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# Multidisciplinarity in Spanish and Foreign Communication Journals

La multidisciplinarietà de las revistas de comunicaci3n espa1olas y extranjeras

## ABSTRACT

Communication can be understood, under an epistemological framework, as a macro-context from which education participates as a part. One of the objectives of this work is to contrast this theoretical consideration with the observed interaction between education and communication scientific journals defined by citations and relatedness towards other scientific journals. At the same time, there might be relevant differences between the citation patterns of Spanish and foreign (journals in Journal Citation Reports) communication journals, particularly with regard to their disciplinary composition. These differences might become a major problem for the interexchange of information between both sets of journals. The authors analyze the citations distribution by subject category for Spanish and JCR journals, as well as for the journal «Comunicar», and also the frequency of related journals per subject category in the case of JCR. It is concluded: a) that the aforementioned epistemological relationship is valid only for Spanish Communication journals, b) that there are relevant differences between both sets of journals in the disciplinary composition of their cited-citing and related journals and that Information Science & Library Science might serve as a suitable communication channel; finally, c) the characteristic multidisciplinarity of the journal «Comunicar» is corroborated, both at the national and international level.

## RESUMEN

La comunicaci3n puede entenderse como un macro-contexto epistemol3gico del que la educaci3n participa como una parte. El an1lisis de la correspondencia entre esta relaci3n te3rica epistemol3gica y la interacci3n real entre las revistas de educaci3n y comunicaci3n es uno de los objetivos de este trabajo. Al mismo tiempo, los patrones de citaci3n de las revistas espa1olas de comunicaci3n, en cuanto a la procedencia de las citas recibidas o emitidas por las revistas de comunicaci3n en el Journal Citations Report, pueden presentar diferencias que dificulten el intercambio de informaci3n entre ambos conjuntos. Se analiza la distribuci3n de citas seg3n disciplina citante para las revistas espa1olas y extranjeras de comunicaci3n, as3 como para «Comunicar», y la frecuencia de aparici3n de revistas con tasa de afinidad seg3n su disciplina para las revistas en la «Subject Category Communication» de JCR. Se concluye que la relaci3n epistemol3gica entre educaci3n y comunicaci3n se da 3nicamente en el caso espa1ol, que existen marcadas diferencias en la composici3n disciplinar de las revistas afines y citantes al comparar las revistas espa1olas con las indexadas en JCR. Adem1s, la interacci3n con las revistas del 1rea «Information Science & Library Science» podr3a ser un canal de comunicaci3n entre ambos conjuntos de revistas. Finalmente, se corrobora la correspondencia de la caracter3stica multidisciplinarietà de «Comunicar» en el 1mbito nacional e internacional.

## KEYWORDS / PALABRAS CLAVE

Citation, relatedness, epistemology, scientific journals, interdisciplinarity, research.

Citaci3n, tasa de afinidad, epistemol3gia, revistas cient3ficas, interdisciplinarietà, investigaci3n.

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## 1. Introduction

The main objective of this research is to contrast the assumption that links theory and practice regarding the relation between the communication and education disciplines, both in terms of epistemology and behavior, understood as relatedness and the origin of citations of, or received by, the journals published in both disciplines. Consequently, the introduction is divided in two subsections, each related to one of these two aspects.

### 1.1. The theoretical relation between communication and education

Almost a decade ago, a paper published in this journal, whose title is relevant, detailed the relatedness between communication and education. It highlighted that both are social, intentional actions which make use of languages and media, that they are unpredictable, use information and require interaction (Alonso-Corral, 2004). The author of this paper, following Kaplún (1998), stressed the need to configure a hybrid communication-education field capable of orientating educational research towards «communication pedagogy» (Alonso-Corral, 2004). Yet this hybrid field should maintain the differentiating identity features that characterize each discipline without overlap. Communication is both an instrument and a necessary means for education. This implies an atmosphere-like environment in which educational action takes place. In the first case, communication can be understood as a mere vehicle for message transmission, while in the second, communication is essentially a consequence of human sociability (Pasquali, 1980: 51). Our human development strongly depends on communication, understood as connection or interaction with others, and on education, as a basis for displaying all human potentialities. Communication is not, therefore, an «added feature to person» (Gómez, López & Velásquez, 2006) but an anthropological need closely related to personality-building and cultural processes. Researchers such as George H. Mead, Claude Lévi-Strauss, Gregory Bateson, Abraham Moles or Martín-Serrano support the idea that «communication is among the nuclear elements involved in reflection on society, culture and universe» (Karam, 2007). Participating in the task of strengthening one's community is only possible when the personal and the community project move in the same direction and complement each other. For this, the conformation of own personality and identification with the community is a precondition. For the achievement of the necessary balance between inclusion and participation in the

