MAY/AUGUST, 2016, VOL. 30, NÚM. 69, MÉXICO, ISSN 0187-358X

Investigación Bibliotecológica

ARCHIVONOMÍA, BIBLIOTECOLOGÍA E INFORMACIÓN

English

Investigación Bibliotecológica

ARCHIVONOMÍA, BIBLIOTECOLOGÍA E INFORMACIÓN

number 69, vol. 30, May/August, 2016, México, ISSN: 0187-358X

Universidad Nacional Autónoma de México
Instituto de Investigaciones Bibliotecológicas y de la Información

Contenido

INVESTIGACIÓN BIBLIOTECOLÓGICA, Number 69, vol. 30, May/August, 2016, MÉXICO, ISSN: 0187-358X

Investigación Bibliotecológica: archivonomía, bibliotecología e información /
Universidad Nacional Autónoma de México, Centro Universitario de Investigaciones Bibliotecológicas. vol. 1— , no. 1— , (ene./jun.)— . – México : Universidad Nacional Autónoma de México, Centro Universitario de Investigaciones Bibliotecológicas. 1986- . ISSN 0187-358X

Entregas a partir de vol. 1, no. 1, ene./jun., 1986 a vol. 21, no. 43, jul.-dic., 2007. Semestral

Entregas a partir de vol. 22, no.44, ene./abr., 2008. Cuatrimestral

Debido al cambio de denominación de Centro Universitario de Investigaciones Bibliotecológicas a Instituto de Investigaciones Bibliotecológicas y de la Información (marzo de 2012), a partir del v. 26, no.57 (may./ago., 2012), se publica por UNAM. Instituto de Investigaciones Bibliotecológicas y de la Información.

Investigación Bibliotecológica: archivonomía, bibliotecología e información, quarterly journal, number 69, vol. 30, May/August, 2016, is published by the Instituto de Investigaciones Bibliotecológicas y de la Información of the Universidad Nacional Autónoma de Mexico. ISSN: 0187-358X. Certificate of Title No. 6187 and Certificate of Content No. 4760 issued November 29, 1991. Copyright No. 236-92 issued February 25, 1992. Correspondence should be sent to Torre II de Humanidades, pisos 11, 12 and 13, Ciudad Universitaria, C.P. 04510. México, D.F. Telephones: 5623 0342 and 5623 0325; Fax 5550 7471; E-mail: revista@iibi.unam.mx. Price per number in Mexico: 200 pesos. Cost aboard: $ 5.38 USD, plus applicable shipping charge. E-mail for sales: promopub@iibi.unam.mx y jorgec@iibi.unam.mx. In charge of edition: Carlos Ceballos; specialized translation: Andrew Kline (klineline2003@gmail.com); layout: José Luis Maldonado; cover design: Mario Ocampo Chávez. Partial and total reproduction is permitted provided source is cited. Individual authors are wholly responsible for the content of their articles. The English edition of this booklet was printed in March 2015 in Mexico D. F.

JOURNAL INDEXED IN:

- **Thomson Reuters Web of Science**
- **SSCI**
- **Índice de Revistas Mexicanas de Investigación Científica y Tecnológica del CONACyT**
- **ELSEVIER**
- **JCR**
- **SciELO**
- **SciELO Citation Index**
- **Scopus**
- **CSIC e-revist@s**
- **CLASE**
- **INFOBILA**
- **DOAJ**
- **LISA**
- **LISTA Full Text**
- **Latindex**

This journal is published online:
- Revista IIBI: http://iibi.unam.mx/revista.html
- Revistas UNAM: http://www.revistas.unam.mx/index.php/ibi/index
- SciELO: http://www.scielo.org.mx/scielo.php?script=sci_serial&pid=0187-358X&lng=es&nrm=iso
- ELSEVIER:www.elsevier.es/unam/investigacionbibliotecologica

CONTRIBUTING RESEARCHERS:

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, No. 69, May/August, 2016, México, ISSN: 0187-358X

Adolfo Alonso Arroyo
Dpto. Hª de la Ciencia y Documentación. Facultad de Medicina y Odontología. Universidad de Valencia, España.
Tel.: (34) 963864957
E-mail: adolfo.alonso@uv.es

Andrés Pandiella
Laboratorio de Estudios Métricos de Información (LEMI), Dpto. de Biblioteconomía y Documentación. Universidad Carlos III de Madrid, España.
Tel.: (34) 916248468
E-mail: apandiella@gmail.com

Angela Maria Grossi de Carvalho
UNESP - Universidade Estadual Paulista.
Faculdade de Arquitetura Artes e Comunicação de Bauru (FAAC), Departamento de Comunicação Social.
Avenida Engenheiro Luiz Edmundo Carrijo Coube, 14-0, Bairro Vargem Limpa - Bauru, SP – Brasil, CEP: 17.033-360
Tel.: +55 (14) 3103-6023 (Ramal: 7210)
E-mail: angela@faac.unesp.br

Ariel Alejandro Rodríguez García
Instituto de Investigaciones Bibliotecológicas y de la Información, UNAM. Torre II de Humanidades, Piso 12, Circuito Interior, Cd. Universitaria, Colonia Copilco Universidad, Delegación Coyoacán, 04510, México, D.F.
Tel.: (52 55) 5623 0351
E-mail: ariel@iibi.unam.mx

Armando Sánchez Soto
Posgrado en Bibliotecología y Estudios de la Información de la UNAM.
Instituto de Investigaciones Bibliotecológicas y de la Información, UNAM. Torre II de Humanidades, Piso 12, Circuito Interior, Cd. Universitaria, Colonia Copilco Universidad, Delegación Coyoacán, 04510, México, D.F.
Tel.: (52 55) 5623 0378
E-mail: armando@iibi.unam.mx

Cristian Berrío Zapata
Universidade Federal do Pará. Instituto de Ciências Sociais Aplicadas ICSA, Faculdade de Arquivologia.
Universidade Federal do Pará, Cidade Universitária Prof. José da Silveira Netto. Rua Augusto Corrêa, N°01, Bairro Guamá, Belém, Pará – Brasil. CEP: 66.075-110
Tel.: +55 (47) 9991-272,
+55 (14) 99697-9938
E-mail: cristian.berrio.research@gmail.com
berriozapata@ufpa.br

Elsa Margarita Ramírez Leyva
Instituto de Investigaciones Bibliotecológicas y de la Información, UNAM. Torre II de Humanidades, Piso 11, Circuito Interior, Cd. Universitaria, Colonia Copilco Universidad, Delegación Coyoacán, 04510, México, D.F.
Tel.: (52 55) 5623 0348
E-mail: eramirez@unam.mx

Ely Francina Tannuri de Oliveira y *Maria Cláudia Cabrini Grácio*
Universidade Estadual Paulista "Júlio de Mesquita Filho"-UNESP-Marília (Brasil).
Tel.: [Ely: 55 (14) 97126747]
[Maria: 55 (14) 34334607]
E-mail: etannuri@marilia.unesp.br
E-mail: cabrini@marilia.unesp.br

Fernando de Assis Rodrigues y *Rita de Cássia Cassiano Lopes*
UNESP - Universidade Estadual Paulista, Faculdade de Filosofia e Ciências (FFC), Departamento de Ciência da Informação.
Avenida Hygino Muzzi Filho, 737. Bairro Mirante - Marília, São Paulo – Brasil, CEP: 17.525-000
Tel.: [Fernando: +55 (14) 3402-1370]

[Rita: +55 (14) 3402-1336]
E-mail: fernando@elleth.org
E-mail: ritacassiano@marilia.unesp.br

Fernando César Lima Leite y *Sely Maria de Souza Costa*
Universidade de Brasília, Faculdade de Ciência da Informação.
Edifício da Biblioteca Central, Entrada Leste, Mezanino, Campus Universitário Darcy Ribeiro, Brasília- DF, Brasil. CEP: 70.910-900
Tel.: + 55 61 3107-2634
E-mail: fernandodfc@gmail.com
E-mail: selmar@unb.br

Genaro Luis García López
Universidad de Salamanca, Facultad de Traducción y Documentación.
C/ Francisco Vitoria 6-16, 37008 Salamanca, España.
Tel.: (0034) 923294580
E-mail: genaroluis@usal.es

Guillermo Armando Ronda Pupo
Departamento de Administración. Universidad Católica del Norte, Chile.
Departamento de Turismo. Universidad de Holguín, Cuba.
Avenida Angamos 0610, Antofagasta, Chile. C.P.: 1270709
Tel.: +56 552355802
E-mail: gronda@ucn.cl

Laura Rafaela García
INVELEC-UNT-CONICET
Alberdi 180 8º C- San Miguel de Tucumán, C.P.: 4000, Tucumán, Argentina.
E-mail: lau2garcia@hotmail.com

Luís Fernando Morales Morante
Facultad de Ciencias de la Comunicación.
Universidad Autónoma de Barcelona.
Edifici I – Campus UAB, Bellaterra-Cerdanyola del Vallès, 08193 – Barcelona, España.
Tel.: 935814514
E-mail: fernando.morales@uab.es

Rafael Aleixandre Benavent
Unidad de Información e Investigación Social y Sanitaria. Universidad de Valencia-CSIC.
IHMC López Piñero. Valencia, España.
Tel.: (34) 963926274
E-mail: rafael.aleixandre@uv.es

Ricardo Cesar Gonçalves Santana
UNESP - Universidade Estadual Paulista.
Faculdade de Ciências e Engenharia (FCE), Departamento de Administração
Rua Domingos da Costa Lopes, 780.
Bairro- Jardim Itaipu - Tupã, SP – Brasil, CEP: 17.602-496
Tel.: +55 (14) 3404-4200 (Ramal: 4247)
E-mail: ricardosantana@tupa.unesp.br

Yesenia Ronda Danta
Universidad de Ciencias Médicas. Holguín, Cuba.
Avenida Los Álamos. SN. Holguín, Cuba. C.P.: 80100.

Yusleydis Leyva Pupo
Policlínica Alcides Pino Coello. Holguín, Cuba.
Carretera de Gibara. S/N. Alcides Pino. Holguín, Cuba. C.P.: 80100.
E-mail: yusleidysleyva@gmail.com

Editorial

The web-based library: challenges and opportunities

> Google can give you 100,000 answers, but the librarian can provide the right one.
>
> Neil Gaiman

The growing use information and communication technology, especially the internet, has etched deep transformations in many fields of life that affect not only the ways in which people and institutions relate and communicate, but also consumer and leisure habits, workplace practices and the delivery of public services.

The convenience and speed of the internet are determining factors in earning the wide acceptance it enjoys in the general population that chooses to do its everyday business online rather than going in person to purchase, for example, an airline ticket or perform a bank transfer. Of course, checking a website to see what is playing at the movies is now old hat. While the internet has not completely supplanted analogue media, an increasing number of companies and institutions exploit the internet to provide a platform for establishing a presence in the marketplace to offer products or services. In the world of the information society, where millions of people are connected online, the internet has become the best, most widely visible display case for companies and institutions to gather users and clients. The products and services offered on line have expanded exponentially in recent years, driving fierce competition among suppliers who constantly strive to improve the operability of their platforms and websites, while adapting to the

tastes and preference of their target populations.

Libraries are no exception to this trend, and early on they endeavored to carve out a place the World Wide Web, first by offering information about the library services, and later, in accord with applicable restrictions, by making collection catalogues and digitized versions of bibliography available to online consultation. More recently, libraries have begun offering other online services, such as virtual reference, loan renewals and user training. Because each library is different in terms of budget and available technology, this deployment of online services has not development along a regular front. The trend, however, is clear enough, and libraries everywhere are striving to exploit the internet as much as possible.

As previously mentioned, competition on the internet is increasing every day, and the dominant role of the library as supplier of information has begun to slip as digital supports and new search engines improve and consolidate. Today one no longer needs to go to the library to search for information about a topic or author. A simple web search can quickly and with little effort bring up literally millions of document hits. In the context the digital world, the question of just what libraries can still offer becomes relevant. Obviously, it can still offer users access to its physical collections, since much of this material is not available in any other way, at least not without considerable cost. Library collections, moreover, offer the advantage of quality, in that they have been rigorously selected. These advantages notwithstanding, the library must offer still more in the form of services in conjunction with the capacity to adapt to the needs and preferences of users.

Since the physical library is not simply a place for holding books, but rather an institution that provides a series of services to users that aid their access to information and documents, web-based libraries similarly cannot limit their scope to simply serving as repositories of collections and also must offer an array of services that provide value and serve to differentiate it from any competitors.

Many of the services provided on site in libraries can be adapted and offered online as well, for example, the array of reference services that has been implemented in many libraries.

Inter-library lending of digitized documents can also be done almost instantaneously. On the other hand, the web opens a broad array of possibilities for disseminating materials owned by the library to users interacting with the library through diverse channels. This allows the deployment of personalized services, allowing users to establish their own spaces for storing and tagging documents, and receiving alerts.

The success or failure of these services shall depend ultimately on the users, who from the many options available select those they believe best suit their needs and requirements. For this reason, it is important not only to provide high quality services and contents, but also a user-friendly, user-oriented interface,[1] since users accustomed to the features of other competing information services and systems will demand similar features, which they have come to consider desirable or indispensable.

When designing and implementing online library services, one should keep in mind the diverse models that have been developed for explaining user behavior in using and appropriating technology in general and for the internet specifically. In the 1980s, Davis proposed the Technology Acceptance Model,[2] according to which the factors that most heavily determine the acceptance and use of a given technology are the user's perceptions of the technology's utility and the ease of its use. This pioneering model has undergone further development and modification in order to adapt it to diverse contexts. In addition to the two factors identified by Davis, two additional factors have been identified for the case of libraries: functionality of services, which is associated to the variety and quality of services offered, and the functionality of tasks, referring to the array of options offered on the web site to users, such as instant messag-

1 A. Pant. "Usability evaluation of an academic library website: experience with the Central Science Library, University of Delhi." *The Electronic Library* 33 (5) (2015): 896-915.

2 F. D. Davis. "Perceived usefulness, perceived ease of use, and user acceptance of information technology." *MIS Quarterly* 13 (3) (1989): 319-339; F. D. Davis, R. P. Bagozzi y P. R. Warshaw. "User acceptance of computer technology: A comparison of two theoretical models." *Management Science* 35 (8) (1989): 982-1003.

ing, search options or management of retrieved information.[3] As mentioned throughout this text, the challenges faced by online library services initiatives are substantial. It is not enough to have a presence on the internet in order win over users. Online libraries must offer quality and competitive services that meets user expectations, while keeping in mind that user expectations undergo change with the march of technology.[4] As such, it is important to remain abreast of these developments, while learning about the strengths and weaknesses of other information systems, and sustaining efforts to understand our current and potential users.

Even though the outlook for libraries is fraught with challenges, it is also filled with promise. The overabundance and chaotic nature of information on the internet has become a serious problem that calls out to the expertise and experience of libraries, which are the institution best suited for helping users make effective use of the information available.

Online libraries services should be of a very high quality, thereby differentiated added value against those offered by competing system in terms of reliability. If libraries can take advantage of these opportunities, they will attain higher levels of visibility, reputation and institutional prestige, while also favoring the physical use of library facilities and services, and enhancing the value of the professional librarian.

Andrés Fernández Ramos

3 J. H. Heinrichs, K. S. Lim, J. S. Lim y M. A. Spangenberg. "Determining factors of academic library web site usage." *Journal of the American Society for Information Science and Technology* 58 (14) (2007):2325-2334

4 A. Benson y R. Favini. "Evolving web, evolving librarian." *Library Hi Tech News* 23 (7) (2006): 18-21.

A R T I C L E S

Informational behavior and public information policies: theoretical considerations arising from the case of DATASUS in Brazil

Cristian Berrío-Zapata *
Fernando de Assis-Rodrigues
Rita de Cássia Cassiano-Lopes
Angela Maria Grossi de Carvalho
Ricardo Cesar Gonçalves-Santana **

Article received on: September 26, 2014.
Article accepted on: February 9, 2016.

Abstract

The information age requires information policies to guide its global articulation. Brazil has attempted to answer this call with policies that despite their good intentions have not obtained desired results. DATASUS, the Brazilian health information system, operates under policies that seem to be designed without considering the latest discoveries of Information Science regarding the informational nature of humans. This article discusses several information behavior models and theories that must be considered when formula-

* Universidade Federal do Pará, Instituto de Ciências Sociais Aplicadas ICSA, Pará-Brasil. berriozapata@ufpa.br
** Los autores pertenecen a la UNESP-Universidade Estadual Paulista, São Paulo-Brasil. (fernando@elleth.org); (ritacassiano@marilia.unesp.br); (angela@faac.unesp.br); (ricardosantana@tupa.unesp.br)

ting information policies and proposes an "Information Field" model containing guideposts for their construction.

Keywords: Information Policy, Internet, Information Systems, e-government, Brazil.

Resumen

Comportamiento informacional y políticas públicas de información: consideraciones teóricas alrededor del caso de DATASUS en Brasil

Cristian Berrío Zapata, Fernando de Assis Rodrigues, Rita de Cássia Cassiano Lopes, Angela Maria Grossi de Carvalho and *Ricardo Cesar Gonçalves Santana*

La era de la información necesita políticas de información para la articulación global; Brasil propuso políticas que, a pesar de sus buenas intenciones, no consiguen los resultados deseados. Es el caso de DATASUS, sistema de información de salud brasileño. Tales políticas ignoran los descubrimientos de la ciencia de información sobre la naturaleza del sujeto informacional. Este artículo discute algunos modelos y teorías sobre el comportamiento informacional que deberían ser considerados en los debates sobre políticas de información, y plantea un modelo de "Campo Informacional" con temáticas que pueden guiar su construcción.

Palabras clave: Políticas de Información; Internet; Sistemas de Información; e-Government; Brasil.

Introduction

In the information age, the discourse surrounding the citizen's need to have access to data has become common. But the problem of "access" is only the tip of the iceberg. The challenge includes empirical evaluation of the informational flows in the population and their effects and the identification of problems that affect democratization of access. Since the decade of the 1990s, many information policies have been designed in Brazil and Latin America and, even when the reductionist tendency of these proposals

has been giving way, their design is still performed without heed to advances in information science in the following three aspects:

1. Policies persist in a system-centered approach, to the detriment of the user;
2. Policies disregard the latest models and theories on human informational behavior; and
3. They remain tied to a rational-reductionist outlook bereft of the ecological-contextual vision.

On the basis of problems reported in public information systems and as exemplified in the case of the Brazilian health information system DATASUS, this paper discusses several models and theories of informational behavior and their relationship to information policy development. The standards that gave rise to DATASUS and weaknesses identified in empirical studies of these standards are described. The paper concludes with a proposal for a conceptual map of the "informational field" that affects the information policies informing the DATASUS case in order to nurture the debate and improve the operation of policies of this kind.

Transparency, open data and datasus

Information policies are underpinned by open access to and transparency of data.[1] Transparency marks the governance style that redistributes the coordination of resources and competencies among the public and private institutional organization levels, while abandoning the state monopoly model and seeking pluralism in public functions.[2] Informatics technologies can broaden access to data and intensify the demand for information and transparency of the state, thereby producing new forms of interaction between the state and the citizen.[3] Access to governmental data is a requirement if citizens are to participate in political processes and public management that make democracy possible.[4] The internet allows one to learn the needs of citi-

1 R. C. G. Sant'ana, *Tecnologia e gestão pública municipal : mensuração da interação com a sociedade.*
2 A. M. B. Malin, "Gestão da informação governamental: em direção a uma metodologia de avaliação".
3 V. Ndou, "E-government for developing countries: opportunities and challenges"; R. C. G. Sant'ana, *Mensuração da disponibilização de informações e do nível de interação dos ambientes informacionais digitais da administração municipal com a sociedade.*
4 K. Frey *et al., O acesso à informação. Caminhos da transparéncia: análise dos componentes de um sistema nacional de integridade.*

zens with some accuracy, thereby facilitating their effective, direct participation in public affairs, while increasing the value of information exponentially through open sharing.[5]

As will be shown further on, however, access to governmental information is partial, superficial and complex because of contextual and user variables and as a function of the volume of public data that is not handled by the existing integration and management systems.[6] The quality of information access is critical if one wishes to promote the development of independent points of view and transparent interactions between the state and society, which are key to citizens' participation.[7]

Moreover, the empowerment of citizens that data encourages depends on guaranteeing its effective use not only through access to the information infrastructure, but also through building the informational competencies, techniques and ethics of users.[8] Otherwise, the technological empowerment reinforces the concentration of capacities and power in those minorities with the knowledge, equipment and context needed to exploit existing data sources and flows.[9]

The problems of informational empowerment in Brazil can be clearly seen in the health sector. To understand these problems, three areas must be examined: a) legislation and structure of the health sector; b) public policies promoting and guaranteeing access to governmental information, and c) features of the web site implemented by the state. In the following section, we will examine each of these facets.

The context of the public information systems in Brazil and the health sector

The Brazilian Constitution establishes the Sistema Único de Saúde (SUS) (Integrated Health System) on the basis of a decentralized model. The states and municipalities enjoy autonomy in the administration of health sector ac-

5 Opengovdata, *8 Principles of Open Government Data*.
6 J. Manyika *et al., Big data: The next frontier for innovation, competition, and productivity.*
7 R. C. G. Sant'ana y F. Rodrigues de Assis, "Acessando dados para visualização de afinidades nas votações entre parlamentares do Senado".
8 C. Berrío-Zapata, "Entre la Alfabetización Informacional y la Brecha Digital: reflexiones para una reconceptualización de los fenómenos de exclusión digital". [Between informational literacy and the digital divide: reflections toward a reconceptualization of digital exclusion phenomena]
9 M. B. Gurstein, "Open data: Empowering the empowered or effective data use for everyone?"; P. Norris, *Digital divide: Civic engagement, information poverty, and the Internet worldwide.*

tions and resources pursuant to their respective needs.[10] El Fundo Nacional de Saúde (FNS) (National Health Fund) is the organ in charge of management, distribution and control of health sector budgets. Citizen participation was included in the management of health pursuant to Act 8.142/90, which established community committees called Conferências de Saúde y Conselhos de Saúde) (Health Committees and Health Counsels), whose job it is to oversee the proper allocation of health resources pursuant to the provisions of decree 1.232/94.[11] Allocation transfers are grouped in funding blocks that are subdivided and assigned to component actions and programs. These blocks are defined in Ordinance 204/2007 for the following areas: a) basic health services, b) complex ambulatory services and medium- or high-grade hospitalization, c) health oversight, d) pharmaceutical assistance, and e) SUS management.[12] Professionals serving on these counsels and in charge of these funding blocks must have legal and administrative knowledge of the field in question and they must be familiar with the public health needs of their locality. All information of this structure resides in the so called DATASUS system.

In the 1988, the Braziian Constitution regulated public access to data in the following terms: "[...] todos têm direito a receber dos órgãos públicos informações de seu interesse particular, ou de interesse coletivo ou geral, que serão prestadas no prazo da lei, sob a pena de responsabilidade, ressalvadas aquelas cujo sigilo seja imprescindível à segurança da sociedade e do Estado".[13]

This same document mandated the creation of mechanisms for consulting information: "Cabem à administração pública, na forma da lei, a gestão da documentação governamental e as providências para franquear sua consulta a quantos dela necessitem".[14]

In 2011 the Information Access Act (12.527) was promulgated. This act added new duties with regard to public information access to governmental documents and confidentiality. Public and private organization are subject to the terms of this Act, which modified the previous legal ordinance by

10 R. F. d. Brasil, *Constituição da República Federativa do Brasil.*

11 R. F. d. Brasil, Lei Nº 8.142 de 28 de Dezembro de 1990. Dispõe sobre a participação da comunidade na gestão do Sistema Único de Saúde (SUS) e sobre as transferências intergovernamentais de recursos financeiros na área da saúde e dá outras providências; Decreto Nº 1.232, de 30 de Agosto de 1994. Dispõe sobre as condições e a forma de repasse regular e automático de recursos do Fundo Nacional de Saúde para os fundos de saúde estaduais, municipais e do Distrito Federal, e dá outras providências

12 R. F. d. Brasil, Portaria Nº 204 /GM de 29 de janeiro de 2007. Regulamenta o financiamento e a transferência dos recursos federais para as ações e os serviços de saúde, na forma de blocos de financiamento, com o respectivo monitoramento e controle.

13 Artículo 5o., inciso 33 de la *Constituição da República Federativa do Brasil.*

14 *Idem.*

changing "confidentiality" of government documents from a general feature to a specific exception.[15] The use data networks to share documents became compulsory: "Para cumprimento do disposto no caput, os órgãos e entidades públicas deverão utilizar todos os meios e instrumentos legítimos de que dispuserem, sendo obrigatória a divulgação em sítios oficiais da rede mundial de computadores (internet)".[16]

This year, Brazil joined the multilateral Open Government Partnership, taking on the obligation to make efforts to provide transparency and ensure access to information. The Open Government Partnership establishes targets that are periodically evaluated by independent committees,[17] even as Brazil had in 2009 already established digital inclusion policies through presidential decree 6.991, de 2009, known as the National Digital Inclusion Plan.[18]

DATASUS, ITS PROBLEMS AND THE CONCEPT OF INFORMATION FIELD

DATASUS is an informatics system that compiles and makes available the information of the Integrated Health System (SUS), including information regarding its administrative actions and federal government funding through the Ministry of Health. These resources are allocated pursuant to Article 2 of Act 8.142 (1990) to cover expenditures of the Ministry of Health, its agencies and administrative agencies, and are also allocated to the federated states and municipalities in the country. Its portal is known as DATASUS. DATASUS has gradually become more visible in accord with the growing demand for information; however, the relations between the system and the user did not improve.

In 2013, Rita Cassiano of the Universidad Estadual Paulista UNESP performed a study of professional nursing users in the City of Assis, Brazil, São Paulo, Brazil[19] in which she measured user degree of mastery of DATASUS.

15 R. F. d. Brasil, Lei nº 12.527 de 18 de novembro de 2011. Regula o acesso a informações previsto no inciso XXXIII do art. 5o, no inciso II do § 3o do art. 37 e no § 2o do art. 216 da Constituição Federal; altera a Lei no 8.112, de 11 de dezembro de 1990; revoga a Lei no 11.111, de 5 de maio de 2005, e dispositivos da Lei no 8.159, de 8 de janeiro de 1991; e dá outras providências.

16 Capítulo II, artículo 8o. de la Lei nº 12.527 de 18 de novembro de 2011.

17 O. G. Partnership. *Open Government Partnership Declaration.*

18 R. F. d. Brasil, Decreto 6.991 de 27 de outoubro de 2009. Institui o Programa Nacional de Apoio à Inclusão Digital nas Comunidades - Telecentros.BR, no âmbito da política de inclusão digital do Governo Federal, e dá outras providências.

19 R. d. C. Cassiano Lopes, *Percepção dos usuários sobre o processo de acesso a dados da saúde em sítios do Governo Federal*.

The results were worrisome. These users, consisting of health sector workers and students, were unable for a variety of reasons to take advantage of the available data structure. The reasons behind these failures included difficulties with menus, broken hyperlinks, unfamiliarity with data display mechanism and unawareness of the administrative structure.

What is worrying is that this situation is not unique to Brazil: it is quite common around the world.[20] About one third to half of all online time is wasted on useless queries and interactions with information systems.[21] It has been estimated that fully half of all internet users in the United States of America feel dissatisfied with the degree of usefulness and granularity of information provided in government websites. They also are frustrated with the time investment required to extract such information that is exacerbated by the opaque terminology used, the unfamiliar thematic organization and deficient metadata support devices.[22]

Other reported sources of user frustration with government websites include unpredictability of interfaces,[23] slow upload and download speed,[24] display deficiencies, unintelligible content and the dearth of user support.[25] The situation is exacerbated, when we understand that these are merely the "hard" elements of information systems,[26] the visible portion of a larger problem. Underlying these issues are the socio-technical properties of the system that Checkland called the "soft" matter that configure the "information field",[27] The information field is a transparent, historical, contextual, individual and collective technological and sociological informational structure that is crisscrossed by conflicting and cooperating forces acting in accord with the laws of field theory.[28]

20 V. S. Oliveira, *Buscando interoperabilidade entre diferentes bases de dados: o caso da biblioteca do Instituto Fernandes Figueira;* E. M. F. Barboza y E. M. d. A. Nunes, "A inteligibilidade dos websites governamentais brasileiros eo acesso para usuários com baixo nível de escolaridade".

21 J. Lazar *et al.,* "Help! I'm lost: User frustration in web navigation".

22 K. Bessiere *et al. Understanding Computer user frustration: Measuring and Modeling the disruption from poor designs.*

23 B. Shneiderman, "Designing information-abundant web sites: issues and recommendations"; *Designing The User Interface: Strategies for Effective Human-Computer Interaction, 4/e (New Edition).*

24 J. Ramsay *et al.* "A psychological investigation of long retrieval times on the World Wide Web."

25 Bessiere *et al., Understanding Computer user frustration…*

26 P. Checkland, "Systems thinking."

27 Berrío-Zapata, "Una visión crítica de la intervención en Tecnologías de la Información y Comunicación (TIC) para atacar la brecha digital y generar desarrollo sostenible en comunidades carenciadas en Colombia: el proyecto Cumaribo." [A critical vision of interventions in information and communication technologies in order to attack the digital divide and generate sustainable development in marginalized communities in Colombia: the Cumaribo project]

28 K. Lewin, *La teoría del campo en la ciencia social. [Field theory in social science]*

The information field can be understood from the following five perspectives:

a) As a technical, technological architecture that includes micro-power, oversight and control structures that guide retrieval of information and monitor users within the standardization field of action, acting as a digital panopticon.[29]
b) As a semiotic, ideological and cultural structure of isotopies that shift and imbed representations and routines from one society to another.[30] Their main transmission medium is classificatory nomenclatures.[31]
c) As a field of conflict and cooperation among informational agents in terms of symbolic negotiation[32] and negotiation of meaning.[33]
d) As a field of action for informational behavior of users and the formulators of the system.
e) As an epistemological, historical, cultural and ideologically conceived object that is studied and explained from the standpoint of common sense, science and technology.[34]

These approaches, which comprise more than 50 years of social science research seeking to provide an accurate understanding of informational phenomena, should be considered by those in charge of designing information policy if they wish to enjoy greater efficiency in the development of associated policies. The conceptualization of public information policies is still wanting for interdisciplinary approaches and a more complex vision. These deficiencies, therefore, turn up in critical information systems such as DATASUS.

29 S. Zuboff, "Be the friction: Our Response to the New Lords of the Rings."
30 I. Blikstein, *Kaspar Hauser ou a fabricação da realidade;* C. Avgerou, "Information systems in developing countries: a critical research review."
31 H. A. Olson, *The power to name: locating the limits of subject representation in libraries.*
32 In the informatics field, Kiingas defines symbolic negotiation as a process by which the parties try to reach agreements on the intellective media to serve their purposes through the application of symbolic reasoning techniques. This is a definition leaning toward mathematical logic including socio-cultural elements. P. Kiingas and M. Matskin. "Partial deduction for linear logic: the symbolic negotiation perspective".
33 For Bouquet, meaning negotiation is any kind of viable approach to semantic interoperability between autonomous entities, who cannot evaluate semantic problems by "by looking inside the head of the other." As such, they accept a social process of negotiation and convention regarding the meaning (semantics) and the intention of the speaker (pragmatics) in the communication process. Burato defines them simply as the general process by which the agents come to agreement about the meanings of a subset of terms. P. Bouquet and M. Warglien. *Meaning negotiation: an invitation;* E. Burato *et al.* "Meaning Negotiation as Inference."
34 K. Tuominen *et al.* "Information Literacy as a Sociotechnical Practice."

Information science as driver of public information policy management

Why are informational phenomena ignored in the field of public information policy management? Why do we continue to see cases such as DATASUS in the sphere of regional public information? Latin American political science moves along a road in which deterministic and complex outlooks coexist,[35] but in practice formalist processes take over that squash any kind of dialectic or participative approach. There is an authoritarian, institutionalized tradition at the foundation of political action systems, which O'Donnell called the "authoritarian bureaucratic state".[36]

All analyses of the formulation of informational policy are conditioned by context, public deliberation and construction of discourses.[37] These factors are affected by the tendency to oversimplify and, as such, they contribute to the loss of essential elements that public policy determines.[38] This is why the interdisciplinary approach of information science (IS) can serve to drive the formulation of public information policies.

