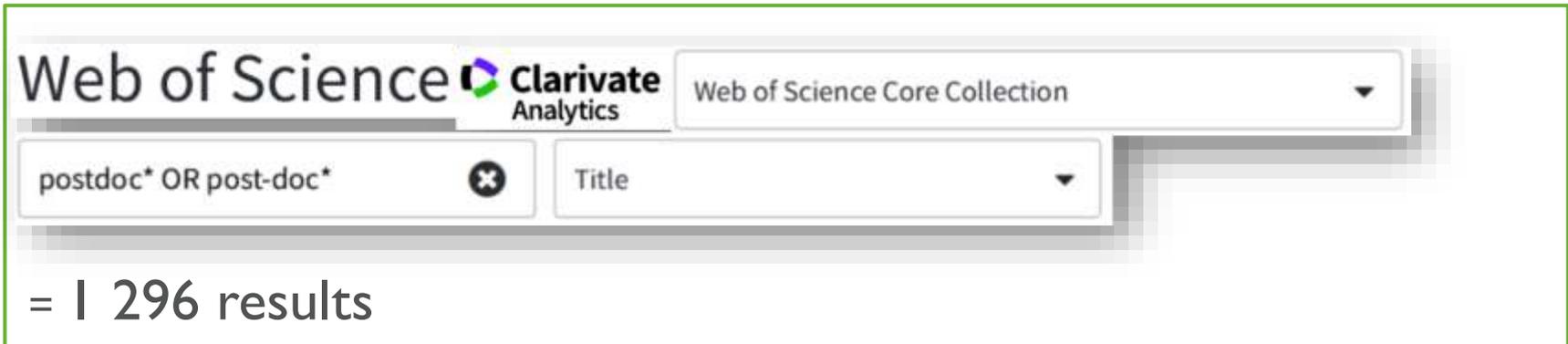
Inclusion criteria: “the postdoc”

- Lack of a systematic, global **definition** of the postdoctoral appointment
- My definition: “a **temporary** position, after completion of a doctorate, taken primarily for **additional training**, in particular advanced **research** apprenticeship **under supervision**”
- Not only research on postdocs as individuals, but on issues, other individuals and/or institutions related to **“the postdoc”**

The Many Ways to Spell "Postdoc"

"postdoc"	The lazy way
"Post-doc"	The grammatically correct way
"PostDoc"	The German way?
"Postdoc Student"	The Confused Admin way
"Post Doctor"	Chinese standard
"Postdoctoral Fellow/Scholar"	"Look at me, I'm Ivy League"
"Postdoctoral Researcher/ Associate"	"I'm not sure this is better but throw me a bone, will you" way

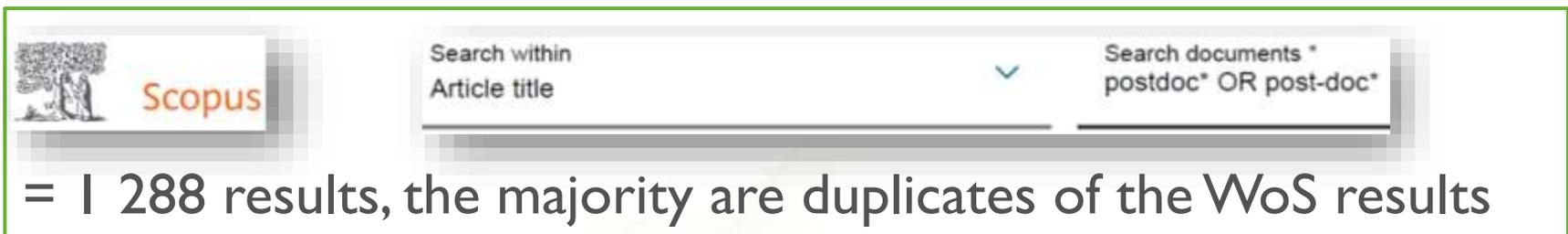
Search strategy, source selection, full-text retrieval and data extraction



Web of Science  Clarivate Analytics Web of Science Core Collection

postdoc* OR post-doc* Title

= | 296 results



 Scopus

Search within Article title Search documents * postdoc* OR post-doc*

= | 288 results, the majority are duplicates of the WoS results

- 1970 to December 2020 (51 years)
- No limitation on document type, language, contextual setting (e.g., discipline, country) or other criteria
- = 811 sources in the data set

