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Using curricula vitae for mapping scientific fields: a small-scale experience for Swiss communication sciences

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This paper presents an approach to mapping a scientific field characterised by conceptual, theoretical and methodological pluralism — communication — in a country characterised by diversity at the socio-political and cultural level: Switzerland. Given the limitations of standard bibliometric analyses in this field, we propose an approach based on a combination of different data sources, including the CVs and publication lists of researchers. Our results show a complex map of the field's institutional, cognitive and social structures. Our pragmatic approach is based on readily available data from different sources. Selective analysis of CVs based on precise research questions appears to be a strong tool that gives insights into the structures of a field in an efficient way. It seems that this kind of approach is best suited for analysing rather small communities, either geographically or subject-wise, where the elaboration of detailed information is possible.

THIS PAPER PRESENTS a small-scale experiment using curricula vitae (CVs) for mapping the field of communication sciences in Switzerland (Probst and Lepori, 2007, 2008). Despite its limitations because of the small sample (67 people) and largely qualitative and pragmatic methodology of data handling, we think that this experiment is interesting to display the potential of CVs not only to get bibliographic information (overcoming well-known coverage problems of international databases; Hicks, 2004; Nederhof, 2006), but also to integrate it with information on careers, research background and geographical mobility to understand the structure and dynamics of a field. Moreover, our work is an example of data collection strategy that carefully integrates different sources, thus reducing some of the technical difficulties related to the use of CVs in the analysis of scientific fields.

This paper is based on a study that mainly aimed at providing a map of Swiss communication sciences by articulating cognitive, institutional and social dimensions ('tribes and territories'; Becher and Trowler, 2001). This topic is relevant because of the diversity of the field concerning theoretical approaches, research subjects, methodologies, and publication habits, which has led to strong debates about whether communication should be considered a scientific discipline or rather a collection of different fields stronger related to parent disciplines (Shepherd, 1999; Schorr, 2003; Masip, 2005).

In this context, the Swiss case is especially interesting because of the cultural and linguistic diversity of the country, with three main linguistic regions (German, French and Italian), each one with its universities (Lepori, 2007). The question to what extent Swiss communication sciences can be considered a single community or the juxtaposition of subcommunities, each one referring to the neighboring countries of the same language, is pertinent. So we expected that we would find two dimensions having an impact on the fragmentation of the field: the linguistic and the disciplinary dimensions.

To this aim, we combined different information sources. First, an analysis of the units active in the field was performed, based on an evaluation of Swiss communication sciences commissioned by the Swiss Association of Communication and Media Research (SGKM, 2004) and on information

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retrieved from the Internet. This gave a general picture of the units' declared research interests, positioning in the universities and staff. On this basis we built the sample of people for whom we collected CVs directly from the Internet.

Second, by using data provided in these CVs, we looked at the academic training of professors, concerning disciplinary and geographical background; this is relevant to understand whether there is specific research training in communication sciences or if the field is occupied by people from other disciplines, and should thus give some information on its internal coherency. Further, geographical origin can give information on the level of exchange between linguistic regions, and on the relationship with other countries.

Third, we characterised publication activities. Given that there is no usable bibliographic database in the field (Lauf, 2005; Masip, 2005) we combined three different sources:

- Publication data from CVs;
- A complete survey for Swiss authors of a corpus of journals in communication, including all ISI Web of Science journals in communication, some national language journals and the Swiss journals in the field; and
- A complete search on WoS for the names of all people considered.

We finally came to a representation of the field that superposes institutional and linguistic borders with main research themes and international reference communities.

In the following, we first address the topic of mapping scientific fields, including the limitations of bibliometric approaches. We then briefly discuss the use of CVs for science studies and present our approach, data and methodological issues. Further, we present some results concerning the educational background of professors in communication sciences, their geographical mobility and their publication activity, as well as the overview map of Swiss communication sciences. Some remarks on the further applicability of this model conclude the paper.

Mapping scientific fields

It is rather common to map cognitive and social structures, communication patterns and historical developments of scientific fields by the use of publication databases and bibliometric techniques (Noyons, 2004).