To begin this approach between IS and information policies, we provide a series of reflections arising from application of Moore's information policy analysis matrix,[39] in the dimensions of "human resources" and "information policy markets" as these are posited by Sebastián and Rodríguez.[40] The following two questions shall serve as guideposts for this discussion:

1) The legitimation and adjustment of internet-based informational architectures; and
2) The construction of "empathy" between informational structures and the needs, feelings and abilities of users.

35 G. Flexor y S. P. Leite. "Análise de políticas públicas: breves considerações teórico-metodológicas."
36 G. A. O'Donnell, *Modernization and bureaucratic-authoritarianism: Studies in South American politics;* "Reflections on the patterns of change in the bureaucratic-authoritarian state."; *Catacumbas.*
37 S. H. Linder y B. G. Peters. "A metatheoric analysis of policy design."
38 Flexor y Leite, "Análise de políticas públicas…".
39 N. Moore, *Information policy and strategic development: a framework for the analysis of policy objectives.*
40 M. C. Sebastián *et al.* "La necesidad de políticas de información ante la nueva sociedad globalizada."

In this discussion, the state plays the role of protagonist in term of symbolic negotiation and violence[41] (negotiation of social representations and their imposition by decree or cooptation). As such, their agents must have clear, broad-based ideas regarding the costs of adjustment and implementation of new informational routines and the symbolic deconstruction of the informational market that this supposes. To these ends, the theories discussed herein contribute central concepts.

The context and the user are critical

It took IS 40 years to recognize the importance of the context in which information systems reside. Similar to the case of informatics science, IS was born during the fall of European powers and the rise of the United States of America and Soviet Russia, in a period marked by reformulation of the scientific, industrial and capitalistic project. Initially, both of these sciences were practical, hermeneutically oriented approaches with only slight critical impetus,[42] marked by a monolithic vision inherited from Euro-centric thought of Paul Otlet.[43] Considerations of the "user" or context other than those with a European profile were non-existent. By the end of the twentieth century, with the popularization of informatics, the question of citizens making use of information, i.e., the user public, began to draw more attention.[44] Later on, in 1976, Brenda Dervin criticized the assumption regarding the needs of users posited by so-called "experts".[45] Twenty years later, the social constructionist epistemology came entered the scene of IS[46] through which the role of context was afforded greater importance.[47] This approach, moreover, offered ecological and evolutionary insights to the disciplinary field of IS.[48]

This series of developments applied to the design of information policies entails serious historical, geographic and cultural consideration of the target

41 P. Bourdieu, "Structures, habitus, power: Basis for a theory of symbolic power"; M. N. Gonzalez de Gomez, "Novos cenários políticos para a informação"; Bourdieu, "La fabrique de l'habitus économique"; C. A. Tamayo Gómez *et al.* "Génesis del campo de Internet en Colombia: elaboración estatal de las relaciones informacionales". ["Genesis of the internet field in Colombia: state implementation of informational elations"]

42 L. J. McCrank, *Historical information science: An emerging unidiscipline.*

43 I. Rieusset-Lemarié, "P. Otlet's mundaneum and the international perspective in the history of documentation and information science."

44 B. M. Wildemuth y D. O. Case. "Early information behavior research."

45 B. Dervin, "Strategies for dealing with human information needs: Information or communication?"

46 K. Tuominen y H. Savolainen. *A Social Constructionist Approach to the Study of Information Use as Discursive Action*; Tuominen *et al.,* "Information Literacy…".

47 C. Courtright, "Context in information behavior research."

48 A. Spink y J. Currier. "Emerging Evolutionary Approach to Human Information Behavior".

population and the application of an interdisciplinary hermeneutics in order to specify the niches and profiles of users who are subject to the proposed informational governance.

Informational behavior of users and formulators

The roles of the user and the formulator of information systems are not fixed. These roles change and alternate as the activity of the subject and context change. What remains fixed is the egocentrism of the implicated subjects. The informational policies and systems are formulated on the basis of group assumptions and interests. From the standpoint of the user and despite its best of intentions, an information system is a sort of invasive force. An efficient symbolic negotiation is required in order to achieve real, lasting effects. Moreover, the self-organization processes gradually emerging from users must be monitored. These emerging elements are intricate and unforeseen. As such, they must be considered in the strategic vision that presupposes complexity and chaos.[49] The central problem resides in the meaning of actions and the structures for the participating agents.[50]

The relationship between policy designers and users is not an empty space, but rather a table on which diverse interest groups may cooperate and conflict as they play their cards, whether openly or covertly. Each of these factions struggles to increase the freedom of its discretionary freedom until such time as thee are checked by the power of the institutional context.[51] In such matters, the main problem is that of information asymmetry and the construction of self-regulation and sustainable means for balancing them out.

Rationality, the meaning of information, "informavores" and hive mentality

One cannot assume the informational behavior is rational. This is something already addressed in in limited rationality theory.[52] Thanks to Brenda

49 K. M. Eisenhardt y S. L. Brown. "Competing on the edge: strategy as structured chaos."
50 Dervin, "Sense-making theory and practice: an overview of user interests in knowledge seeking and use."
51 M. Crozier, *La sociedad bloqueada;* P. Medellín Torres, *La política de las políticas públicas: propuesta teórica y metodológica para el estudio de las políticas públicas en países de frágil institucionalidad. [The blocked society: P. Medellín Torres, The politics of public policy: theoretical proposal for the study of public policies in country with fragile institutions.]*
52 H. A. Simon, *Models of bounded rationality.*

Dervin, we know that a) giving more information is not necessarily better; b) information is not consumed out of context; c) formal information channels are not always the best; and d) the multiple functions of information are not simple, specific or pragmatic. The purpose of information is to make meaning and to conceptualize. To know is more of a verb than a noun: it is diversity and complexity. Informational behavior, understood as everyday human action mediated by language, is a social construction erected through negotiation of meaning. The design of public policy must take into account the reality of the user, supported by the concept of social fabric.[53] It is important to understand the information flows in the community logic from the standpoint of "small worlds"[54] and their social gratification structures.[55] Information policies must be designed with a bottom-up vision, that is, from the community upward and not from the standpoint of technology, technological trends or the world-view of the formulators. The process must include consultation with users and interest groups, while providing room for negotiation to make permanent corrections.

Nurtured by information, human beings may be seen as *informavores,*[56] that constantly attempt to flee from cognitive dissonance and doubt. The data hunter needs to build meaning at the least cost in terms of energy investment. As such, credibility beats out accuracy, convenience outdoes veracity and consonance trumps dissonance. An informational architecture is not accepted as much for its technical excellence as for the meaning it conveys to the user in terms of economy of effort. Even though we inhabit a grapho-centric world,[57] the formal written channels are not necessarily those most widely used. When information is seasoned with ludic elements, it no doubt enjoys greater acceptance.[58]

Human being move in swarms,[59] informational chain structures that unconsciously drive coordinated collective action, while mobilizing primal mechanisms based on the emotional underpinnings of the herd.[60] This feature of human behavior cannot be left out of the design of information policies.

53 Tuominen y Savolainen. *A Social Constructionist Approach…*
54 Concepto de Efreda Chatman que refiere al poder que un grupo social pequeño y cerrado ejerce sobre la actividad informacional de sus miembros.
55 E. A. Chatman, "Life in a small world: Applicability of gratification theory to information-seeking behavior."; "The impoverished life-world of outsiders."
56 G. A. Miller, "Informavores".
57 H. M. Serres, *Hominescências: O começo de uma outra humanidade.*
58 W. Stephenson, *The play theory of mass communication.*
59 S. Gutiérrez *et al.* "Swarm Intelligence Applications for the Internet."
60 D. Nahl, "The Centrality of the Afective in Information Behavior".

Asymmetries of information, energy requirements and opportunism

Ronald Coase saw that all economic transactions are informational and entail the costs of searching, negotiation and preservation.[61] The transaction is an information exchange structure that stipulates requited payments to be made in the future for the property, asset or service that is enforceable through express stipulations to fulfill respective duties. We would never attempt to access all information because search costs are prohibitive. Acting with limited information, we prefer data that is easy to access regardless of its quality. We exchange information with agents who are unfamiliar and also less than ideal. We prefer simplified negotiations to more complex ones that might be more favorable to our interest. This information gathering behavior of minimum effort has been observed in the field of linguistics[62], library science[63] and information science.[64]

The transaction cost and the tendency to exert the minimum effort are sources of informational asymmetry. Those agents with energy/economic capacity are able to gain access to more and better information, thereby reaping advantages. Members of government, organizational representatives and knowledge workers are examples of groups that are capable of affording the high costs of information, while also clearing technical and competency barriers. This concentration of power will tend to institutionalize, with the inference that it is the proper order things. Once this situation is deemed natural, the dominant interest groups will have reasons to reject technological or policy changes that cast doubt upon their dominance and otherwise put their information capital at risk. All policies will simultaneously have to offer, market and impose their proposals to change the state of things.

This asymmetrical situation is intersected by what Williamson defined as "opportunism," which is the tendency to economically exploit counterparties in transactions without regard to the damage that might be done.[65] Opportunism is the basis of the agent-principal dilemma in agency theory.[66] A social actor called the "principal" (which may be a person or a collective) chooses and formally designates an "agent" to act on his behalf. Once duly

61 R. Coase, *The firm, the market and the law.*
62 G. K. Zipf, *Human behavior and the principle of least effort: an introduction to human ecology.*
63 Z. Liu y Z. Y. L. Yang. "Factors influencing distance-education graduate students' use of information sources: A user study."
64 C. N. Mooers, "Mooers' Law or Why Some Retrieval Systems Are Used and Others Are Not."; L. A. Adamic y B. A. Huberman. "Zip's law and the Internet."
65 O. Williamson y S. E. Masten, *The economics of transaction costs.*
66 S. A. Ross, "The economic theory of agency: The principal's problem"; B. Mitnick, "Origin of the theory of agency: an account by one of the theory's originators".

empowered, the agent manipulates the information flows he receives in the name of the principal for the purpose of increasing his power and influence. Elected public officials and bureaucrats representing citizens are affected by the institutional agency phenomenon. As such, their handling of information policy will be influenced by minority interests and maneuvers that tend to support the information monopoly they wield.[67] All information policy will bring changes in the statutory agency relationships existing between government, citizens and the state; and will tend to create uncertainty and opposition among government political groups, which often indulge in covert boycotts of each other's policies and positions. The behaviors of government officials should also be monitored and subject to ongoing adjustment. All policy is a process of ongoing learning and accommodation.

Since information is limited, expensive to secure and subject to opportunism, that portion of information especially valued for being optimal or strategic will be retained by powerful interest groups. Using the Akerlof lemon theorem,[68] we can fairly deduce that monopolization of the best information and the citizen's incapacity to differentiate good information from bad would cause growth in the use of the latter. These reflections bring us to the question: Just what constitutes "good information?"

This problem is one of "relevance of information," something Saracevic considered key,[69] concluding that we have not invested enough resources to research this problem, even when globalization and popularization of informatics media have become a public problem. With the privatization of search and retrieval media, the problem of relevance was also privatized, and studies on relevance have offered scant improvements to information systems.

In conclusion, the understanding of information in terms of transactional costs within an asymmetrical context and in light of agency, opportunism and monopoly is a prerequisite of designing realistic policies. Research on the concept of relevance embodied in each policy, user and circumstance is also needed; unfortunately, this area of research has been shirked and left to flounder by the large information corporations.

67 Eisenhardt, "Agency theory: An assessment and review".
68 G. A. Akerlof, "The market for" lemons": Quality uncertainty and the market mechanism".
69 Saracevic, T. "The concept of "relevance" in information science: A historical review"; "Relevance: A review of and a framework for the thinking on the notion in information science."; "Relevance: A review of the literature and a framework for thinking on the notion in information science. Part III: Behavior and effects of relevance".

Informational competencies and empowerment of the citizen

The concept of I-literacy, or international literacy (ALFIN), also contributes to the study of information policy. The development of informational competencies requires literacy in informatics technology, and in reading and writing; but these are necessary conditions not sufficient condition of ALFIN. Two additional levels are required: the meta-analytical level, or the capacity to assess and duplicate sources; and the critical ability underpinning comprehension of discourse and the ability to propose alternatives. It is an analytic, synthetic, shared information processing chain for debate and generation of new proposals.[70] The final level consists of what Capurro calls "responsible moral action",[71] a kind of informed, foundational action that demands ongoing communication and critical dialogue with other agents for the purpose of securing data, joint reflection and retaining flexibility in the opinions held.

Creating informational competencies is difficult and expensive to manage because it entails profound changes in terms of education and empowerment. It requires ensuring basic rights, such as the right to education and free expression. It means thinking in broad terms about variables that are apparently far removed from matters of information policy, but which can nonetheless determine their success or failure.

Conclusions

The countries lying on the so-called "periphery" were late to the digital information game. Because of their lack of experience and human capital they ended up reinforcing their traditional dependence on Europe and North America, importing the policies in vogue without reflection or genuine knowledge of cause. These policies tend to clash with the typical features of the informational order of developing countries, a reality that has been neglected in terms of research and is as yet largely unknown. Information policies in Latin America have been posited in a context of problems, restrictions, inequality and authoritarianism.

A distinct approach is urgently needed, one that can be built on the foundation of social science and research in IS describing human informa-

70 Berrío-Zapata, "Entre la Alfabetización Informacional…". ["Between Informational Literacy…"]

71 R. Capurro, "Información y acción moral en el contexto de las nuevas tecnologías". ["Information and moral action in the context of new technologies."]

tional behavior. This paper compiles several of these theories to serve as lenses to examine DATASUS. This exercise is presented in *Figure 1.* This exercise allowed us to develop a drawing of the "informational field" of health in Brazil, whose center is DATASUS. This summative, but not simplified, picture allows us to articulate multiple phenomena and lines of research that could provide an empirical-theoretical foundation for information policy makers.

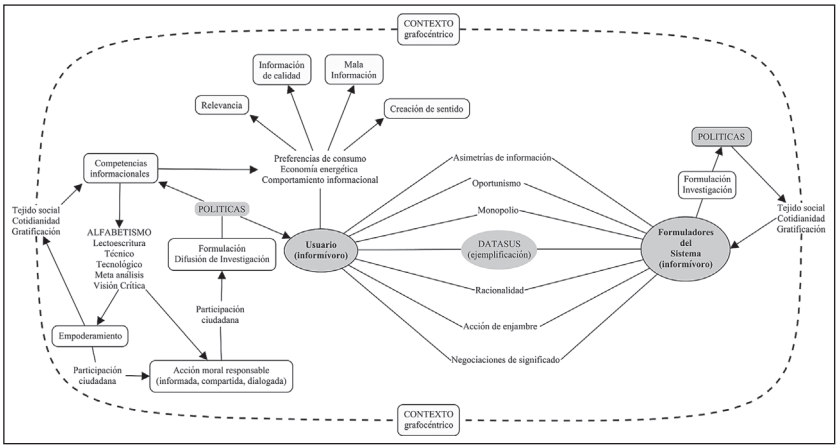


Figure 1. Diagram of the "information field" structured by factors that affect the development of information policy, exemplified using the Brazilian health information system DATASUS. Each node corresponds to the different theoretical concepts developed in this paper and is a research area to be explored. Source: By author.

Each theoretical area addressed in this paper generates research questions, such as the following:

- Context: What is the context of the users of DATASUS? Are they largely urban dwellers? Are they in small cities? What is the history of DATASUS and who are its stakeholders? What interests and conflicts align with these *stakeholders*?
- Meaning: How do the diverse users and stakeholders perceive, represent and associate with the DATASUS system? Are these representations associated with other social or cultural processes and features? What is the definition and level of relevance of the system and its contents from the standpoint of the users and the stakeholders?
- What is the system's degree of "intuitiveness"? What are its ludic and gratification elements? What is the system's rationale and that of the user? Is there room for "symbolic negotiation" with users?

- Asymmetries: Who are the system actors that can be subject to the phenomena of agency, opportunism and information monopoly; and what asymmetries can they produce? How can these inequalities be counteracted in a sustainable, self-regulating way?
- Effort: What is the degree of usability of the system in terms of energy investment? What is the degree of complexity of contents and data representation?
- ALFIN: What is ALFIN level of the users in diverse fields that converge in the system (legal, medicine, bureaucracy, etc.)? Is the system aligned with the competencies of the target users?
- Control: What kinds of "swarm" phenomena can be triggered in the system? What kinds of consequences can these phenomena produce? How can detrimental consequences be anticipated and controlled?

These discussion areas can be used in a complete review exercise or evaluation of any public information policy project. The usefulness of this kind of questioning and thought structures resides in the attempt to preserve the complexity implied in the development of policies, while maintaining an organized, systematic approach based on consistent theoretical models. This exercise also encourages previously unexplored perspectives, such as those associated with problems of power, agency, information monopoly and opportunism, and the principle of least effort.

The dream of a public network of open and free data, and the nightmare of oversight, control, electronic colonization, and other forms of power concentration, coexist in the project of the information society. The dominant actors hope to perpetuate information asymmetries that provided them advantage. Only a state policy designed with an awareness of these conflicts will be able to bring control and balance to the field. Policy makers, however, often end up acting through authoritarian schemes that fail to question the local reality, while never endeavoring to make room for negotiation with users. They are content merely to mimic imported perspectives and impose these approaches through the force of law, accompanied by hefty doses of demagoguery. The investment of resources favors things rather than persons. Without research or technically or ethically literate users, technological progress will continue to foster ever greater informational asymmetry. In this way, the people will be more malleable and the already feeble state of the institutional order will be further eroded; while normative efforts will be largely cosmetic leaving the underlying state of things untouched.

Works cited

Adamic, L. A. y B. A. Huberman. "Zip's law and the Internet." *Glottometrics* 3 (1) (2000): 143-150.

Akerlof, G. A. "The market for" lemons": Quality uncertainty and the market mechanism." *The quarterly journal of economics* (1970): 488-500.

Avgerou, C. "Information systems in developing countries: a critical research review." *Journal of Information Technology* 23 (3) (2008): 133-146.

Barboza, E. M. F. y E. M. d. A. Nunes. "A inteligibilidade dos websites governamentais brasileiros eo acesso para usuários com baixo nível de escolaridade." *Inclusão Social* 2 (2) (2007): 19-33.

Berrío-Zapata, C. "Una visión crítica de la intervención en Tecnologías de la Información y Comunicación (TIC) para atacar la brecha digital y generar desarrollo sostenible en comunidades carenciadas en Colombia: el proyecto Cumaribo." *Management* XIV (23-24) (2005): 165-181.

—— "Entre la Alfabetización Informacional y la Brecha Digital: reflexiones para una reconceptualización de los fenómenos de exclusión digital." *Revista Interamericana de Bibliotecología* 35 (1) (2012): 39-53.

Bessiere, K. *et al. Understanding Computer user frustration: Measuring and Modeling the disruption from poor designs.* Digital Repository at the University of Maryland. Maryland, University of Maryland Computer Science Department. CS-TR-4409 UMIACS; UMIACS-TR-2002-89 HCIL-TR-2002-18, 2003.

Blikstein, I. *Kaspar Hauser ou a fabricação da realidade.* São Paulo: Editora Pensamento-Cultrix Ltda, 2003.

Bouquet, P. y M. Warglien. *Meaning negotiation: an invitation.* AAAI Workshop 2002 Edmonton, Association for the Advancement of Artificial Intelligence (AAAI), 2002.

Bourdieu, P. "Structures, habitus, power: Basis for a theory of symbolic power", en N. B. Dirks, G. Eley y S. B. Ortner (ed.), *Culture/power/history: A reader in contemporary social theory.* New Jersey, Princenton University Press: 155-199, 1994.

—— "La fabrique de l'habitus économique." *Actes de la recherche en sciences sociales* (5) (2003): 79-90.

Brasil, R. F. d. *Constituição da República Federativa do Brasil.* Brasilia, 1988.

Brasil, R. F. d. Lei Nº 8.142 de 28 de Dezembro de 1990. Dispõe sobre a participação da comunidade na gestão do Sistema Único de Saúde (SUS) e sobre as transferências intergovernamentais de recursos financeiros na área da saúde e dá outras providências. Brasilia, 1990.

Brasil, R. F. d. Decreto Nº 1.232, de 30 de Agosto de 1994. Dispõe sobre as condições e a forma de repasse regular e automático de recursos do Fundo Nacional de Saúde para os fundos de saúde estaduais, municipais e do Distrito Federal, e dá outras providências. Brasilia, 1994.

Brasil, R. F. d. Portaria Nº 204 /GM de 29 de janeiro de 2007. Regulamenta o financiamento e a transferência dos recursos federais para as ações e os serviços de saúde, na forma de blocos de financiamento, com o respectivo monitoramento e controle. Brasilia, 2007.

Brasil, R. F. d. Decreto 6.991 de 27 de outoubro de 2009. Institui o Programa Nacional de Apoio à Inclusão Digital nas Comunidades - Telecentros.BR, no âmbito da política de inclusão digital do Governo Federal, e dá outras providências. Brasilia, 2009.

Brasil, R. F. d. Lei nº 12.527 de 18 de novembro de 2011. Regula o acesso a informações previsto no inciso XXXIII do art. 5o, no inciso II do § 3o do art. 37 e no § 2o do art. 216 da Constituição Federal; altera a Lei no 8.112, de 11 de dezembro de 1990; revoga a Lei no 11.111, de 5 de maio de 2005, e dispositivos da Lei no 8.159, de 8 de janeiro de 1991; e dá outras providências. Brasilia, 2011.

Brasil, R. F. d. Lei nº 12.527 de 18 de novembro de 2011. Regula o acesso a informações previsto no inciso XXXIII do art. 5o, no inciso II do § 3o do art. 37 e no § 2o do art. 216 da Constituição Federal; altera a Lei no 8.112, de 11 de dezembro de 1990; revoga a Lei no 11.111, de 5 de maio de 2005, e dispositivos da Lei no 8.159, de 8 de janeiro de 1991; e dá outras providências. Capítulo II, Artículo 8º, inciso 2. Brasilia, 2011.

Burato, E. *et al.* "Meaning Negotiation as Inference." *Arxiv.org Cornell University.* Ithaca NY, Cornell University. arXiv:1101.4356v1 (2011): 1-54.

Capurro, R. "Información y acción moral en el contexto de las nuevas tecnologías." *VII Encontro Internacional de Informação, Conhecimento, Ética e Ação,* Marília, Brasil, Universidade Estadual Paulista (UNESP), 2011.

Cassiano Lopes, R. d. C. *Percepção dos usuários sobre o processo de acesso a dados da saúde em sítios do Governo Federal. Encontro Internacional Dados, Tecnologia e Informação.* Marilia, Universidade Estadual Paulista UNESP, 2013.

Chatman, E. A. "Life in a small world: Applicability of gratification theory to information-seeking behavior." *Journal of the American Society for information science* 42 (6) (1991): 438-449.

—— "The impoverished life-world of outsiders." *Journal of the American Society for information science* 47 (3) (1996): 193-206.

Checkland, P. "Systems thinking." *Rethinking management information systems* (1999): 45-56.

Coase, R. *The firm, the market and the law.* Chicago: University of Chicago, 1988.

Courtright, C. "Context in information behavior research." *Annual Review of Information Science and Technology* 41 (1) (2007): 273-306.

Crozier, M. *La sociedad bloqueada.* Buenos Aires, Amorrortu, 1970.

Dervin, B. "Strategies for dealing with human information needs: Information or communication?" *Journal of Broadcasting & Electronic Media* 20 (3) (1976): 323-333.

—— "Sense-making theory and practice: an overview of user interests in knowledge seeking and use." *Journal of knowledge management* 2 (2) (1998): 36-46.

Eisenhardt, K. M. "Agency theory: An assessment and review." *Academy of management review* 14 (1) (1989): 57-74.

Eisenhardt, K. M. y S. L. Brown. "Competing on the edge: strategy as structured chaos." *Long Range Planning* 31 (5) (1998): 786-789.

Flexor, G. y S. P. Leite. "Análise de políticas públicas: breves considerações teórico-metodológicas." *Encontro Nacional de Economia Política* 12 (2007).

Frey, K. *et al. O acesso à informação. Caminhos da transparéncia: análise dos componentes de um sistema nacional de integridade.* B. W. Speck. Campinas, Editora da Unicamp, 2002.

Gonzalez de Gomez, M. N. "Novos cenários políticos para a informação." *Ciência da Informação* 31 (1) (2002): 27-40.

Gurstein, M. B. "Open data: Empowering the empowered or effective data use for everyone?" *First Monday* 16 (2) (2011).

Gutiérrez, S. *et al.* "Swarm Intelligence Applications for the Internet." *Encyclopedia of Internet Technologies and Applications.* Hershey, PA: Information Science Publishing, 2007.

Küngas, P. y M. Matskin. "Partial deduction for linear logic: the symbolic negotiation perspective", en J. Leite, A. Omicini, P. Torroni y P. Yolum, *DALT 2004: Declarative Agent Languages and Technologies.* Berlin, Springer-Verlag. LNAI 3476: 35-52, 2005.

Lazar, J. *et al.* "Help! I'm lost: User frustration in web navigation." *It & Society* 1 (3) (2003): 18-26.

Lewin, K. *La teoría del campo en la ciencia social.* Buenos Aires, Editorial Paidós, 1978.

Linder, S. H. y B. G. Peters. "A metatheoric analysis of policy design", en W. N. Dunn y R. M. Kelly, *Advances in policy studies since 1950.* London, Transaction Publishers, vol. 10: 201-237, 1992.

Liu, Z. y Z. Y. L. Yang. "Factors influencing distance-education graduate students' use of information sources: A user study." *The Journal of Academic Librarianship* 30 (1) (2004): 24-35.

Malin, A. M. B. "Gestão da informação governamental: em direção a uma metodologia de avaliação." *DataGramaZero - Revista de Ciência da Informação* 7 (5) (2006).

Manyika, J. *et al. Big data: The next frontier for innovation, competition, and productivity.* New York: McKinsey Global Institute, 2011.

McCrank, L. J. *Historical information science: An emerging unidiscipline,* Information Today, Inc., 2001.

Medellín Torres, P. *La política de las políticas públicas: propuesta teórica y metodológica para el estudio de las políticas públicas en países de frágil institucionalidad.* Proyecto "Política y políticas públicas en los procesos de reformas en América Latina. Similitudes y Diversidades" (Proyecto FRA/02/073). Santiago de Chile, Naciones Unidas, CEPAL, 2004.

Miller, G. A. "Informavores", en F. Machlup y U. Mansfield, *The study of information: Interdisciplinary messages.* New York, Wiley-Interscience: 111-113, 1983.

Mitnick, B. "Origin of the theory of agency: an account by one of the theory's originators." Available at *SSRN* 1020378, 2006.

Mooers, C. N. "Mooers' Law or Why Some Retrieval Systems Are Used and Others Are Not." *Bulletin of the American Society for Information Science and Technology* 23 (1) (1996): 22-23.

Moore, N. *Information policy and strategic development: a framework for the analysis of policy objectives.* Aslib proceedings, MCB UP Ltd., 1993.

Nahl, D. "The Centrality of the Afective in Information Behavior", en D. Nahl y D. Bilal, *Information and emotion: The emergent affective paradigm in information behavior research and theory.* Medford, NJ, Information Today Inc: 3-37, 2007.

Ndou, V. "E-government for developing countries: opportunities and challenges." *The Electronic Journal of Information Systems in Developing Countries* 18 (2004).

Norris, P. *Digital divide: Civic engagement, information poverty, and the Internet worldwide.* New York, Cambridge University Press, 2001.

O'Donnell, G. A. "Reflections on the patterns of change in the bureaucratic-authoritarian state." *Latin American Research Review* 13 (1) (1978): 3-38.

—— *Modernization and bureaucratic-authoritarianism: Studies in South American politics.* Institute of International Studies, University of California Berkeley, 1973.

—— *Catacumbas*. Buenos Aires, Prometeo Libros Editorial, 2008.

O. G. Partnership. *Open Government Partnership declaration,* 2011. http://www.opengovpartnership.org/about

Oliveira, V. S. *Buscando interoperabilidade entre diferentes bases de dados: o caso da biblioteca do Instituto Fernandes Figueira.* Fundação Instituto Oswaldo Cruz Rio de Janeiro Escola Nacional de Saúde Pública Sergio Arouca, 2005. Mestre.

Olson, H. A. *The power to name: locating the limits of subject representation in libraries.* Kluwer Academic Publishers Dordrecht, 2002.

Opengovdata.org. *8 Principles of Open Government Data*. 2007.

Ramsay, J. *et al.* "A psychological investigation of long retrieval times on the World Wide Web." *Interacting with computers* 10 (1) (1998): 77-86.

Rieusset-Lemarié, I. "P. Otlet's mundaneum and the international perspective in the history of documentation and information science." *Journal of the American Society for information science* 48 (4) (1997): 301-309.

Ross, S. A. "The economic theory of agency: The principal's problem." *The American Economic Review* 63 (2) (1973): 134-139.

Sant'ana, R. C. G. y F. Rodrigues de Assis. "Acessando dados para visualização de afinidades nas votações entre parlamentares do Senado." *Informação & Sociedade: Estudos* 23 (1) (2013).

Sant'ana, R. C. G. *Mensuração da disponibilização de informações e do nível de interação dos ambientes informacionais digitais da administração municipal com a sociedade. Faculdade de Filosofia e Ciências,Departamento da Ciência da Informação.* Marilia: UNESP. Doutorado: 158, 2008.

—— *Tecnologia e gestão pública municipal : mensuração da interação com a sociedade.* São Paulo, Cultura Acadêmica, Programa de Publicações Digitais da Pró-Reitoria de Pós-Graduação da Universidade Estadual Paulista "Júlio de Mesquita Filho" (UNESP), (2009).

Saracevic, T. "The concept of "relevance" in information science: A historical review." *Introduction to information science* (1970): 111-151.

—— "Relevance: A review of and a framework for the thinking on the notion in information science." *Journal of the American Society for information science* 26 (6) (1975): 321-343.

—— "Relevance: A review of the literature and a framework for thinking on the notion in information science. Part III: Behavior and effects of relevance." *Journal of the American Society for information Science and Technology* 58 (13) (2007): 2126-2144.

Sebastián, M. C. *et al.* "La necesidad de políticas de información ante la nueva sociedad globalizada." *Ciência da Informação* 29 (2) (2000): 22-36.

Serres, M. H. *Hominescências: O começo de uma outra humanidade.* Rio de Janeiro, Bertrand Brasil, 2003.

Shneiderman, B. "Designing information-abundant web sites: issues and recommendations." *International Journal of Human-Computer Studies* 47 (1) (1997): 5-29.

—— *Designing The User Interface: Strategies for Effective Human-Computer Interaction, 4/e (New Edition).* Pearson Education India, 2003.

Simon, H. A. *Models of bounded rationality.* Cambridge, Cambridge MIT, 1997.

Spink, A. y J. Currier. "Emerging Evolutionary Approach to Human Information Behavior", en A. Spink y C. Cole, *New Directions in Human Information Behavior.* Dordrecht, Netherlands: Springer: 13-31, 2006.

Stephenson, W. *The play theory of mass communication,* Transaction Publishers, 1988.

Tamayo Gómez, C. A. *et al.* "Génesis del campo de Internet en Colombia: elaboración estatal de las relaciones informacionales." *Signo y pensamiento* 28 (54) (2009): 238-264.

Tuominen, K. y H. Savolainen. *A Social Constructionist Approach to the Study of Information Use as Discursive Action*. Taylor Graham, 1997.

Tuominen, K. *et al.* "Information Literacy as a Sociotechnical Practice." *The Library Quarterly* 75 (3) (July, 2005): 329-345.

Wildemuth, B. M. y D. O. Case. "Early information behavior research." *Bulletin of the American Society for Information Science and Technology* 36 (3) (2010): 35-38.

Williamson, O. y S. E. Masten. *The economics of transaction costs.* Northampton, Massachusetts: Edward Elgar, 1999.

Zipf, G. K. *Human behavior and the principle of least effort: an introduction to human ecology.* Oxford, England: Addison-Wesley Pres, 1949.

Zuboff, S. "Be the friction: Our Response to the New Lords of the Rings." *Frankfurter Allgemeine,* Feuilleton, 2013.