community and a distance that allow permanent reflection regarding the various aspects of the community, enabling personal perfecting, it has recently been claimed that there is a need for civic education capable of developing a feeling of citizenship in increasingly globalized environments (Diestro & Cruz, 2006; Tucha, 2006), one which seeks out participation and to involve itself in social change. Some authors have seen in this idea a new paradigm; eduCommunication –a concept already stated by Kaplún (1998)– closely related to the creation of a communicative ecosystem which, in short, aims to plan communicative actions which incorporate a sense of culture and community belonging so that through cooperative work projects for the transformation of society are undertaken (Castro, 2011). Despite the clear link between communication and education, the agreement on its precise relation is not yet clear. In any case, what seems crucial for Education is the constant asking of the question: «What do changes in communication represent in terms of challenges for Education and what do these really mean?» (Martín-Barbero, 1998: 29). An answer, given by Martín-Barbero himself, is the change from a linear sequence-based model to a hypertext model, with the consequent change in the teacher's role (Martín-Barbero, 1999). Following this reasoning and contrary to the traditional role of education as mere transmission of knowledge, some years ago there emerged the concept of «knowledge management», focused on access to knowledge through the use of different sources and forms of communication (Fontcuberta, 2003). Furthermore, taking into account the complexity of educational contexts and requirements, there has been a tendency towards interdisciplinary teams and approaches (Fernández-Ríos, 2010, Folegatto & Tambornino, 2004: 49; Sierra, Méndez & Mañana, 2013). More recently, the concept of interdisciplinarity, understood as a form of articulation of knowledge around the idea of transversality, has become relevant (Pozzoli, 2007). Nicolescu points out that this latter term has already appeared in the works of Jean Piaget, Edgar Morin and Eric Jantsch among others, and that it is now used to address complex realities, such as education (Nicolescu, 1996). In summary, this perspective aims to overcome the limits of interdisciplinarity in a totalizing attempt at the integration of levels of reality.

### 1.2. Spanish and foreign Communication journals and their relation to education

It might be of interest to investigate whether the scientific communication tools of Communication and

Education journals really reflect this theoretical relation. Taking into account that there are data available to enable the comparison of such behavior both at national and international level, the question is whether there exist specific features related to the behavior of Spanish Communication journals that significantly differentiate them from their equivalent journals in JCR, which are mostly non-Spanish journals. The analysis of the citations –both in terms of the cited and the citing publications– applied to Communication journals, and particularly in the case of «Comunicar», whose scope is the intersection of communication and education, could be a useful instrument for the analysis of theoretical-practical coherence, since citation behavior is a reflection of the behavior corresponding to the interest of specialist in a given field (Atkinson, 1984).

The various methodologies already in use for citation analysis include the so-called bottom-up approach, which make use of pre-established subject categories (Wagner & al., 2011), as in the case of Tomov & Mutafov (1996), or those which take as a starting point the mapping of scientific domains in order to characterize the interactions between scientific disciplines or clusters, formed by journals according to measures of similitude, such as Boyack (2004), Leydesdorff & Schank (2008), Rafols & Meyer (2010), Stirling (2007) and Leydesdorff & Rafols (2011).

Apart from the analysis of the subjects related to the citations received (in the case of Spanish journals) and in the citing and cited publications (in the case of non-Spanish journals), as well as the place occupied by citations from Education in each field, it is possible to obtain and analyze information on the Relatedness indicator, which is available in Thomson Reuters' Journal Citations Report. This indicator is based on the developments of Pudovkin and Garfield (2002), and takes into account the strength of the sets of citations given and received between pairs of journals, or when applied to a whole discipline, between a particular journal and the set of journals in that discipline.

It is a well-documented fact (Engels, Ossenblok & Spruyt, 2012; Giménez & Román, 2009, Nederhof, 1991; Archambault & al., 2006) that Social Sciences

as well as Humanities have peculiarities in their behavior related to features such as the national environment and the preference for communication media other than journals. In some nationally delimited geographical settings, we can identify conditions and relations between disciplines that are substantially different to those observed between the same disciplines in other countries. Communication and Education are not an exception to this reality. For this reason, it is worth considering, with regard to the unique position of «Comunicar» (specialist in edu-communication, the intersection between Education and Communication,

**The theoretical relation between Communication and Education can be observed in Spanish journals since the relevance of Communication papers for authors publishing in Education journals has been proved. In this sense, as has been detailed in the introduction, Education can be understood within an epistemological framework as a specific form of Communication, and the results confirm this theoretical relation since the number of citations from Education to Communication is considerably higher than vice versa.**

a field that is on the rise in terms of the number and relevance of papers published, [Repiso & Fonseca, 2012]), whether we can observe an intense citation relation between communication journals and education journals in Spain, whether this pattern can also be found in the international framework by observing the citation and relatedness patterns, and finally, if it is necessary to explore the consequences of the observed situation for Spanish Communication journals regarding their internationalization possibilities. It is also worth mentioning here that, as contextual information, the set of Spanish Communication journals is highly dynamic in its behavior for aspects such as citations, self-citation and interaction with Spanish / foreign journals (Fernández-Quijada, 2010).