This approach, however, entails well-known limitations based on characteristics of the data sources used for analyses: large international publication databases as ISI or Elsevier Scopus. They focus on international, English-language, journal publications. They are thus useful for the analysis of fields where this type of publications prevails, such as science and engineering.

Other fields, however, organise scientific activity differently. Especially in social sciences and humanities, literature and publications in local languages and monographs or book chapters are frequent (Nederhof, 2006). This affects the usability of results drawn from international databases (Van Raan, 2004, Lauf, 2005). Also in young or multidisciplinary fields, there are challenges in using these databases: it is, for example, difficult to identify a core set of journals representative for the aggregate output of a domain.

These challenges apply to the case analysed in this study: in communication, literature in national languages is frequent (Hicks, 2004; Masip, 2005); the share of publications in channels other than journals is high; additionally, scholars tend to publish in journals not labelled as communication journals (Froissart and Cardy, 2005).

Despite these limitations, bibliometric analyses of the structure of communication sciences have been performed. They have shown that the field is divided in two sub-fields: *mass media communication*, with origins in sociology and political sciences, and *interpersonal communication*, emerging from (social) psychology (e.g. Reeves and Borgman, 1983; Rice *et al*, 1988; Rogers, 1999). A study based on network analysis of membership structures of the International Communication Association comes up with four sub-fields (Barnett and Danowski, 1992):

- Humanities
- Mass media
- Interpersonal and
- Information science/technology.

Other analyses show that communication sciences do not (yet) build an inter-reading community, and thus cannot be called a discipline (Van den Besselaar and Leydesdorff, 1996). It's also hardly possible to identify classics or milestones in the field (Chang and Tai, 2005).

Differences between European and US communication sciences are found in the importance of empirical work (higher in the USA) and in the main topics of interest (Möhring and Scherer, 2005). European authors predominantly publish in European journals, and collaboration between colleagues from different countries is scarce (Möhring and Scherer, 2005). Regarding topic areas, similarities but also differences among linguistic areas are visible (e.g. Schorr, 2003; Froissart and Cardy, 2005).

Recently, new approaches to analysing scientific fields have been proposed (Braam and Van den Besselaar, 2008; Merkx and Van den Besselaar, 2008). They account also for other than scholarly dimensions, for example through policy relevance. Extending mapping to other data sources and fields is useful. Triangulation of different indicators and methods seems promising (Thelwall, 2004, Merkx and Van den Besselaar, 2008). The use of multi-method approaches compensates for some weaknesses of

ad-hoc indicators (Lepori, 2006). Our study joins these new approaches by combining an analysis of different types of data from different sources. An important focus is on CV analysis.

The use of CVs for science studies: general remarks

The choice of using CVs among the major information sources was motivated by four main reasons

- The interest of getting personal information on careers, alongside publication information;
- The lack of a complete bibliographic database;
- The evidence that, given the field's structure, no collection of journals alone could provide a sufficiently complete picture; and
- The fact that, in the limits of this academic study, looking for CVs seemed simpler and faster than collecting data using surveys.

CVs have so far been used rather seldom as a research device. If researchers have employed CVs, they usually used them as additional information to answer questions not answered by other sources (Dietz *et al*, 2000). Only a few studies (e.g. Dietz *et al*, 2000; Dietz and Bozeman, 2005; Cañibano *et al*, 2008) use CVs as primary information source. CVs are often analysed for measuring and understanding researchers' career paths, including mobility issues, or for evaluating outcomes of programs, as faculty development or funding programs (e.g. Morzinski and Schubot, 2000; Gaughan and Bozeman, 2002) — looking at people and their development. We use them in a slightly different way: as data source for mapping a scientific field — looking at a whole community.

Potential problems and disadvantages of using CVs as data source include the coding process, which, as long as no standardised databases exist, is done 'by hand'. This time-consuming and tedious process entails a certain risk of introducing errors, especially when coding huge amounts of data (Dietz *et al*, 2000, Cañibano *et al*, 2008). In our case, this risk was limited, given the small sample.