Para citar este artículo:

Berrío Zapata, Cristian *et al.* 2016. "Comportamiento informacional y políticas públicas de información: consideraciones teóricas alrededor del caso de DATASUS en Brasil." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 19-41. http://dx.doi.org/10.1016/j.ibbai.2016.04.011

Modelo genérico de gestão da informação científica para instituições de pesquisa na perspectiva da comunicação científica e do acesso aberto

Fernando César Lima Leite
Sely Maria de Souza Costa *

Artículo recibido: 26 de agosto de 2014.
Artículo aceptado: 14 de mayo de 2015.

Resumo

Este artigo relata resultados de pesquisa que teve como objetivo geral propor modelo genérico de gestão da informação científica para instituições de pesquisa, tendo por base os fundamentos da comunicação científica e do acesso aberto. Trata-se de uma pesquisa de natureza teórica e exploratória. Do ponto de vista metodológico, é um estudo de abordagem mista que adotou a estratégia de triangulação concomitante. Os dados foram coletados por meio da aplicação de questionários, realização de entrevistas e lista de verificação e, em seguida, submetidos à análise estatística e de texto. Além da coleta e análise de dados empíricos, realizou-se análise de modelos de comunicação

* Ambos autores pertenecen a la Universidade de Brasília, Brasil. (fernandodfc@gmail.com); (selmar@unb.br)

científica e de gestão da informação identificados na literatura. O universo da pesquisa foi constituído dos pesquisadores vinculados às unidades de pesquisa do Ministério da Ciência, Tecnologia e Inovação e a base amostral, definida a partir de amostragem não probalística intencional, foram os pesquisadores do Centro Brasileiro de Pesquisas Físicas e do Museu de Astronomia e Ciências Afins. Como principal resultado da investigação apresenta-se modelo genérico de gestão da informação científica para institutos de pesquisa, tendo por base a comunicação científica e o acesso aberto, em sua versão gráfica e textual. No modelo, fluxos de entrada e saída de informação são sistematizados por processos de gestão da informação científica que estão envolvidos pela perspectiva da comunicação científica e do acesso aberto. Sua estrutura, além de embutir conceitos essenciais, considera o ambiente do instituto de pesquisa como um sistema aberto onde ocorre o fluxo da informação científica. O modelo proposto é constituído também por elementos flexíveis que representam especificidades institucionais e disciplinares, e que variam em função dos contextos dos institutos de pesquisa. Além disso, todo o conjunto de elementos e relações entre eles estão sob influência constante de forças provenientes da comunidade científica em uma perspectiva ampla.

Palabras-chave: Comunicação Científica; Acesso Aberto; Gestão da Informação; Informação Científica; Comunicação na Ciência.

Abstract

A generic model of scientific information management for research institutes based on principles of scientific communication and open access

Fernando César Lima-Leite and *Sely Maria de Souza-Costa*

This paper presents theoretical and exploratory research whose aim is to propose a generic model of scientific information management for research institutes based on principles of scientific communication and open access. The mixed methodological approach adopts the concurrent triangulation strategy. Data collected using questionnaires, interviews and checklists

were subjected to statistical and text analyses. In addition to collecting and analyzing empirical data, the study also presents an examination of the literature on communications and information management models. The object of study consisted of scientists associated with the Ministry of Science, Technology and Innovation; and the sample was acquired using intentional, non-probabilistic sampling of researchers of the Brazilian Centre for Physics Research and the Museum of Astronomy and Related Sciences. The study concludes with a generic model of scientific information management for research institutes built on the basis of scientific communication and open access to texts and graphical elements. In the model, the information input and output flows are systemized through scientific information management processes. Beyond imbedding keys, the structure approaches the research institute domain as an open system in which scientific information flows. The model proposed also offers flexible elements representing institutional and disciplinary particularities that vary depending on the context of each research institute. This set of elements and their interrelationships are, broadly speaking, under the constant influence of forces arising from the scientific community

Keywords: Scientific Communication; Open Access; Information Management; Scholarly Information; Scientific Information; Communication in Science.

Introdução

Diante das realidades da informação digital em rede, da mutação do modo de produção do conhecimento e suas demandas diferenciadas de acesso, uso e disseminação da informação no ambiente científico, da necessidade de reestruturação do sistema de comunicação científica e subversão de sua lógica, instituições científicas estão imersas em um cenário de incerteza cujo ambiente informacional requer transformações concretas. Mais do que nunca, é necessário que as instituições sistematizem processos que otimizem o ciclo da informação que alimenta e que resulta das atividades de pesquisa. As práticas e metodologias de gestão da informação científica pautadas na

estrutura do modelo tradicional de comunicação da ciência já não são suficientes para atender a estas expectativas.

A implementação de processos sistemáticos de gestão da informação científica norteados pelas demandas do novo ambiente informacional, promovem e otimizam fluxos de informação que são suportados pelo sistema de comunicação científica, de maneira que suas funções sejam potencializadas e ampliadas. A gestão da informação científica deve, portanto, considerar a nova perspectiva informacional e comunicacional do sistema científico. A comunicação da informação científica é um processo complexo que envolve e está presente ao longo de toda a cadeia de produção do conhecimento, ou seja, desde o momento em que pesquisadores formulam o problema de pesquisa até o momento do uso do novo conhecimento produzido por parte de outros pesquisadores. Assim, quanto mais apropriados ao contexto forem os processos de gestão da informação científica, mais coerentes e fluidos serão o processos de comunicação científica.

Desse modo, processos de gestão da informação científica devem corresponder às expectativas e comportamentos dos atores envolvidos e, ao mesmo tempo, serem compatíveis com a natureza da informação e do conhecimento científico e de sua produção e, naturalmente, com as forças e propriedades que governam e influenciam o seu fluxo. Desta feita, toda e qualquer influência sofrida pelo sistema de comunicação científica deve ser refletida nas práticas de gestão da informação científica.

Desde o surgimento da Internet, o maior evento que transformou, e não apenas modernizou, as bases sobre as quais o sistema de comunicação científica se estruturou foi a emergência de um movimento mundialmente conhecido como Acesso Aberto à Informação Científica. Na realidade, o acesso aberto constitui uma reação da comunidade científica à lógica do sistema de comunicação tradicional de comunicação da ciência, especialmente ao sistema de publicações. Seus pressupostos e estratégias compatibilizam esforços que contribuem para reestruturar/reformar o sistema de comunicação científica de modo que sejam removidas as barreiras presentes no fluxo da informação científica, como aquelas relacionadas com tecnologias, custos e direitos autorais. A principal intenção é fazer com que resultados de pesquisa científica estejam pública e permanentemente acessíveis e sem custo a quem possa interessar. Aliado a isso, por ser constituído também de processos de comunicação científica mais flexíveis, o modelo permite maior vazão a demandas das novas de formas de produção, compartilhamento e uso do conhecimento científico

A abordagem do acesso aberto tem se instituído gradativamente como modelo alternativo de comunicação da ciência. Por promoverem as condi-

ções que favorecem um maior controle institucional da informação científica, as estratégias do acesso aberto, como uma expressão emergente de um novo cenário da comunicação científica, torna-se aspecto fundamental a ser considerado em iniciativas de gestão da informação científica em nível individual, institucional, nacional e internacional. Os resultados aqui relatados têm origem em pesquisa que teve como objetivo geral *propor modelo genérico de gestão da informação científica para instituições de pesquisa, tendo por base os fundamentos da comunicação científica e do acesso aberto*. O modelo genérico foi proposto a partir da i) identificação e descrição de modelos de gestão da informação e de comunicação científica, incluindo seus elementos e processos, da ii) identificação da percepção de pesquisadores, características das atividades de produção do conhecimento científico e do iii) mapeamento das atividades de busca, acesso e uso da informação, assim como hábitos de comunicação científica de pesquisadores de institutos de pesquisa.

Relações entre gestão da informação científica, comunicação científica e acesso aberto: uma perspectiva conceitual

Tendo em vista o objetivo geral da pesquisa, que foi propor modelo genérico de gestão da informação científica para instituições de pesquisa tendo por base os fundamentos da comunicação científica e do acesso aberto, foi realizada uma análise da literatura. A fundamentação teórica construída a partir da literatura permitiu explicitar as relações conceituais entre gestão da informação científica, comunicação científica e acesso aberto. Tais relações são apresentados a seguir como plataforma teórica sobre a qual o desenvolveu o estudo.

A primeira parte da construção teórica formulada evidencia as relações mais amplas existentes entre gestão da informação científica, comunicação científica e acesso aberto. Nesse sentido, a partir de diferentes perspectivas acerca do entendimento do que constitui a gestão da informação (Choo, 1998; Davenport, 1998; Detlor, 2009; Fairer-Wessels, 1997; Jaeger *et al.,* 2005; Middleton, 2002; White, 1985; Wilson, 2002) a gestão da informação científica foi definida como o conjunto de políticas e processos que sistematizam a identificação de necessidades, coleta/aquisição, organização, armazenamento e preservação, recuperação, disseminação e uso da informação científica no contexto das instituições que a produzem. Levando em consideração os níveis de gestão da informação propostos por Rowley (1998) - sobretudo aquele que define os contextos informacionais, assim como o funcionamento do sistema de comunicação científica e de seus processos (Hills, 1983; Hurd, 1996, 2000, 2004; Shearer e Birdsall, 2002) foi possível definir a finali-

dade da gestão da informação científica no âmbito de instituições de pesquisa. Tal finalidade diz respeito a promoção de condições para que a informação que alimenta e que resulta das atividades de pesquisa esteja disponível e acessível para que pesquisadores, dentro ou fora da instituição, gerem novos conhecimentos e, consequentemente, contribuam para o avanço da ciência.

Das considerações feitas resultou o entendimento de que para que a gestão da informação científica ocorra de modo apropriado, é necessário que seja levada em consideração uma série de peculiaridades do ambiente que envolve as comunidades científicas, sobretudo, aquelas que impactam, em qualquer medida, o fluxo da informação científica. Ou seja, as forças que influenciam o sistema de comunicação científica (Borgman, 2007), por impactarem o fluxo da informação, influenciam, do mesmo modo, os processos de gestão da informação (Choo, 1998; Davenport, 1998) nesse ambiente. Por outro lado, tendo em vista a ideia da inseparabilidade da comunicação científica das atividades a que serve, ressaltado por Goffman e Warren (1980) e Meadows (1999), a comunicação científica pode ser definida como um complexo sistema que viabiliza os fluxos da informação científica entre pesquisadores, de modo que estes possam, em uma dinâmica cíclica, acessar, usar, gerar e disseminar informação durante a realização de suas atividades como pesquisadores. A partir de dessa definição, considera-se que a comunicação científica e a gestão da informação científica estão inexorável e funcionalmente unidas. A primeira promove/gera os fluxos de informação enquanto que a segunda os sistematiza.

Na relação entre comunicação científica e gestão da informação científica destaca-se a perspectiva da interdependência e complementaridade. De um lado a gestão da informação científica que pressupõe, além do entendimento do ambiente em que os principais atores da comunidade científica estão inseridos (Birdsall, 2005; Mikhailov *et al.,* 1984; Shearer e Birdsall, 2002), o envolvimento com processos e estruturas de comunicação científica. Estes, por sua vez, promovem, com a legitimidade conferida pela comunidade científica, o fluxo da informação na ciência. Do outro lado, o própria comunicação científica, que, *per se*, não dispõe de estratégias, mecanismos e procedimentos necessários para lidar com a sistematização requerida pelo volume crescente de informação científica, especialmente em ambiente digital, de modo que suas funções sejam efetivamente alcançadas. Nenhuma das abordagens é capaz de lidar, isoladamente, com questões estruturais emergentes que dizem respeito ao acesso e disseminação da informação científica. Essas questões surgem exatamente de deficiências ou limitações existentes tanto da gestão da informação científica quanto na comunicação científica, elencadas no *Quadro 1.*

Limitações para promoção do acesso e disseminação da informação científica
Comunicação científica
Demandas relacionadas com o aumento da visibilidade e do impacto dos resultados de pesquisa, provenientes da comunidade científica, em função das quais torna-se imperativo o deslocamento da ênfase nos sub-processos organização, armazenamento e preservação da informação para os sub-processos de disseminação e promoção de seu uso. Tais demandas foram identificadas em obras de pesquisadores como, por exemplo, Borgman (2007), Houghton, Steele e Henty (2003), Swan (2004, 2006) Swan e Brown (2004, 2005).
Desenvolvimento de tecnologias, metodologias e mecanismos que correspondam às especificidades da informação científica, de seu fluxo e do seu contexto de geração e uso
Volume crescente da informação científica e emergência do digital como formato predominante para o acesso e disseminação da informação científica (Borgman, 2007).
Diversificação de suporte para a veiculação da informação científica (Houghton, Steele e Henty, 2003).
Gestão da informação científica
Restrições de acesso e disseminação de resultados de pesquisa publicados em artigos de periódicos científicos, impostas pelo modelo de direito de cópia, o qual preconiza que o autor ceda direitos patrimoniais exclusivos aos editores. Isso conduz ao monopólio do sistema por editores científicos comerciais que impõem custos exorbitantes às assinaturas de periódicos ao ponto que nem mesmo instituições de países ricos são capazes viabilizar a manutenção de suas coleções (Brody *et al.*, 2004; Costa, 2006; Declaração de Berlin, 2003; Jacobs, 2006; Suber, 2007; Willinsky, 2006).
Mudanças nas atividades de produção do conhecimento científico, decorrentes, sobretudo, do uso crescente de tecnologias de informação e comunicação. Tais mudanças, além de interferir nas maneiras como a pesquisa científica é conduzida, requerem transformações nos modos como seus resultados são gerenciados e comunicados (Houghton, Steele e Henty, 2003).
Aumento crescente das atividades científicas, e, consequentemente, do volume de informação científica produzida e disseminada, principalmente em formato digital.
Necessidade de acesso amplo a uma variedade cada vez maior de recursos e fontes de informação de modo a subsidiar a produção do conhecimento científico e que, além disso, transcendam limites disciplinares e favoreçam a interação entre áreas do conhecimento (Houghton, Steele e Henty, 2003; Maron e Smith, 2008).
Demanda de uso de tecnologias de informação e comunicação como suporte ao trabalho colaborativo entre pesquisadores e instituições (Borgman, 2007; Haridasan e Khan, 2009; Hine, 2006; Olson *et al.*, 2008).
Necessidade de armazenamento, preservação, acesso, disseminação e reutilização de recursos informacionais não convencionais que, do mesmo modo, resultam das atividades de pesquisas como, por exemplo, conjuntos de dados brutos de pesquisa, simulações, software, objetos multimídia e outros (Houghton, Steele e Henty, 2003).

Os aspectos em destaque figuram entre os principais que se impõem como fatores limitantes para que ambas as abordagens - gestão da informação científica e comunicação científica - a partir de processos, mecanismos e estratégias próprias, respondam satisfatoriamente às necessidades da comunidade científica. Ou seja, nem uma nem outra prática, isoladamente, dispõe de ferramental suficiente para lidar com o cenário atual dos fluxos de informação que alimentam e que resultam das atividades de pesquisa. Entretanto, em razão dos entraves do sistema de comunicação científica tradicional, como aqueles que fizeram culminar a crise dos periódicos, a própria comunidade científica empreendeu esforços em direção à remoção de barreiras ao flu-

xo da informação científica, resultando no movimento mundial em favor do acesso aberto (Odlyzko, 2006; Willinsky, 2006). O acesso aberto é responsável pela reestruturação de processos de comunicação científica relacionados com a produção, disseminação e uso do conhecimento. A despeito de suas motivações primárias estarem ligadas a tais aspectos, sua operacionalização somente é viável pelo fato de que suas ações estarem pautadas por processos de gestão da informação científica, conforme denotam características e estratégias apontadas por diversos autores (Brody *et al.,* 2004; Costa, 2006; Declaração de Berlin, 2003; Jacobs, 2006; Suber, 2007; Willinsky, 2006). Considerando a vinculação funcional entre acesso aberto e gestão da informação científica, assume-se que, para otimizar o fluxo da informação científica, reformulando processos de comunicação científica, o acesso aberto recorre a processos sistematizados de gestão da informação científica.

Desse modo, conforme representado na *Figura 1*, parte-se do pressuposto que, na abordagem do acesso aberto, a solução de problemas de comunicação científica passa, necessariamente, pelo gerenciamento apropriado da informação científica. Esta, por sua vez, deve considerar aspectos próprios da comunicação científica - como é o caso das estratégias de acesso aberto, como esforço de melhoria dos processos de comunicação da informação no contexto científico. Nesse sentido, como já destacado, revela-se a relação de interdependência e complementaridade entre as duas abordagens, cuja intersecção corresponde ao acesso aberto, conforme ilustrado na *Figura 2*. Portanto, a análise da literatura proveniente das duas abordagens permitiu sugerir que o acesso aberto constitui a intersecção existente entre a gestão da informação científica e a comunicação científica.

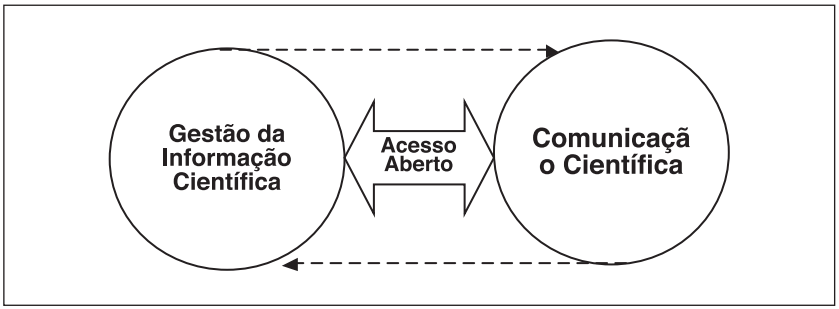


Figura 1. Relacionamento entre os tópicos gestão da informação científica e comunicação científica e acesso aberto
Fonte: Elaboração própria.

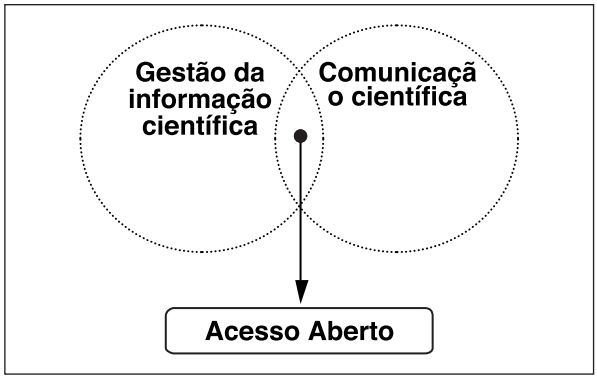


Figura 2. Acesso aberto como a intersecção entre gestão da informação científica e comunicação científica
Fonte: Elaboração própria.

Metodologia

Trata-se de uma pesquisa de abordagem mista, ou seja, foi operacionalizada com base na combinação de métodos qualitativos e quantitativos para a coleta e análise dos dados. Nesta perspectiva, adotou a estratégia de triangulação concomitante, onde dados quantitativos e qualitativos foram coletados simultaneamente e, em seguida, integração e comparados lado a lado. A pesquisa teve como sujeito pesquisadores vinculados aos institutos de pesquisa do Ministério da Ciência, Tecnologia e Inovação (MCTI). Estabeleceu-se como parâmetro para a escolha de duas instituições a aplicação dos critérios produtividade científica e representação de diferentes divisões do conhecimento. Para o primeiro critério, adotou-se a quantidade de recursos de informação indexados na plataforma *Web of Knowledge*. De acordo com a plataforma, entre os institutos de pesquisa vinculados ao MCTI, o Centro Brasileiro de Pesquisas Físicas (CBPF) encabeçou a lista, e, portanto, foi selecionado para o estudo dentro do critério produtividade. Da aplicação do primeiro critério para a definição da amostra, que resultou na escolha do CBPF, foi possível aplicar o segundo critério, que foi a representação de diferentes divisões do conhecimento. Por contemplar tanto disciplinas das ciências sociais quanto das humanidades, do ponto de vista das práticas de produção do conhecimento, o MAST foi considerado o instituto de pesquisa que mais se diferencia do CBPF. Desse modo, a amostra foi constituída de todos os pesquisadores doutores das ambas as instituições. O modelo genérico de gestão da informação científica fundamentado na perspectiva da comunicação científica e do

acesso aberto, objetivo maior da pesquisa, foi construído com base nos dados coletados a partir de três estratégias distintas, resumidas na *Figura 3.*

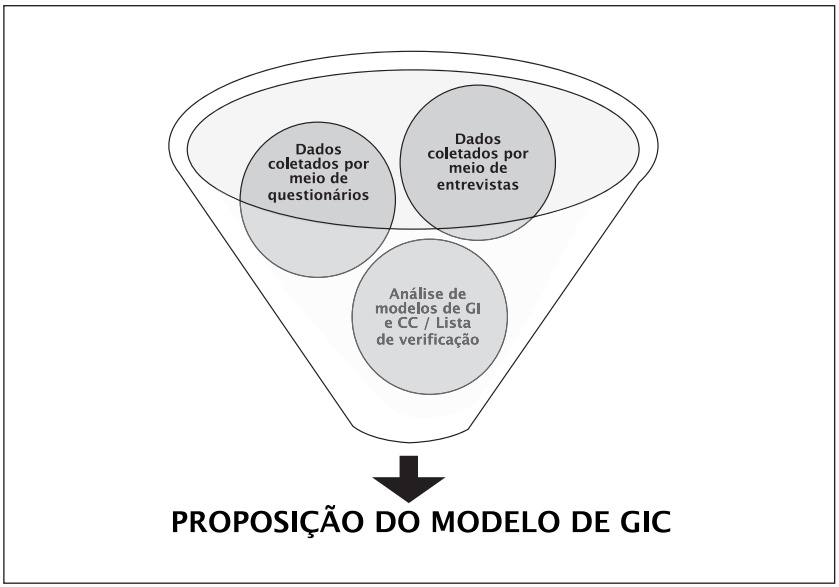


Figura 3. Procedimentos para a coleta de dados para a proposição do modelo de GIC
Fonte: Elaboração própria.

Os resultados apresentados a seguir dizem respeito ao modelo proposto resultante da pesquisa realizada. Resultados da investigação a partir da qual o modelo foi derivado encontram em Leite (2011), onde é possível realizar uma leitura detalhada que permite verificar a origem de cada um dos seus elementos e das relações entre eles.

Modelo de gestão da informação científica

Locus*: os institutos de pesquisa*

O modelo proposto tem como *locus* os próprios institutos de pesquisa, vistos como um sistema aberto (espaço cor-de-rosa da representação gráfica). Os institutos de pesquisa interagem e intercambiam recursos com seu ambiente, dentre os quais está a informação científica, um dos principais insumos e resultados de suas principais atividades: a produção do conhecimento científico.

Fluxo da informação científica

A entrada e a saída de informação científica dos institutos de pesquisa (cujos requisitos foram identificados a partir da análise de necessidades e atividades de busca, acesso e uso da informação e hábitos de comunicação) dependem das relações estabelecidas com o ambiente em que atuam. Dentre as formas de viabilizar tais relações estão os processos realizados pelo sistema de comunicação científica, que é responsável por todos os aspectos que dizem respeito ao fluxo da informação científica. Significa dizer que a informação que alimenta e que resulta das atividades de pesquisa (conceito derivado da análise e discussão dos resultados da pesquisa) tem seu fluxo promovido por processos de comunicação científica. Modelos que representam o sistema de comunicação científica (Birdsall, 2005; Shearer e Birdsall, 2002; Mikhailov *et al.,* 1984), assim como modelos que representam processos de comunicação científica (Garvey e Griffith, 1979; Hills, 1983; Houghton *et al.,* 2009; Hurd, 1996, 2000, 2004; Lancaster e Smith, 1978; Mikhailov *et al.,* 1984; Søndergaard *et al.,* 2003; UNISIST, 1971) ilustram o aspecto da entrada e da saída de informação científica no contexto de instituições de pesquisa. Além disso, tal dinâmica foi detectada de dados obtidos por meio de entrevistas e questionário (busca, acesso, uso e comunicação da informação) e lista de verificação (comunicação da informação). A informação e a comunicação científica estão representadas na versão gráfica do modelo pelas formas em alaranjado.

Contexto determinante: o acesso aberto

Dados os principais obstáculos que tornam difícil o alcance das funções da comunicação científica, o acesso aberto constitui um imprescindível componente (forma de cor verde na versão gráfica). Trata-se do principal componente que contribui para a retomada e garantia dos fluxos desimpedidos de informação que alimentam, tal como enfatizado por pesquisadores sujeitos da investigação, e resultam das atividades de pesquisa, necessários ao desenvolvimento da ciência, tal como enfatizado por pesquisadores na seção "Processos de gestão da informação científica", e como aquilo que o modelo tradicional de comunicação científica já não proporciona (Brody *et al.,* 2004; Costa, 2006; Declaração de Berlin, 2003; Jacobs, 2006; Suber, 2007; Willinsky, 2006). Na congregação de suas diferentes dimensões, representados pelos elementos de cor amarela, os esforços do acesso aberto são úteis e necessários à livre circulação da informação científica, em concordância com as motivações de pesquisadores para disseminar resultados de pesquisa, discutidos nos resultados da pesquisa, um dos principais elementos propulsores das atividades de produção do conhecimento.

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 69, mayo/agosto, 2016, México, ISSN: 0187-358X, pp. 41-71

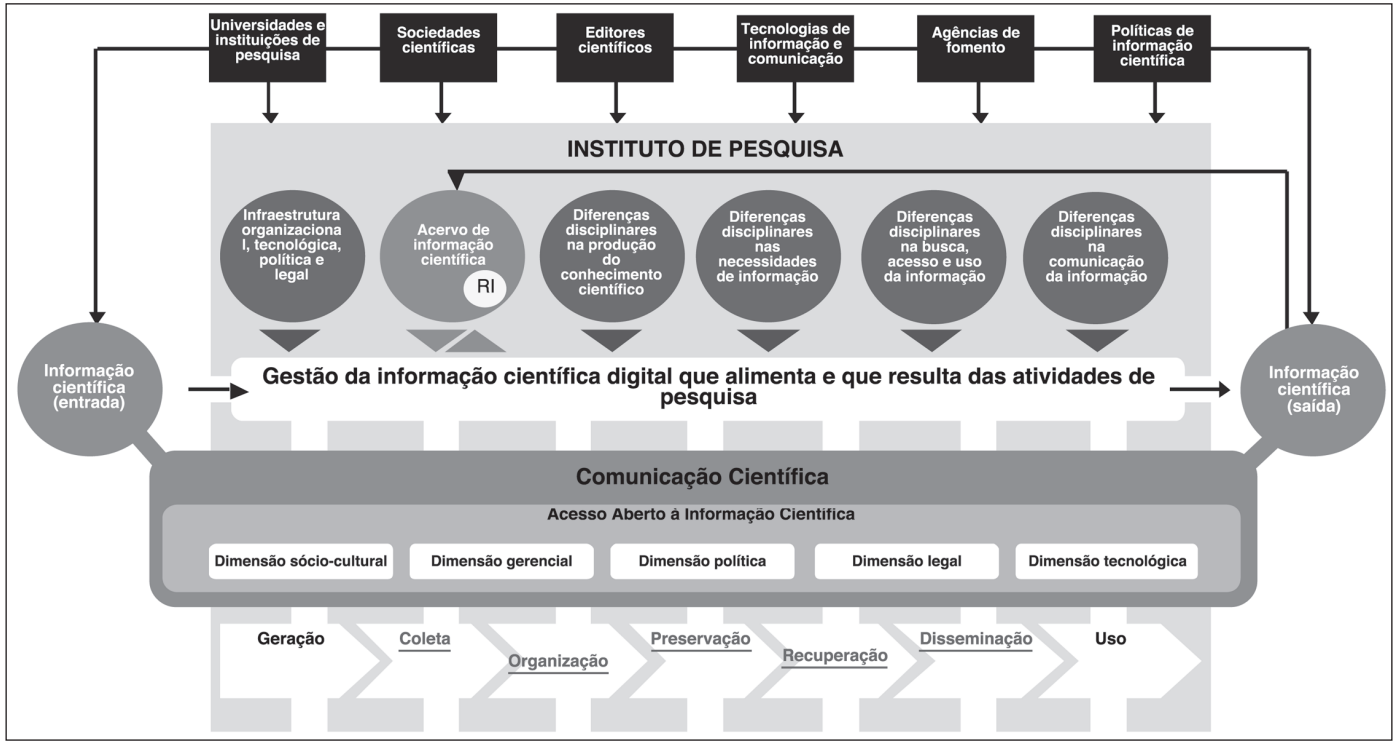


Figura 4. Procedimentos para a coleta de dados para a proposição do modelo de GIC
Fonte: Elaboração própria.

Na perspectiva do modelo proposto quanto a promoção de fluxos desimpedidos de informação científica, o acesso aberto age sobre duas principais situações fundamentais. A primeira situação diz respeito à criação de condições para que pesquisadores possam buscar, acessar e usar toda a informação que necessitam para desenvolver seu trabalho, atividades exploradas da investigação. A segunda situação refere-se à garantia de condições para que os resultados das pesquisas realizadas circulem e sejam rapidamente utilizados por outros pesquisadores, dentro e fora da instituição, favorecendo a geração de novos conhecimentos. Aspectos relacionados com essa atividade foram explorados no estudo sobre hábitos de comunicação. Nessas duas situações fundamentais a contribuição do acesso está sobre a aceleração da produção de conhecimento, aumento do impacto dos resultados de pesquisa e de sua visibilidade e de seus geradores (Brody *et al.,* 2004; Costa, 2006; Declaração de Berlin, 2003; Jacobs, 2006; Suber, 2007; Willinsky, 2006).

Dimensões do acesso aberto

Os institutos de pesquisa necessitam lidar com a informação científica que é necessária e que resulta das atividades de pesquisa. É imperativo satisfazer as necessidades de informação dos pesquisadores, informação esta que se encontra dentro e fora dos institutos. Ao mesmo tempo, é preciso promover amplamente a circulação da informação que resulta de suas atividades. Para tanto, o modelo de gestão da informação científica proposto leva em consideração a comunicação científica fundamentada nas estratégias de acesso aberto, que agem nas duas situações, segundo resultados da pesquisa. É oportuno ressaltar que, no modelo proposto, os esforços de acesso aberto são conduzidos tendo em vista suas diferentes dimensões, que, somadas, resultam em ações robustas. Cada uma dessas dimensões é sucintamente descrita a seguir.

- *Dimensão sócio-cultural*: o acesso aberto requer mudança de comportamento entre os atores envolvidos. O comportamento de pesquisadores frente ao sistema de comunicação científica foi moldado e legitimado a partir normas de convivência estabelecidas ao longo dos tempos. Além disso, variam também em razão das próprias diferenças existentes entre as disciplinas (Antelman, 2004, 2006). Com isso, a transformação de atividades, o compartilhamento de funções que antes era executadas por determinados atores, ou mesmo a inserção de um determinado processo antes inexistente no sistema de comunicação científica requer a observação dos comportamentos vigentes. Isso é

importante, inclusive, para o estabelecimento das ações intervenientes necessárias no contexto social e cultural em que estão inseridos. Como exemplo, cabe mencionar o autoarquivamento da produção científica, que requer interferências políticas e legais no contexto sociocultural em que se inserem pesquisadores (Crow, 2002);

- *Dimensão gerencial*: a implementação do acesso aberto no bojo de um modelo de gestão da informação requer atividades de planejamento, organização, direção e controle, de modo que os objetivos sejam efetivamente alcançados. Nessa perspectiva, a implementação da via dourada e da via verde para o acesso aberto, também como estratégia constituintes de esforços de gestão da informação científica, requer a coordenação de processos gerenciais que contribuam para que seus benefícios sejam alcançados. A ideia da aplicação de funções administrativas em processos de gestão da informação é recorrentemente mencionada na literatura (Diener, 1992; Fairer-Wessels, 1997; Vickers, 1985; Wilson, 2002) e se justifica no modelo uma vez que o acesso aberto envolve recursos, processos, sistemas e pessoas que necessitam ser geridos apropriadamente;
- *Dimensão política*: o acesso aberto depende de normas que suportem institucionalmente suas ações. Dentre as normas mais relevantes estão aquelas que tornam obrigatório o arquivamento da produção científica em ambientes de acesso aberto. Estas são estabelecidas por universidades, institutos de pesquisa e agências de fomento. No contexto dos repositórios institucionais de acesso aberto, são os mandatos de depósito os responsáveis pelas altas taxas de povoamento (Carr *et al.,* 2006; Harnad, 2006). Ou seja, aquelas universidades ou institutos de pesquisa que o estabeleceram, alcançam praticamente 100% da produção científica depositada. Além dos instrumentos normativos, são fundamentais também as estratégias de apoio político às iniciativas de acesso aberto, seja em direção ao convencimento de comunidades, seja aprimorando e qualificando processos gerenciais.
- *Dimensão legal*: diz respeito, sobretudo, ao estímulo ou determinações para que pesquisadores publiquem os resultados de suas pesquisas em veículos de acesso aberto (via dourada) ou que permitam o arquivamento em repositórios (via verde). Mais do que isso, tais mecanismos legais preveem que os autores retenham seus direitos de cópia e que estes sejam cedidos não exclusivamente à própria instituição (Bailey, 2006; Moore, 2011; Suber, 2010). Desse modo, é possível disseminar amplamente a produção científica sem constrangimentos de qualquer natureza. Em sentido amplo, esta dimensão foi objeto de discussão

a partir de dados coletados tanto por meio de entrevistas quanto de questionário. Constatou-se que, embora seja um aspecto apontado como central no acesso aberto, pesquisadores não a importância da retenção de direitos de cópia dos trabalhos por parte dos autores.