Manual inspection of 811 full-text versions (excl. 3)

- Applying predetermined definitions
 - “the postdoc”
 - “empirical research”
- = 260 sources of evidence
 - 85% are articles
 - 81% indexed in WoS
 - 6 are not English
 - 1973–2020

ProDEC Framework

- Research **p**roblem (Pro)
- Research **d**esign (D)
- **E**mpirical evidence (E)
- **C**onclusions (C)

Data processing and analysis

- Research designs were classified inductively
 - Unit of analysis: **type of data** collected and/or analysed
 - Quantitative, univariate analysis
 - **Volume over time**
 - **Frequency of research designs**
 - In-depth analysis of the **instances of bibliometrics**
 - Applying the definitions of Thompson and Walker (2015) and of Godin (2006), namely “the application of mathematical and statistical methods to **scholarly publications**” to measure the “output side of science”
 - Quantitative & qualitative content analysis
 - Why, how and in which context (country and field) was the evidence produced?
- 

Findings I: Results of a quantitative analysis of all the sources of evidence on the postdoc

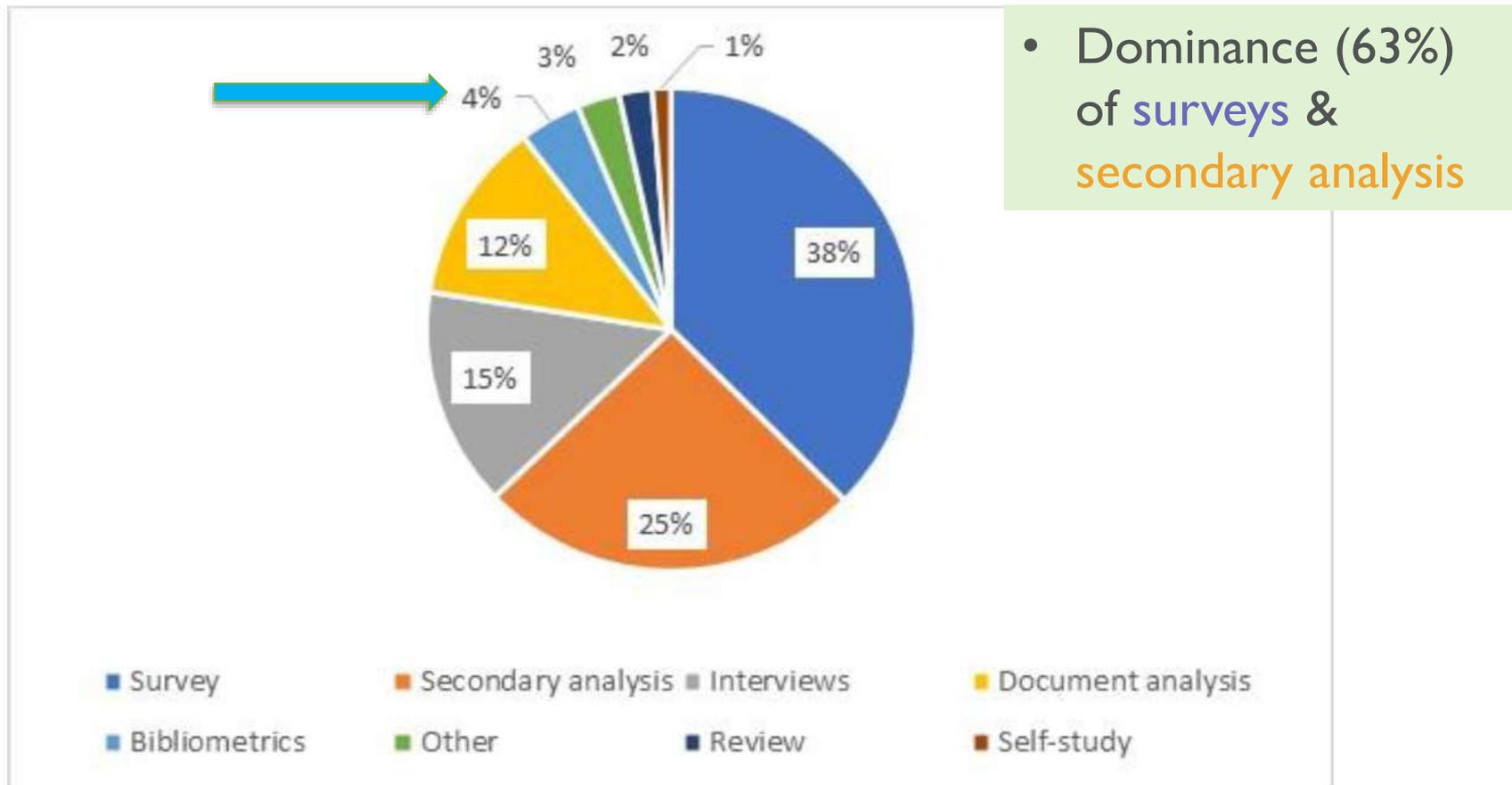
Table I. The distribution of sources of evidence (n=260) published in the period 1973–2020.