CVs are rich data sources, but richness varies. There is diversity in length, ordering and completeness of information (Cañibano *et al*, 2008). These issues appeared also in our small sample, but since we have been looking at rather little information, which is connected to important steps in a researcher's career (e.g. doctorate), the problems appeared rather as missing details (e.g. university of doctorate) than as completely lacking information.

We decided to obtain the CVs 'passively' (Dietz *et al*, 2000; Morzinski and Schubot, 2000), by searching them on the Internet, and not asking them directly from people. This non-invasive way of data collection is considered a cheap way to rapidly get this kind of information and thus was particularly well-suited to our exploratory study. Moreover, for our purposes the public availability of these CVs is interesting — they reflect what professors in communication communicate about themselves.

This way of data gathering showed itself to be relatively easy and not too time-consuming, an advantage pointed out by Cañibano *et al* (2008). Even though the information obtained was not complete and rather heterogeneous, it was sufficient for our purposes, as an important element for our map of Swiss communication sciences.

Field definition, data retrieval and methodological issues

Our sample was based on an institutional definition of the field: we looked at the institutes contained in a list provided by the Swiss Association of Communication and Media Research (SGKM, 2004). In Switzerland, communication units are identifiable in all 10 cantonal universities and in two universities of applied sciences (UAS). In the only Italian-language university, there is a whole department of communication sciences, while in most other cases there are communication institutes inside philosophy, social sciences or humanities departments (faculty). The number of students enrolled in communication sciences has rapidly grown recently, from about 150 in 1995/6 to nearly 2,500 today. More than 130 doctoral students are preparing a thesis (source: Swiss Federal Statistical Office), the SGKM currently has 280 members.[1]

Thematic diversity in communication sciences is high. We performed an analysis of the institutes' websites (spring 2006) to get an overview on their *declared* research areas. There is no uniformity in these websites, and therefore data had to be retrieved from different sections (see Probst and Lepori, 2007).

For organising the information, we adapted categories developed by Schorr (2003) in her content analysis of two European communication journals. An overview on the results is displayed in Figure 1.

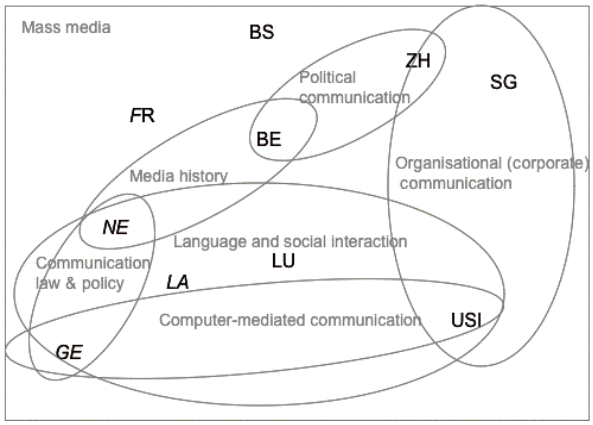

Figure 1. Declared research topics in Swiss communication institutes

Abbreviations represent universities; location in the figure displays geographic location. Universities in italic are located in the French-speaking part (Fribourg has a French- and a German-speaking section), USI (Lugano) is the only university in the Italian-speaking part of Switzerland.

The picture is quite clear: All institutes are at least to some extent interested in *mass media*. The other topic areas are rather regionalised, only *media history* — and to a certain extent *language and social interaction* with Lucerne focusing on sociology — is present in the German- and French-speaking part. *Political communication* is important mainly in the capital (Bern) and in Zurich, the biggest institute in the German part, while *organisational/corporate communication* is important in St Gallen, a university with strong economic tradition, and in Lugano, a young university (opened in 1996), and to some extent in Zurich.

Data collection

From the institutes' websites we collected the names of all professors, including assistant and associated professors, but excluding 'teachers'. This led to a total of 67 people. This approach, however, entails also limitations. In a broad and fragmented field, an institutional definition might be problematic especially at the border of what is considered the core of the domain in the Swiss context, namely mass media communication. The Faculty of Communication Sciences in Lugano, for example, is so broadly defined that some of its members might well be considered as belonging to other communities, such as informatics or economics; equally, people in institutes not considered as part of communication sciences (e.g. economics departments) might work on communication topics and publish in the field.