- *Dimensão tecnológica*: de um modo geral esta dimensão requer que as iniciativas de acesso aberto acompanhem e desenvolvam-se sob a luz da iniciativa de arquivos abertos, primando pelos padrões de interoperabilidade entre sistemas (Costa, 2006; Crow, 2002; Hurd, 2004; Suber, 2010) Além disso, a adoção de software livre tem sido ocorrido amplamente em todo o mundo.

Processos de gestão da informação científica

Diante dos inúmeros desafios em lidar com o ambiente informacional do qual fazem parte os institutos de pesquisa, há a necessidade de sistematizar e controlar os fluxos de informação científica em nível institucional, tanto daquela que alimenta quanto daquela que resulta das atividades de pesquisa, de modo a maximizar seus benefícios interna e externamente. Para tanto, faz-se necessária a institucionalização de processos de gestão da informação científica.

Tal como em outros contextos, os processos de gestão da informação científica correspondem a um ciclo. Ou seja, um conjunto de fases interconectadas e interdependentes que se repetem sucessivamente em uma ordem estabelecida. O modelo proposto assume a perspectiva processual tanto de modelos de gestão da informação registrados na literatura (Choo, 1998, Davenport, 1998; Detlor, 2009) quanto de modelos de processos de comunicação científica (Garvey e Griffith, 1979; Hills, 1983; Houghton *et al.,* 2009; Hurd, 1996, 2000, 2004; Lancaster e Smith, 1978; Mikhailov *et al.,* 1984; Søndergaard *et al.,* 2003; UNISIST, 1971). Dessa forma, compreende os processos específicos de geração, coleta, organização, preservação, recuperação, disseminação e uso da informação necessária e criada a partir das atividades de pesquisa dos institutos de pesquisa. Com base nos elementos e definições presentes nos modelos mencionados, tais processos estão sucintamente definidos a seguir a partir de resultados obtidos nesta pesquisa:

- *Geração*: diz respeito aos processos de geração da informação científica, que tem início em resultados das atividades de pesquisa que são consolidadas a partir de processos editoriais de modo a resultar na literatura científica. Características dos processos de geração do conhecimento, assim como a própria produção da informação com vistas à

comunicação foram discutidas ao longo dos resultados da pesquisa realizada;

- *Coleta:* corresponde à aquisição dos recursos de informação científica que é necessária para fazer pesquisa e que resulta delas. Trata-se dos esforços empreendidos em capturar informação científica a ser gerenciada pelo sistema. Características desse processo foram exploradas ao longo dos resultados da pesquisa realizada;
- *Organização:* diz respeito aos processos e utilização de instrumentos de representação dos recursos de informação científica com vistas à sua posterior recuperação pelos usuários. Aspectos relacionados com esse processo surgiram em citações dos entrevistados;
- *Preservação:* conjunto de atividades de cunho tecnológico e gerencial que contribuem para garantir o acesso permanente e a longo prazo à informação em suporte digital;
- *Recuperação:* processo realizado a partir de uma interface de busca onde os usuários elaboram de estratégias de busca, cuja execução, por meio do sistema de recuperação, resulta inicialmente na apresentação dos registros que representam recursos de informação, e, em seguida, ao seu inteiro teor, correspondentes às suas necessidades de informação. Aspectos relacionados com esse processo surgiram em citações dos entrevistados;
- *Disseminação:* corresponde aos esforços e mecanismos para fazer fluir amplamente recursos de informação científica e facilitar sua descoberta e uso, contribuindo para a visibilidade dos resultados de pesquisa, do pesquisador e da instituição. Aspectos relacionados com esse processo surgiram em citações dos entrevistados;
- *Uso*: processo que precede e está intimamente relacionado com a geração da informação. Diz respeito ao consumo da informação manifesta na literatura científica.

Influências do acesso aberto e de forças externas sobre os processos de gestão da informação científica

Os processos específicos de gestão da informação científica, sob a égide da perspectiva sistêmica da comunicação científica e do acesso aberto, recebem influência direta do ambiente interno e externo dos institutos de pesquisa. Isso quer dizer que:

- *Geração*: esse processo é influenciado em diferentes aspectos. Primeiro, na medida que a pesquisa é realizada colaborativamente, como per-

cebido no estudo, argumenta-se que há uma influência externa direta, seja de pesquisadores, grupos ou mesmo instituições (Fry, 2006; Houghton, Steele y Henty, 2003; Hurd, 1996; Jamali e Nicholas, 2008; Katz e Martin, 1997; Swan, 2008). Os resultados da pesquisa refletem esta situação que se manifesta em tipo de autoria e, sobretudo, em decisões de quando, onde (o que determina tipos os detentores dos direitos de cópia e licenças), o que publicar e como fazer disseminá-los (dependendo de onde foi publicado). Além disso, a maior ou menor exposição de usuários à sistemas de informação de acesso aberto influenciam a geração de resultados de pesquisa;

- *Coleta*: a coleta de informação científica ocorre tanto nos acervos dos próprios institutos de pesquisa, quanto no ambiente externo a eles, como pôde ser observado em alguns modelos de comunicação científica (Houghton *et al.,* 2009; Søndergaard *et al.,* 2003; UNISIST, 1971) e em funções desempenhadas por atores presentes no sistema de comunicação científica (Birdsall, 2005; Mikhailov *et al.,* 1984; Shearer e Birdsall, 2002). A noção do processo de coleta de informação, e as influências externas sobre ele, além de encontrarem fundamento na literatura, são sustentados também em aspectos revelados pela investigação das atividades de busca, acesso e uso (análise e discussão dos dados da pesquisa). A construção de um mecanismo de busca temático (provedor de serviços na principal área de atuação e de áreas correlatas do instituto de pesquisa) baseado na perspectiva do acesso aberto permite a sistematização e a coleta automatizada e monitoramento de recursos de informação disponíveis e acessíveis online na Internet. Esses mecanismos de busca monitoram tanto periódicos científicos de acesso aberto, quanto repositórios institucionais, repositórios disciplinares, bibliotecas digitais e portais de conferências de acesso aberto, dentre outros possíveis recursos. Além disso, é necessário estimular o uso de mecanismos de buscas multidisciplinares (provedores de serviços), que realizam buscas cruzadas, com a intenção de suportar demandas de informação de atividades de pesquisa de natureza interdisciplinar;
- *Organização*: trata-se de um processo fortemente influenciado pela perspectiva do acesso aberto, uma vez que se torna imprescindível a adoção de padrões internacionais de interoperabilidade entre sistemas (Borgman, 2007; Hurd, 2004; Lagoze e Van de Sompel, 2001). Tais padrões referem-se principalmente a esquemas de metadados e instrumentos auxiliares de representação da informação, protocolos de comunicação. No contexto do acesso aberto à informação científica são adotados vários esquemas padronizados de metadados, como

por exemplo o Dublin Core, e o Protocolo para a Coleta de Metadados da Iniciativa de Arquivos Abertos (OAI-PMH). Nesse caso, muito embora o OAI-PMH não se refira a qualquer processo de representação da informação, sua presença no processo de organização é justificável. Infraestruturas desse tipo são capazes de permitir a exposição de metadados das coleções de recursos de informação científica de modo a permitir sua coleta por outras instituições;

- *Preservação*: embora o acesso aberto à informação científica não tenha como principal objetivo a preservação da informação digital, mas sim a maximização dos impactos de pesquisa por meio da maximização do seu acesso a uso, algumas de suas estratégias necessariamente a promovem. Repositórios institucionais de acesso aberto à informação científica, caso sejam bem planejados, além de terem como uma de suas linhas de atuação a preservação da produção científica da instituição, criam condições férteis e objetivas para o desenvolvimento de programas de preservação digital baseadas em modelos internacionalmente recomendados (Crow, 2002; Lynch, 2003). Do mesmo modo, a adoção de identificadores persistentes contribuem para a preservação do acesso permanente aos recursos de informação;
- *Recuperação*: a recuperação da informação é potencializada caso o sistema tenha por base mecanismos de acesso aberto e interoperáveis (Borgman, 2007; Crow, 2002; Hurd, 2004; Lagoze e Van de Sompel, 2001; Lynch, 2003). Tais mecanismos, além de possuírem relação direta com o processo de organização da informação, promovem melhores condições para que recursos de informação tornem-se mais encontráveis e recuperáveis por diversos sistemas distribuídos em todo o mundo. Nesse sentido, a partir de uma única interface, ou mesmo poucas interfaces, usuários podem realizar buscas simultâneas em centenas de provedores de dados (instituições que alimentam e mantém os ambientes de acesso aberto) mesmo desconhecendo autores ou as instituições que os mantém. A recuperação da informação na perspectiva do acesso aberto beneficia ao mesmo tempo a descoberta facilitada de informação para pesquisadores dos institutos, ao tempo que torna sua produção científica encontrável e recuperável em todo o mundo. Este ponto tem a ver com o próximo processo;
- *disseminação*: na perspectiva do acesso aberto, sistemas de informação passam a atender a demandas dos pesquisadores por aumento da visibilidade de sua produção científica e de si mesmos (Brody *et al.,* 2004; Costa, 2006; Declaração de Berlin, 2003; Jacobs, 2006; Suber, 2007; Willinsky, 2006). Este aspecto talvez tenha sido um daqueles

que bibliotecas e centros de documentação mais mantinham distância durante muito tempo, pois se tratava de uma prerrogativa, sobretudo, de editores de publicações científicas. A partir do desenvolvimento de ações do acesso aberto, muitas dessas funções foram alteradas (Crow, 2002). As instituições dos pesquisadores, por meio de seus serviços de informação, passaram a atuar sobre a construção de gerenciamento de vias alternativas de comunicação científica, como aquelas representadas por repositórios institucionais. Esses serviços de informação passaram então a não apenas constituir e organizar acervos de informação, mas principalmente, como nunca antes, disseminá-los amplamente, graças ao modo como os processos de gestão da informação científica anteriores à disseminação foram estruturados. Nessa forma de atuação é possível atender às demandas por promoção da visibilidade dos resultados de pesquisa, do pesquisador e da própria instituição. Aspectos relacionados com esse processos foram analisados e discutidos na pesquisa realizada, mais especificamente na análise e discussão dos dados sobre hábitos de comunicação;

- *Uso*: todos os processos anteriores visam, em última análise, promover o uso da informação científica de modo que novos processos de geração de conhecimento sejam iniciados. Este constitui um dos objetivos imediatos do acesso aberto, que é aumentar o impacto dos resultados de pesquisa, leia-se, aumento das taxas de citação, por meio da maximização do seu acesso e uso (Harnad e Brody, 2004; Swan, 2010). Ou seja, na medida que os processos anteriores são potencializados pelo o acesso aberto, o uso também o é.

Nesse momento é importante frisar que os processos de coleta, organização, preservação, recuperação e disseminação são conduzidos a partir da implementação de repositório institucional de acesso aberto à informação científica (Crow, 2002, Costa, 2006; Suber, 2007). Por esta razão, na versão gráfica do modelo de gestão da informação científica, tais processos estão destacados e em verde. Esta é a mesma cor que representa o repositório institucional sinalizado, um círculo verde inserido no elemento acervo de informação científica institucional. Desse modo, a informação científica que resulta das atividades de pesquisa no instituto de pesquisa é incorporada ao acervo de informação institucional, a partir de seu repositório. E é a partir desse mesmo repositório institucional que os processos de gestão da informação científica em destaque (verde) são realizados.

Elementos flexíveis do modelo

Por outro lado, além da influência direta do da comunicação científica e do acesso aberto, o modelo de gestão da informação científica também prevê a influência de um conjunto de elementos internos ao ambiente dos institutos de pesquisa. Esses elementos constituem as partes flexíveis do modelo, ou seja, aquelas que variam em razão dos ambientes institucionais e das diferenças disciplinares existentes entre as áreas do conhecimento, conforme indicação dos resultados presentes na seção de análise e discussão. É importante ressaltar que o modelo é genérico. Por esta razão, prevê a influência de tais elementos, porém, não considera em sua constituição a explicitação de particularidades da infraestrutura da instituição nem tão pouco as diferenças disciplinares relacionadas com necessidades, busca, acesso uso e hábitos de comunicação da informação.

Até então, todos os elementos descritos, assim como as relações entre eles, constituem partes presentes do modelo genérico, que tem nas partes flexíveis mais alguns de seus componentes. Tais partes correspondem às representações circulares internas ao instituto na versão gráfica do modelo. Cada um desses elementos e o modo como influenciam a gestão da informação científica são explorados a seguir:

- *Infraestrutura organizacional, tecnológica, política e legal*: essa força de influência aglutina um conjunto de aspectos fundamentais para a gestão da informação científica. No quesito infraestrutura organizacional, presume-se a existência de departamento ou área específica cujas funções primordiais estejam relacionadas com atividades informacionais (Fairer-Wessels, 1997; Detlor, 2009; Søndergaard *et al.,* 2003; UNISIST, 1971). Normalmente essas funções estão reunidas em torno de bibliotecas de pesquisa ou centros de documentação (Birdsall, 2005; Lancaster e Smith, 1978; Shearer e Birdsall, 2002). Decorrente disso, presume-se que a infraestrutura organizacional requer suporte financeiro e recursos humanos qualificados não apenas em relação às técnicas de gestão da informação mas também quanto ao funcionamento das comunidades científicas, da comunicação científica e do acesso aberto. No quesito infraestrutura tecnológica, estão inseridos todos os aspectos inerentes à provisão da malha tecnológica e de redes necessária à implantação do modelo de gestão da informação científica (Choo, 1998; Detlor, 2009; Fairer-Wessels, 1997; Rowley, 1998). Isso requer o conhecimento técnico de software livres e padrões utilizados em iniciativas de acesso aberto bem como também é necessária a ciência

dos analistas quanto ao funcionamento das comunidades científicas, da comunicação científica e do acesso aberto (Borgman, 2007; Brody *et al.,* 2004; Costa, 2006; Jacobs, 2006; Hurd, 2004; Lagoze e Van de Sompel, 2001; Willinsky, 2006; Suber, 2007). A infraestrutura política, por seu turno, encerra uma importante função na governança da gestão da informação científica. A legitimação corporativa do alcance dos novos processos de gestão da informação científica, ou mesmo da mudança de processos já existentes, depende de sua institucionalização formal, a ser promovida por instância de nível estratégico. Exemplo disso são as políticas institucionais de acesso aberto, que podem, ao mesmo tempo, estimular a publicação de resultados de pesquisa em veículos de acesso aberto e requerer que a produção científica de seus pesquisadores seja depositada em repositório institucional de acesso aberto (Bailey, 2006; Carr *et al.,* 2006; Moore, 2011; Harnad, 2006; Suber, 2010). Ações políticas, incluindo as de convencimento, provenientes também dessas instâncias junto aos pesquisadores, são fundamentais para que a gestão da informação científica, tal como prevista pelo modelo, possa ser instituída e praticada na organização. A infraestrutura legal, por seu turno, constitui uma importante condição que viabiliza ou inviabiliza a prática de gestão da informação científica. Uma situação comum em instituições de pesquisa é a coexistência da pressão por produtividade científica (publicação) e os conflitos decorrentes da cessão de direitos patrimoniais dos resultados de pesquisa publicados, sobretudo, em artigos de periódicos científicos (Bailey, 2006; Moore, 2011; Suber, 2010). Ou seja, as instituições passam a não ter controle sobre aquilo que produziram em razão da pressão, exercida por ela mesma, por publicação em periódicos internacionais de prestígio que, via de regra, tomam de assalto os direitos de cópia em troca da publicação. Isso é um círculo vicioso que tende a ser interrompido à medida que a gestão da informação científica orientada pelo acesso aberto passa a vigorar. Quer-se dizer com isso que os institutos de pesquisa devem conscientizar, estimular e instrumentalizar seus pesquisadores a negociarem os direitos de cópia no momento publicação de seus trabalhos, quando, evidentemente, estes puderem estar comprometidos. Ou mesmo estimular a publicação em veículos de acesso aberto, que já preveem tal condição. Além e mais do que isso, os institutos de pesquisa devem estabelecer normas que prevejam que seus pesquisadores cedam direitos não exclusivos de distribuição de seus trabalhos em formato digital na Internet. Para as atividades editoriais sob responsabilidade do próprio instituto de pesquisa, como é

o caso da publicação de periódicos científicos, livros, séries e outros produtos de informação, é mister que sejam incorporadas licenças e permissões que favoreçam à sua livre circulação, como que o caso de algumas combinações de licenças *Creative Commons* ou similares (Suber, 2010). Aspectos desse elemento flexível têm origem nas sentenças derivadas da análise e discussão dos resultados da pesquisa;

- *Acervo de informação científica institucional*: os acervos de informação científica das instituições devem ser formados em razão de dois critérios fundamentais elementares recorrentes no modelo proposto: a informação que é necessária para fazer pesquisa e a informação que resulta das atividades de pesquisa (Birdsall, 2005; Lancaster e Smith, 1978; Roosendaal e Geurts, 1997; Shearer e Birdsall, 2002). Historicamente, as bibliotecas e centros de documentação vinham atuando principalmente no primeiro momento, ou seja, reunindo e permitindo acesso, mal ou bem, aos recursos de informação necessários à realização da pesquisa (Søndergaard *et al.,* 2003; UNISIST, 1971). Por outro lado, uma vez que maior parte dos resultados de pesquisa são publicados fora da instituição, sob a lógica do sistema tradicional de publicação científica, as bibliotecas ou centros de documentação enfrentavam dificuldade para reunir e permitir acesso à produção científica de autoria de pesquisadores da instituição. A emergência do acesso aberto, como novo paradigma da comunicação e certamente também da gestão da informação científica, transformou determinadas funções e deu à esses serviços de informação condições para gerenciar a informação científica de autoria de pesquisadores da instituição por meio dos repositórios institucionais de acesso aberto (Borgman, 2007; Brody *et al.,* 2004; Costa, 2006; Jacobs, 2006; Hurd, 2004; Lagoze e Van de Sompel, 2001; Willinsky, 2006; Suber, 2007). Ou seja, o acervo de informação científica de uma determinada instituição passa a contar também com processos de gestão da informação científica que resulta de suas atividades. A formação das coleções do repositório institucional são fundamentais que os resultados de pesquisa, pesquisadores e a própria instituição tenham sua visibilidade aumentada. Aspectos desse elemento flexível têm origem nas sentenças derivadas da análise e discussão dos resultados da pesquisa;
- *Diferenças disciplinares na produção do conhecimento científico*: o modo como pesquisadores conduzem suas atividades de pesquisa (Jamali e Nicholas, 2008; Houghton, Steele y Henty, 2003; Katz e Martin, 1997; Swan, 2008) influencia os processos de gestão da informação científica que resulta de tais atividades. A satisfação de necessidades de infor-

mação de pesquisadores cujas atividades de investigação são mais ou menos interdisciplinares requer particularidades dos processos de coleta, recuperação e disseminação da informação científica (Houghton, Steele y Henty, 2003). Ou seja, áreas correlatas presentes em determinadas atividades demandam o suporte informacional também nessa perspectiva, o que exige sistemas de informação do mesmo modo mais ou menos interdisciplinares. O trabalho colaborativo, por envolver pesquisadores de outras instituições, também influencia determinados processos de gestão da informação científica. Isso ocorre porque impactam a geração da informação, o que, por sua vez, determina tipo de autoria, decisões de quando, onde, o que publicar e como disseminar. Aspectos desse elemento flexível têm origem nas sentenças derivadas da análise e discussão dos resultados da pesquisa;

- *Diferenças disciplinares nas necessidades de informação*: as necessidades de informação são influenciadas pelos contextos de atuação dos pesquisadores (Choo, 1998; Davenport, 1998; Rowley, 1998; Shearer e Birdsall, 2002). Como exemplo disso está a constatação, alcançada por meio dos levantamentos, de que físicos possuem necessidades de informação diferentes de cientistas sociais e humanistas. Evidentemente, nenhum modelo de gestão da informação científica poderá ser genérico caso tente explicitar em sua própria constituição as necessidades específicas de informação. Contudo, também como foi possível constatar, as atividades de pesquisa de qualquer área do conhecimento, invariavelmente, dependem de informação científica e culminam na geração de informação científica. Estes contornos gerais devem ser levados em consideração e previstos na proposta e estruturação de um modelo genérico de gestão da informação científica. Além disso, qualquer modelo deve prever que há essas especificidades que variam em função das diferenças disciplinares. Aspectos desse elemento flexível têm origem nas sentenças derivadas da análise e discussão dos resultados da pesquisa;
- *Diferenças disciplinares na busca, acesso e uso da informação*: os comportamentos associados à busca, acesso e uso da informação, são influenciados pelos contextos de atuação dos pesquisadores (Choo, 1998; Garvey e Griffith, 1979; Gorraiz *et al.,* 2009; Houghton, Steele y Henty, 2003; Huang e Chang, 2008; Hurd, 2000). Do mesmo modo, como constatado na pesquisa, físicos possuem comportamento de busca, acesso e uso da informação diferente de cientistas sociais e humanistas. Essas diferenças influenciam o desenho de sistemas de informação científica para as áreas. Contudo, nenhum modelo de gestão

da informação poderá ser genérico caso especifique em sua estrutura tais diferenças. Como se tratam de diferenças de natureza contextual, esse elemento está previsto no modelo proposto tendo em vista seu potencial de influência. Ou seja, padrões de busca, acesso e uso da informação devem ser previstos na implementação de um modelo dessa natureza. Aspectos desse elemento flexível têm origem nas sentenças derivadas da análise e discussão dos resultados da pesquisa;

- *Diferenças disciplinares na comunicação da informação*: os hábitos de comunicação da informação científica também variam em razão das áreas do conhecimento (Hurd, 2000; Houghton, Steele y Henty, 2003; Gorraiz *et al.,* 2009; Huang e Chang, 2008). Pelas mesmas razões exploradas anteriormente, os hábitos de comunicação, que são empreendidas por pesquisadores de todas as áreas, invariavelmente, constituem um elemento influenciador da gestão da informação científica objeto do modelo proposto. Aspectos desse elemento flexível têm origem nas sentenças derivadas da análise e discussão dos resultados da pesquisa.

Forças externas: elementos da comunidade científica

Há outro conjunto de elementos que influencia as atividades dos institutos de pesquisa como um todo e também suas atividades de gestão da informação científica. São forças externas à instituição que representam atores ou mesmo tendências que impactam as atividades previstas no modelo de gestão da informação científica proposto, principalmente por estar fundamentado na comunicação científica e no acesso aberto. São seis grandes forças externas, identificadas em diversos modelos (Birdsall, 2005; Mikhailov *et al.,* 1984; Shearer e Birdsall, 2002) e relacionadas com aspectos do acesso aberto (Borgman, 2007; Brody *et al.,* 2004; Costa, 2006; Jacobs, 2006; Hurd, 2004; Lagoze e Van de Sompel, 2001; Willinsky, 2006; Suber, 2007), descritas a seguir:

- *Universidades e instituições de pesquisa*: são organizações que produzem e, por esta razão, consomem conhecimento e informação. Desse modo, constituem, ao mesmo tempo, fornecedoras e usuária da informação os institutos de pesquisa necessitam e geram, respectivamente. Comumente assumem papeis de colaboradoras em atividades de geração do conhecimento, o que, por sua vez, implica em comprometimentos no modelo de gestão da informação científica. Seus modelos de gestão da informação científica devem servir de *benchmarking* para a os esforços de gestão da informação científica do instituto de pesquisa;

- *Sociedades científicas*: são entendidas como o agrupamento formal e representativo de pesquisadores que compartilham tópicos de estudo, desenvolvem pesquisas e se reúnem periodicamente. Constitui um dos ambientes em que pesquisadores compartilham resultados de suas pesquisas. Sua influência sobre o modelo de gestão da informação científica reside principalmente no fato de que tais sociedades além de representarem pesquisadores, catalisando suas aspirações, são muitas vezes responsáveis por publicações científicas, de acesso aberto ou restrito;
- *Editores científicos*: certamente uma das forças externas que mais exerce influência sobre o modelo de gestão da informação científica. Editores científicos influenciam diretamente tanto o fluxo da informação que alimenta as atividades de pesquisa quanto o fluxo da informação que resulta de tais atividades. Pesquisadores e suas instituições são produtores e usuários de informação científica. A informação científica, por sua vez, depende de editores científicos para poder se manifestar como literatura científica. A sua incorporação aos fluxos que alimentam e que resultam das atividades de pesquisa, seja na perspectiva do acesso aberto ou não, depende diretamente dos editores científicos, que são responsáveis pela consolidação dos resultados de pesquisa em informação científica;
- *Tecnologias de informação e comunicação*: os desenvolvimentos em tecnologias de informação e comunicação influenciam o próprio ciclo da informação, potencializando suas funções desde a geração até a utilização da informação. Esses avanços proporcionam novas possibilidades e oportunidades para processos informacionais. Exemplos claros disso são a aplicação da Internet nos processos de comunicação científica e, mais recentemente, toda a infraestrutura tecnológica que viabilizou o próprio acesso aberto à informação científica. Nesse contexto, desenvolvimentos em redes de banda larga, dispositivos móveis para acesso à informação, computação em nuvens, aperfeiçoamento de experiências entre humanos e computadores e de sistemas de recuperação de informação são eventos promissores.
- *Agências de fomento*: em uma perspectiva ampla, é possível que as agências de fomento sejam os atores que mais poder tenham em contribuir para o funcionamento efetivo de um sistema de gestão da informação científica fundamentado na comunicação científica e no acesso aberto. São muitos os exemplos de agências de fomento em todo o mundo que estabelecem suas políticas de acesso aberto. Essas políticas requerem que autores que recebem financiamento para suas pesquisas

se comprometam em depositar seus resultados publicados ou aceitos para publicação em repositórios institucionais de acesso aberto ou que publiquem em periódicos de acesso aberto. Por esta razão, as políticas de acesso aberto instituídas por agências de fomento contribuem para a operacionalização tanto do acesso aberto por meio da via dourada quanto por meio da via verde;

- *Políticas de informação científica*: a articulação entre atores e variáveis presentes no contexto da produção e do uso da informação científica é objeto das políticas nacionais de informação em ciência e tecnologia. Normalmente, os atores constituem os mesmos presentes no sistema de comunicação científica. As variáveis, por outro lado, são aquelas relacionadas com a legislação e regulamentação, interesses dos diferentes atores e os contextos político- governamental, econômico e educacional. As políticas de informação científica são as responsáveis por provocar a sinergia entre os diferentes atores e variáveis. Por esta razão o estabelecimento de políticas de informação científica influenciam o funcionamento de um sistema de gestão da informação científica em qualquer contexto. Um exemplo de política de informação científica foi aquela em que a Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) em encerrar recursos para que bibliotecas mantivessem suas assinaturas de periódicos científicos e passou a promover o acesso eletrônico a um acervo de periódicos no modelo consórcio.

Conclusões

A ciência depende de fluxos de informação livres e desimpedidos para que possa se desenvolver efetivamente. O sistema de comunicação científica é responsável pelo fluxo da informação que alimenta e que resulta das atividades de pesquisa. Por esta razão, a comunicação rápida, adequada e eficiente dos resultados de pesquisas, transformados em informação, influencia diretamente o desempenho dos institutos de pesquisa, um dos atores que tem como principal função a geração de novos conhecimento científicos. Quanto mais rápida e completamente pesquisadores receberem a informação científica necessária às suas atividades, mais produtos científicos ele gerará a custos menores. Entretanto, como discutido ao longo deste trabalho, as funções da comunicação científica já não são alcançadas em razão de inúmeros desafios que são colocados no cenário informacional em que se inserem os institutos de pesquisa.

Tendo em vista tais desafios, o modelo de gestão da informação científica tendo por base a comunicação científica e o acesso aberto foi proposto, visando a contribuir para que institutos de pesquisa possam responder de modo efetivo demandas emergentes de acesso, circulação e uso da informação científica. A solução, como indicado, perpassa pela intersecção de aspectos da gestão da informação, da comunicação científica e do acesso aberto à informação científica, atuando de forma integrada. Nenhuma dessas perspectivas isoladamente dispõe de instrumental teórico e metodológico para tratar dos problemas informacionais discutidos. Portanto, considera-se que o modelo proposto, além de um avanço no reconhecimento de como tais fenômenos podem ser observados e explicados, constitui um conjunto robusto de diretrizes norteadoras para a implementação da gestão da informação científica integrada à comunicação científica e ao acesso aberto.

É importante frisar que a construção do modelo proposto contou com diferentes estratégias para geração de dados que o sustentam (análise da literatura, análise e discussão de dados quantitativos e qualitativos) cujos resultados são apresentados por Leite (2011). É importante também mencionar a perspectiva genérica do modelo proposto, uma vez que seu delineamento considerou aqueles elementos gerais e necessários a qualquer modelo de gestão da informação científica e previu em sua constituição alguns elementos flexíveis, que acomodam possíveis diferenças contextuais que variam de instituto para instituto.

Referências

Antelman, K. 2004. "Do open access articles have a greater research impact?". *College and Research Libraries* 65 (5), set.

—— 2006. "Self-archiving practice and the influence of publisher policies in the social sciences". *Learned Publishing* 19: 85-95.

Bailey, C. W. 2006. "What is open access?", N. Jacobs, ed., *Open access: key strategic, technical and economic aspects*. Oxford: Chandos Publishing, 13-26.

Birdsall, W. F. 2005. *Towards an integrated knowledge ecosystem: a canadian research strategy.* Report submitted to the Canadian Association of Research Libraries/L'Association des bibliothèques de recherche du Canada (CARL/ABRC).

Borgman, C. L. 2007. *Scholarship in the digital age: information, infrastructure, and the internet.* Cambridge, Londres: MIT Press.

Brody, T. *et al.* 2004. "The effect of open access on citation impact", *National Policies on Open Access (OA) Provision for University Research Output: an International meeting*. Southampton UK: Southampton University.

Carr, L. *et al.* 2006. *Repositories for institutional open access: mandated deposit policies.* Documento não publicado. Disponível em: https://core.ac.uk/download/files/34/1506254.pdf

Choo, C. W. 1998. *Information management for the intelligent organization: the art of scanning the environment.* 2 ed. Medford: ASIS/ Information Today.

Costa, S. 2006. "Filosofia aberta, modelos de negócios e agências de fomento: elementos essenciais a uma discussão sobre o Acesso Livre à informação científica". *Ciência da Informação* 35 (2): 39-50.

Cresswell, J. W. 2010. *Projeto de pesquisa: métodos qualitativo, quantitativo e misto*. 3 ed. Porto Alegre: Artmed.

Crow, R. 2002. "The case for institutional repositories: A SPARC position paper". *ARL Bimonthly Report* 223.

Davenport, T. H. 1998. *Ecologia da informação: por que só a tecnologia não basta para o sucesso na Era da Informação.* São Paulo: Futura.

Declaração de Berlin. 2003. *Conference on Open Access to Knowledge in the Sciences and Humanities*. Berlin: Outubro.

