

# HOW WELL DOES THE RESEARCH SUPPORTED BY THE BIAL FOUNDATION PERFORM? A BIBLIOMETRIC ASSESSMENT

## Aims & Method

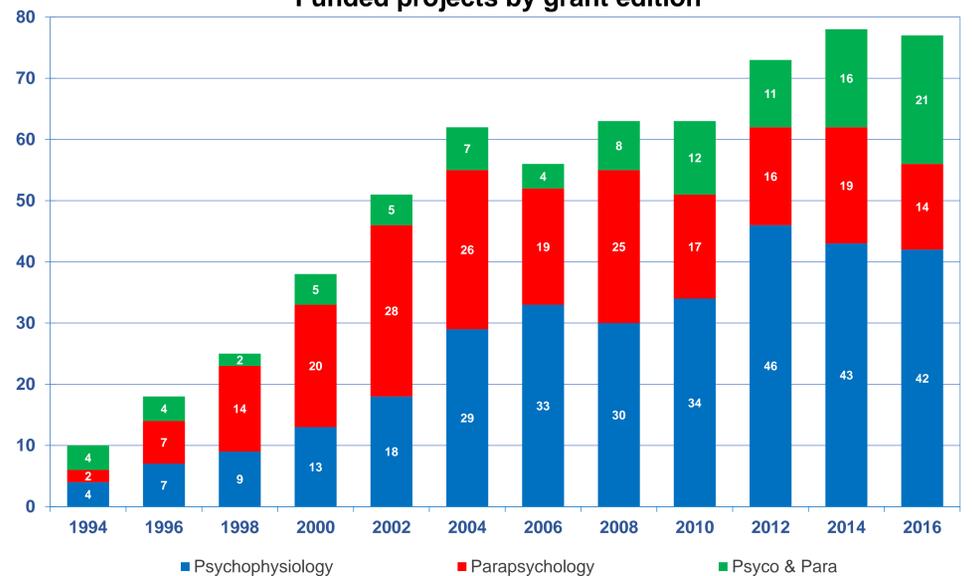
**Aims:** To analyse and to monitor the research productivity and impact of projects supported by the BIAL Foundation by using bibliometric indicators.

### Method:

- Research projects' productivity** - assessed by the number of papers published in academic journals indexed by Scopus or Web of Science (WoS).
- Publications' impact** - assessed by:
  - the number of citations per item retrieved from WoS Core Collection in March 2018, total number of times cited and the average citations per item.
  - BIAL Foundation's *h-index*, where *h* equalled the number of publications for which it received at least *h* citations each.
  - distribution of papers published from 2007 to 2017 by percentiles of citations, comparing the actual number of citations with the expected number of citations for papers in the same research field and publication year.
  - the **Highly Cited Papers**, featuring those that ranked in the top 1% most cited papers for field and publication year in WoS.
- Journals' quality** - assessed by their impact factor and mainly by their quartile score (provided by Journal Citation Reports) to mitigate differences between research fields. Selection of the best quartile score when a journal was associated to more than one subject category and as result had different positions in the quartile ranking (Q1, Q2, Q3 or Q4). Results were compared with the previous assessment made in March 2016 to pinpoint the major improvements achieved in these last 2 years.

## Funded projects

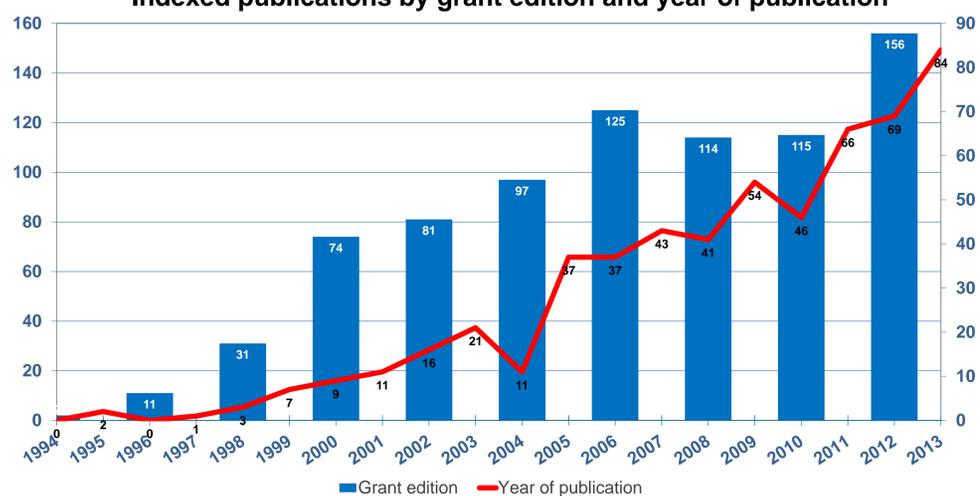
Funded projects by grant edition



The BIAL Foundation has supported **614 research projects** in the areas of Psychophysiology (308 grants, 50%), Parapsychology (207 grants, 34%) and Interdisciplinary – a combination of Psychophysiology and Parapsychology (99 grants, 16%). These projects have been carried out by **1351 researchers**, in universities and research centers from **25 countries**.

