

## My interdisciplinarity *à moi* An analysis of neuroscience research in French Universities, 2008-2012

Lorenzo Cassi\*, Wilfredo Mescheba\*\* and Elisabeth de Turckheim\*\*\*

\*lorenzo.cassi@univ-paris1.fr  
CES-University of Paris 1 and HCERES-OST, France

\*\* wilfredo.mescheba@obs-ost.fr  
HCERES-OST, France

\*\*\* elisabeth.deturckheim@obs-ost.fr  
INRA-Délégation à l'Évaluation and HCERES-OST, France

The aim of this paper is to analyse the degree of interdisciplinarity of the research in neuroscience in French universities over the period 2008-2012. The paper is an application of the analytical framework proposed by Cassi et al. (2014) to study interdisciplinarity at the institution level. The present work, which is the result of interactive process involving representatives of university management teams, shows how the comparison of interdisciplinarity indexes of different institutions in a research domain could be used to provide quantitative evidence on the different institution strategies.

### **A global index for the interdisciplinary of an institution**

Interdisciplinarity can be defined as the integration of knowledge, theories and methods from different disciplines, more or less distant from an epistemological perspective. Following a part of the literature (Porter & Rafols 2009, Rafols & Meyer 2010), we use a measure of the diversity of the disciplines of the references as an indicator of the interdisciplinarity of the institution in a domain. As developed in a former work (Cassi et al., 2014), the widely used Rao-Stirling diversity index (Stirling, 2007) is able to measure interdisciplinarity at different scales. We explore here how two decompositions of a global interdisciplinarity index can provide some relevant information on interdisciplinary practices of institutions.

### **More insight on interdisciplinarity through two decompositions of the index**

In the case when an institution has a larger global interdisciplinarity index than a benchmark, it is possible to determine whether this higher value is due to the diversity of references in each publication – an interdisciplinarity *within* publication – or to the diversity of the disciplinary profiles of references *between* the publications, or to both practices.

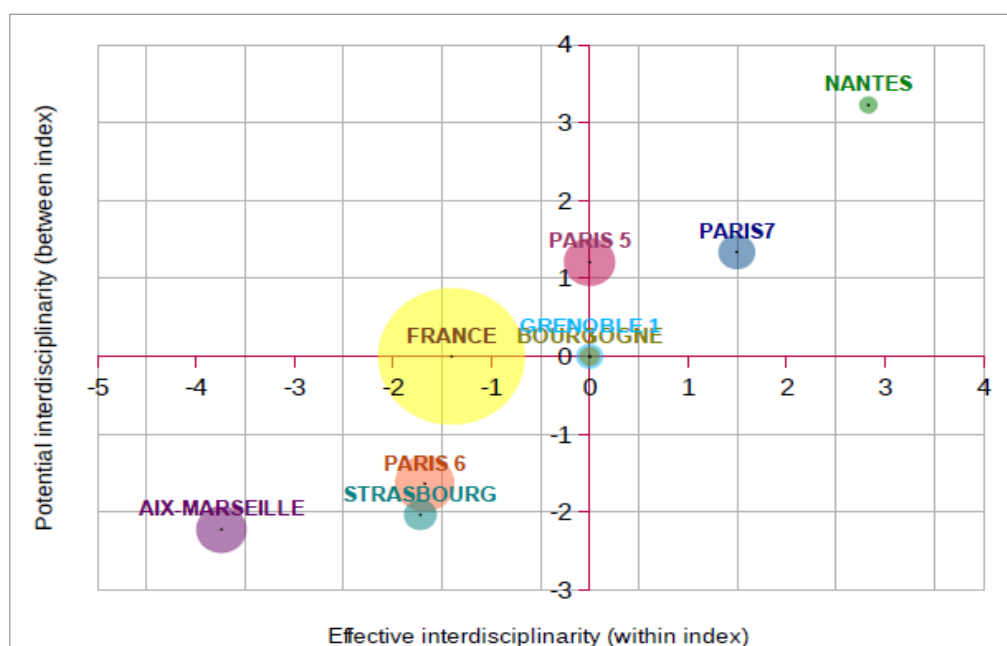
Another issue when the global index of a corpus is large compared to its world counterpart, is to find which disciplines are more cited by the institution than what is normally done. It is

possible to split the global interdisciplinarity index into discipline contributions and to provide comparative profiles of interdisciplinary collaborations.

### Interdisciplinarity practices of French universities in neurosciences

This study reveals a diversity of strategies and practices in terms of interdisciplinarity. It allows identifying universities which develop a wide variety of themes in various institutes or teams, leading them to cover the discipline in a richer way than the world standard. Such a university may have a level of within publication interdisciplinarity equivalent to the world average - as does Paris 5 University - or higher than this average, as Nantes and Paris 7. Universities which have a modest investment in the discipline can target their research effort towards collaboration with other fields, as in Nantes. Another strategic option for a university is to develop a specialized component in relation to its excellence area as the University of Grenoble 1 does with imaging technology and computer analysis. Finally, universities that have heavily invested in this area as Aix-Marseille may have a strategy focusing on advanced research on specific topics where its research teams could be leader.

Figure 1. Within and between interdisciplinarity indexes of eight French universities in Neuroscience



### References

Cassi, L., Mescheba, W., Turckheim, E. de, (2014). How to evaluate the degree of interdisciplinarity of an institution? *Scientometrics* **101**:1871–1895 DOI: 10.1007/s11192-014-1280-0

Porter, A. and Rafols, I. (2009). Is science becoming more interdisciplinary? Measuring and mapping six research fields over time. *Scientometrics*, **81**(3):719–745.

Rafols, I. and Meyer, M. (2010). Diversity and network coherence as indicators of interdisciplinarity: case studies in bionanoscience. *Scientometrics*, **82**(2):263–287.

Stirling, A. (2007). A general framework for analysing diversity in science, technology and society. *Journal of The Royal Society Interface*, **4**(15):707–719.