<i>Year range</i>	<i>Frequency</i>	<i>Percent</i>	<i>Mean</i>
1973-79	6	2%	0,9
1980s	8	3%	0.8
1990s	25	10%	2,5
2000s	47	18%	4,7
2010-20	174	67%	15,8
Total	260	100	

Increased in small increments from a very low base in the first two decades, to the next two, but followed by **a significant increase in volume over the past decade**

Findings I: Quantitative results (cont.)

Figure I: Distribution of research designs (n=320 designs)



Findings II: Results of the content analysis of bibliometric sources of evidence on the postdoc

Table 2: Summary
of features of
sources of
evidence (n=13)
produced by
bibliometric
analysis (1976–
2019)

<i>Author(s)</i>	<i>Pub. date</i>	<i>Time frame</i>	<i>Sample size (publications)</i>	<i>Country</i>	<i>Discipline/field</i>
Reskin	1976	1955–1970	450	USA	Chemistry
Pion & Ionescu-Pioggia	2003	1995–2000	101	USA & Canada	Biomedical sciences
McKay & Daniels	2003	1992–2000	87 (247)	Canada	Gastroenterology & related disciplines
Bornmann & Daniel	2006	1990–1995	397 (1 586)	Germany	Biomedical sciences
Levitt	2010	1992–2009	439	USA	Basic life sciences
Jacob & Lefgren	2011	1980–2000	12 189 (13 426)	USA	Biological sciences (predominantly); physical, social & “miscellaneous”
De Castro & Porto	2012	Unknown	86	Portugal	Biology, engineering, geosciences & health sciences
Miller & Feldman	2014	1993–2006	N/A	USA	Life sciences
Schneider & van Leeuwen	2014	2001–2009	632 (6 196)	Denmark	Health, natural & technical sciences
Igami, Nagaoka & Walsh	2015	2001–2006	4 410 (≈10 000)	USA & Japan	Natural sciences
Mbuagbaw et al.	2018	2010–2015	6 (40)	Canada	HIV (clinical)
Pepper et al.	2019	2014–2017	133	USA	Astronomy
Zabetta & Geuna	2019	1986–2015	15 385 (285 283)	Italy	All

Findings II (cont.)

- Two interesting **themes** emerged: the study of
 - Gender differences (3)
 - Elite populations (3) / fast-moving, competitive research (1)
 - Sources of **bibliometric data**
 - Creative uses beyond measuring research performance
 - ...but some “precarious” assumptions
 - All the studies depended on **other data sources**
 - For sample identification, verification of publication data, and analysis
 - Publicly available vs. availability dependent on positionality of evaluators of interventions
 - Context (country & field) reflects where the postdoc has been **institutionalised** for the longest time
 - North America & Europe
 - Medical & life sciences; natural sciences
- 

Points for discussion / future research

- **Growth pattern of research on postdocs** differs from that observed for global scientific publication output (1980-2012)
 - Systematic review of survey evidence (primary & secondary) is feasible
 - ...if not limited to a topic or field
 - **...but not for bibliometric evidence: insufficient in terms of volume, standardisation and rigour**
 - What has been **limiting the volume** bibliometric analyses of the postdoc (not a recent phenomenon)?
 - Postdocs' "meagre" publication history (Schneider & van Leeuwen, 2014)
 - But one could study postdocs over **longer time periods**, or as part of **mentor-mentee dyads or research teams?**
 - Lack of non-bibliometric data
 - But **surveys** also require sampling frames from which to construct publication portfolios?
 - **Knowledge gaps** in terms of context studied
 - Outside of North America and Europe
 - Social sciences and humanities
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