For each of the 67 professors, we searched for CVs containing background and educational information, and publication lists (if not contained in CVs). We first checked the institutes' websites for this information; additionally, we searched the Internet. In many cases CVs, publication lists or other pieces of information, such as short authors' biographies, were available elsewhere.

This procedure allowed us to find at least some information for all but one of the 67 professors. We found 28 more or less complete CVs (as PDFs or Word-documents and directly on websites), 47 short descriptions containing CV-like information and 53 publication lists.

We found CV information on the institutes' websites for 55 professors. In seven cases, information was retrieved from websites of other universities, where professors have (had) other appointments. For 11 cases we resorted to other information sources, such as the list of speakers at conferences or short presentations in universities' newspapers. In some cases, we combined different sources to obtain more complete information.

The CVs and CV-like information we found are quite heterogeneous not only regarding presentation (from table-style to prose), but also in content. For example, regarding the period of doctoral studies, some professors indicate the field of study and/or title of the dissertation, while others give information about their academic position at that time.

Also publication lists were mainly retrieved from universities' websites. We found 53 lists, 47 of them on the websites of the universities currently employing the professors, four on other universities' websites, and in two cases we relied on other sources.

The publication lists we found show different levels of detail. In some cases, seemingly complete publication lists could be retrieved, while in other cases only short lists, sometimes out of date, were available. For one institute we found complete publication lists for every professor — they use a publicly accessible database. In another institute, every collaborator indicates his 'newest and most recent publications' on the website; between 11 and 25 entries per person were listed. In other institutes, personal pages of professors include a section 'publications', but not all professors use it alike; some insert selected publications, while others offer links to documents containing long lists.

There is seemingly no mutual consent on which publications to include. All lists contain books, book chapters, and refereed journal articles. Some also include encyclopedia entries, conference presentations (with and without proceedings) and contributions to non-academic journals. In some publication lists, multimedia products such as radio essays or television programs are mentioned, and some lists include also newspaper articles or didactic material. As a result, our sample included publication lists ranging from three to 234 entries.

Data analysis and results

We extracted four types of information from the CVs: educational background, year of doctorate, place of education and publications. We comment below on the availability of information and present results relevant for our study.

Educational background

We found information on both the dissertation's title and the discipline for 11 out of the 67 professors. In 21 cases, only information about the discipline, in 15 cases only the title was available. Thus for 47 professors we had information regarding the discipline(s) and/or title of doctoral studies. Regarding the remaining 20 cases, we had another indicator providing some information for six professors: the denomination of the degree obtained (e.g. 'Dr.math.').

Table 1 summarises the information retrieved from this data in different groups of disciplines, and by linguistic region. We assigned cases where we had only the title of the thesis or the name of the degree to the group of disciplines that seemed most adequate; for example, a thesis on television was included in media studies. This assignment, of course, is susceptible to coding errors but, due to limited resources, was the most feasible way of proceeding.

Results are striking: we found that only 17 out of the 53 professors (32%) have a background in a field of study related to communication (e.g. journalism, media studies, marketing) or explicitly called communication. Eighteen professors have a doctorate in social sciences, nine in philosophy; the remainder are distributed among other fields. An analysis by linguistic regions displays variation: in German-speaking communication units (Zurich, St Gallen, Basel, Bern, Lucerne and Fribourg) the presence of people with a background in the field is larger, while social sciences and ethnology are the main backgrounds in French-speaking universities (Neuchâtel, Lausanne, Geneva and Fribourg); Lugano displays a composite population in terms of professors' disciplinary background.

Communication sciences are a rather young field of study; in Switzerland, institutes and study courses emerged and grew from the second half of the 1990s on. Thus, younger professors are more likely to have a background in the field than those who did their doctorate decades ago.

Information on the year of doctorate was available for 42 professors in our sample; 28 of the professors received their degree between 1970 and 1994, four of them in communication. In the period 1995–2004, out of 14 professors receiving their doctoral degrees, eight received it in communication. Even if numbers are small, they show an increasing tendency, probably indicating a consolidation of the field with the development of its own academic track (confirmed by the increased number of doctorates in the field; SGKM, 2004; Probst, 2008).