## 2. Objectives

On the basis of the relation between Education, Communication and interdisciplinarity developed in

the introduction, the first objective is to identify the degree of relation by topic between Spanish Education and Communication journals, taking into account the topic affiliation of the citations received by journals in both sets. In order to fulfill this objective, journals in each discipline will be characterized according to the pattern of received citations aggregated by the discipline of the citing journals. The database used for this purpose is the «Índice de Impacto de Revistas Españolas de Ciencias Sociales», IN-RECS (Impact Factor of Spanish Social Sciences Journals) in its 2009 version (the latest data available).

Considering the twin topic scope of «Comunicar» and the fact that it is indexed in the Journal Citations Report (JCR), the general pattern of citation exchange of the journal in that database will be analyzed from data available in its 2011 version. In this case, the pattern of aggregated citations by discipline of the citing and cited journals will be analyzed. In order to search for divergences in the behavior of «Comunicar», as well as assembling a comparative framework, the same analysis will be carried out for the whole Communication subject category. With the aim of analyzing the role of education as a discipline related to Communication, the values of the Relatedness for Communication indicator for journals will be structured in quartiles by its accumulated value, and the disciplinary composition of each quartile will be studied. The values of relatedness between Communication journals in the first quartile by impact factor in the JCR and Education journals will also be analyzed. Finally, both the theoretical-practical coherence of the hypothesized epistemological relation between Education and Communication and the possible existence of communication patterns obstructing the exchange of information between Spanish and non-Spanish Communication journals will also be explored.

### 3. Methods and materials

The source of information on Spanish journals is IN-RECS, in its 2009 version – a database that extracts impact indicators from the bibliometric data in Spanish Social Sciences journals, developed by the EC3 research group at the University of Granada. From this database, which has been selected since it provides specific information on the disciplines that cite any indexed journal, the information extracted and analyzed for all journals in Education and Communication subject categories (132 and 23 journals respectively) was the frequency of citations received from the different subject categories (hyperlinked from the text-citing disciplines-, available after accessing the

website linked to each journal's title in the general ranking). In the case of «Comunicar», we discovered the disciplinary origin of citations given and received on the basis of the information in JCR 2011 (72 journals in the Communication subject category). The selection of the JCR as source of information for the analysis of non-Spanish journals derives from the fact that this database is relevant worldwide and the inappropriateness of the alternative, Scopus, due to the multiple gaps in its coverage of journals, which rendered this database unreliable as a source of information, at least at the discipline level (Jacsó, 2010). The analysis by JCR-derived information was carried out by aggregating the citing and cited journals according to the subject categories in which they are indexed in the database. Taking into account the possible co-classification of journals in various subject categories, both of the citing and cited journals as well as the journal under analysis (in the case of «Comunicar», the journal is in the Communication and Education & Educational Research subject categories), it is relevant to mention that: a) it is considered that a citing or cited journal belongs to the «Communication» subject category if that journal is classified, at least, in that discipline; that is to say, applying the «or» Boolean operator to the journal's classification; b) for the rest of journals included in the analysis, not classified in the Communication or Education & Educational Research categories, the discipline of the journal has been randomly chosen from among the disciplines in which that journal is classified. The reason for a random choice is the potential bias which a selection by the authors of this work could imply, and the fact that a fractional counting could spuriously increase the number of received citations. The discipline has been randomly selected by attaching a pseudorandom number between 1 and the maximum number of disciplines in which the journal is classified to the name of each of the disciplines, then selecting as the discipline to which the journal belongs all those with the number two. This procedure provides equiprobability in the choice for all cases on the same level of co-classification.

For non-Spanish journals, the information obtained was: abbreviated title and number of citations from/to cited/citing journals by the set of journals in the Communication subject category) in 2010, as well as the disciplines in which the citing/cited journals are indexed in JCR 2010. JCR 2010 was used in the case of non-Spanish journals, while the 2011 version provided the basis for the analysis of «Comunicar»; the reason for this being the availability of information for all subject categories in JCR 2010 and the scarce loss of

comparability between the two versions, given its contiguity and the volume of information involved in the analysis. The procedure for the assignation of a discipline to the citing/cited journals has been, in this case, the same as the one applied to «Comunicar», its classification in the Communication subject category and in others places is it in Communication. The value of

the Relatedness indicator, from discipline to each journal and in the opposite direction, has been captured for the set of journals in the Communication subject category, as well as the disciplines in which the related journals are classified. In the case of journals in the first Impact Factor quartile of Communication a frequency analysis was carried out, taking as an aggregation unit the discipline in which each of the journals with a Relatedness value (in its Rmax value) is classified.