Detlor, B. 2009. "Information management". *International Journal of Information Management* 30 (2): 103-108.

Diener, R. A. V. 1992. "Strategic, analytic and operational domains of information management". *Bulletin of the American Society for Information Science* 19 (1): 18-19.

Fairer-Wessels, F. A. 1997. "Information management education: towards a holistic perspective". *South African Journal of Library and Information Science* 65 (2): 93-102.

Fry, J. 2006. "Scholarly research and information practices: a domain analytic approach". *Information Processing and Management* 42 (1): 299-316.

Garvey, W. D. e B. C. Griffith. 1979. "Communication and information process within scientific disciplines, empirical findings for psychology". W. D. Garvey, *Communication: the essence of science: facilitating information among librarians, scientists, engineers and students*. Oxford: Pergamon, 127-147.

Goffman, W. e K. S. Warren. 1980. *Scientific information systems and the principle of selectivity*. New York: Praeger.

Gorraiz, J. *et al.* 2009. "International publication output and research impact in social sciences: comparison of the Universities of Vienna, Zurich and Oslo". *Research Evaluation* 18 (3): 221-232.

Haridasan, S. e M. Khan. 2009. "Impact and use of e-resources by social scientists in National Social Science Documentation Centre (NASSDOC), India". *The Electronic Library* 27 (1): 117-133.

Harnad, S. 2006. *Optimizing OA self-archiving mandates: what? where? when? why? how?* Technical Report, ECS, University of Southampton.

Harnad, S. e T. Brody. 2004. "Comparing the Impact of Open Access (OA) vs. Non- OA Articles in the Same Journals". *D-Lib Magazine* 10 (6).

Hills, P. J. 1983. "The scholarly communication process". *Annual Review of Information Science and Technology* 8: 99-125.

Hine, C. M., ed. 2006. *New infrastructure for knowledge production: understanding e-science.* Hershey: Information Science Publishing.

Houghton, H. W., C. Steele e M. Henty. 2003. *Changing research practices in the digital information and communication environment*. Canberra: Department of Education, Science and Training.

Houghton, J. *et al.* 2009. *Economic implications of alternative scholarly publishing models: exploring the costs and benefits. JISC EI-ASPM project. A report to the joint information systems committee (JISC).* London: JISC.

Huang, M. e Y. Chang. 2008. "Characteristics of research output in social sciences and humanities: from a research evaluation perspective". *Journal of the American Society for Information Science and Technology* 59 (11): 1819-1828.

Hurd, J. M. 2004. "Scientific communication: new roles and new players". *Science & Technology Libraries* 25 (1): 5-22.

—— 2000. "The transformation of scientific communication: a model for 2020". *Journal of the American Society for Information Science* 51 (14): 1279-1283.

—— 1996. "Models of scientific communication systems". S. Y. Crawford, H. M. Hurd e A. C. Weller. *From print to electronic: the transformation of scientific information.* Medford: Asis, 9-33.

Jacobs, N., ed. 2006. *Open access: key strategic, technical and economic aspects.* Chandos Publishing: Oxford.

Jaeger, P. T. *et al.* 2005. "Information management". *Encyclopedia of Social Measurement*, v. 2.

Jamali, H. R. e D. Nicholas. 2008. "Information-seeking behavior of physicists and astronomers". *Aslib Proceedings: New Information Perspectives* 60 (5): 444-462.

Katz, J. S. e B. R. Martin. 1997. "What is research collaboration?" *Research Policy* 26.

Lagoze, C. e H. Van de Sompel. 2001. "The open archives initiative: building a low-barrier interoperability framework". *ACM/IEEE Joint Conference on Digital Libraries*, Roanoke, Virginia, 54-62.

Lancaster, F. W. e L. C. Smith. 1978. "Science, scholarship and the communication of knowledge". *Library Trends* 27 (3): 367-387.

Leite, F. C. L. 2011. *Modelo genérico de gestão da informação científica para instituições de pesquisa na perspectiva da comunicação científica e do acesso aberto.* Tese (Doutorado em Ciência da Informação), Brasília: Universidade de Brasília.

Lynch, C. A. 2003. "Institutional repositories: essential infrastructure for scholarship in the digital age". *ARL Bimonthly Report* 26.

Maron, N. L. e K. K. Smith. 2008 *Current models of digital scholarly communication.* Washington, DC: Association of Research Libraries.

Meadows, A. J. 1999. *A comunicação científica*. Brasília: Briquet de Lemos.

Middleton, M. R. 2002. *Information management: a consolidation of operations analysis and strategy.* WaggaWagga: Charles Sturt University.

Mikhailov, A. I. *et al.* 1984. *Scientific communications and informatics.* Arlington: Information Resources.

Moore, G. 2011. *Survey of University of Toronto Faculty Awareness, Attitudes, and Practices Regarding Scholarly Communication: A Preliminary Report.* Toronto: University of Toronto.

Odlyzko, A. 2006. "Economic costs of toll access". N. Jacobs, ed. *Open access: key strategic, technical and economic aspects.* Oxford: Chandos Publishing.

Olson, G. M. *et al.,* ed. 2008. *Scientific colaboration on the internet.* Cambridge: MIT Press.

Roosendaal, H. e P. Geurts. 1997. "Forces and functions in scientific communication: an analysis of their interplay". *Cooperative Research Information Systems in Physics*, August 31-September 4, Oldenburg, Germany.

Rowley, J. 1998. "Towards a framework for information management". *International Journal of Information Management* 8 (5): 359-369.

Shearer, K. e B. Birdsall. 2002. *The Transition of Scholarly Communication in Canada. CARL/ABRC Backgrounder.* Ottawa: CARL/ABRC.

Søndergaard, T. F. *et al.* 2003. "Documents and the communication of scientific and scholarly information: revising and updating the UNISIST model". *Journal of Documentation* 59 (3): 278-320.

Suber, P. 2010. *Open access overview: focusing on open access to peer-reviewed research articles and their preprints.* Disponível em: http://legacy.earlham.edu/~peters/fos/overview.htm

—— 2007. *Timeline of the Open Access Movement.* Disponível em: http://legacy.earlham.edu/~peters/fos/timeline.htm

Swan, A. 2004. *Journal authors survey: report.* Cornwall: Key Perspectives.

—— 2008. *Key concerns within the scholarly communication process: report to the JISC Scholarly Communications Group.* Truro: Key Perspectives Ltd.

—— 2006. "The culture of open access: researchers' views and responses". N. Jacobs, ed. *Open access: Key strategic, technical and economic aspects.* Oxford: Chandos.

—— 2010. *The open access citation advantage: studies and results to date. Technical Report.* Southampton: University of Southampton.

Swan, A. e S. Brown. 2004. "Authors and open access publishing". *Learned Publishing* 17: 219-224.

—— 2005. *Open access self-archiving: an author study.* Cornwall: Key Perspectives.

UNISIST. 1971. *Study report on the feasibility of a world science information system*. Paris: Unesco.

Vickers, P. 1985. "Information management: selling a concept". B. Cronin, *Information management: from strategies to action*. Londres: Aslib, 151-160.

White, M. 1985. "Intelligence management". B. Cronin, ed. *Information management: from strategies to action.* Londres: Aslib, 21-35.

Willinsky, J. 2006. *The access principle: the case for open access to research and scholarship.* Massachusetts: MIT Press.

Wilson, T. D. 2002. "Information management". J. Feather e P. Sturges, ed. *International Encyclopedia of Information and Library Science*. Londres: Routleg.

Para citar este artículo:

Lima Leite, Fernando César y Sely Maria de Souza Costa. 2016. "Modelo genérico de gestão da informação científica para instituições de pesquisa na perspectiva da comunicação científica e do acesso aberto." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 43-73. http://dx.doi.org/10.1016/j.ibbai.2016.04.012

Correlation between a country's centrality measures and the impact of research paper: The case of biotechnology research in Latin America

Guillermo Armando Ronda-Pupo *
Yesenia Ronda-Danta **
Yusleydis Leyva-Pupo ***

Article received on: October 1th, 2014.
Article accepted on: October 27, 2015.

Abstract

The aim of this paper is to unveil the latent structure of the Latin American regional biotechnology research collaboration network, as well as to determine whether the impact of a biotechnology paper is correlated to centrality measures (degree, betweenness and closeness) of Latin American countries within the structure of the regional collaboration network. To achieve these objectives, 14,173 Latin American biotechnology papers published between 1988 and 2012 were analyzed, using a combination of social network analysis and bibliometric techniques. Results of the study show the impact of a Latin American biotech-

* Universidad Católica del Norte, Chile. Universidad de Holguín, Cuba. gronda@ucn.cl
** Universidad de Ciencias Médicas, Holguín, Cuba.
*** Policlínica Alcides Pino Coello, Holguín, Cuba. yusleidysleyva@gmail.com

nology paper is positively correlated to its country´s betweenness, but not to its degree of centrality or closeness. These findings show the importance of developing collaboration networks to impel biotechnology research in Latin America.

Keywords: Centrality Degree; g-index; Research on Biotechnology; Scientific Impact.

Resumen

Correlación entre las medidas de centralidad de los países y el impacto de sus artículos. Caso de estudio de la investigación sobre biotecnología en Latinoamérica

Guillermo Armando Ronda Pupo, Yesenia Ronda Danta and *Yusleydis Leyva Pupo*

El objetivo del presente estudio es develar la estructura latente de la red latinoamericana de colaboración regional en la investigación sobre biotecnología y determinar si el impacto de los artículos latinoamericanos sobre biotecnología se relaciona con las medidas de centralidad (grado, intermediación y proximidad) de los países latinoamericanos en la estructura de la red de colaboración regional. Para lograrlo se examinaron 14 173 artículos, publicados entre 1988 y 2012, combinando técnicas del análisis de redes sociales con métodos bibliométricos. Los resultados obtenidos muestran que el impacto de los artículos latinoamericanos sobre biotecnología está correlacionado positivamente con la intermediación de los países, no así con el grado de centralidad o la proximidad. El hallazgo demuestra la importancia de fomentar las redes de colaboración internacional como una vía favorecedora para desarrollar la investigación sobre biotecnología en Latinoamérica.

Palabras clave: Investigación sobre Biotecnología; Grado de Centralidad; Índice Crown; Impacto Científico; Intermediación, Proximidad.

Introduction

World-wide scientific output in the field of biotechnology has grown significantly over the last 30 years. In 1990 we saw the publication of 5,427 papers in this field in journals listed in *ISI Web of Science*, but by 2010 this number had quadrupled to 23,292. The United States alone accounted for 5,417 of these papers in 2010, which is nearly equal to the output for the entire world in 1990.

Output in the field of biotech from the Latin American and Caribbean region also has grown in recent years. The output for 2010 was 1,157 papers, fully 12 times greater than the 93 published in 1990. Despite this impressive growth in the number of papers published in world-class biotech journals from Latin America, these still comprised only 4.96% of total output for that year. This result exhibits a gap between developing and developed countries with regard to this area of research. For example, South Korea, ranked ninth in world in scientific output in 2010, accounted for three papers more than the entire scientific output of Latin America in 2010.

Because of its substantial societal impact, the increase in the number of published papers and the growing interest of developing countries in biotech has attracted the attention of sciencometrics researchers. This is evident in the research in the field (Dalpé, 2002; Glänzel y Zhou, 2010; Huang *et al.,* 2013; McCain, 1995).

Impact studies of biotech papers are scarce. Previous research has been performed by Dalpé (2002), who analyzed papers and patents, demonstrating that there is no significant difference in the impact of published papers that cite patents and those that do not. Another study by Eslami, Ebadi and Schiffauerova (2013) analyzed the effects of collaboration networks in scientific output in Canada, finding that the structure of the co-authorship network of Canadian paper exerts effects on biotech scientific output. The structure of the network, however, does not exert a significant effect on the impact of the patents produced by the researchers. In Latin America researchers have studied scientific collaboration networks in the field of biotech in northern Brazil (Costa, Da Silva y Macedo, 2012), showing that the predominance of intra-institutional and intra-regional collaboration over international configurations in the field of biotech in northern Brazil.

The relationship between measures of centrality and the impact of papers has been studied in information science at the level of author (Abbasi, Chung and Hossain, 2012), institutions (Abassi, Altmann and Hossain, 2011), researchers within a single institution (Cimenler, Reeves y Skvoretz, 2014); and in the field of chemistry at the level of author in a single country

(Badar, Hite and Badir, 2012, 2014). No previous antecedents on the analysis of the influence of centrality on the impact of papers published in the area of biotech at the level of countries in a region have been found. In previous studies, Cimenler, Reeves and Skvoretz (2014) analyzed the relationship between the measures of centrality to impact using the Hirsch index (2005). Meanwhile, Abbasi, Chung and Hossain (2012; also see Abbasi, Hossain and Leydesdorff, 2012) measured this relationship using the g index (Egghe, 2006); and Badar, Hite and Badir (2012, 2014) measured the impact through standardized scientific output. No antecedents on the analysis of the relationship of measures of centrality to the impact using the Crown index (which will be used in this study) were found.

Thus, the result of this research will contribute information for the design of a publication strategy in research centers and the scientific research funding agencies in the region of Latin American and the Caribbean.

Study objective and research question

The objective of this research is to determine whether the degree of centrality of Latin American countries in the collaboration network predicts the impact of its biotech papers. This objective can be specified on the basis of the following research questions:

1. What is the latent structure of the collaboration network and centrality of countries in Latin American biotech research?
2. As gauged by the Crown index, what is the impact attained by Latin American biotech papers for each of the countries in the network?
3. As gauged by the Crown index, is there a relationship between the measures of centrality, degree, intermediation and closeness of Latin American countries in the regional academic collaboration network and the impact of their papers on biotech?

In order to answer these questions, we have applied sciencometrics methods combined with social network analysis. This approach allows both quantitative analysis of biotech science output in Latin America and qualitative analysis, exhibited in the network the most central countries in scientific collaboration with regard to papers in the field of biotech published in journals from 1988 and 2012 and listed in the *ISI Web of Science*.

Theoretical framework and antecedents

Relación entre las medidas de centralidad y el impacto de las publicaciones

Frenken, Hoolzl and De Vor (2005) have stated that collaboration networks are effective for production and dissemination of new knowledge, and how both of these factors increase the impact of journals.

Table 1 shows previous studies that have analyzed the relationship of measures of centrality and the impact of research. As can be seen, all of these studies analyze the three most important measures of centrality: degree, betweenness and closeness. The differences, however, lie in the areas of study and the indicator used to measure impact. Thus, Abasi, Chung and Hossain (2012) and Abbasi, Altmann and Hossain (2011) gauge performance using the g index Egghe, 2006); Cimenler, Reeves and Skvoretz (2014) use the Hirsch index (2005), and Badar, Hite and Badir (2012, 2014) use the adjusted impact factor of scientific output of researchers in the field of chemistry in Pakistan.

Table 1. Previous studies on the relationship of centrality to the performance of published papers

Study	Centrality measure	Performance indicator	Area of study analyzed
Abbasi, Altmann and Hossain (2011)	Degree Betweenness Closeness Eigenvector	Index g	477 papers on IS from 5 universities
Abbasi, Chung and Hossain (2012)	Degree Ego Betweenness	Index g (Google Academic)	10 researchers in IS
Badar, Hite and Badir (2012)	Degree Proximidad Betweenness	Scientific output Impact Factor (*ISI Web of Science*)	1 699 papers by 2 027 researchers in the field of chemistry in Pakistan
Cimenler, Reeves and Skvoretz (2014)	Degree Betweenness Closeness Eigenvector	Index h	107 researchers in the University of South Florida
Badar, Hite y Badir (2014)	Degree Closeness Betweenness	Scientific output (ISI Web of Science)	1 699 papers by Pakistani authors
This study	Degree Proximidad Betweenness	Index Crown	14 173 papers on biotech from 21 Latin American countries

Relationship of degree of centrality to impact

Abbasi, Altmann and Hossain (2011) have reported a positive correlation between the degree of centrality of the authors of 477 papers on information science and their impact (g index) r= ,305, p< 0,001. Subsequently, Abbasi, Chung and Hossain (2012) analyzed the relationship of centrality of ten researchers in information science and their performance (g index), showing the existence of a positive correlation of r= ,327, p< 0,05 between degree and impact.

In like fashion, Badar, Hite and Badir (2012) analyzed the relationship between centrality and performance of 2,027 Pakistani researchers in the field of chemistry, showing that centrality determined the performance of 56% of researchers with R^2= ,568, p < 0,01. Thereafter, Badar, Hite and Badir (2014) complete their previous study and reported that the degree of centrality of 2,027 Pakistani chemistry researchers influences their performance (β= 1.056, p< 0,01). .

Additionally, Cimenler, Reeves and Skvoretz (2014) studied the relationship between the degree of centrality to performance gauged by the Hirsh index of 107 researchers of the University of South Florida, concluding that degree of centrality exerts a positive influence on their performance, while reporting a positive relationship between the degree of centrality to researcher performance of r= ,422, p> 0,01.

According to previous results, the degree of centrality is associated positively with performance of researchers and institutions. Our research expects to find that papers by biotech researchers exhibiting more links to other countries will have higher impact in the field. The number of relationships increases the absorption capacity of the country by promoting its intellectual capital, which would happen because of the increasing capacities to assimilate new knowledge, techniques, technologies and scarce resources, while they learn from the experiences of other researchers with greater scientific development in the field of biotechnology. Thus, an initial hypothesis proposes that there is a positive correlation between the degree of centrality of the Latin American country within the regional collaboration network and the impact of its papers on biotech topics.

Relationship of betweenness to impact

Abbasi, Altmann and Hossain (2011) have reported a positive correlation between betweenness of authors in the collaboration network and their impact (index g) of r= ,529, p< 0,001. In a later study, Abbasi, Chung y Hos-

sain (2012) demonstrated the existence of a positive correlation of r= ,771, p< 0,05 between betweenness of ten information science researchers and their impact.

A study by Badar, Hite and Badir (2012) reports that the betweenness of 2.127 Pakistani chemistry researchers predicts performance of R^2= ,139, p< 0,01. Sin Badar, Hite and Badir (2014) reported, however, that the proximity of 2027 researchers in the network does not exert any such influence on performance in the same sample (β= 0,014, p> 0,01). Meanwhile, Cimenler, Reeves and Skvoretz (2014) found influence of betweenness on the impact (h index) of 107 authors in the collaboration network of the University of South Florida, though this influence was only significant in cases of co-authorships.

This paper expects to find that when the betweenness of countries in the regional collaboration network increases, impact will also increase. As such, the second hypothesis may be stated as follows: There is a positive correlation between the betweenness of the Latin American country in the regional collaboration network and the impact of the biotech literature they produce.

Relationship of proximity to impact

Abbasi, Altmann and Hossain (2011) have reported the existence of a positive correlation between the proximity of authors in the collaboration network and their impact (g index), with r= ,055, p< 0,05. Badar, Hite and Badir (2014) reported that the non-existence of the influence of betweenness of 2,027 Pakistani chemistry researchers in the co-authorship network does not influence their performance (β= 0,046, p> 0,01). In this light, we posit our third hypothesis as follows: There is a positive correlation between closeness of the Latin American country in the regional collaboration network and the impact of the biotech literature they produce.

Dependent variable: the impact of Latin American papers on biotechnology

When employed for the purpose of justifying funding and securing accreditations, the use scientific research output figures and the number of citations received to gauge scientific performance of researchers, research centers and universities is an area of increasing interest of researchers. Currently, the academy is well aware that their careers, salaries and promotions depend on the impact of their research among their academic peers (Cordero-Villafáfila and Ramos-Brieva, 2014; Finkel, 2014). In science in general, the influence of an author within the community is gauged by looking at the frequency with which his or her publications are cited by peers. Thus, the number of

citations an author receives serves as the gauge for measuring performance and assigning one's position on the pay scale. For example, in management it has been found that there is a positive correlation between the number of citations received by a researcher and the salary that researchers earns (Gómez-Mejía and Balkin, 1992).

The relationship between collaboration and impact of journals has been analyzed by several authors (Gazni y Thelwall, 2014; Glänzel, 2002; Li, Liao and Yen, 2013; Yu *et al*., 2014). Since the foundation of the *Science Citation Index,* there has been broad consensus in the international scientific community regarding the importance of measuring the impact of scientific literature. This impact measure is performed largely by adding up the citations received by papers published by an author. In her paper "Self-Citations in Scientific Literature," Renata Tagliacozzo (1977) called attention to the padding impact caused by authors citing themselves. Thus, in recent years the method of counting citations to measure performance has come under further scrutiny, with most of these criticism centering on distortions caused by the practice of self-citation (Chang, McAleer and Oxley, 2013; Diekhoff, Schlattmann and Dewey, 2013; Ferrara and Romero, 2013). This situation has brought about not only serious questioning of the reliability of the citation count approach to gauging performance, but it also has raised doubts about the genuine influence within the scientific community of authors who indulge heavily in self-citation.

Several indexes have been developed that attempt to improve the reliability of impact and performance measures. The most popular of these was created by Jorge Hirsch (2005). This method was elaborated further in the e index developed by Zhang (2009), and discounted h index created by Ferrara and Romero (2013) and the g index of Egghe (2006), the latter of which has become widely accepted in the academic community because it overcomes the limitation of the h index by not rewarding papers with high numbers of citations. Nonetheless, the g index has issues with the reliability of the country impact measurement, because it tends to favor countries with greater scientific production. Thus, a large Latin American country such as Brazil benefits from having much greater scientific output than that seen in other countries of the region.

To overcome these limitations, we have opted to use the Crown index (Waltman *et al*., 2011a, 2011b) to measure the impact of biotech research produced by Latin American countries. The Crown index overcomes the limitation of the Hirsch index and its variants, and those of the g index, which tends to favor countries with higher rates of scientific output.

To generate the Crown index, one takes into account not only citations received by countries, but also the relevance of the journals from whence

these come. The composition of the subset of journals is weighted against the mean, which is this study is against the mean for biotech. Thereafter, the impact is normalized so that the countries with impacts normalized to the world average will have a value of 1. The papers from said country have been published in journals that stand at the mean of impact in their category. Thus, a normalized impact above 1 indicates a means impact above the category of the journal, while normalized impacts below 1 indicates a mean impact below the category of the journal. The procedure for calculating the Crown index is explained in Waltman *et al*., 2011a, 2011b, and Moed, 2010.

Independent variables

The degree of centrality of Latin American countries in the collaboration network

The analysis of social networks has awakened considerable interest in recent years and plays a key role in many disciplines (Liu *et al*., 2005). The analysis of social networks is a powerful strategy for information sciences (Abbasi, Hossain and Leydesdorff, 2012). Otte and Rousseau (2002) define analysis of social networks as a broad strategy for researching social structures. The increased complexity of problems and sustained growth dynamics of knowledge have driven increased interest in the structure and sociology of scientific collaboration (Racherla y Hu, 2010).

The basic principle of analysis of social networks is the quantification of relationships established by the participating members of the group. These relationships constitute a structure. In the analysis of scientific journals, networks can be analyzed by analyzing co-authorships of the papers. Thus, when authors from two distinct countries join forces to write a paper, they create a link between their countries. The greater the number of links received by a country, the greater will be its centrality in the network structure.

The measure of centrality is a subset of algorithms that are calculated in the network and which allow one to determine both the structure and the position of each vertex (understood as the country) within the structure (De Nooy, Mrvar and Batagelj, 2008). The measure of centrality arises from the work of Bavelas (1948; 1950), and currently there are several measures for analyzing the influence of an actor within the network structure. Those most often employed are degree, betweenness (Freeman, 1977), closeness and the information (Stephenson and Zelen, 1989). The present study uses the degree of centrality and betweenness of each Latin American country in the biotech research collaboration network.

The degree of centrality brings together the measure of total centrality of a Latin American country in the biotech research network on the basis of the links that it establishes with other countries participating through co-authorship of papers. This process serves to identify those countries that stand at a central position in the collaboration structure, while determining those that are more related to the rest of the network structure. To calculate the degree, the following formula is employed:

$$C'_D(n_i) = cd(n_i)/g\text{-}1$$

Where $C'_D(n_i)$ is the degree of centrality of the country n_i, $cd(n_i)$ is the number of Latin American countries contributing papers to the biotech field in accord with the ISI data base, and g-1 is the total number of countries in the network excluding the country under examination.

Betweenness of Latin American countries in the collaboration network

Betweenness is a measure of centrality based on the nearest distance between the diverse countries participating in the collaboration structure. Thus, the most central country in terms of betweenness is that which is situated on the shortest link between the other countries in the network. That is, it becomes the communication hub for many other countries. To calculate betweenness the following formula is used:

$$C'_D(n_i) = \frac{C_B(n_i)}{[(g-1)(g-2)/2)]}$$

where $C_B(n_i)$ is the sum of probabilities of a country (n_i) appearing as a bridge along the nearest route between other countries and $[(g-1)(g-2)/2)]$ is the total number of shortest routes between the other countries in the network other than the country (n_i).

The proximity of Latin American countries in the collaboration network

The centrality measure of closeness was proposed by Freeman (1979) in order to measure centrality of several nodes in a network. Thus, a node is central when it is nearest to the other nodes in the network. To calculate the proximity of the counties in this study, we have employed the formula developed by Abbasi, Altmann and Hossain (2011).

To calculate the three measures of centrality of the Latin American countries in the biotech collaboration network, a 1-mode matrix was constructed and the Pajek informatics program was used (Batagelj and Mvar, 1998).

Data and information sources

This study employs social network analysis techniques to reveal and graphically represent the latent structure of the Latin American international research collaboration network in biotechnology. The procedure employed consists of the following three steps:

1. A search of the *ISI Web of Science* data base was performed according to the following strategy: advanced search CU = (country) and category of the *Web of Science* (WC) = *Biotechnology & Applied Microbiology.* Time frame: from January 1, 1988 to December 31, 2012; Language: all, Citation data base: *Science Citation Index Expanded;* Type of document: scholarly paper. To quantify the relationships between Latin American countries in biotech journals, the results by country and territory were ranked with a minimum value of 1.
2. A 1-mode matrix was created (*n x n*) placing the 21 Latin American countries having contributed at least one biotech paper within the time frame as the unit of analysis (rows), and the Latin American countries with which they collaborated in publications as the variables (columns). During the data encoding, we came across two situations: 1) the author signs in representation of a country (in which case one point was assigned for each country represented by each signing author), and 2) 4.07% of papers had authors signing in representation of more than one country. The encoding of these instances entailed adjusting the number of appearances as per the procedure described by Heck and Cooley (1988), Morrison and Inkpen (1991), and Shane (1997). This procedure assigns one half of a point to each country when an author signs for two countries, and one third of a point when the authors signs for three, and so on. .
3. The Latin American biotech research collaboration network was graphically represented using Pajek software and the Kamada-Kawai (1989) spatial distribution technique. Once the latent structure of the collaboration network was determined, the degree of centrality of each country in the network structure was calculated using the partition command provided in the Pajek software.

Analysis and discussion

Table 2 shows the bibliometric data on the study variables. As can be seen, four countries account for 87.29 % of the biotech scientific output between 1988 and 2012. These countries are Argentina, Brazil Chile and Mexico. The papers on biotech from these countries have the weightiest impact in the period under study. This result shows the advantage in terms of impact held by countries with the greater economic and scientific development, in that these are the countries that produce the most papers.

When the impact is normalized using the crown indicator, only two small countries, Bolivia and Costa Rica, exhibit impacts above the world average. This result shows the advantage of using the crown indicator to compare the impacts of counties without allowing the county size to skew the results.

Table 2. Descriptors of biotech research in Latin American countries

Country	Scientific output	Number of citations	Degree	Betweenness	Closeness	Crown index
Argentina	2 262	30 322	0,60	0,087	0,536	0,75
Bolivia	48	715	0,30	0,015	0,409	1,05
Brasil	6 203	82 508	0,65	0,082	0,576	0,54
Colombia	332	4 779	0,50	0,016	0,501	0,5
Chile	994	14 816	0,55	0,035	0,518	0,84
Costa Rica	84	1 799	0,55	0,062	0,501	1,71
Cuba	659	8 490	0,60	0,082	0,501	0,28
Ecuador	24	533	0,20	0	0,345	0,49
Guadalupe	28	495	0,10	0,027	0,324	0,59
Guatemala	20	204	0,15	0	0,361	0
México	2 913	41 949	0,55	0,097	0,518	0,73
Nicaragua	12	376	0,10	0	0,324	0,42
Panamá	23	694	0,25	0,01	0,388	0,41
Paraguay	5	85	0,05	0	0,33	0,06
Perú	102	1 578	0,40	0,001	0,444	0,78
Trin Tobago	45	744	0,15	0,001	0,311	0,49

Uruguay	192	3 552	0,05	0,001	0,33	0,68
Venezuela	198	2 875	0,35	0,022	0,444	0,62
Haití	1	4	0,05	0	0	0,81
Honduras	11	137	0,05	0	0,317	0,16
Barbados	9	55	0,05	0	0	0,47

Figure 1 shows the structure of the Latin American biotech research collaboration network. The countries with highest centrality are Brazil, Cuba, Argentina, Chile, Costa Rica and Mexico. The ones with the lowest centrality in the network are Barbados, Haiti and Honduras, all of which depend on collaboration to be linked to the network.

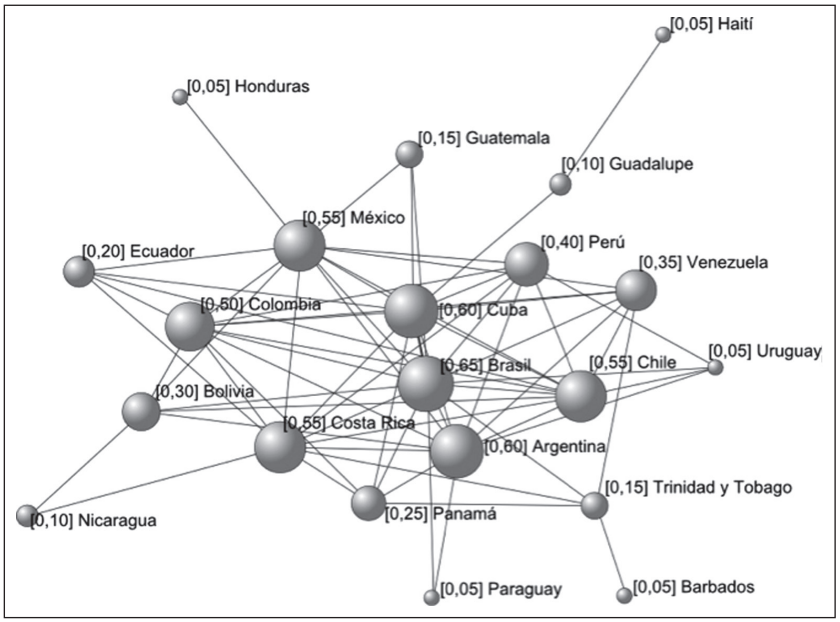


Figure 1. Latin American biotech research collaboration network
Note: Centrality values appear in brackets

1,710 and a mean of ,589. The result of the Shapiro Wilki test (*W-Statistic* = 0,915, p = 0,029) shows that this variable is not normally distributed. *Table 3* shows the mean values and the standard deviation.

Since the four variable in the study do not exhibit normal distribution, a Spearman Rho test was run in order to determine if the variable impact is related to the means of centrality of degree, betweenness and closeness.

Table 3 show the results. As can be seen, the impact variables and the degree of centrality are not correlated (0,369, $p< 0,099$): as such, the first hypothesis is not validated. The result is the opposite of those reported by Abbasi, Chung and Hossain (2012), and Abbasi, Altmann and Hossain (2011), who measured impact with the g index, and of Cimenler, Reeves and Skvoretz (2014), who measured impact with the h index, and of Badar, Hite and Badir (2012, 2014), who used scientific output. The results obtained suggest the influence of the size of the country on impact, when this is measured using the Hirsch, g or discounted Hirsch approaches. Likewise, the result shows the neutralizing effect of the crown indicator of the disadvantage of these indices, which tend to favor large institutions or countries.

Table 3. Inter-correlations, means and standard deviation of impact and measures of centrality (*N*= 14,173).