## 1. Research projects' productivity

Indexed publications by grant edition and year of publication



The projects of the 2006 and 2012 grant editions have been the most productive ones, publishing on average 2 indexed papers per project.

Progressive increase of indexed publications along the years.

Research field	Indexed Publications	Projects 1994-2012	Ratio
Psychophysiology	524	223	2.35
Parapsychology	186	174	1.07
Psyco & Para	96	62	1.55
<b>Total</b>	<b>806</b>	<b>459</b>	<b>1.76</b>

Excluding the last 2 grant editions (2014/15 and 2016/17), in which most projects are still ongoing or starting, the **ratio of indexed publications per project** was on average **1.76**.

**910 indexed papers** were published from 1995 to 2018. In the current year, 27 papers were already published or are in press.

In 2016, 91 indexed papers were published, representing an **increase of 26%** when compared to 2015.

The BIAL Foundation has **136 ongoing projects** involving **411 researchers**. Projects of the last grant edition, which started in 2017, already published 18 indexed papers.

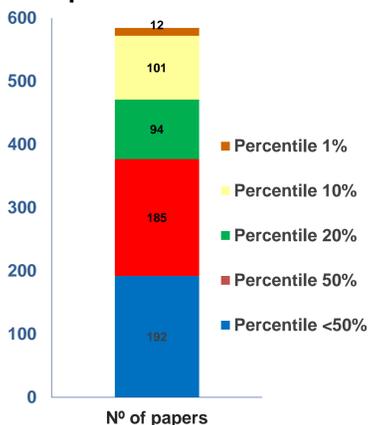
## 2. Publications' impact

### Number of citations

Total Publications	Sum of Times Cited	Average citations per item	<i>h-index</i>
756	12.737	16.85	52

52 papers obtained at least 52 citations. One of the papers was **cited 353 times**.

### Number of publications by percentiles of citations



**113 papers** were among the **top 10% most cited papers**, when considering the expected number of citations for papers published in the same year and research field.

### Highly Cited Paper

**Science**  
Chronic Stress Causes Frontostriatal Reorganization and Affects Decision-Making  
Eduardo Dias-Ferreira et al.  
Science 325, 621 (2009); DOI: 10.1126/science.1171203

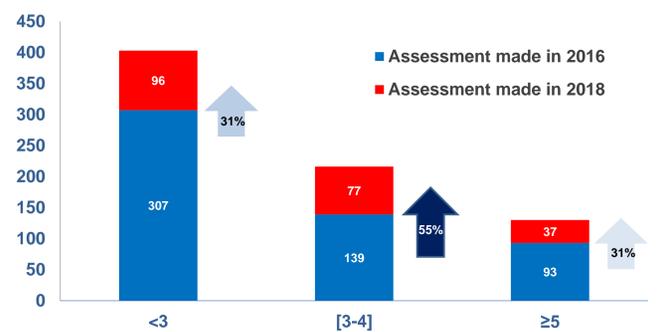
**eLIFE**  
What is embodiment? A psychometric approach  
Matthew R. Longo et al.  
eLIFE 5, 0107 (2016); DOI: 10.7554/eLife.11015

**THE NEUROSCIENTIST**  
Demixed principal component analysis of neural population data  
Dmitry Kobak et al.  
The Neuroscientist 22, 10 (2016); DOI: 10.1177/1043986216654441

**PLOS BIOLOGY**  
Transcranial Electrical Stimulation: What We Know and Do Not Know About Mechanisms  
Anna Ferloni et al.  
PLOS Biol 14, e1005111 (2016); DOI: 10.1371/journal.pbio.1005111

## 3. Journals' quality

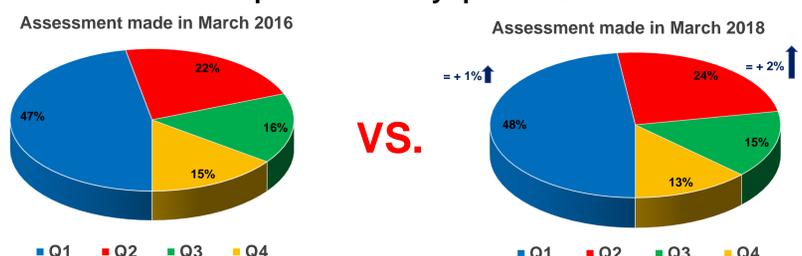
### Number of publications by journal impact factor



Overall, **749 papers** were published in journals with an **average impact factor of 3,5**.