#### 4. Results

Firstly, the results of the analysis of the origin of the citations received by Communication journals (IN-RECS 2009) from Education journals are presented. Taking into account that the number of citations is highly variable, the number of citations from Education to Communication has been expressed here as a percentage of the total number of external citations (citations which do not come from other Communication journals, except in the case of «Comunicar»).

As can be observed, partially due to its double topic classification, «Comunicar» has the highest number of citations from Education journals (the number of self-citations is 39). The journal «Icono 14», receives a single citation from Education journals, which therefore represents 100% of the references from that sector. Consequently, the role of «Comunicar» in the interaction between education and communication in Spain is remarkable. Among the non-education jour-

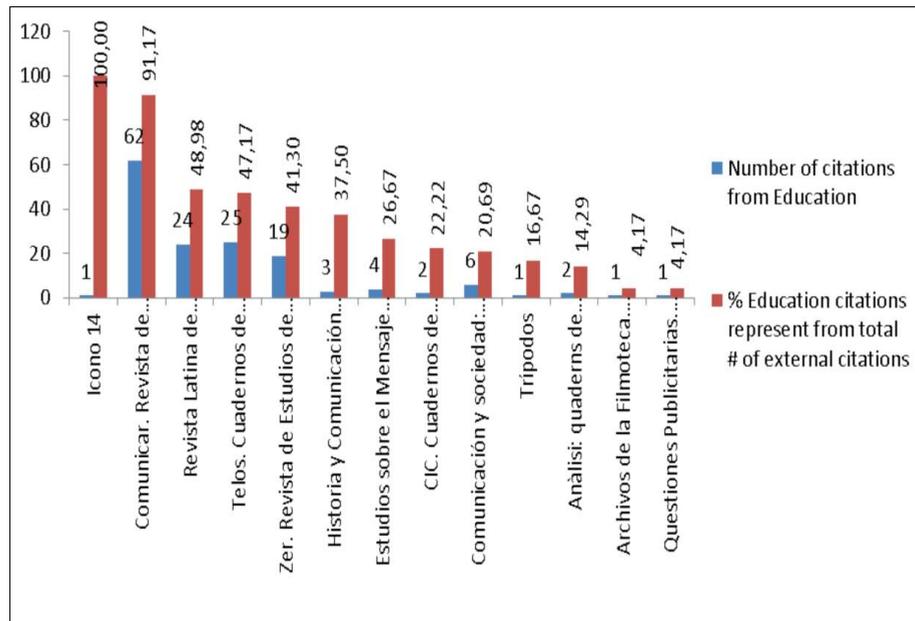


Chart 1. Number and percentage (in terms of the total number of external citations) of citations from Education journals received by Communication journals (1996-2009).

nals, «Revista Latina» and «Telos» are also highly relevant. In general terms, it can be stated that there is a relatively generalized relation between Communication and Education journals, with Communication journals being receptors of citations from Education journals, with percentages ranging from 4.17% to 100%, since 13 of the 23 Communication journals in IN-RECS 2009 have received, at least, one citation from Education journals.

The situation in the case of Education journals is, nevertheless, substantially different.

Despite the special situation of «Comunicar», indexed in both disciplines, and removing from the quantification in the chart all self-citations which would increase the number of external citations due to their analysis as citations from Education, the total number of external citations from Communication would be 12, which in practice shows that this journal has as the highest number of citations from Communication.

Aggregating citations received by the set of Communication journals by discipline of origin yields the following distribution pattern.

As the chart shows, papers published in the set of Spanish Communication journals are mainly cited by authors publishing in Education, Library & Information Science, Sociology and Psychology. However, the volume of citations coming from other journals in the same discipline is highly superior to the ratio of citations from journals in other disciplines: 615 cita-