	Degree	Betweenness	Proximity	Mean	Standard deviation
Impact	,369	,473*	,364	0,590	0,366
Degree		,847**	,934**	0,298	0,223
Betweenness			,819**	0,026	0,034
Closeness				0,380	0,152

**p< 0,05, **p< 0,001.*

A positive correlation was found between betweenness (0,473, $p< 0,05$) of the countries in the regional collaboration structure. This value is interpreted as the median effect in accord with the base values of Cohen (1988). This result validates the second hypothesis. The finding is contrary to that reported by Badar, Hite and Badir (2014) for the area of chemistry in Pakistan, where the researchers found the no correlation between betweenness and impact gauged as normalized scientific production. Thus, in this paper we corroborate the findings of Abbasi, Chung and Hossain (2012) for the g index, although our correlation is lower than that reported by them. Just as in the first hypothesis, the ratio could be lower because of the crown indicator neutralizes country size. This finding also corroborates the results found by Cimenler, Reeves and Skvoretz (2014)..

No relationship was found between impact and closeness of the countries (0,364, $p< 0,105$): as such the third hypothesis is not validated. This result is similar to that reported by Badar, Hite and Badir (2014) and contrary to that of Abbasi, Altmann and Hossain (2011).

Conclusions

The results reported herein show the growing interest of Latin American countries in the field of biotech research in recent years. This facet is evidenced in the 12-fold growth of research from 1990 to 2010. Brazil, Argentina, Mexico and Chile are the countries with the highest levels of scientific output in this research field.

Academic collaboration with developed countries, such as the United States of America, Japan, Germany, England, Spain and France (all of which stand near the center of the biotech research network) has played a key role in this very significant growth in biotech research. These elements constitute evidence of the need to orient regional scientific policy toward promoting links with the major research centers, as part of an overall strategy to increase the impact of regional research in the broader field of biotechnology.

When the centrality values of each Latin American country in the regional collaboration structure are examined, we find Cuba and Mexico trailing only Brazil. This result shows that there is a positive correlation between impact and betweenness of countries in the structure of the regional collaboration network, but this is not the case for measures the degree and closeness measures of centrality.

This result shows that within a scientific network the role of producers of quality, high-impact research is as important as serving as a mediator or hub that facilitates collaboration between other countries in the regional network. In this way researchers in countries that serve this communicating function increase their capacity to attract and vie for resources, bring in new technologies and generally enhance laboratory facilities.

These elements contribute to enhancing the reputations of researchers within the network, thereby favoring the establishment of more collaborative links with researchers and institutions of increasing importance, while also opening the doors for their respective countries to participate in important and ever more complex biotech research projects.

Finally, it has been shown that the crown indicator is an effective way to compare the impact of countries, in that it reduces the effect of size differentials of the countries being compared. This conclusion is based on the finding herein that two of the smallest Latin American countries exhibit impacts above the world biotech research impact mean.

The research reported herein can be complemented by an analysis of the Latin American research collaboration network against countries that lie outside of the region, and by the study of the world-wide collaboration network in order to compare and contrast findings.

Acknowledgements

The authors wish to thank the three anonymous peer reviewers for their suggestions and guidance, which have served to improve this research report. The authors thank Professor Félix de Moya Anegón of Grupo Scimago for facilitating the data of the crown index used in our analyses, and for his comments on the manuscript and additional invaluable insights.

Works cited

Abbasi, A., J. Altmann y L. Hossain. 2011. "Identifying the effects of co-authorship networks on the performance of scholars: A correlation and regression analysis of performance measures and social network analysis measures". *Journal of Informetrics* 5 (4): 594-607. doi: 10.1016/j.joi.2011.05.007

Abbasi, A., K. S. Chung y L. Hossain. 2012. "Egocentric analysis of co-authorship network structure, position and performance". *Information Processing & Management* 48 (4): 671-679. doi: 10.1016/j.ipm.2011.09.001

Abbasi, A., L. Hossain y L. Leydesdorff. 2012. "Betweenness centrality as a driver of preferential attachment in the evolution of research collaboration networks". *Journal of Informetrics* 6 (3): 403-412. doi: 10.1016/j.joi.2012.01.002

Badar, K., J. M. Hite y Y. F. Badir. 2012. "Examining the relationship of co-authorship network centrality and gender on academic research performance: the case of chemistry researchers in Pakistan." *Scientometrics* 94 (2): 755-775. doi: 10.1007/s11192-012-0764-z

—— J. M. Hite y Y. F. Badir. 2014. "The moderating roles of academic age and institutional sector on the relationship between co-authorship network centrality and academic research performance." *Aslib Journal of Information Management* 66 (1): 38-53. doi: 10.1108/ajim-05-2013-0040

Ball, P. 2005. "Index aims for fair ranking of scientists." *Nature* 436 (7053): 900. doi: 10.1038/436900a

Batagelj, V. y A. Mrvar. 1996. *Pajek (Version 1.24)* [Free for noncomercial use]: Vladimir Batagelj and Andrej Mrvar.

—— y A. Mrvar. 1998. "Pajek. Program for large network analysis." *Connections* 21: 47-57.

Bavelas, A. 1948. "A Mathematical model for group structure." *Human Organizations* 7: 6-30.

—— 1950. "Communication patterns in task-oriented groups." *Journal of the Acoustical Society of America* 22: 271-282.

Cimenler, O., K. A. Reeves y J. Skvoretz. 2014. "A regression analysis of researchers' social network metrics on their citation performance in a college of engineering." *Journal of Informetrics* 8 (3): 667-682. doi: 10.1016/j.joi.2014.06.004

Cohen, J. 1988. *Statistical Power and Analysis for the Behavioral Sciences*. 2a. ed. New Jersey: Lawrence Erlbaum.

Cordero-Villafáfila, A. y J. A. Ramos-Brieva. 2014. "La evaluación del factor de impacto individual de investigadores y centros de investigación utilizando el algoritmo RC." *Revista de Psiquiatría y Salud Mental*. doi: 10.1016/j.rpsm.2013.11.002

Costa, B. M. G., E. da Silva Pedro y G. R. Macedo. 2012. "Scientific collaboration in biotechnology: the case of the northeast region in Brazil." *Scientometrics* 95 (2): 571-592. doi: 10.1007/s11192-012-0924-1

Chang, C. L., M. McAleer y L. Oxley. 2013. "Coercive journal self citations, impact factor, Journal Influence and Article Influence." *Mathematics and Computers in Simulation* 93: 190-197. doi: 10.1016/j.matcom.2013.04.006

Dalpé, R. 2002. "Bibliometric analysis of biotechnology." *Scientometrics* 55 (2): 189-213. doi: 10.1023/a:1019663607103

De Nooy, W., A. Mrvar y V. Batagelj. 2008. *Exploratory Social Network Analysis with Pajek*. New York: Cambridge University Press.

Diekhoff, T., P. Schlattmann y M. Dewey. 2013. "Impact of Article Language in Multi-Language Medical Journals - a Bibliometric Analysis of Self-Citations and Impact Factor." *Plos One* 8 (10): 8. doi: 10.1371/journal.pone.0076816

Egghe, L. 2006. "Theory and practise of the g-index." *Scientometrics* 69 (1): 131-152. doi: 10.1007/s11192-006-0144-7

Eslami, H., A. Ebadi y A. Schiffauerova. 2013. "Effect of collaboration network structure on knowledge creation and technological performance: the case of biotechnology in Canada." *Scientometrics* 97 (1): 99-119. doi: 10.1007/s11192-013-1069-6

Ferrara, E. y A. E. Romero. 2013. "Scientific Impact Evaluation and the Effect of Self-Citations: Mitigating the Bias by Discounting the h-Index." *Journal of the American Society for Information Science and Technology* 64 (11): 2332-2339. doi: 10.1002/asi.22976

Finkel, A. 2014. "Perspective: powering up citations." *Nature* 511 (7510): S77. doi: 10.1038/511S77a

Freeman, L. 1977. "A set of measures of centrality based on betwenness." *Sociometry* 40 (1): 5-41.

Freeman, L. C. 1979. "Centrality in social networks conceptual clarification." *Social Networks* 1 (3): 215-239.

Frenken, K., W. Hoolzl y F. de Vor. 2005. "The citation impact of research collaborations: the case of European biotechnology and applied microbiology (1988–2002)." *Journal of Engineering and Technology Management* 22: 9-30.

Gazni, A. y M. Thelwall. 2014. "The long-term influence of collaboration on citation patterns." *Research Evaluation*. doi: 10.1093/reseval/rvu014

Glänzel, W. 2002. "Coauthorship Patterns and Trends in the Sciences (1980-1998) :A Bibliometric Study with Implications for Database Indexing and Search Strategies." *Library Trends* 50 (3): 461-473.

Glänzel, W. y B. Thijs. 2004. "Does co-authorship inflate the share of self-citations?" *Scientometrics* 61 (3): 395-404.

—— y P. Zhou. 2010. "Publication activity, citation impact and bi-directional links between publications and patents in biotechnology." *Scientometrics* 86 (2): 505-525. doi: 10.1007/s11192-010-0269-6

Gómez-Mejía, L. R. y D. B. Balkin. 1992. "Determinants of faculty pay: An agency theory perspective." *Academy of Management Journal* 35 (5): 921-955.

Hartley, J. 2012. "To cite or not to cite: author self-citations and the impact factor." *Scientometrics* 92 (2): 313-317. doi: 10.1007/s11192-011-0568-6

Heck, J. y P. Cooley. 1988. "Most frequent contributors to the finance literature." *Financial Management,* Autumn: 100-108.

Hirsch, J. E. 2005. "An index to quantify an individual's scientific research output." *Proc Natl Acad Sci U S A* 102 (46): 16569-16572. doi: 10.1073/pnas.0507655102

Huang, M.-H., S.-H. Chen, C.-Y. Lin y D.-Z. Chen. 2013. "Exploring temporal relationships between scientific and technical fronts: a case of biotechnology field." *Scientometrics* 98 (2): 1085-1100. doi: 10.1007/s11192-013-1054-0

Kamada, T. y S. Kawai. 1989. "An algorithm for drawing general undirected graphs." *Processing Letters* 31 (1): 7-15.

Li, E. Y., C. H. Liao y H. R. Yen. 2013. "Co-authorship networks and research impact: A social capital perspective." *Research Policy* 42 (9): 1515-1530. doi: 10.1016/j.respol.2013.06.012

Liu, X., J. Bollen, M. L. Nelsonb y H. Van de Sompel. 2005. "Co-authorship networ ks in the digital library research community." *Information Processing & Management* 41: 1462-1480.

McCain, K. W. 1995. "The structure of biotechnology R & D." *Scientometrics* 32 (2): 153-175. doi: 10.1007/bf02016892

Moed, H. F. 2010. "CWTS crown indicator measures citation impact of a research group's publication oeuvre." *Journal of Informetrics* 4 (3): 436-438. doi: 10.1016/j.joi.2010.03.009

Morrison, A. J. y A. C. Inkpen. 1991. "An Analysis of Significant Contributions to the International Business Literature." *Journal of International Business Studies* 22 (1): 143-153.

Otte, E. y R. Rousseau. 2002. "Social network analysis: a powerful strategy, also for the information sciences." *Journal of Information Science* 28 (6): 441-453.

Racherla, P. y C. Hu. 2010. "A social network perspective of tourism research collaborations." *Annals of Tourism Research* 37 (4): 1012-1034. doi: 10.1016/j.annals.2010.03.008

Shane, S. A. 1997. "Who is Publishing the Entrepreneurship Research?" *Journal of Management* 23: 83-95.

Stephenson, K. y M. Zelen. 1989. "Rethinking centrality: Method and applications." *Social Networks* 11 (1): 1-37.

Tagliacozzo, R. 1977. "Self-Citations in Scientific Literature." *Journal of Documentation* 33 (4): 251-265. doi: 10.1108/eb026644

Torabian, R., A. Heidari, M. Shahrifar, E. Khodadi y S. A. E. Vardanjani. 2012. "The Relation between Self-Citation and Impact Factor in Medical Science Open Access Journals in ISI & DOAJ Databases." *Life Science Journal-Acta Zhengzhou University Overseas Edition* 9 (4): 2206-2209.

Van Raan, A. F. J. 1998. "The influence of international collaboration on the impact of research results - Some simple mathematical considerations concerning the role of self-citations." *Scientometrics* 42 (3): 423-428.

Waltman, L., N. J. van Eck, T. N. van Leeuwen, M. S. Visser y A. F. J. van Raan. 2011a. "Towards a new crown indicator: an empirical analysis." *Scientometrics* 87 (3): 467-481. doi: 10.1007/s11192-011-0354-5

—— N. J. van Eck, T. N. van Leeuwen, M. S. Visser y A. F. J. van Raan. 2011b. "Towards a new crown indicator: Some theoretical considerations." *Journal of Informetrics* 5 (1): 37-47. doi: 10.1016/j.joi.2010.08.001

Yu, Q., H. Shao, C. Long y Z. Duan. 2014. "The Relationship Between Research Performance and International Research Collaboration in the C&c Field." *Experimental & Clinical Cardiology* 20 (6): 145-153.

Zhang, C. T. 2009. "The e-index, complementing the h-index for excess citations." *Plos One* 4 (5): e5429. doi: 10.1371/journal.pone.0005429

Para citar este artículo:

Ronda Pupo, Guillermo Armando *et al.* 2016. "Correlación entre las medidas de centralidad de los países y el impacto de sus artículos. Caso de estudio de la investigación sobre biotecnología en Latino América." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 75-94. http://dx.doi.org/10.1016/j.ibbai.2016.04.013

Encouraging reading for pleasure and the comprehensive training for readers

Elsa Margarita Ramírez-Leyva *

Article received on: January 23, 2014.
Article accepted: May 14, 2015.

Abstract

This paper proposes an approach to renewing the teaching of readers how to cope with the complex demands of the information society. In this context, the role of the library in training, learning, and construction of sociability and culture requires examination; and librarianship needs to develop broadly conceived proposals that move beyond pedagogical reading models offered schools. *Bildung* provides guidance for the comprehensive training of readers across a variety of codes, thereby equipping trainees with reading skills needed to develop broader lexicons and other associated tools and cultural capital that are useful in

* Instituto de Investigaciones Bibliotecológicas y de la Información de la UNAM, México. eramirez@unam.mx

the construction of knowledge. Moreover, such training enriches the subject with aesthetic experiences that have the potential to effectuate subjective transformation of citizens over the long term.

Keywords: Reader's Education; Library Science; Reading and Knowledge Societies; *Bildung*; Multiple Literacies.

Resumen

De la promoción de la lectura por placer a la formación integral de lectores
Elsa Margarita Ramírez Leyva

En artículo tiene el objetivo de proponer elementos para renovar la formación de lectores ante la complejidad de la lectura que hoy exigen las sociedades del conocimiento. En este contexto surgen concepciones sobre la función de la biblioteca como espacio de formación, aprendizaje, cultura y construcción de sociabilidades; por ello la bibliotecología debe desarrollar una propuesta con una perspectiva de lectura más amplia que la de los modelos pedagógicos en las instituciones educativas. Se identifican en la *Bildung* aportaciones para una formación de lectores integral, se incorporan además una variedad de recursos que favorecen la lectura de diferentes códigos para ampliar el capital cultural y léxico que a la vez generan modalidades de lectura dirigidas al desarrollo de capacidades de pensamiento crítico y de reflexión involucradas en la construcción de conocimiento, así como para causar experiencias estéticas necesarias en la formación y transformación subjetiva de los ciudadanos a lo largo de su vida.

Palabras clave: Formación de Lectores y Bibliotecología; Lectura y Sociedades del Conocimiento; *Bildung;* Alfabetización Múltiple.

Si lo que uno quiere es educarse y formarse,
es de fuerzas humanas de lo que se trata, y en que,
sólo si lo conseguimos, sobreviviremos indemnes
a la tecnología y al ser de la máquina.

HANS-GEORG GADAMER

Time has turned library into school and
the librarian is a teacher, at his best, and the visitor is
a reader among books as a worker is among his tools.

MELVIL DEWEY

INTRODUCTION

Twentieth century societies require readers capable of using information and transforming it into knowledge. In this context, the librarian's duty of training readers has split into two branches: one is aimed at increasing the practice of serious and pleasure reading, which extends increasingly to groups of adults, including communities within higher education; and the other carried out in the realm of user services in the modality of education or training of users. Nowadays, faced with changing modalities of reading, access, selection and the varieties of uses of written contents, the library also demands informative abilities and literacy in conjunction with a broad range of audio-visual and hyper-text resources generated by innovations in electronic resources that entail changes in the way people read, become informed and deliver information.

The scenario of the current century requires innovation in the way librarians train readers. This task has become increasingly complex owing to the now required capacity to transform information into knowledge, which is revalued as the common denominator of current society and is considered a strategic element for driving economies, innovation, competitiveness and global interaction. The production of information, increasingly abundant and immediately available through mobile devices almost anywhere on the face of the earth, and its use are essential, because they tend to cover the vast majority of daily labor, learning, entertainment and communication activities. As such, citizens must develop reading abilities in order to potentiate the capacities within a context of global competition. Today more than ever risk factors must be resolved.

Among the problems that still persist, limiting some countries full integration with knowledge societies, are the social gaps, caused by the lack or deficiency in educational processes, illiteracy and the functional illiteracy of communities that have not enjoyed the opportunity to exercise their reading

and writing abilities. To this situation, we can add reading deficiencies, identified in national and international evaluations of diverse countries, among students that have concluded their courses of basic, middle and higher education. Likewise, in the recent decades, both serious and pleasure reading have declined among young people enrolled in school. These problems affect the societies that seek to homogenize the mastery of reading and learning underpinning the informative and communicative abilities of their citizens.

In sum, the abundance of information to which one can gain access today, the opportunities offered by technologies to allow people to exploit educational resources, labor and productive activities, and ongoing education, even while they offer opportunities for social advancement, can become adverse in communities that suffer reading, informational and communication weaknesses. The matter previously stated is not limited to underprivileged communities, but also extends to communities of higher education where cognitive, cultural, social and economic gaps can be exacerbated. As such, this study configures a context in which library science needs to renew training models for readers and the education of librarians in the performance librarianship, for the purpose of contributing to solutions to problems that limit opportunities to access and use the contents offered through diverse resources, not only those with utilitarian or common uses, but also for the full development of the capacities of each individual —cognitive, reflexive, critical, dialectic, creative, imaginative, affective and aesthetic. All of these abilities are involved in training throughout their lives, not only for utilitarian purposes, but also for creating citizens who participate in social changes that benefit themselves, their communities and the ecosystem and the development of a better environment. Therefore, it is necessary to transform and strengthen the library as an alternative space of appropriation of information, learning, training, recreation, construction of social skill that are not limited to the local context, but which extend to diverse points on the planet and open new multicultural modalities of sharing as part of globalization.

The librarian's duty to provide training does not mean an educational function in the pedagogical sense as practiced in school, but rather the task of creating alternatives beyond school learning in work and familial contexts, and which entail commercial interest. Therefore, we propose that the librarian's function in the training of readers potentiates reading and information in a broad sense, in terms of the variety of codes, practices and uses, that in addition to meeting the needs of students and other academic requirements and those pertaining to the workplace and daily life, also stimulate the individual's capacity required in the process of training and transformation, which implies appropriation, empowerment and ownership of the language of infor-

mation, which is not ever achieved permanently, but rather requires ongoing development. Thus, each individual enjoys the option of being an actor and not the object of the written word and the discursive powers that surround us and which extend to the digital environment.

From diverse perspectives the function of training readers as part of the social duties of the librarian is announced, and especially in the panorama of societies in the current century, in which the ways of reading and receiving and issuing information are undergoing so much change. For this reason, the objective of this paper is to analyze the proposals for the educational duties of the library and identify elements for renewing the discourse and models of library science education and the practice of librarians with regard to training readers, which now must include contents in diverse codes, while broadening the ends beyond the promotion of pleasure reading and including other capacities that contribute to the development of academic literacy, informational abilities or information literacy needed by citizens of the knowledge society.

Reading and information: agents of risk in twentieth century societies?

The twentieth century is oriented toward the development of knowledge societies, but also we know that in every age communities have conceived their own ways of generating information, communicating it and transforming it into knowledge. As such, civilizing processes have been achieved, but problems of underdevelopment, exclusion and social gaps have persisted. Nowlies in the shift toward a central place, while the resource on which production and supplies in the innovation systems depend, whose results consist in products, processes, organizational forms, systems or services, are applied in the solution to problems and obtaining benefits for some human group.[1] He adds that the emphasis in an authentic knowledge society should be on education and the conditions that guarantee the development of capacities for exploiting existing knowledge, in order to generate the new knowledge required to solve problems and to develop the plans of life, as well as in how there exists effective public availability to the universal archive of knowledge.[2]

In effect, access to the vast amounts of information and innovation is not enough. In fact, paradoxically, these things can become risk factors in communities that face weaknesses with regard to informative and communica-

1 León Olivé, "El libro, la lectura y las bibliotecas en la sociedad del conocimiento", 21.
2 *Ibid.,* 24.

tive reading and writing, a problem found even at the level of higher education. These conditions also exhibit worrying features as expressed in the statements of the UNESCO and the International Federation of Library Associations (IFLA), and of many other authors who have identified problems that exacerbate cognitive, social and generational gaps between countries and inside the communities in line with the following:

- The cognitive gap widens between those who enjoy access to a better education, infrastructure, quality informative resources and abilities for their selection, validation, use and exploitation for the purpose of generating and innovating knowledge, resulting in better personal and work opportunities.[3]
- The excessive use of electronic technology by youngsters can have adverse effects on the development of neurological processes associated with speaking, writing, visual cognition and maturation of motor and affective capacities. Similarly, the pedagogical models that in the earliest stages of emphasize reading speed can exert negative neural effects by demanding capacities that not every young student is ready to face, because people mature a different and progressively from reading aloud to reading in silence, through spelling and to handwriting.[4]
- Excessive concentration on a display screen steals away the senses and perception needed to read the signs and extract information about the reality that surrounds us. The use of technology without limits can propitiate a growing dependence on it, which would cause a weakening of essential human capacities. As perfect as these machines are nowadays, they have not yet substituted man in the process of transforming information into knowledge, a task for which reading is indispensable.[5]
- The overwhelming amount of information and its constant evolution and one's inability to discern its quality and the tendency to abandon serious reading in favor of superficial scanning leads to difficulties with reflection and assimilation. .
- The mass media and the internet offer entertainment and a broad array of contents, many of these quite banal, which could lead to a kind of society largely devoted to having fun. The speed and ease with

3 Unesco, *Hacia las Sociedades del Conocimiento*; véase también IFLA (International Federation of Library Associations and Institutions), *¿Surcando las olas o atrapados en la marea? Navegando el entorno en la evolución de la información.*

4 Stanislas Dehaene, *El cerebro lector: Últimas noticias de las neurociencias sobre la lectura, la enseñanza, el aprendizaje y la dislexia*, 235 ss.

5 M. Serres, *Los cinco sentidos. Ciencia, poesía y filosofía del cuerpo*, 23.

which one can access a variety of information and entertainment media allows full-time communication anywhere. The overuse of mobile devices might create a complaisant, ignorant class of people completely fixated on technological devices, increasingly alienated and indifferent to other concerns, which stands in stark contrast to the expert class of productive people. With such a large mass of undereducated peoples, such a model will be economically unsustainable.[6]

- Different cultures could be at risk, as their nourishing traditions, theoretical knowledge and practices vanish before the waves of innovation that ignore that knowledge societies require memory and the ability to transmit knowledge.[7]
- Super-specialization propitiates fragmentation of knowledge, in that it largely fails to procure links between fields of knowledge, causing a narrowing of vision in which on one hand a lot is known without, on the other, any understanding of what is ignored. This can promote the adoption of "certainties" that can lead to ethical clashes, communication problems and incomprehension in general, where specialists prefer to read endogenic materials while neglecting reading from other areas that could broaden their horizons.[8]
- To exclude the formation of the varied possibilities of plastic arts, photography, film, theater and music, which can aid the individual in building up a cultural legacy to think and learn about human problems and contextualize information of the specialty, in such a way that the possibilities of establishing links and mutual influences between the parties and the whole are reduced within an increasingly complex world, given that nowadays multicultural relationships are products that exert social effects on a world-wide scale.[9]
- Libraries can face conflicts in order to fulfill their mission of offering free access to informative resources and reading before the model of privatization of knowledge, which can extend to the book in its traditional format and all those made possible by ICT, because of book publishers' mastery of the securement of earnings, which stands in stark contrast to the dissemination of knowledge as a public service, whose production and accessibility should be understood as part of the infrastructure that any contemporary society requires, whose existence and

6 Antoni Brey, Daniel Innerarity y Gonçal Mayos, *La sociedad de la ignorancia. Una reflexión sobre la relación del individuo con el conocimiento en el mundo hiperconectado,* 38.
7 *Ibid*., 51 ss.
8 Edgard Morin, *Los siete saberes necesarios para la educación del futuro*, 19-23.
9 *Idem.*

operation should not therefore be neglected by states or international organizations.[10]

These matters come in addition to the decline in sustained reading for pleasure. According to reading assessments conducted by the Program for International Student Assessment (PISA), reading for pleasure fell five points between the years 2000-2009. The report also points out that the crucial difference between students who have a good performance in reading assessment and those with poor performance is that the former read daily for pleasure, without regard to the length of time they engage in reading. This institution claims that on average students who read daily for pleasure have more than one year and a half grade level score over those who do not.[11] In Mexico, for example, the 2012 National Reading Survey[12] showed that rates have not changed since 2006. In the United States it was found that reading for pleasure has declined over the last twenty years, especially among young people between 18 and 24 year old; also it noted that there is a relationship between daily reading for pleasure with academic achievement, and improving reading comprehension, writing style, vocabulary, spelling and grammar.[13]

Against this background, considerations about the need to renew the role of the library arises, since the it is traditionally part of the social communication system that preserves and facilitates the articulation between the information recorded and the diverse communities. Therefore, also it tends to be revalued as part of the solution to problems of reading and access to and use of information. The formation of readers is among the contributions that our discipline can contribute to the construction of societies of this century, which forces them to innovate the paradigm of the library as a diverse training space.

The library: a space for learning, training, culture and socialization

The formation of readers as part of the functions of the library of the XXI century is embodied in proposals from different theoretical perspectives that conceive these things as matters of learning, training, socialization and

10 Olivé, *op. cit*., 28.
11 PISA, OCDE, "¿Leen actualmente los estudiantes por placer?".
12 Fundación Mexicana para el Fomento de la Lectura, A. C., "De la penumbra a la obscuridad. Encuesta Nacional de Lectura 2012. Primer informe".
13 Heidi Gauder, Joan Giglierano y Christine H. Schramm, "Encouraging recreational reading among college students", 3.

development of information skills. The library is considered an alternative to reduce cognitive, social, cultural and generational gaps, while providing as options to reduce risks associated with an uninformed, uneducated and ignorant society.

In its report Towards knowledge societies, UNESCO reaffirms that in the twenty-first century, the development of critical thinking and the possibilities of Internet or multimedia are vital without prejudice to authentic instruments of knowledge such as the press, radio, television and school.[14] Also it sees learning as a key to balance societies in terms of social, cultural, cognitive and digital gaps, so from this perspective it is considered that "libraries can become key actors in development, while favoring the reduction of the extreme polarization of our world with regard to access to cultural goods and information."[15] It also highlights the fact that, as a learning space, "the library —from the bookmobile to the great contemporary— architectural complex— will remain a pillar of the social movement of knowledge and a factor of vitality for learning networks. Indeed, cognitive and evolutionary functions make it a learning organization par excellence."[16]

The idea of the library as a learning space is not new. If we go back to the societies of ancient Egypt and Pergamum, we find that their libraries were places of learning and research; likewise monastic libraries were training centers. The emergence of the public library in the nineteenth century responded to the need to provide literate citizens the possibility of continuing their self-learning. Later, in the sixties of the last century, the library is renewed and becomes meaningful as part of a conception of learning societies undergoing a paradigm shift in of learning that encouraged learning beyond the school environment or confined to a process in specific, definitive time. This outlook believed learning should be extended and undergo continuous updating, helping individual grow and enabling them to perform new activities. The 1972 UNESCO Faure Report stated that "education is no longer the privilege of an elite and should not be limited to a certain age group: Rather it should be coextensive at once with the entire community and the duration of the existence of the individual.[17] . The report stresses that it is more important "to learn how to learn, to reflect, to doubt and to adapt as quickly as possible and learn to question one's own cultural heritage while respecting consensus. These are the pillars on which knowledge societies should rest."[18]

14 Unesco, *op. cit*., 18.
15 *Ibid.,* 71.
16 *Ibid.,* 73.
17 *Ibid.,* 61.
18 *Ibid.,* 66.

Jorge Larrosa asserts that it is the teacher's responsibility to maintain the library as a space for training, something that rarely occurs in educational institutions of our country. Therefore, the librarian must assume the dual responsibility, the first entailing training within the library and the second entailing the renewal of social ties with communities by providing innovative support for their activities and projects. The concept of reading as proposed by Larrosa includes training oriented in the sense of *Bildung*, which goes beyond the scope of the school-room. To the extent that individuals learn and take responsibility for their education, they build their own identities, shaping their particular humanity to become what they are.[19]

For Larrosa, experience offers many critical practices and possibilities for the field of education. In this light, reading experiences produce something in the individual; therefore reading is not a process that expends itself in any given lesson, but rather it serves to support understanding content, extending into an infinite space that unfolds the text in the broadest sense. It is this experience of the infinite in the training process that pulls the reader to move beyond the text. Because of information overload, Larrosa states that such experiences are increasingly difficult toachieve. Our current overdependence on informants and onmerely being informed subjects seems to cancel our chances of attaining this high level reading experience.

He adds that the information subject knows many things. He spends time searching for information and comes to know more and more;, but in this obsession with information and knowledge (not in the sense of "wisdom" but in the sense of "being informed") he does not undergo any genuine transformation, while also running the risk of missing out on deeper reading experiences that require time to foster sensitivity in the skin, to voices, tastes and smells, to pleasure and suffering, to caresses and wounds and the human mortal condition[20] These reading experiences open awareness, critical thinking, reflection, imagination and creativity. This approach provides means for weighing the elements of experience, which can have a positive impact within the realm of education and the formation of reading and readers.

With regard to the library as a space for creating sociability, Roger Chartier believes that one of the purposes of "libraries of tomorrow could be to reconstitute lost sociability associated with books."[21] His proposal stems from his research on the history of the development of written culture and

19 Jorge Larrosa, "Sobre la experiencia".
20 *Ibid.,* 105-106, 111.
21 Roger Chartier, "Muerte o transfiguración del lector", 114-115.

the diverse ways that reading has built social ties. Therefore, the proposal aims to reclaim reading as an option of communication, dialogue and shared moments centered on the written word, while including electronic media, because the virtual space includes diverse applications allowing sharing, discussion, exchange ideas and experiences, and the ability to raise questions. Similarly, the modalities of the blog, booktubers or social networks, where readings, comments and suggestions are shared, promote this text-centered sociability. It is interesting to contrast Chartier's proposal against the traditional libraries that have adopted the pedagogical model of solitary, quiet reading and study in their silent reading rooms that leave little room for socializing. Therefore, the author points out that "libraries should expand the opportunities and ways for readers to talk about their written intellectual and aesthetic heritage. In this way, they can build a public square based on the critical appropriation of writing".[22] He adds: "In a future that is already our present, these effects will collectively be what we know how to build. For better or worse, this is now our common responsibility".[23]

In the *Tunis Declaration on libraries reading and intergenerational dialogue*, signed by the Literacy and Reading Section of the International Federation of Library Associations (IFLA), we find another aspect of the library as a space for building sociability. This declaration posits the role of libraries as spaces where reading is a means of social cohesion and intergenerational dialogue, solidarity and experience. Libraries also help reduce gaps between communities to the extent that the formation of readers and the information they access can promote social inclusion and integration. The document reiterates that learning is an activity occurring throughout life facilitated by reading and access to information.[24]

From the perspective of librarianship, Alvarez Zapata and colleagues propose that the educational role of the public library is based on "a twin perspective, i.e., to serve as institutions for reading and places for expression, and as institutions that promote citizenship".[25] Moreover, the authors note, the ideas of librarians who participated in the study on the relationship of the public library with reading and readers reveal "the persistence of a significant degree of the old dichotomy between library and classroom." He adds that this occurs sometimes to differentiate library reading that is largely

22 *Ibid.,* 115.
23 *Ibid.,* 116.
24 *¡Únete a IFLA. Sección de Alfabetización y Lectura!*
25 Didier Álvarez Zapata, Yicel Nayrobis Giraldo Giraldo, Norfi Yamili Ocampo Molina, Luz Marina Guerra Sierra, Liliana Melgar Estrada y Maricela Gómez Vargas, "Representaciones bibliotecarias sobre la biblioteca pública, la lectura, el lector, la promoción y la animación a la lectura en Medellín, Colombia", 235.

done of pleasure from reader training and practice that occurs in schools".[26] In contrast, the other perspective views the library as an "and educational institution in itself tasked with of supporting lifelong learning and socialization".[27]

While the discourse regarding the library's relationship to written culture still has a way to go toward scientific consolidation, this approach nonetheless holds that, "it still contains a rich set of possible assessments allowing comprehension of the social world that often is lost or masked behind technical and administrative discourse".[28] In this regard, we would add that traditional librarianship conceived the act of reading in the light of the conservative education and print media discourse that emphasizes reading of books especially for pleasure.