Since the previous assessment, additional 210 papers were published, representing an **increase of 39%**.

### % of publications by quartile score



Increase of the percentage of papers published in journals of quartile 1 and 2, when compared with the previous assessment.

## Conclusion

The systematic **qualitative analyses** of scientific reports alongside the use of **bibliometric indicators** provide a reliable assessment of the quality, quantity and impact of the scientific research supported by the BIAL Foundation. When comparing the present results with the previous assessment conducted in 2016, the **steady increase of indexed papers** and higher **number of citations** is noteworthy. This improvement aligns with BIAL Foundation's primary goal: **To promote research of excellence**.

## HOW WELL DOES THE RESEARCH SUPPORTED BY THE BIAL FOUNDATION PERFORM? A BIBLIOMETRIC ASSESSMENT

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Fundação BIAL

**Background:** Created in 2014, the BIAL Foundation's online database, which gathers all funded projects' scientific publications, has enabled a more systematic and quantitative assessment of the projects' productivity over the years. Bibliometric indicators have been widely used and proven to be useful tools in the assessment of the research performance, provided that their pitfalls are taken into consideration and they are combined with more qualitative knowledge about the projects to be assessed.

**Aims:** To analyse and to monitor the research productivity and impact of projects supported by the BIAL Foundation by using bibliometric indicators.

**Method:** The research projects' productivity was assessed by counting the number of papers published in academic journals indexed by Scopus or Web of Science (WoS). The publications' impact was assessed by the number of citations per item retrieved from WoS Core Collection in March 2018. This information was used to manually calculate the total number of times cited and the average citations per item. Combining the productivity (total number of papers published) and the impact (number of citations for each paper) the BIAL Foundation's *h*-index was calculated, where *h* equalled the number of publications for which it received at least *h* citations each. For papers published from 2007 to 2017, the number of citations were compared with the expected number of citations for papers in the same research field and publication year, based on field baselines percentiles dataset of Essential Science Indicators (ESI), updated on January 1<sup>st</sup>, 2018. The Highly Cited Papers, featuring those that ranked in the top 1% by citations for field and publication year in WoS, were also retrieved. The quality of journals was assessed by their impact factor and mainly by their quartile score (provided by Journal Citation Reports) in order to mitigate differences between research fields. When a journal occupied different positions in the quartile ranking (Q1, Q2, Q3 or Q4) depending on the subject category with which it was associated, the best one was chosen. These results were compared with the previous assessment made in March 2016 to pinpoint the major improvements achieved in these last 2 years.

**Results:** Since 1994, the BIAL Foundation has supported 610 research projects through its grants programme, in the areas of Psychophysiology (307 grants, 50%), Parapsychology (206 grants, 34%) and Interdisciplinary – a combination of Psychophysiology and Parapsychology (97 grants, 16%). The BIAL Foundation has also supported four additional projects focused on specific topics of research interest. Overall, 910 indexed papers (journal article, review, conference paper, letter, book and book chapter) were published from 1995 to 2018. Excluding the last two grant editions (2014/15 and 2016/17), in which most projects are still ongoing or starting, a ratio of 1.76 indexed papers per project was obtained (806 papers per 459 projects).

Currently, the BIAL Foundation has 136 ongoing projects. It is worth noting that some projects of the last grant edition, which started during 2017, have already a substantial number of published papers. In 2016, 91 indexed papers were published, representing an increase of 26% when compared to 2015.

Overall, a total of 12.737 citations were counted, with 756 papers being cited on average 17 times ( $M = 16.85$ ), ranging from 0 to 353 citations. The BIAL Foundation *h*-index was 52. In the last 10 years, almost 20% of the papers ranked in the top 10% by citations for field and publication year.

749 papers were published in journals with an average impact factor of 3.5. In comparison with the previous analyses made in 2016, an additional 210 papers were published. This represents an increase of 39%. The majority of papers were published in journals of quartile 1 ( $n = 360$ ; 48%) and quartile 2 ( $n = 183$ ; 24%).

**Conclusion:** The systematic qualitative analyses of scientific reports alongside the use of conventional and up-to-date bibliometric indicators provide a reliable assessment of the quality, quantity and impact of the scientific research supported by the BIAL Foundation. When comparing the present results with the previous assessment conducted in 2016, the steady increase of indexed papers and higher number of citations is noteworthy. This improvement aligns with BIAL Foundation's primary goal: to promote research of excellence.

**Keywords:** BIAL Foundation grants, Indexed publications, Citations, Impact factor, Quartiles.