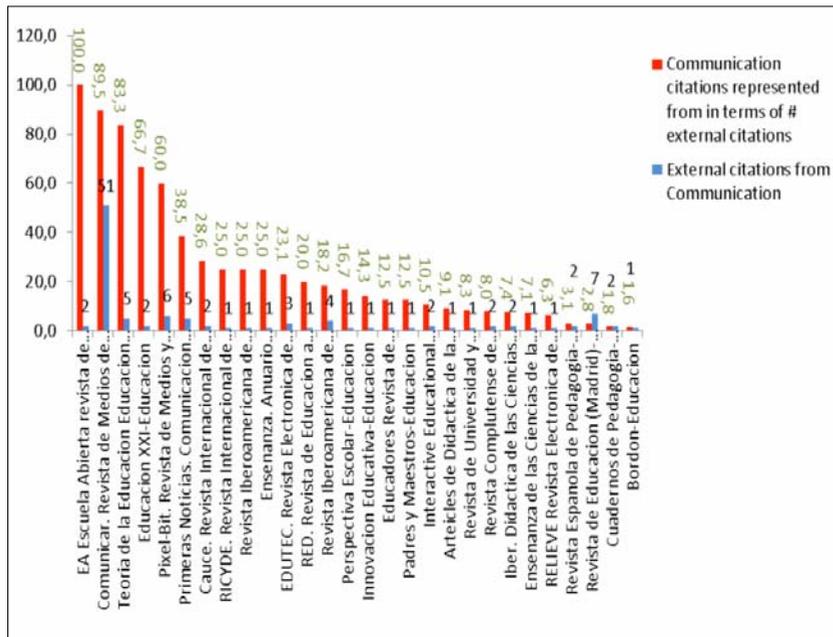


Chart 2. Number and percentage (in terms of the total number of external citations) of citations from Communication journals received by Education journals (1996-2009).

change of citations when compared to its Spanish counterpart (627 citations from Education & Educational Research to Communication journals, but only 205 from Communication to Education & Educational Research). By contrast, the closest discipline to Communication (apart from the discipline itself, with 9,014 citations distributed among the journals in the Communication subject category, which differs considerably from the findings of Reeves & Borgman, 2006, revealing a discrete 13% of citations from Communication journals to Communi-

tion journals against only 156 from Education journals, the second discipline by number of citations. Nevertheless, it is relevant to consider the comparability of this situation with the set of journals in the JCR Communication subject category.

According to the results, it seems clear that the behavior of journals in both sets (Spanish and non-Spanish journals) regarding the distribution of citations given and received (this variable is proportional to each node's diameter, except in the case of internal Communication citations and their place in the network) differs strongly from Communication journals in JCR 2010. Education & Educational Research occupies a distant position regarding the ex-

ternal citations from Communication journals, though their study was published in 1983) according to the citation pattern observed is Business (2,950 citations from Business to Communi-

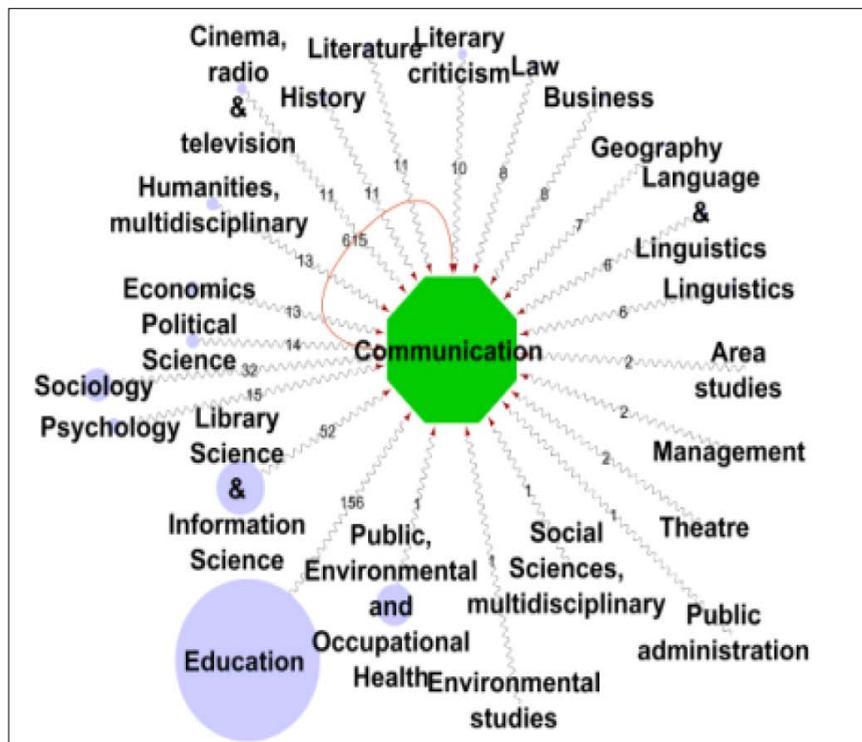


Chart 3. Distribution of citations received by Spanish Communication journals (IN-RECS), aggregated by citing discipline.