Table 1. Disciplinary background doctorate

	German	French	Italian
Communication	13	3	1
Social sciences	5	8	5
Philosophy	8	1	1
Psychology, education	2	–	3
Linguistics, semiotics	–	–	2
Languages, literature	1	2	–
Business, management	1	–	–
Organisational theory	1	–	1
Economics	2	–	2
Politics, public administration	2	1	–
Ethnology, culture	–	5	–
Law	2	1	1
History, arts history	1	–	–
Sciences, engineering	2	–	–

Note: N = 53

Geographical mobility

The analysis of geographical patterns of careers is an interesting marker of the social structure of a domain, both in terms of exchange of people and in their relationship in the academic hierarchy (e.g. identifying the training places for researchers). This is particularly interesting in the Swiss case because of the linguistic fragmentation; hence also the need to look at the relationship between Swiss units in the field and the neighboring countries.

We analysed the geographical provenience of professors by looking at where they did their doctorate, thus at the place of initial research training. This information was available for 50 of the 67 professors.

Results are visualised in Figure 2. The thickness of the arrows represents the number of professors with a doctorate from the place where the arrow

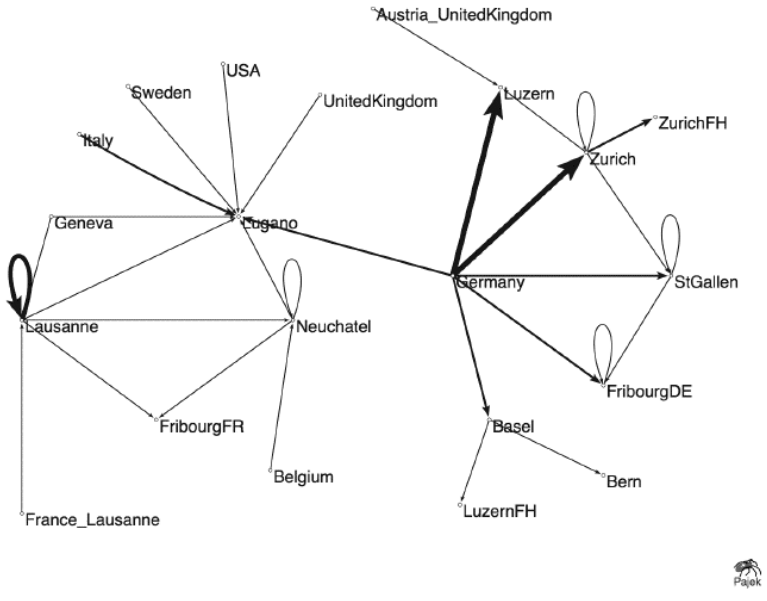

Figure 2. Geographical background: place of doctorate

starts, currently working at the university indicated by the end of the arrow.

These results reveal a clear pattern: there is no (long-term) mobility between the two main linguistics regions in Switzerland. In German-speaking universities most professors come from Germany. German-speaking UAS and French-speaking universities seem to be more self-contained; most of their professors had their academic training in the same region. At the Italian-speaking university, there are professors from French-, Italian-, German- and English-speaking regions as well as from others; this could be expected since the university was created in 1996 only and considers internationality one of its important assets.

Publications

Finally, we used the information for analysing professors' publication activities as a basis for a broader analysis of Swiss publications in the field. Since it was clear that the retrieved publication lists were too diverse for in-depth analysis, the information contained was used for a first rough identification of publication patterns. We therefore coded all publications in CVs and separate publication lists with the following attributes: author name, today's university affiliation, publication period (1995–1999; 2000–2004), type of publication (all journal-type publications/books and reports), journal title or publisher, place and language. This allowed us to produce summary statistics for each university (Table 2). Despite all limitations, some patterns emerged clearly, mainly concerning the prevalence of the regional language in German-speaking universities (88%) and French-speaking universities (77%). In St Gallen (focusing on economics) and Lugano, English is more present. Regarding Lugano, this is at least partially explained by the minor importance of the local language (Italian) in communication sciences, while there is, for example, a strong German-speaking community in the field.