Another proposal on the relationship between the library, readers and reading was provided by Jose Ortega y Gasset in his inaugural speech at the Second International Congress of Librarians of the International Federation of Library Associations and Institutions (IFLA) held in Madrid the May 20, 1935, titled *The Librarian's Mission*, in which he offers an ontological philosophy of librarianship that emphasizes the "being" and "doing" of the profession in terms of "what every man has to do to be what he is and the professional mission".[29] To this he adds: "to practice this profession, a librarian undertakes to do what society requires."[30] In this regard, in one of his most noteworthy judgments, we find these invaluable words: "Now you feel the need not to search for books -that is no longer the real problem- but to encourage reading and to seek readers. And indeed, at this stage, libraries are multiplying and with them the librarian."[31] "The librarian of the future will have to lead the general reader through the jungle of books and be the doctor and hygienist of his reading."[32] Ortega y Gasset was concerned that readers would be lost in a "jungle" of books and the librarian would have to lead them so they would not get lost. This is still true in today's vast sea of ever growing information. Hence, Library Science programs have become increasingly focused on information literacy.

Librarianship has renewed its models of education and training of users by incorporating the development of informational abilities or information literacy emphasizing search, retrieval and use of information in diverse languages,

26 *Ibid.,* 216.
27 *Ibid.,* 215.
28 *Idem.*
29 José Ortega y Gasset, *Misión del bibliotecario,* 40.
30 *Ibid.,* 41.
31 *Ibid.,* 53.
32 *Ibid.,* 78.

specialties and formats. In some of these models training in critical reading is included.[33] This type of reading is essential to discriminating, choosing and using information from the overabundance and variety that exist.

In the context of the twenty-first century, proposals positing the library as a place of learning, training and socialization are conducive to renewing discussion on the practice of librarianship and its role in the formation of readers. This discussion can serve to help librarians think about and act in accord with the risks and advantages posed by the expanding universe of information; and ultimately it must include the development of capacities in which reading is a basic factor standing at the center of social development.

The contribution of *Bildung* in training readers in the area of Library Science

With regard to the development of twentieth century societies, the library assumes the social duty to make innovative contributions that employ information as a factor of transformation. This scenario is conducive to renewing the paradigm of the library's educational function, not in the traditionalist sense as a complement to school, but rather with an expanded scope of intervention that transcends to meet a higher challenge, which is nothing less than the comprehensive training of readers that strives to strengthen reading of written codes and audiovisual media so readers can more fully exploit myriad information media. It is essential, then, to incorporate literacies of different types, such as digital, visual, sound, mathematical, spatial geometric, social, historical, cultural, kinesthetic; and even tactile, olfactory and gustatory literacy. These variations renew the undervalued modalities of reading and information that, because they are part of our routine reality, we assume they do not require decoding. As Roland Barthes reminds us, these are sources of information and experiences as well:

> When I go down the street —or through life— and find these objects and without realizing it, I apply the same activity to all of them, which is to engage in some sort of reading. Modern man, the man of the cities, spends his time reading. First and foremost, he reads images, gestures and behaviors. This car tells me the social status of its owner; this costume indicates to me exactly the degree of conformism or eccentricity of its wearer; this appetizer (whiskey, Pernod or white wine), tells me about the lifestyle of my host. Even if it is a written text, a second message,

33 irinazey, "October is National Information Literacy Awareness Month".

provided between the lines of the first, is always given to us.[34]

Because libraries assume the duty of renovating the library as a space for training, learning and socialization, they adopt the German *Bildung* pedagogical approach to construct a discourse on the formation of readers. This approach encourages subjects to develop diverse resources to unfold their abilities, thereby aiding them to become integrated, responsible and ethical as way of life. This approach stresses four central aspects, which E. C. Noguera takes from Klafki as follows:

1. Training for rational self-determination, in which the self-directed activity is the central embodiment of the training process, expressed by the concepts of self-determination, freedom, emancipation, autonomy, reason and self-regulation.
2. Training occurs within the context of a preceding human culture; therefore, human productions, civilization's successes in meeting the needs, knowledge about nature and human beings, political actions, system standards and ethical actions, forms of social life and aesthetic products are favored.
3. It involves a dialectical relationship between individuality and collectivity. Dialogue is necessary in the training process.
4. Human activity, which should be the goal of *Bildung*, consists of three activities:
    - Moral activity: the practice of self-regulated moral responsibility..
    - Cognitive activity: that aims to make a link to human rational reflection on the meaning of being human and the responsibility for choices and their application. This activity requires permanent questioning as to possibilities and limits of instrumental rationality as part of the human condition.
    - Aesthetic activity: that refers to the improvement of the experience of sensitivity to the phenomena of nature and human expression. Such sensitivity requires the development of the imaginative faculty, or fantasy, taste and the capacity for joy, aesthetic judgment, and includes such abilities as play and general sociability. While this may include training in appreciation of literature, theater, music and plastic arts, it also includes the aesthetic of everyday life.

These dimensions can be conceived, asserts Noguera, as comprising the

34 Roland Barthes, "La cocina del sentido", 223.

general three-pronged training of human beings, i.e., the head, heart and hand. We might well add a fourth tine: multiple interests. The author also notes that in *Bildung* the development of the subject in the universal objective world is achieved when he reaches rationality as part of a process of appropriation of a critique of culture, an outcome that is not really a curricular objective, but rather is something that unfolds through the course of one's lifetime.[35]

Interestingly, E. Rodriguez Moncada's conception on the term "training " or *Bildung* "is a recognition of one's own knowledge acquired in life experiences and actual practice, Insofar as such knowledge and skills are not acknowledged, people are not valued and they will continue considering themselves ignorant or be deemed so by others." ".[36] Destaca que esta formación está dentro y fuera de los espacios de educación,

> This does not mean the individual ceases his learning. When he reads a book, when he converses with friends and when he enjoys a melody or film, the subject enters into a relationship with objects (distinct, apprehensible texts of reality), with which he lives, experiences and learns, thereby receiving a kind of training. In this regard the importance of informal education should also be acknowledged.[37]

On the other hand, according to M. R. Farrow and R. Deimann, the *Bildung* approach leads to a participatory culture, because learning is not only cognitive, but also social and emotional, notwithstanding that the fact that these elements have been exiled from theories based on traditional learning models.[38] This could be because *Bildung* is empowering for people; since as V. Gomez Ibanez says: "while subjective appropriation of culture implies the possibility of progressive 'enlightenment' (Erhellung) of individual consciousness in order to enlighten society at large, the most highly enlightened individuals are, the more enlightened will be the entire social order".[39]

As previously mentioned, Jorge Larrosa's conceptions of reading and training incorporates elements of *Bildung*, by associating it to the subjectivity of the reader in terms of what the reader may know and what the reader is. It is not simply a form of entertainment or reading for learning as one might

35 Carlos Ernesto Noguera Ramírez, *Aproximación conceptual a la constitución de las tradiciones pedagógicas modernas*, 4-6.
36 Ernesto Rodríguez Moncada, "Reflexiones en torno a la formación y la práctica de educadores de adultos", 140.
37 *Ibid*., 140-141.
38 Markus Deimann y Robert Farrow, "Rethinking OER and their use: Open Education as Bildung".
39 Vicente Gómez Ibáñez, "La liquidación de la filosofía. Notas sobre la disputa entre R. Rorty y J. Habermas", 124.

find in school. With regard to reading as training, Larrosa stresses the importance of experience, and reminds us that the experience of the training is nothing less than the appropriation of what is contained in those memorable words that are safeguarded in the library. The experience of reading is a way of relating to the text in which this appropriation is assured.[40] He adds, however, since the kind of reading experience that encourages the reader to appropriate contents is largely absent from schools, whether because of time constraints and the ever swelling flood of information available through diverse communication and entertainment media, making any degree of assimilation difficult, in that: an experience is something that fills and then empties indefinitely" as a function of the speed and amount of information.[41] Experience is one of the fundamental elements of the training in *Bildung*. Neuroscience research acknowledges the importance of experience in the processes of neuronal renewal resulting from cells imprinted by information that exert effects on various processes involved and reflected in the production of knowledge and artistic creations.[42]

Bildung has begun to consider alternatives in order to face current educational problems in reading, mathematics and science identified by PISA in several countries over the past ten years. Many thinkers and experts on these topics have revisited educational models in this field, including Kotthoff and Pereyra, whose see in Bildung a "guide to deal with educational changes arising from new communications technologies and virtual culture, [which are] very significant at a time of a new humanism when the identity, subjectivity and philosophy of the subject should problematized with greater scrutiny and care".[43] The authors cited identified the essential aspects of Bildung after the philosopher Christina Schües updated them. Of these aspects, we emphasize the following:

- Everyone is free. In this type of formative training, Schües believes that while knowledge is important, it is not everything, because aspiration, love and personal motivation should be encouraged in the same way. These factors can be applied to knowledge, but they are not necessary for knowledge to exist.
- The specific field of implementation of Bildung ranges from the concept of humanity in terms of the relationships of tension to the forma-

40 Larrosa, "La experiencia de la lectura", 568.
41 *Ibid.*, 594.
42 François Ansermet y Pierre Magistretti, "Neurociencias y psicoanálisis".
43 Hans-Georg Kotthoff y Miguel A. Pereyra, "La experiencia del PISA en Alemania: recepción, reformas recientes y reflexiones sobre un sistema educativo en cambio", 21.

tion of the world itself. This means being bold; and it means to broaden the horizons of information and the orientation of thought, both of which entail the ability to compare and reflect on different ways of thinking.

- Establishment of doubt between the unity of rationality and the plurality of worlds, histories and cultures. Schües supports this contradiction, saying it is a self-reflection that is not subordinate to strategic thinking, but that it demonstrates a meditation (high consciousness) that leads to insight and the ability to possess carry a style of its own life responsibly, a condition that issues from empowerment.[44]

In librarianship, authors such as E. Naranjo J. Verdugo have reviewed the notion of "formation" against the German concept of *Bildung*, identifying elements for which reading, experience, information and communication are essential[45] The discourse of library science and library practice in the formation of readers can find elements in the postulates of *Bildung* to guide its foundational philosophy and the work of its professionals, in that we have the responsibility to renew the librarian paradigm to strengthen the role of the library as a place for reading and to access information to support learning, training, socialization, while ensuring access to culture and its uses through the action of librarians in order to ensure that persons and the graphic record reside within a fruitful intellectual experience.[46] Thus, each person can develop creative, imaginative, emotional, contemplative and playful cognitive, reflective, critical, dialogical cognitive capacities that nurture wonderment, curiosity, free will, and intellectual and aesthetic enjoyment that is stimulated, not supplanted, by reading and information. All of these things are involved in the formation and transformation of subjectivity of knowledge and experiences, as being and knowing do not occur once and forever, but rather are tilled often through difficult efforts for the purpose of attaining wholeness.

Multifaceted literacy in the training of well-rounded readers

44 *Idem.*

45 Edilma Naranjo Vélez, "Formación de usuarios de la información y procesos formativos: hacia una conceptuación", 40 ss; José Alfredo Verdugo Sánchez, "Hacia un concepto de formación de usuarios y propuesta de un programa", 4-6.

46 Jesse Shera, *Fundamentos de la educación bibliotecológica,* 41.

The social role of the library can be enhanced in knowledge societies that require citizens to possess a higher mastery of reading in order to raise academic, work and learning performance throughout life. In response to this need, the field of library science can contribute with proposals to expand the promotion of reading to include such things as critical reading, the academy and dialogue between literature, the fine arts and sciences, thereby building sociability, multiple literacy and information skills.

Reader training programs can incorporate a wide range of resources that promote different types of reading desire to read, including pleasure reading. The resources that can be integrated into recreational reading activities offer a variety of topics from diverse fields of knowledge for critical or comparative reading, research, learning about other cultures, since multicultural training is promoted in some countries. In addition to supporting specialized topics, vocabulary is enriched and culture expands with the development of sensory experience and intellectual joy. All told, the library can expand and diversify the uses of reading, while strengthening the skills involved in deeper readings and reconstituting negative experiences that might have spoiled the reading experiences of readers in the past.

D. Masny views multiple literacy as the mastery of the multimodal variety of textualities with multiple meanings found in visual, oral, written, tactile, olfactory and digital texts. Texts in this sense include music, plastic arts, physics, mathematics and digital combinations that are fused with religion, sex, race, culture and power. These literacies are updated according to a particular temporal-spatial context in which they operate. Masny observed enriched thinking abilities and more complex associations in communities capable of reading diverse codes.[47]

In conjunction with academic and literary genres, diverse reading codes can be incorporated including plastic arts , cinema , opera , theater , dance , comic books , news, radio and television broadcasts, while electronic genres offers various codes such as hypertexts, blogs and games, not to mention the resources offered by electronic technology to build sociability through reading and information media such as *fanfic*, social networks, *booktubers* and social reading. Other unique forms of texts completing this idea of the reading spectrum might include natural phenomena, architecture, nature and sports.

All of the resources listed above involve specific modalities of reading, the decoding of the language in which they are expressed. This leads to multiple literacy that extends the informational aspect toward deep, critical,

47 Diana Masny, "Multiple Literacies Theory: how it functions, what it produces".

comparative reading capable of unraveling things beyond those that are apparent. This can favor a hermeneutic or semiotic kind of reading that unveils symbolic elements used in film and the arts, which are conducive to research. These pathways of reading can encourage reflection, the desire to know, while eliciting pleasure through sensory experiences. The variety codes activate diverse areas of the brain associated with memory of information, experiences, feelings, joy, anger, sadness or happiness. As we have already stated, when the brain receives greater variety and novelty of information from the senses, neural activation will stimulate the expansion of human capabilities associated with the production of knowledge, invention and the arts.

Reading diverse codes also contributes to the development of the skills involved in the literacies that are part of learning the languages of diverse disciplines promoted as part of academic and informational literacy. Librarianship has developed more versatile models, such as the one proposed by the National Forum on Information Literacy by the American Library Association (ALA), which includes among its categories media literacy (visual and computational) and critical literacy (critical reading and critical thinking).[48] The Iceberg model[49] S. Kurbanoglu proposes covers skills and literacies of diverse print and audiovisual codes.[50] Dianne McKenzie´s model includes diverse literacies such as reading, writing, speaking, listening, visual and cultural-historical modalities, as well as channels associated with multimedia, digitalization and mathematical and scientific knowledge, even extending to social networking, financial matters, music, graphics and kinesthetic expression.[51]

The diversity of written resources and a full range of audiovisual resources have been legitimized in the twenty-first century as sources of information and as objects of reading and culture. Recall that since the end of the last century, U. Eco and R. Barthes have been talking about the diverse signs existing in the social, cultural and natural world, linking sensory channels with the way people receive certain signs classified by the mind. In this way, the recipient receives signals from the sensory channels and transforms them into messages.[52] For both of these authors, by reading the signs surrounding us we can extract information for the construction of knowledge and to serve as cultural capital for the maturation of the capabilities involved in perception.

48 irinazey, *op. cit.*
49 El modelo Iceberg indaga sobre los elementos que no son perceptibles y es necesario profundizar para conocerlos y comprender los factores que producen los resultados visibles que son la punta del iceberg, lo que permite una mayor comprensión del mundo y utilizarlos para que se produzcan o se modifiquen, ejemplo de ello pueden ser los modelos mentales.
50 Serap Kurbanoglu, "An Analysis of Concept of Information Literacy", 83.
51 Dianne McKenzie, "Information literacy is the basis for all learning".
52 Umberto Eco, *Signo*, 47; Roland Barthes, *Lo obvio y lo obtuso. Imágenes, gestos y voces*, 31-34.

All this clarifies the information that citizens read in the elements, facts, objects or messages that make up the contexts and contribute to their training.

Today reading skills have become more complex. In this light, we propose extending library programs beyond the pursuit of pleasure per se to include promoting the desire to know, to do research, to think, to imagine, to create, and to know beyond the obvious. This is a more diverse kind of reading in which individuals take ownership of their development toward attaining a more robust, versatile cognitive, informational and cultural position, which is exactly what *Bildung* proposes. Thus, to the extent that a progressive enlightenment is forged among individuals, the illustration of the whole and society itself is occurring. The more enlightened the individual, the more enlightened will be the entire society and the greater with be the possibility of attaining genuine *Erhellung*.

In this light, the library can be place where knowledge favorable for learning from all times intersect. These information resources are conducive to training, culture, enlightenment, discovery and joy. Libraries will need to consider diversifying their collections to generate broad, diverse bibliographies to support academic programs, and cultural inurnment. But the librarian will have to cultivate a broad and varied culture. In this regard, J. Shera believes the librarian must cultivate broad culture. He also stated that such knowledge can only be understood from the point of view of the social responsibility assumed by the library. Regardless of the type of user "the interest of the librarian is the interaction of human minds communicating through the barriers of space and time, while making use of the graphic records to deliver content through the senses, sound, touch and sight. In this light, the graphic record is understood as including audible, tactile and visual modalities."[53]

In this regard, the author refers to a broader concept of information resources. It should be noted that for decades most modern libraries stimulate audiovisual media, unlike the traditional libraries focused on the development of print collections as sources of legitimate information. Today, however, the trend is to diversify the holdings. On the other hand, the digital culture, which is also written, has helped to renew its interaction with audiovisual codes that make up hypertext genres, while also offering a broad array of resources for diverse scientific, academic, educational, labor, productive, play, aesthetic and domestic activities, as well as communication options through the use of written and audiovisual codes.

53 Shera, *op. cit.,* 209.

Conclusion

Within the framework of knowledge societies, it is worthwhile to recall the following observations made by Jesse Shera: "The foundation of the library system is the communication of information, where information is deemed any graphic manifestation of intellectual activity. Thus, professionally the librarian must see the world as an intricate communications model." In this connection, Shera adds: "the aptitude of the librarian consists of the ability to conceptualized a system on the basis of intellectual, emotional, social and physical world -the world that the librarian 'serves'."[54]

Leaving aside the question of communications for the moment, a librarianship model for the societies of the twentieth century, characterized by profound shifts in the cultural model toward favoring knowledge in a global social context that requires production and innovation, articulated by electronic technology that accelerates the production and exchange of information, is needed. In this context, modalities through which citizens learn, inform, create, know, communicate, socialize, entertain themselves and use information are undergoing transformations. This information, moreover, is growing exponentially at a far greater rate than those who broadcast it from anywhere in the world. Like never before, all this opens up possibilities to generate, communicate, access and use content, ensuring the direct link between being informed and progress. The advantages of overabundance and instant availability of content, however, entails risks, because there are limits on a human being's ability to read, analyze, reflect on and assimilate knowledge, and otherwise have experiences. This situation has already come to the attention of critics, who warn of the potential of becoming societies of ignorance, misinformation and vulgarity, as the media, the information industry and technology exempt people from the need to invest time and effort in becoming properly informed.

Against this backdrop, the library can become a place where citizens choose a path other than the preferred cultural, social and educational determinisms. By appropriating reading and information, they can become citizens responsible for building knowledge societies. The library as an institution will become increasingly important in sustaining their formation or *Bildung* and will be comprised of written culture, arts, dialogue, social interaction, experiences, and interpersonal and social skills. But the library must make reading unfold in a variety of potentials wielded by under increasingly expert readers; thus, subjects would be trained to the extent that they en-

54 *Ibid.*, p. 210.

hance their capabilities and become responsible for their development and, thereby, their fates.

Works cited

Álvarez Zapata, Didier, Yicel Nayrobis Giraldo Giraldo, Norfi Yamili Ocampo Molina, Luz Marina Guerra Sierra, Liliana Melgar Estrada y Maricela Gómez Vargas. "Representaciones bibliotecarias sobre la biblioteca pública, la lectura, el lector, la promoción y la animación a la lectura en Medellín, Colombia". *Investigación Bibliotecológica* 23 (49) (2009): 197-240.

Ansermet, François y Pierre Magistretti. "Neurociencias y psicoanálisis". *Cuadernos de psiquiatría y psicoterapia del niño y del adolescente* 43/44 (2007): 5-16.

Barthes, Roland. *Lo obvio y lo obtuso. Imágenes, gestos y voces*. Barcelona: Paidós Ibérica, 1986.

—— "La cocina del sentido", en *La aventura semiológica*, 2a. ed. Buenos Aires: Paidós Comunicación, 1993, 223-225.

Brey, Antoni, Daniel Innerarity y Gonçal Mayos. *La sociedad de la ignorancia. Una reflexión sobre la relación del individuo con el conocimiento en el mundo hiperconectado.* Barcelona: Libros Infanzonía, 2009.

Chartier, Roger. "Muerte o transfiguración del lector", en *Las revoluciones de la cultura escrita. Diálogos e intervenciones.* Barcelona: Gedisa, 2000, 101-119.

Dehaene, Stanislas. *El cerebro lector: Últimas noticias de las neurociencias sobre la lectura, la enseñanza, el aprendizaje y la dislexia.* Buenos Aires: Siglo Veintiuno Editores, 2014.

Deimann, Markus y Robert Farrow. "Rethinking OER and their use: Open Education as Bildung". *The International Review of Research in Open and Distance Learning* 14 (3) (2013). Disponible en: http://www.irrodl.org/index.php/irrodl/article/view/1370/2542 [Fecha de consulta: 10 de noviembre de 2013].

Eco, Umberto. *Signo.* Barcelona; Labor, 1994.

—— *Tratado de semiótica general*, 5a ed. España: Lumen, 2000.

Fundación Mexicana para el Fomento de la Lectura, A. C. "De la penumbra a la obscuridad. Encuesta Nacional de Lectura 2012. Primer informe". México, 2013. Disponible en: http://www.educacionyculturaaz.com/wp-content/uploads/2013/04/ENL_2012.pdf [Fecha de consulta: 10 de febrero de 2013].

Gauder, Heidi, Joan Giglierano y Christine H. Schramm. "Encouraging recreational reading among college students". *College & Undergraduate Libraries* 14 (2) (2007): 1-24.

Gómez Ibáñez, Vicente. "La liquidación de la filosofía. Notas sobre la disputa entre R. Rorty y J. Habermas". *CONVIVIUM. Revista de filosofía* 6 (1994): 124. Disponible en: www.raco.cat/index.php/Convivium/article/download/73317/98529 [Fecha de consulta: 10 de noviembre de 2013].

IFLA (International Federation of Library Associations and Institutions). *¿Surcando las olas o atrapados en la marea? Navegando el entorno en la evolución de la información,* 2013. Disponible en: http://trends.ifla.org/files/trends/assets/surcando_las_olas_o_atrapados_en_la_marea.pdf [Fecha de consulta: 20 de febrero de 2014].

irinazey, "October is National Information Literacy Awareness Month", en *THLNewsBlog*, 9 de octubre de 2012. Disponible en: http://thlibrary.wordpress.com/2012/10/09/october-is-national-information-literacy-awareness-month [Fecha de consulta: 15 de junio de 2013].

Kotthoff, Hans-Georg y Miguel A. Pereyra. "La experiencia del PISA en Alemania: recepción, reformas recientes y reflexiones sobre un sistema educativo en cambio". *Profesorado, Revista de currículum y formación de profesorado* 13 (2) (2009): 1-24.

Kurbanoglu, Serap. "An Analysis of Concept of Information Literacy". *Media and information literacy for knowledge societies*. Moscú: Interregional Library Cooperation Centre, 2013: 1-42. Disponible en: http://www.ifapcom.ru/files/News/Images/2013/mil_eng_web.pdf [Fecha de consulta: 7 de noviembre de 2013].

Larrosa, Jorge. "La experiencia de la lectura", en *Estudios sobre literatura y formación,* 2003. México: Fondo de Cultura Económica.

—— "Sobre la experiencia". *Aloma: revista de psicologia, ciències de l'educació i de l'esport* 19 (2006): 87-112.

Mckenzie, Dianne. "Information literacy is the basis for all learning". *Library Grits*, 1 de mayo de 2010. Disponible en: http://librarygrits.blogspot.mx/2010/05/information-literacy-is-basis-for-all.html [Fecha de consulta: 15 de junio de 2012].

Masny, Diana. "Multiple Literacies Theory: how it functions, what it produces". *Perspectiva* 28 (2) (2010). Disponible en: http://www.perspectiva.ufsc.br/ [Fecha de consulta: 23 de julio de 2012].

Morin, Edgar. *Los siete saberes necesarios para la educación del futuro*, 2a. reimp. Buenos Aires: Nueva Visión, 2002.

Naranjo Vélez, Edilma. "Formación de usuarios de la información y procesos formativos: hacia una conceptualización". *Investigación Bibliotecológica: archivonomía, bibliotecología e información* 19 (38) (2005): 33-60. México.

Noguera Ramírez, Carlos Ernesto. *Aproximación conceptual a la constitución de las tradiciones pedagógicas modernas*, 2013. Disponible en: http://hdl.handle.net/11195/304 [Fecha de consulta: 20 de septiembre de 2013].

Olivé, León. "El libro, la lectura y las bibliotecas en la sociedad del conocimiento". *Lectura y vida* 30 (3) (2009): 20-29.

Ortega y Gasset, José. *Misión del bibliotecario,* ed. conmemorativa del 50 aniversario luctuoso del autor y de la celebración del Día Nacional del Bibliotecario. México: CONACULTA, DGB, 2005.

PISA, OCDE. "¿Leen actualmente los estudiantes por placer?". *PISA in Focus* 8 (2011). Disponible en: www.oecd.org/pisa/pisaproducts/pisainfocus/49184736.pdf [Fecha de consulta: 20 de septiembre de 2013].

Rodríguez Moncada, Ernesto. "Reflexiones en torno a la formación y la práctica de educadores de adultos". *Revista Interamericana de Educación de Adultos* 31 (1) (2009): 137-150. Disponible en: http://www.crefal.edu.mx/rieda/images/rieda-2009-1/contrapunto1.pdf [Fecha de consulta: 10 de noviembre de 2013].

Serres, M. *Los cinco sentidos. Ciencia, poesía y filosofía del cuerpo.* México: Taurus, 2002.

Shera, Jesse. *Fundamentos de la educación bibliotecológica*. México: Universidad Nacional Autónoma de México (UNAM), Centro Universitario de Investigaciones Bibliotecológicas (CUIB), 1990.

Unesco. *Hacia las Sociedades del Conocimiento.* París: UNESCO, 2005. Disponible en: http://unesdoc.unesco.org/images/0014/001419/141908s.PDF [Fecha de consulta: 19 de marzo de 2014].

¡Únete a IFLA. Sección de Alfabetización y Lectura! (s. a.). Disponible en: http://www.ifla.org/files/assets/literacy-and-reading/publications/Tunis-declaration-spanish.doc [Fecha de consulta: 12 de agosto de 2012].

Verdugo Sánchez, José Alfredo. "Hacia un concepto de formación de usuarios y propuesta de un programa". *Investigación Bibliotecológica: archivonomía, bibliotecología e información* 7 (15) (1993): 4-15.

Para citar este artículo:

Ramírez Leyva, Elsa Margarita. 2016. "De la promoción de la lectura por placer a la formación integral de lectores." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 95-120. http://dx.doi.org/10.1016/j.ibbai.2016.04.014

New directions in information access

Ariel Alejandro Rodríguez-García *

Article received on: November 7, 2012.
Article accepted: May 14, 2015.

Abstract

With the development of Web 2.0 and information technologies, new models of production, distribution and consumption of information have emerged. This study examines the changes undergone in information access for both general users and information professionals. The study's approach is informed by Kuhn's contention regarding the priority of paradigms, in which neophyte professionals will adopt emerging practices without questioning their causes or origins. This hypothesis is tested by way of Rifkin's postulates on the network economy and those proffered by Vargas Llosa regarding the metamorphosis of written culture for the network. The results presented are derived

* Instituto de Investigaciones Bibliotecológicas y de la Información de la UNAM, México. ariel@iibi.unam.mx

from the project PAPIIT IT 312 400 Digital Library in library science and information studies.

Keywords: Access to Information; Podusage; Web 2.0.

Resumen

Las nuevas pautas para el acceso a la información
Ariel Alejandro Rodríguez García

El título del estudio sugiere que con el desarrollo de la Web 2.0 y las tecnologías de la información han surgido nuevos modelos de producción, distribución y consumo de información. De ahí que el propósito del trabajo sea examinar los cambios que se han suscitado en el acceso a la información tanto para usuarios como para profesionales de la información. La tesis del estudio centra su atención en los señalamientos de Kuhn respecto a la prioridad de los paradigmas, la cual refiere que los nuevos profesionales adoptarán las prácticas emergentes sin cuestionar las causas que le dieron origen. La comprobación se hace por medio de los postulados de Rifkin sobre la economía-red y los vertidos por Vargas Llosa con relación a la metamorfosis de la cultura escrita para la red. Los resultados que se presentan en el estudio se derivan del proyecto PAPIIT IT 400 312 Biblioteca Digital en Bibliotecología y Estudios de la Información.

Palabras claves: Acceso a la información; Prosumidores; Web 2.0.

Introduction

The question of information access has been examined from diverse disciplines, among which are library science and information studies. A review of the literature reveals studies of copyright, open source, privacy and data security, as well as the domain of digital information within emerging practices of information production, distribution and consumption.

Our interest in the development of information access aims to provide an interpretation of how the digital library, with its organized collection and

associated services, must assume that library models are not really the best for describing what is occurring in a digital environment characterized by the emergence of other models that are entirely dissimilar to those in place.

The recent focus on the nature of the digital library examines the use of information technology and emerging applications, while neglecting the basics, a situation that is leading to empiricism. This confirms Shera's hypothesis, which argues that the new procedures for high reduction miniaturization seem to have no limit; and also confirms Rifkin who points out that as the printing press altered human consciousness over the past centuries, information technology will probably exert a similar effect on human consciousness in the years to come.

This approach to new guidelines for information access arises from the digital library model supported by the archetype of Web 2.0, which takes full advantage of current technological applications used to produce and consume digital information in open information systems. In this sense, as these users enjoy diverse tools to teach and guide them in their efforts to achieve cultural convergence in digital environments, the assumption that access to digital information in an open context allows both traditional and so-called "pro-sumers" to produce, consume and share information through networks becomes very relevant.

We thank the coordinators *PAPIIT IT400312 Digital Library Project in Library Science and Information Studies* for the funding needed to deliver these research results.

Three approaches to information access

The economy underpinned by access, the rapid growth of information and communication technologies that modify information consumption habits and the redefinition of the nature of the entities in the information organization are evidence of events that in recent years have led to drastic change in information access.

The network economy, as Rifkin[1] has called it, has as its essential feature connectivity. Unlike the economy established in the industrial age, which was tied to a specific geographic location, where negotiations and transactions occurred, the new economy unfolds through the exchange of data in cyberspace. It establishes new organizational models in economic life and is governed by networks rather than markets, where sellers and buyers are

1 Jeremy Rifkin, *La era del acceso: la revolución de la nueva economía.*

replaced by suppliers and users, and virtually all products acquire the trait associated with access.

In the realm of information technology, just as in the economy at large, these changes are present in individual information users, who are no longer passive consumers, but rather active participants in the production of digital content.

These new users of digital information have been dubbed "information prosumers." According to Burns,[2] a prosumer is actively involved in producing content using community-generated content within social networks. Traditional or hybrid users may still be present. In common terms, these parties remain passive consumers, because they have not yet begun to produce and consume information at the same time.