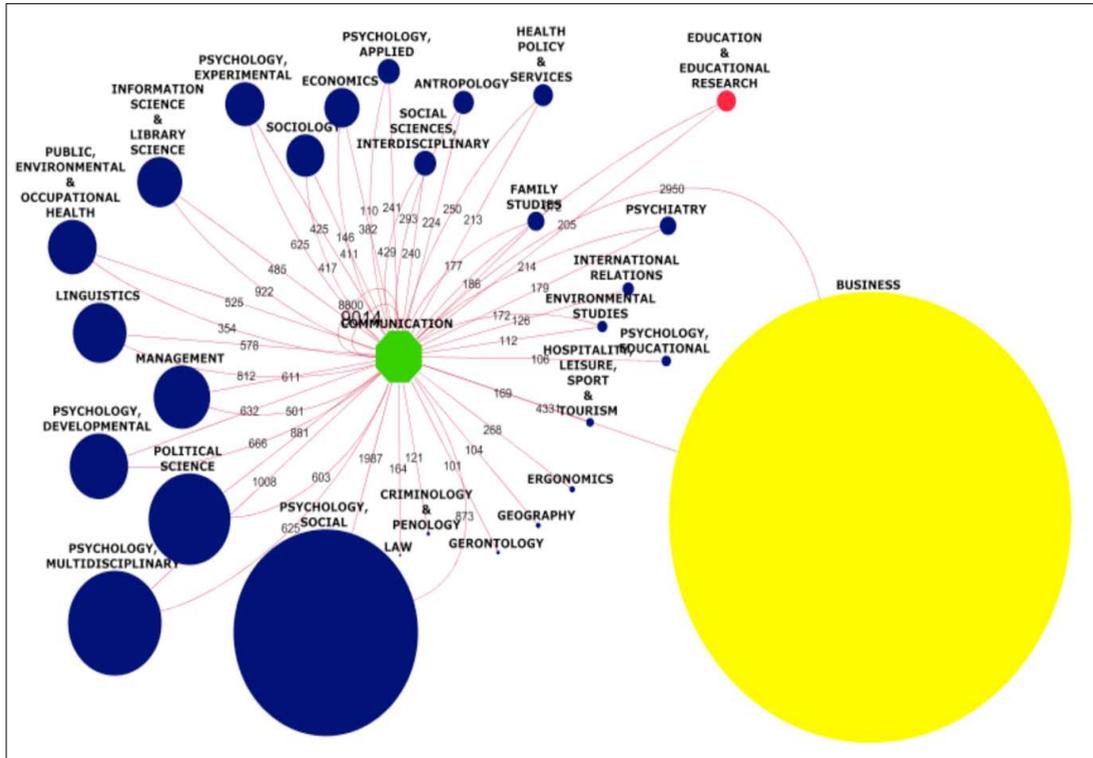


Chart 4. distribution of citations given and received by Communication journals (JCR 2010) grouped by journals according to subject category.

cation journals and 4,331 citations from Communication to Business) followed by Psychology, Social, Psychology, Multidisciplinary and Political Science.

The structure of the research front in the set of non-Spanish journals clearly differs from the Spanish structure; the most important input is still, as in the Spanish case and in most disciplines, the set of journals in the same subject category, but the origin of the cited journals is very different, since not only the disciplinary structure of received citations is significantly different in its «nominal coincidence» but also in the nature of these disciplines: Business and Education differ in key aspects such as their methodology, study objectives and research aims. Communication has been defined by Leydesdorf (2009) as a hybrid field between Political Science and Psychology which seems, at first sight, to differ from the concept of the Communication journal in Spain.

The question is what is the position of «Comunicar» within the international framework?. The following chart reflects the citations given and received for «Comunicar», aggregated by origin of discipline (JCR 2011).

The chart shows that the journal is strongly related to other journals in terms of JCR Communication subject category. Yet it is necessary to point out, that in

citations given (sine-wave line) and received (curved line), the number of citations to and from the same journal is 75. Also of note is the presence of Education & Educational Research journals, which occupy second place in citations received.

The Relatedness indicator values, when applied to sets of journals in a given subject category, vary depending on the method of calculation according to whether a journal is considered in terms of a discipline or in terms of another journal. JCR provides a stable value for measuring this relation:  $R_{max}$ , which consist of the highest of these values. Its value is proportional to the degree of relation between a given journal and a subject category, or vice versa. For the set of Communication journals in the JCR, we analyzed the value of Relatedness for each of the related journals and the set of journals in the Communication subject category, the inverse value ( $R$  from Communication, SC to each journal) and  $R_{max}$ . Once the discipline of each related journal was identified, these journals were ordered according to their attachment to a quartile in the  $R_{max}$  distribution. Therefore, journals in the first quartile would be those more closely related to the set of journals in the Communication subject category, and so on. We also analyzed the frequency with which journals of each discipline appear in each of the quartile