Results also show a (expected) majority of book-like publications, relatively stable across the sample: 50% of the professors have a share of book-like publications between 43% and 76% (average: 57%). Differences by university appear with German-speaking universities having a higher share of books (average: 67%, excluding St Gallen), while the universities of Lugano, St Gallen and French-speaking universities display a higher share of journal publications (average: 47%).

Moreover, we got some information on most important editors and journals for Swiss communication sciences. For books, of the 15 locations cited more than 10 times, 10 are German and Austrian cities, four are in Switzerland (Bern, Lausanne, St Gallen and Zurich), one in Italy. This is also reflected in the importance of German and Swiss German publishers (Westdeutscher Verlag, UVK, Leske, Surhkamp, Campus, Seismo, Haupt and Chronos at the top), and the absence of international English publishers (exception: Springer).

The list of journal publication displays astonishing dispersion: the 552 publications are spread among more than 360 titles, just nine journals have five and more entries: five of them are Swiss journals, four are German journals in the area of media studies (Table 3).

Based on this information and on the SGKM self-evaluation report (SGKM, 2004), we defined a corpus of journals composed of: all ISI journals in communication; a number of German, French and Italian journals in the domain; and the five journals identified in the publication lists, published in Switzerland.

We searched this corpus for Swiss contributions, including also authors not included in our sample. The results show that there are clearly more publications from Swiss authors in Swiss journals than in all

Table 2. Summary of publications

	Language						Type		
University	**German**	**French**	**Italian**	**English**	**Other**	**Unknown**	**Book, book chapter, report**	**Journal**	**Total**
Basel	93	1	–	3	–	–	73	24	97
Bern	6	–	–	–	–	–	6	–	6
Fribourg German	48	–	–	7	2	2	34	25	59
Lucerne	183	5	–	20	9	10	151	76	227
St. Gallen	136	3	2	57	1	6	107	98	205
Zurich	112	–	1	9	–	–	87	35	122
Lucerne UAS	7	–	–	–	–	–	4	3	7
Zurich UAS	95	–	–	4	–	2	60	41	101
Fribourg French	–	3	–	–	–	–	1	2	3
Geneva	–	3	–	–	1	–	1	3	4
Lausanne	9	67	4	9	–	4	48	45	93
Neuchâtel	–	22	–	–	–	2	5	19	24
Lugano	58	23	82	149	11	10	152	181	333
Total	**747**	**127**	**89**	**258**	**24**	**36**	**729**	**552**	**1,281**

Table 3. Journals with more than five publications

Title	Editor	N
Electronic Markets	University of St Gallen	22
Studies in Communication Sciences	University of Lugano	21
International Journal on Media Management	University of St Gallen	15
Soziale Systeme. Zeitschrift für Soziologische Theorie	University of Lucerne	15
Publizistik	Germany	8
Medienwissenschaft Schweiz	Swiss Association of Communication and Media Research	7
Medien & Kommunikation-swissenschaft	Germany	7
Rundfunk und Fernsehen	Germany	6
Medien Journal	Germany	5

non-national journals considered. Journals hosted by a Swiss university publish mainly articles from authors from this same university and from foreign universities. The 272 publications are written by 185 authors; only five of them have more than five publications in the 10-year period covered. Thus, publication in these journals cannot be the only type of scientific output in the field.

Of the 272 publications, only 23 are in ISI communication journals. This underlines again the limits of analysing this field based on such databases. As communication is a multidisciplinary field, we searched the whole ISI database for the 67 professors in our sample; 34 had publications in ISI journals. Among the 108 publications, however, only 15 are in journals in the ISI subject domain communication; higher numbers of publications by Swiss communication professors in ISI journals are found in journals of social sciences (26), economics (21) and computer science/engineering/information systems (17). These numbers are influenced by the weight of some universities in specific sectors: Lugano in the area of economics and computer sciences, Lucerne in social sciences, Zurich in communication.

A map of the field

By combining the results from the analysis of CVs, publication lists and other sources, we have drawn a map of the field, integrating different dimensions; particularly the institutional/social and the cognitive/thematic dimension. Expectedly, this map is complex, but some clusters emerge (Figure 3).