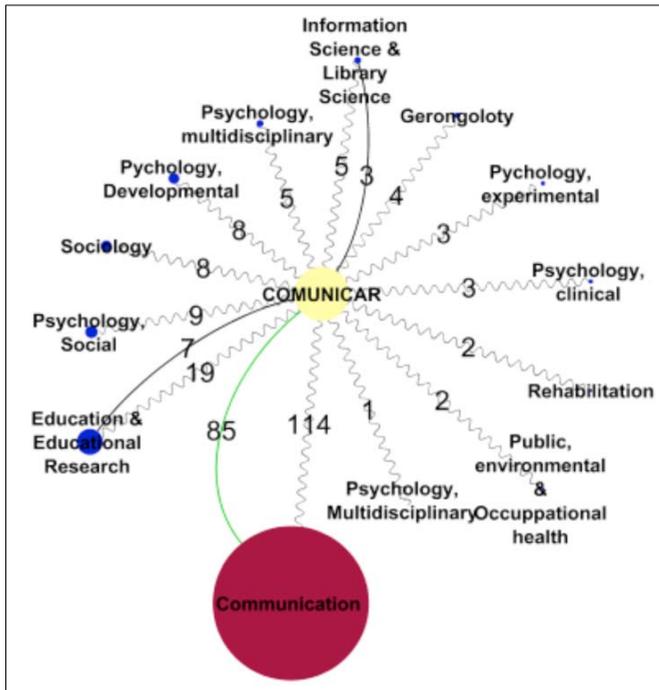


Chart 5. Citations given and received for «Comunicar». Journals indexed in JCR 2011, aggregated by subject category.

observe a rapid diversification in the number of different disciplines as the quartile number increases; that is to say, as the degree of relation to Communication journals diminishes. Also, it is important to note the numeric relevance of Business journals in all quartiles, even in the fourth, in which Communication is not observed, which reveals a deep relation across all strata.

In regard to the relation between Communication journals and other journals in the JCR Science Edition, the set of disciplines of the related journals are, by order of accumulated value: Public, Environmental & Occupational Health (13 journals, 19% of the total number of related journals), Computer Science, Information Sciences (9 journals, 13% of the total) and Computer Science, Cybernetics (5 journals, 7%). Given the multidisciplinary nature of Public, Environmental & Occupational Health, this relevant relation is not particularly conclusive. Nevertheless, the fact that Computer Science, Information Sciences is the second highest in terms of the number of related

journals can be understood as a consequence of the publication of papers related to the underlying aspects of highly developed communication media in recent decades, namely information systems.

les, obtaining the following results. (The inner circle represents the disciplinary composition of quartile 1 by Rmax, the second inner circle corresponds to quartile 2, and so on).

It is necessary to reach the fourth quartile before Education & Educational Research journals appear. Regarding the other quartiles, the set of journals in the first quartile are, predictably, Communication journals, as well as in the second and third quartiles, whereas there are none in the fourth quartile. It is possible to

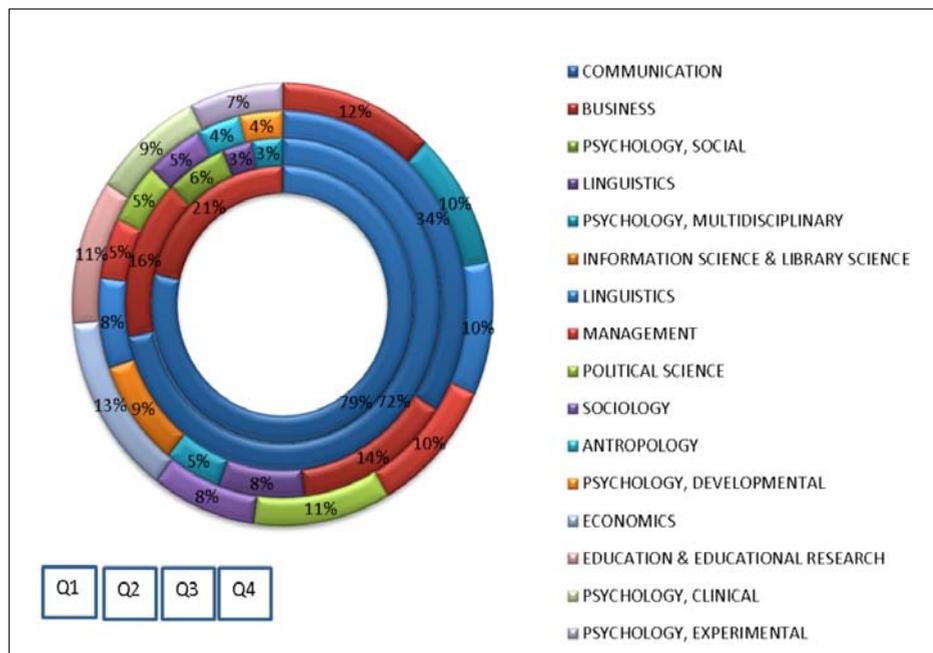


Chart 6. Frequency of appearance of journals related to the set of Communication journals according to the quartile to which they belong by Rmax ranking.

The analysis of the percentage which Education & Educational Research journals related to Communication (regardless its value) journals in the first quartile by Impact Factor in terms of the total number of related journals is further evidence of the weak link between both disciplines.