A first cluster contains mass media and communication in German-speaking universities (including public and political communication). Dominated by Zurich, the largest unit, it includes also (with different accents) Bern, Basel and the German-speaking unit in Fribourg. This cluster is part of the German community concerning origin and training of people, language and publication means (with the importance of German journals and publishers for Swiss authors); at national level, it maintains a journal (*Medienwissenschaft Schweiz*), which until now did not have international ambitions. Lucerne is also related to this area, but occupies a specific position for its sociological orientation as expressed by the presence of two editors of *Soziale Systeme*.

A second, more specific cluster is related to economics and corporate communication, respectively to

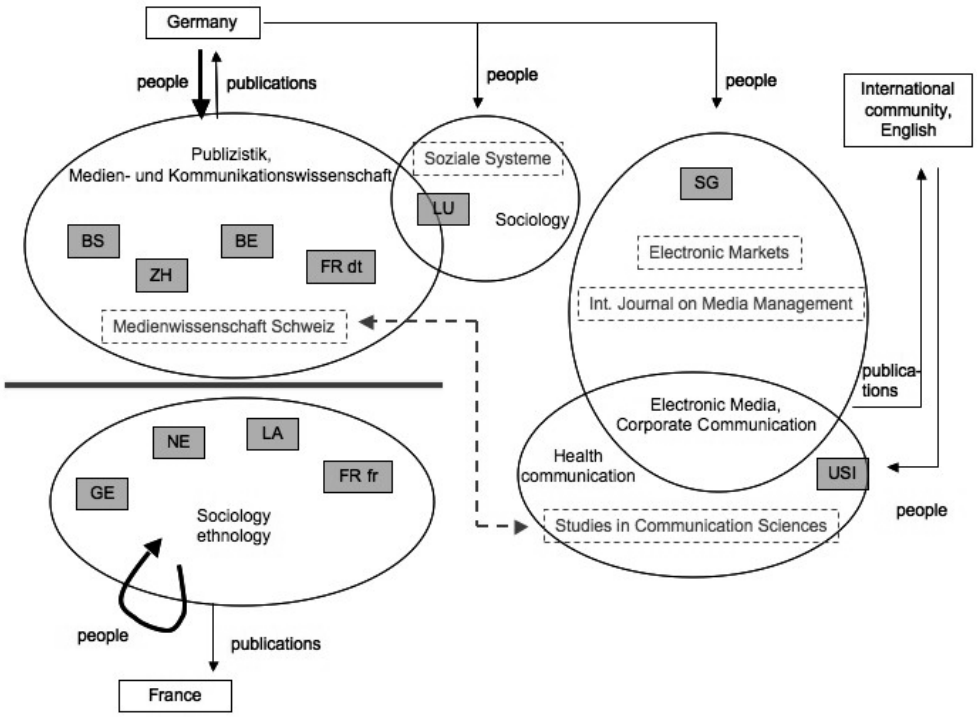

Figure 3. A map of the field

the use of information technology for communication (e-commerce, knowledge management, etc.). These areas are dominant in St Gallen, with two international peer-reviewed journals, and present also in Lugano, with a broader interest for e-communication in general. Its specific feature is the use of English and thus, presumably, its connection to an international community not linked to a specific linguistic region.

A third cluster is represented by the Faculty of Communication Sciences in Lugano, which largely represents a separate world in the Swiss context for the origin of people (mostly outside Switzerland), for the simultaneous presence of most of the domains of communication and for having its own publication means (*Studies in Communication Sciences*). That this divide is institutional and social, rather than of content, is demonstrated by the fact that media studies are present also in Lugano, but mostly represented by people of different origin and reference spaces than in German-speaking universities.

Finally, in French-speaking universities the place of communication is more limited and linked to sociological studies; we could say that in this linguistic area communication is hardly recognised as a domain in itself, but largely as a subdivision of sociology or related domains such as ethnology.

Of course, this aggregated view, although including data from different sources and levels, still disregards a number of specificities of institutions and people involved in communication. It is, however, useful to understand the main structural features of the domain. It shows that the field has to be considered rather as aggregation of distinct communities, working on largely separated topics and more integrated with their parent communities than with the rest of the country, than as a coherent field. The divide is more based on language borders than on different approaches or research themes.

The feeling of joint membership and action has been developed at the level of policy action in national research and higher education policy, especially through the Swiss Association of Communication and Media Research, but until now had limited implications for the structure of the field. Some years will be necessary to understand to what extent the creation of a Swiss journal in communication, created from the merger of *Medienwissenschaft* and *Studies in Communication Sciences*, will change this situation. Other external forces — such as increasing internationalisation of research also in social sciences and humanities, institutional pressures concerning careers and benchmarking research output and the evolution of research funding towards mode competitive modes — are also likely to impact on this landscape.

Discussion and conclusions

We consider our approach an example of how one can combine and exploit easily accessible information to get a map of a scientific field where bibliometric techniques cannot be readily used. We started with an institutional delimitation of the field for identifying a set of core people to consider for analysis. Then, we searched the Internet for information and produced a first rough analysis of different characteristics, including education, mobility and publications. This information was then integrated with a more complete analysis of publications based on corpora of journals, and of publications of the identified people in the ISI.

We consider our approach an example of how one can combine and exploit easily accessible information to get a map of a scientific field where bibliometric techniques cannot be readily used

The experiences made in this analysis lead us to at least four important conclusions. In methodological terms, a first conclusion is that today it is to a large extent possible to *retrieve this information directly from institutional websites*, without requesting CVs from people or resorting to other sources. Of course, using the Internet as the only data source entails restrictions and possible biases, as was, for example, visible in the varying availability and high heterogeneity of data. Information contained in websites might also be obsolete and outdated. But there are advantages: the effort required is more limited than when directly asking researchers; no anonymity requirements apply; information can be updated if necessary. Given that CVs and publication lists based on databases are becoming a standard element in universities' websites, we believe that this approach will become increasingly relevant, at least when one looks for basic information on careers and publications without aiming at reconstructing career paths in detail. Application could include simple statistics on mobility of people or characterisation of publication output of fields and institutions in domains where bibliographic databases are not adequate.

A second conclusion concerns the potential of *the combination of different data sources*. We did not try to produce a full analysis of publication activities from CVs only, which would have required extensive coding and validation efforts, but we used CVs as first step towards an analysis using a corpus of journals (composed on the basis of insights from CVs). This approach could be extended to getting a delimitation of the core literature(s) in the field, including lists of journals, of editors, etc., and then proceeding to a more complete analysis of this core literature only. Thus, CV analysis was an important starting point that was consequently integrated with

other sources. This of course makes more acceptable the reliance on such a disparate material, as can be retrieved from the Internet, and helps overcoming some of the limitations of this data source.

Our third conclusion concerns the process of coding data from CVs: it is interesting to *use CVs in a selective way on the basis of precise research questions.* Thus, before coding data from CVs, it is useful to compare available data with the questions to be answered and to find a match between them. This allows the definition of a strategy for coding data from CVs, and thus effective proceeding. Additionally, our study shows that it is not for all purposes necessary to have highly detailed CVs; several interesting questions can be answered also with only basic information available.

The fourth conclusion is that, at least for social sciences and humanities, it makes more sense to map a field by *combining different points of view*, namely the institutional definition of the field, people and their education, publication activities and, finally, expert evaluation and the results of national evaluations, than to just rely on bibliometric analysis (see also Merkx and Van den Besselaar, 2008). This not only provides to a large extent complementary insights into the field's structure, but also wide potential for cross-checking and integration of different analyses, which overcomes to some extent individual limitations and makes the whole analysis more robust.

Finally, we believe that this approach is best suited for rather small communities — either for their subject or geographical size — where fine mapping using very detailed information is possible. It could be usable to some extent for larger countries or fields, but probably not for very large fields. We conclude that, beyond all technical questions on data handling and analysis, the design of the study and the choice of data sources have to be explicitly targeted to the objectives and to the nature of the object of study.

Note

1. <http://www.sgkm.ch/sgkm_1.html>, last accessed 21 April 2009.

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