From a total of 16 journals in the first impact factor quartile in the JCR 2011 for the Communication subject category, only 7 Education & Educational Research journals have a Relatedness value.

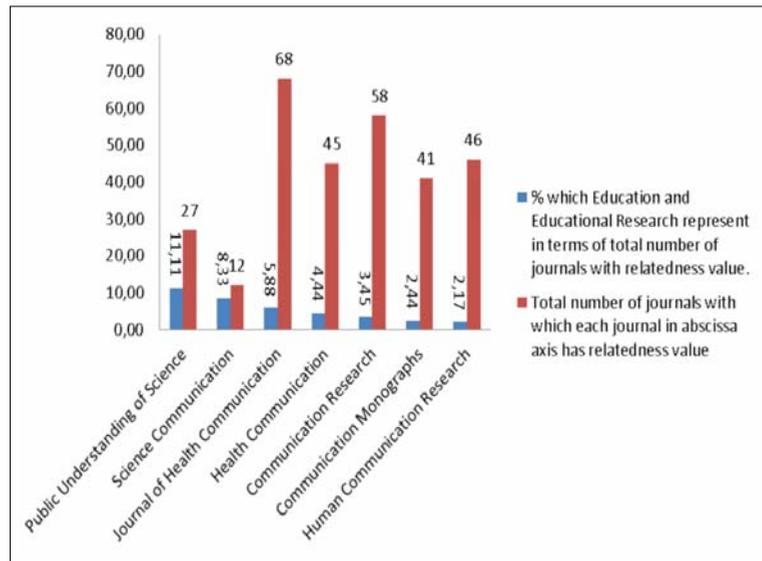


Chart 7. Percentage of Education & Educational Research Journals represented in terms of the total number of journals related to Communication journals in the first quartile by Impact Factor.

## 5. Conclusions and discussion

One immediate conclusion, directly derived from the evidence shown, is the relevant difference regarding the disciplines of the citing journals between Spanish and non-Spanish journals, and more specifically, between Communication and Education journals. It can be stated that the close interaction between Communication and Education is a characteristic feature of Spanish journals. The theoretical relation between Communication and Education can be observed in Spanish journals since the relevance of Communication papers for authors publishing in Education journals has been proved. In this sense, as has been detailed in the introduction, Education can be understood within an epistemological framework as a specific form of Communication, and the results confirm this theoretical relation since the number of citations from Education to Communication is considerably higher than vice versa.

When looking at JCR Communication journals, not only is the relation between Education and Communication for Spanish journals invisible, but also the discipline that occupies that «privileged position», Business, strongly differs in basic aspects such as study objects, methodology and premises with its Spanish counterpart, and maintains a prominent position even beyond the discipline under study, Communication – which becomes evident when analyzing journals with low Relatedness to Communication journals.

«Comunicar», as a reference among Spanish Communication journals and, at the same time with regards to its far reaching, multidisciplinary scope, is a clear exception to the general rule in the JCR Com-

munication subject category, since although not being the general pattern in its topic environment, it maintains close citation relations with Education journals in terms of citations received and given.

IN-RECS and JCR are two very different information systems, not only in the obvious aspect related to coverage and geographical / topic delimitation, but also in the classification structure used. This would represent a major problem if considering the possibility of carrying out more detailed comparative studies. Nevertheless, in the case of this work, the fact that external citations in IN-RECS are associated to the original name of the discipline in which the citing journals are indexed in the original system, it is a potentially interesting overlapping point between the names of the citing disciplines.

The implications of this difference for fruitful citation exchanges between Spanish Communication journals and those indexed in JCR (apart from «Comunicar»), are not conclusive, but point to considerable topic differentiation, which does not contribute to the this exchange in any way. One of the most revealing data supporting this paradoxical ‘communication difficulty’ between Communication journals in both sets might not be the fact that the relation with regards to Education journals is substantially different, but that the discipline with a higher number of external citations given and received for journals in the JCR (Business) does appear to be firmly in second place in the case of Spanish journals (with only 8 received citations).

For these reasons, it is necessary to find a «communication bridge» between both sets of journals. A discipline fulfilling the features for fitting such a role might be Library Science and Information Science (LIS). In the JCR, Communication journals gave 485 citations to LIS and received 922 LIS citations, while in the case of Spanish journals, Communication journals received LIS 52 citations, the latter being the second discipline with the highest citation intensity towards Communication. A hypothetical citation exchange between Spanish Communication journals and JCR LIS journals might serve as an indirect diffusion medium.

Finally, we confirm the highly interdisciplinary profile of «Comunicar» since, although there are strong differences between the citing/cited profiles of the journal and the set of journals in the JCR, «Comunicar» still maintains a close relation with Education journals.

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