Regarding the latter, Vargas Llosa has posited the following questions about book production: Will printed books survive or will e-books finish them off once and for all? Will future readers use digital tablets exclusively? In a somewhat distraught tone, Vargas Llosa[3] states that the arrival of the electronic book is imminent. It seems the vast majority of readers will prefer the screen, while small minorities continue to read printed books. Bookstores, libraries, publishers, literary agents, editors and book distributors also may be consigned to the halls of nostalgia. He concludes by saying that when writers write virtual literature, they will not do so seeking the concrete, tactile and durable object embodied in the printed book.

With regard to the redefinition of the nature of the entities from the perspective of the organization of information, the rationale offered by Svenonius[4] on document language invites one to observe that descriptive attributes are the most suitable for retrieving information, since there are others that will respond to the language of the work, thereby allowing access to content. A good document language, asserts Svenonius,[5] helps with identification and retrieval, while supporting selection and acquisition and allowing navigation within the document.

No doubt these three perspectives on information access are conducive to raising the central contention of this paper. With the development of digital information and distinctive features of digital information resources, it is possible to establish new guidelines for information access. If so, what is the role played by re-signification of the document language? To be active in any information system, how do new users assimilate the idea that digital

2 Axel Burns, *Blogs, Wikipedia's, second life, and beyond: form production to produsage,* 24.
3 Mario Vargas Llosa, *La civilización del espectáculo,* 204-205.
4 Eleaine Svenonius, *The intelectual foundation of information organization,* 122-123.
5 *Ibid.,* 108.

information requires their active participation in the labeling of information resources?

Information access attributes

It is of interest to this paper to expand upon the attributes of access from two vantage points. The first vantage takes into account what Svenonius has observed about changes in the language of the document arising from the new attributes of information resources and modernizing of the cataloging model. The second refers to the issue of information retrieval seen from the standpoint of what Burns observes about the information prosumer and how new guidelines are created for both production and consumption of digital information.

The language of documents: attributes for access

The language of the document has changed since the advent of electronic documents and then even more so with the digital document. So marked is this change, the model of cataloging conceptualized as per AACR , Second Edition (AACR2) had to be modified, because it was difficult to adapt the Cardinal Principle[6] to the attributes of these new documents. Hence in cataloging, since the nineties of the last century, these rules consider information technology as the mediator between the way of describing the electronic and digital document and way in which information and content are accessed.

In different ways it has been noted that the Cardinal Principle is one of the great traditions of cataloging: its rigidity, however, prevents new documents from being described in depth. For this reason, it was necessary to update the various bibliographic description rules and create the model of Functional Requirements as the main artifice of change.[7]

It should be emphasized that while the conceptual model was being developed, there were those who predicted that, with the arrival of the new millennium, the organization of information would be in serious trouble if

6 El Principio Cardinal fue concebido para gobernar el proceso de transcripción, de despliegue y las opciones de acceso a los objetos bibliográficos que como característica común tienen un formato físico.

7 IFLA Study Group on the Functional Requirements for Bibliographic Records. El grupo de trabajo FRBR tuvo como objetivos proponer un marco estructurado y claramente definido para relacionar los datos consignados en los registros bibliográficos con las necesidades de los usuarios y recomendar un nivel básico de funcionalidad de los registros creados por las agencias bibliográficas nacionales.

systems failed to take into account digital documents. Many believed that this matter was so serious that the future of information retrieval systems could be jeopardy.[8]

The model introduced by the IFLA recognizes that the whole body of information found in the bibliographic universe can be described and represented regardless of its nature. This position is taken before a new set of assumptions. One of the main assumptions is that every attribute of any entity, such as digital document, will allow access and retrieval of data of any kind, whether intrinsic or extrinsic.

It is clear that digital information has brought new forms and formats for storing information to the bibliographic universe; and this has led to discussions on how to understand and relate to the information residing in an intangible object. The basic forms for organizing information have been established, allowing information professionals to carry out their work on the basis of a basic unit of the subset of entities or digital information resources sets, and, for the purpose of access, identification and retrieval in an information system, by means of their specific attributes identified as logical elements.[9]

With regard to the model of Functional Requirements, it seems important to mention that after three decades since its appearance, it has begun to be used as a theoretical framework in the structure and content of the Guidelines for the Resource Description and Access (RDA), substituting the RCAA2.

In the words of Oliver,[10] the new guidelines are a standard designed to focus on users and the tasks they perform when they use the resources discoverers. As such, this model is a new alternative for reflecting on bibliographic data and data authority.

With regard to these guidelines, Oliver[11] reports that they were created so data management can use both current technologies and emergent databases structured for future technologies. In this regard, the guidelines for description and access propose making use of the specificities to cover both traditional and non-traditional resources, while also covering analogue and digital resources and those existing within and outside of the library environment.

We would like to go into more detail about the guidelines and their relationship to the attributes for information access. These guidelines have been proposed for diverse communities to use as description standards, in

8 Ariel Alejandro Rodríguez García, *Las nuevas entidades de información analizadas desde la perspectiva de la organización de la información,* 11.
9 Linda Schamber, "What is a document? Rethinking the concept in uneasy time", 669.
10 Chris Oliver, *Introducing RDA a guide to the basic,* 2.
11 *Ibid., 2-3.*

the understanding that their flexibility and extension allow different metadata structures to contain the necessary elements to enable the attributes of entities for storing, transmitting and exchanging data using diverse coding schemes, thereby bringing benefits to end users.

From the perspective of documentation, metadata cannot be overlooked as we strive to grasp the attributes of access. In information organization, metadata play an important role, because, since the advent of the Internet, various digital information labeling schemes have been developed on the basis of emerging resources. Those who organize information acknowledge that metadata ensure data can be managed, retrieved, used, reused and that access to them can be controlled. The role they play in the basic structure of the internet, however, makes it possible to carry out activities such as electronic commerce and the construction of the Semantic Web. Metadata serve to facilitate retrieval and interoperability between various systems, and ensure the administration of the rights of both the source and intellectual content. In short, the uses of metadata are diverse. [12] For example, metadata serve to identify a resource, to ensure the length of content, to establish the structure and context of content, and to assist the user in the discovery, retrieval and delivery of resources, among others purposes.

In information management, the importance of metadata resides in how it facilitates the registration of descriptive properties of the resource and solves the problems of retrieval, while providing the elements allowing correct data entry to gain access to topics. Moreover, metadata maintain data blocks, which in the information architecture are used to develop the means needed to perform retrieval. For all of these reasons, metadata have the potential to transfer data and thereby ensure interoperability and information exchange between systems.

We may also say that metadata are valuable in information architecture, because without them the organizational problems would be common, since if they are used improperly or erroneously information would be impossible to find and retrieve. Chowdhury and Chowdhury[13] have stated that if the metadata are not made intuitive and easy to grasp, users will be unlikely to use software systems and digital information resources.

On the subject of access, it has been said that the information architecture must act decisively in all organizations because it serves to guide the access, use and appropriate sharing of information and increase the volume of digital information. Without coordination and planning to create and

12 G. G. Chowdhury y Sudatta Chowdhury, *Organizing information: from the shelf to the web*, 142.

13 *Ibid.,* 188-189.

manage the information, short-sighted efforts to develop metadata will cause chaos and difficulties in finding and using information. If standards are employed with local characteristics, not those agreed upon nationally and internationally, one runs the risk of getting lost in the internet because the development of vocabulary to describe and represent the resources will not be properly standardized.

It is evident that with the emergence and development of information architecture, a new field of study and work opened up in organizing information involving computers, the internet and diverse disciplines. This specialized area exploits both library traditions and practices associated with computers. Anyone interested in exploring the topic of metadata must then pay particular attention to the progress of information architecture.

In short, the approach to information access from the new standpoint of the attributes of the document language, the adaptation of the Cardinal Principle in cataloging, the appearance of the guidelines for description and access, the metadata standard to describe and represent digital information resources combined with and administration and information architecture provides us a battery of skills and appropriate abilities that must be mastered by those wishing to practice the art and science of organizing digital information.

The user as information tagger

For over 150 years, storage and retrieval of information have been considered the basic functions for proper use of document data. These were principles that the organization of information established as the paths to follow to accommodate the needs of the user employing the library catalog. In these core functions, we find the ideas expressed by Cutter with respect to the objectives of the catalog and those emphasized by Svenonius[14] regarding the preparation of substitute records for users to get to know the contents of the library collection. Similarly, we can assert that with the appearance of the Functional Requirements model, automated cataloging and the emergence of information resources other than books, the objectives of the new catalog must modify the four basic library tasks of finding, identifying, selecting and obtaining performed by the user in order to gain access not only to the bibliographic record, but also to the information contained in each information resource.

14 Svenonius, *op. cit.,* 15-30.

As a result of the latest update of the principles governing the catalogue, diverse questions are raised[15] that have not yet been answered conclusively. Further inquiry on how records for several format types and information resources should be pursued in order to posit guidelines for the descriptive entries in the catalog, the access points or keywords to be employed, and to determine whether all the descriptive elements are potentially retrieved and in what order.

For the moment, we will not answer each of the questions above, since the focus of this paper is to examine the way the user, rather than the librarian, is participating in the labeling of digital information resources; since we find veiled approaches in the model of Functional Requirements that say the user will be able, locally or through links, to employ all those manifestations and representations of a work, and may use different, specific[16] instances of a work for its identification.

Nor will we linger on the issue of bibliographic formats, such as MARC21, since this format allows us to create standardized entry records, while operating under rules that allow the creation and exchange of bibliographic records. This is common knowledge in the international library community. We agree with Chowdhury and Chowdhur[17] that bibliographic formats play a fundamental role in the creation, management and sharing of records. The focus of this paper is to contextualize the use of free or communal labeling of data, which is known in online social network circles as *social labeling*.

The variety of digital information resources available in digital libraries, digital repositories and the internet has led to the emergence of alternatives allowing these resources to be described and represented almost as soon as they are made operational. The idiosyncrasies of these resources require specialized rules and labeling systems.

We have mentioned that metadata allows us to understand how to use data resources from a different angle and how the hypertextuality of resources will facilitate interconnectivity and how most metadata systems transcribe inherent data in an entity. Most of the time the end user ignores everything that defines a metadata system. When the structure of the elements is set correctly in accord with the information it provides, the efficient use of entities will be achieved. This requires the system to be grouped at three levels in order to perform the basic tasks of identification, and obtaining and accessing

15 Chowdhury y Chowdhury, *op. cit.,* 31.

16 En el tecnicismo del modelo conceptual de los Requerimientos Funcionales, se ha denominado instancia específica (atributo) a lo que en catalogación se conoce e identifica como elementos descriptivos de las entidades. Escamilla González los denominó en su *Interpretación catalográfica de los libros* como los elementos más importantes para elaborar la ficha catalográfica.

17 Chowdhury y Chowdhury, *op. cit.,* 47-69.

information resource. Professional librarians, whose main task is to organize information, should be interested in and know about these matters.

Social or community tagging[18] recommends that the end user superficially review issues such as information architecture, social software, personal information management issues, the framework of social tagging of books, procedures for sharing collections of digital objects and the conditions set by electronic commerce (e -commerce) for the purchase of a consumer good.

One principle of social online networks indicates that the user must label his information in order to achieve a balance between system performance and the interacting counterparty. In this light, we wonder what motivates the user to label their resources. What are the questions at the center of recent debates on social tagging versus professional labeling? What factors should interest the user when dealing with social tagging?

Smith[19] provides the following five reason for having the social tagger coexist with the labeling system. Without stopping to examine motivations, he states that the most solid is that labels be easy to use with the least time investment:

- *Simple tag.* On the basis of this idea, the social tagger can create multiple access routes for retrieving his resources and add more than one tag.
- *Flexible tag.* A tag that can be adapted to any situation, purpose or class of information.
- *Extensible tag.* That under no circumstance is the creation of new tags denied or forbidden. Anyone who wishes to describe something new can do so without impediments.
- *Aggregate tags.* The diverse folder types provide local information, but with tags that allow information from other sites to be added. These can be used to bring together information from multiple websites.
- *Recommendation.* Not everyone who enters the system knows the meaning of each tag. As such, brief explanations on use are provided.

Regarding matters that should interest the tagger when beginning to use social metadata, we agree with Smith[20] when he asserts that the cornerstones of good practice are information architecture, social software and personal information management.

Tagging must be fixed in the information architecture, because this is

18 Gene Smith, *Tagging: people-powered metadata for the social web*, 12-13.
19 *Ibid.,* 23-24.
20 *Ibid.,* 12-13.

where the structural design for sharing information resides, and it allows the system to focus on the controlled vocabulary, search and discovery systems, and the consistency of the navigation schemes.

Regarding social software, the tagger is asked to identify the existing variants in each software. Some of these are simpler than others, but the intention is to allow users to move about the system in an easy and interactive way.

Finally, the tagger should view the management of personal information as a way by which he can acquire, maintain, retrieve and use information from the specific instances of each document.

The stresses existing between this conception of social tagging and standard cataloging practices, can be found in our view along four main moments: between the personal and the social; between idiosyncratic and standard, between the free and I controlled; and between amateur and professional. Smith concludes that from the perspective of the beholder, there will always be stress points, because the systems are created for different purposes, economic values and from distinct tagging perspectives. As such, tagging on the social or collaborative model will prevail in systems, repositories or websites that operate with simple and easy to understand structures.

The information prosumer: Who is he and what does he do for information access?

The first logical approach to creating a metadata system[21] is to analyze the content, determine the user and decide on the functional requirements. This was also observed in social tagging, which requires three main elements to form an online social network: users, resources and tagging.[22]

Both fundamentals report that early identification of needs and information resources of both the main and secondary user groups is worthwhile. When each of these is recognized, it will be possible to determine the attributes of digital resources used to find and identify documents.

For the development of digital collections,[23] the work with users is performed through a metadata designer, who works jointly with an expert or curator on the subject area. They will establish the users of a particular collection, the needs associated with browsing and searching for each location and time. They will also establish navigation as per a selected set of relevant thematic categories within a given collection, while placing range limits obey-

21 Steven J. Miller, *Metadata for digital collections*, 253.
22 Smith, *op. cit.,* 39-51.
23 Miller, *op. cit.,* 254.

ing date and type of primary resources.

In online social networks[24] three types of connections between users can be considered, namely:

- *Followers.* These users simply make contact with each other.
- *Contacts.* These carry out reciprocal communication with network users.
- *Groups.* These actors share resources on a given topic. Subgroups may also form as the request of any member of the group.

The contexts cited above serve as a prelude to refer to the main features that the user will assume on the way to becoming prosumer, in which there is consonance between the tagging system and the individual who tags any given information resource.

Theoretical models of the eighties and early nineties could not yet be deemed the most suitable for situating the prosumer, because the internet had not yet become popular as a form of mass communication. It was not until the beginning of the year two thousand that conditions began to favor the consolidation of the prosumer. The internet had introduced significant changes to the traditional model of production and distribution of information, so much so that the traditional physical distribution of goods and services had been undermined by the production of goods without physical existence.

Unlike the traditional model, the emerging model allowed access to information resources[25] but with unequal feedback. That is to say:

- The relationship between producers and consumers was disproportionate because of the supremacy in the distribution channels of the producers;
- Access to means of production and distribution of information was available, although limited to a small group of operators, a situation that did not favor business practices;
- The same technology pushing person-to-person communications underwent change due to the incorporation of peer-to-peer models, which began to enrich the collaborative communication, production and distribution on a global scale, and
- Contents in digital format can be shared more easily and modified faster. As such, the concept of "consumption" in the traditional sense

24 Smith, *op. cit.,* 44-45.
25 Axel Burns, *Blogs, Wikipedia, Second Life, and Beyond: from Production to Produsage,* 13.

was no longer applicable, hence the digital information was without rival.

If the information production and distribution model has changed due to the rapid development of digital information, a method is needed in which the user is the agent responsible for its creation and upkeep. In this light, the question to be answered is: What are the features of this new user understood as a prosumer?

Burns[26] explains that before becoming a prosumer, one necessarily passes through a hybrid state in order to interact with digital information. In traditional terms, they are user-producers, but these hybrids do not become producers and users at the same time.

According to Burns [27] the four identifying principles of a prosumer are:

- *Open participation*. Community assessment. Many of the participants are able to examine, evaluate and add contributions to preceding comments, which yields better outcomes and higher quality discussions.
- *Fluid Heterarchy, meritocracia Ad Hoc*. A prosumer necessarily derives from the equipotential principle, which asserts that he has the skills and abilities as a prosumer, because not all participants are equal, but they have equal ability to make worthy contributions to the project.
- *Unfinished actions, ongoing processes*. Because participants adopt a probabilistic model they involve themselves in equipotential work. These projects unfold gradually, and modular tasks invite prosumers to contribute casually to producing collaborative contents that are broadcast and shared in open access information context. Hence, the prosumer process tends to be ongoing and without a fixed end.
- *Common property, individual rewards*. As noted previously, in a community of prosumers information must necessarily be shared and valued by those who create the content while aiming to keep the creation process open and available to all future participants, who, in turn, will be prepared to incorporate their contributions. Of course, if anyone wants to participate as a hybrid prosumer, they must abide by the moral and legal provisions included in the GNU (General Public License and Free Documentation License), the Open Source License and the Creative Commons *License*. These documents stipulate, for example, that the community content shall be freely available; and that changes to such contents will be performed under identical conditions and that

26 *Ibid.,* 23.
27 *Ibid.,* 24.

the contributions of individual prosumers should be acknowledged and appropriately rewarded, as warranted.

Over the last twenty years, prosumer information has begun to appear in institutions, organizations and companies. An unlikely process of convergence is underway, and to such a degree that the idea of Cultural Convergence,[28] in which the current culture loses its position, while favoring the end of the production chain in order to reduce the levels of participation of all those who are in the network.

It should be noted that the model of cultural convergence is thriving in startups, which encourage "win-win" environments for consumers. Moreover, the companies themselves perceive this approach as a key to attaining popularity. For example, sophisticated services that require the support of networked information systems specialists are often promoted in this way.

Using other words, Jackson[29] cites that the presence of Web 2.0 in companies serve to facilitate the exploitation of applications developed through this technology:

- With responsible use with regard to the expanding universe of information and proliferation of e-mails, since this can generate significant returns of knowledge that can be of a valuable product to the company.
- Addressing the concerns and inclinations of the next generations of workers.
- Assume the loss of knowledge as the baby boom generation retires.
- Grasp the opportunities connectivity and dynamic networks offer.
- Possess the ability and knowledge to create sophisticated products that allow some small contributions.
- Reason about the fragmentation of the value chain work and the creation of multi-tasking.
- Understand the proliferation of outsourcing work for certain contracts and the mobility of team members.

From the foregoing, it should be understood that much depends on the system of information in place, because the performance of Web 2.0 applications shall depend on a good decision to purchase and implement technology solutions.

In view of the characteristics of the information prosumer and cultural convergence, we may well assume that the digital discourse has turned a cor-

28 *Idem.*

29 Paul Jackson, *Web 2.0 knowledge technologies and enterprise: smarter, lighter and cheaper*, 92-93.

ner with its structure taking on special relevance. In broad terms, what has come to be stressed is the increased use of acronyms and emoticons as means of expression. It has also been found that digital discourses occur within the limits of the oral tradition. Similarly, the use of pre-figurative gesticulations is being used as a transitional style and as part of the rules of participation. Existing near to these features of digital discourse are the folksonomy, or wiki, which aim to contribute ideas about the order within the chaos generated from the structure of digital discourse.

Surely, we should not lose be sight of the information prosumer in the generation of digital content. The prosumer should be seen as a user who demands more information than that required by the passive or hybrid user. We must assume that their knowledge and expertise in the use of information technologies is more advanced, and we can safely believe that the prosumers cultural values, practices, traditions and beliefs are undergirded by the culture of digital information.

The composition of information access guidelines

Many of the discussions addressed in this paper revolve around three ideas: 1) access to information; 2) tagging systems and the re-signification of the document language; and 3) information prosumer as creator of culture and digital discourse.

Access to information has changed. There are new models of production, distribution and consumption, because digital information exhibits various traditional features. But this model did not appear until experts validated and acknowledged it as a new approach to produce and distribute information. Moreover, this has required appropriate knowledge on access-based economic activities, cultural convergence and composition of digital information to be appropriated by diverse communities in order to establish a new category for digital literacy and skills around which news user will develop their skills with regard to the practices followed by a prosumer.

Currently, access to information through new production models, such as blogs, wikis or podcasts, has evolved the existing information formats. These are found in social networks, such as Facebook, and search engines, such as Google, which are not comparable to anything in the analogue world.

Browing[30], Braman[31] and Block[32] point out that the digital transition has forced librarians, publishers and booksellers to reassess their roles. Some libraries watched how collections began to "come out" of copyright to be distributed digitally. This led to several bookstores and publishers to enter into free-for-copy or pay-for-play schemes. Over time, this change has demonstrated that it is not easy for the library to establish itself within the digital context, while for booksellers and publishers it is somewhat little easier provided matters of intellectual property and associated compensation are duly settled.

In sum, examined from the perspective of the network economy and new production models, information access has spurred discussion on the emergence of cultural convergence and the information prosumer.

In the organization of the information, it has been shown that the new access guidelines are being set from the perspective of tagging systems, metadata and the user as a tagger of digital information. The traditional perception of the organization of information is to maximize the social utility of bibliographic records for the benefit of the user, even if this means resorting to techniques and procedures on the verge of obsolescence because of the exponential growth of information, living conditions and use of information technology.

Despite this situation, today it is common to hear about the World Wide Web, Internet, the digital library and digital repositories, XML, Web 2.0, mobile technology, the semantic web and many other associated things. Technically, these ideas express how information technology has become the leading actor on the library's information access stage.

Without having explained the technical aspects and operation of each of these, we realize that tensions exist between the public and private tagging systems. Discrepancies between the practices of amateur and expert labeling will continue as long as they do not follow the same method. The same will be the case for idiosyncratic and regulated labeling systems that do not follow the same principles.

In the context of web technology and digital libraries, Chowdhury and Chowdhury[33] clarify that ontologies are playing a significant role because their mechanisms allow analysis of the meaning of resources, favoring their performance in the information access process and the in the process of or-

30 John Browing, "What is the role of libraries in the information economy?", 55.
31 Sandra Braman. "Theorizing the impact of it on libraries-state relations", 105.
32 Maryline Block (ed.), *Net effects: how librarians can manage the unintended consequences of the Internet.*
33 Chowdhury y Chowdhury, *op. cit.,* 220.

ganizing and gathering heterogeneous information contained in digital information resources. The purpose of these initiatives is to facilitate the organization and processing of digital information, imbuing it with meaning to allow its use, access and retrieval in the development of the semantic web. Moreover, they assert that the ease of implementing metadata schemas allows users to tag their information, as we have pointed out with regard to prosumers, giving rise to social classification systems or folksonomies. In these systems, the user can tag and classify resources.

Web technologies are based on markup languages known as XML and key to creating Web-based information systems. According to Clarke,[34] XML has applications at various levels, ranging from the analysis of the document as a raw material to sophisticated interfaces that interact on the Web.

The image of the future library serving information prosumers with new access models suggests that current efforts should be devoted to grasping how XML can enhance library services. Thus, according to Miller and Clarke[35], XSLT or CSS should be revised, since each of these constitutes a support capable of reconfiguring the operational digital information medium. As noted regarding the user's agency as tagger, the creation of XML reference manuals will help review and resolve the media lying between the content and presentation of the resources, and between goods and services.

The prosumer emerges from online environments and networking, participating not only passively as a consumer, but also as an active user who tends to engage with a strong personal interest. In some cases the prosumer actively participates with a focus on productivity of social networks and community content, hence the importance of the prosumer in social tagging.

34 Kevin Clarke, "Updating MARC records with XMLMARC", 3-13.
35 Miller y Clarke, *Putting XML to work in the library*, 173-190.

Works cited

Block, Maryline, ed., *Net effects: how librarians can manage the unintended consequences of the Internet.* Medford, New Jersey: Information Today, 2003.

Braman, Sandra. "Theorizing the impact of it on libraries-state relations", en Gloria J. Leckie y John E. Buschman, eds., *Information Technology in Librarianship: New Critical Approach.* Westport, Conn.: Libraries Unlimited, 2009.

Browing, John. "What is the role of libraries in the information economy?", en *Mark Stefik. Internet dreams: archetypes, myths and metaphors*. Chicago: The MIT Press, 1997.

Burns, Axel. *Blogs, Wikipedias, Second Life, and Beyond: from Production to Produsage*. New York: Peter Lang, 2008.

Chan, Lois Mai y Edward T. O´Neil. *FAST: faceted application of subject terminology: principles and applications.* Santa Barbara, California: Libraries Unlimited, 2010.

Chowdhury, G. G. y Sudatta Chowdhury. *Organization information: from the shelf to the web*. London: Facet Publishing, 2007.

Clarke, Kevin S. "Updating MARC records with XMLMARC", en Roy Tennant, *XML in libraries.* New York: Neal-Schuman Publishers, 2007, 3-13.

Curran, Kevin, ed., *Understanding the Internet: a glimpse into the building blocks, applications, security and hidden secrets of the Web.* Oxford: Chandos Publishing, 2009.

Escamilla González, Gloria. *Interpretación catalográfica de los libros*. México: UNAM, 1987.

Jackson, Paul. *Web 2.0 knowledge technologies and enterprise: smarter, lighter and cheaper*. Oxford: Chandos Publishing, 2010.

Kuhn, Thomas. *La estructura de las revoluciones científicas*. México: Fondo de Cultura Económica, 2007.

Leckie, Gloria J. y John E. Buschman. *Information technology in librarianship: new critical approaches*. Westport, Connecticut, 2009.

Miller, Dick R. y Kevin S. Clarke. *Putting XML to work in the library: tools for improving access and management*. Chicago: American Library Association, 2004.

Miller, Steven J. *Metadata for digital collections: a how-to-do-it- manual*. New York: Neal-Schuman Publisher, 2011.

Oliver, Chris. *Introducing RDA: a guide to the basics*. United States of America: Facet Publishing, 2010.

Perales Ojeda, Alicia. *De la informática*. México: Universidad Nacional Autónoma de México, 1975.

Rifkin, Jeremy, *La era del acceso: la revolución de la nueva economía.* Barcelona: Paidós, 2002.

Rodríguez García, Ariel Alejandro. *Las nuevas entidades de información analizadas desde la perspectiva de la organización de la información*. México: UNAM, Centro de Universitario de Investigacio-

nes Bibliotecológicas, 2010.
Schamber, Linda. "What is a document? Rethinking the concept in uneasy time", *JASIS* 47 (9) (1996): 669-671.
Segev, Elad. *Google and the digital divide: the bias of online knowledge.* Oxford: Chandos Publishing, 2012.
Stefik, Mark. *Internet dreams: archetypes, myths, and metaphors*. Cambridge, Massachusetts, 1996.
Smith, Gene. *Tegging: people-powered metadata for the social web.* Berckley, Ca.: New Riders, 2008.
Svenonius, Elaine. *The intellectual foundation of information organization*. Cambridge, Mass.: The MIT Press, 2000.
Tennant, Roy, ed., *XML in libraries*, New York: Neal-Schuman Publishers, 2002.
Torres Vargas, Georgina Araceli. *El acceso universal a la información, del modelo librario al digital*. México: Universidad Nacional Autónoma de México, 2010.
Tredinnick, Luke. *Digital information cultura: the individual and society in the digital age.* Oxford: Chandos Publishing, 2008.
Vargas Llosa, Mario. *La civilización del espectáculo.* México: Alfaguara, 2012.

Para citar este artículo:
Rodríguez García, Ariel Alejandro. 2016. "Las nuevas pautas para el acceso a la información." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 121-141. http://dx.doi.org/10.1016/j.ibbai.2016.04.015

Information needs and information behavior of blue agave farmers in Tequila, Jalisco: A case study

Armando Sánchez-Soto *

Article received: August 28, 2014.
Article accepted: May 14, 2015.

Abstract

This article presents an analysis of information needs and information behavior of blue agave farmers in the municipality of Tequila, Jalisco (Mexico). Nowadays we can find many different kinds of *agaveros* —as these farmers are commonly called in Mexico— who are classified by some characteristic features, such as property holdings, economic power, social status, and others. There are two main groups of *agaveros*, the independent farmers and those who rent out land for others to cultivate. Findings show that the information needs of blue agave farmers and the information resources they consult are associated with their farming activities and daily lives.

* Instituto de Investigaciones Bibliotecológicas y de la Información de la UNAM, México. armando@iibi.unam.mx

Keywords: agaveros; blue agave farmers; information behavior; information needs; information source; information resource.

Resumen

Necesidades de información y comportamiento informativo de los agricultores de agave azul de Tequila, Jalisco: un estudio de caso
Armando Sánchez Soto

En este artículo se presenta un análisis sobre las necesidades de información y el comportamiento informativo que muestran los agricultores de agave azul del municipio de Tequila, Jalisco. Actualmente existen diferentes grupos de agaveros —como también se les conoce a esta clase de agricultores— que se distinguen por elementos característicos como la tenencia de la tierra, su poder adquisitivo y su estatus social. Destacan los agricultores independientes y los agricultores que alquilan sus parcelas, grupos de población en los que se enfocó la investigación De acuerdo con los resultados del estudio, tanto sus necesidades de información como la consulta de determinadas fuentes y recursos informativos para satisfacerlas giran en torno a sus actividades agrícolas y al desarrollo de su vida cotidiana.

Palabras clave: Agaveros; Agricultores de Agave Azul; Comportamiento Informativo; Fuentes de Información; Necesidades de Información; Recursos Informativos.

Introduction

The tequila maguey cactus (*Agave tequilana weber*) is most often used as a raw material for the production of tequila in the state of Jalisco, lying in Mexico's central highlands. The municipalities of Amatitán, Tequila and El Arenal are leading producers of this crop.

Agricultural practices used in the cultivation of blue agave had changed

little since pre-Hispanic times. More recently, however, some innovative agricultural techniques based on technological and scientific progress have been implemented. These technologies became available during the so-called "tequila boom," which began around 1996, when Mexico began exporting tequila to the world market at an unprecedented volume. This high demand led to critical over-exploitation of the agave harvest. The agave supply crisis spurred interest in the cultivation of blue agave, centered largely in the Mexican state of Jalisco. Several lines of research were launched focusing mostly on the history of agave production, its physiology, agricultural practices, associated plant diseases and pests and, of course, the importance of blue agave to the tequila industry.

Similar interest was born in the world of plastic arts, cultural spheres, the academy and social organizations with regard to the elements that comprise the agave-tequila production chain. This is seen in artistic renditions of the agave landscape, ancient tequila distilleries, the current leading brands in the tequila industry, and more recently, the iconic image of the *jimador* (harvester). Up until the present, however, the fundamental personage undergirding the entire productive edifice, the blue agave farmer, has been completely neglected.[1]

Most research on the production of tequila mention the blue agave farmer only indirectly and peripherally, largely in regard to the history of large tequila houses or socio-political movements such as the Mexican Revolution and land redistribution. None of these studies examines the work of farmers, their lifestyle, idiosyncrasies, and much less their information needs and behaviors.

Putting a finger on this informational gap about blue agave farmers is what makes this research relevant, particularly when so little is known about what information resources this population resorts to in order to meet the information needs associated with their work and daily lives. This purpose arises from the scientific principle that suggests studying the information needs and information behavior of non-academic communities, which have so far been largely neglected, specifically those residing in the Mexican agricultural sector.

This research report is divided into five main parts. In the first, we offer some background and a review of research on the topic to serve as a knowledge base; the second part describes the current state of blue agave farmers with regard to their agricultural work and local idiosyncrasies in Tequila,

1 For a long time it was believed this plant grew wildly without need of any care, treatment or conservation.

Jalisco; part three describes the research methodology; part four offers an analysis of results, and part five offers some general conclusions.

Background

The first research paper addressing the information needs and behaviors of farmers was conducted in 1985 in Nigeria by Lenrie O. Aina, who determined that the most important areas of information for this group of people are "irrigation techniques; fertilization techniques; equipment for plowing, cultivation and harvesting; and weather, climate, meteorology and cultivation techniques as per crop species, pest control and pesticides" (Aina, 1985: 38). Sometime later, Nason (2007: 20) states the following:

> [...] the needs of farmers in developing nations are similar to those of their American counterparts, and include such concerns as soil, fields type, climate, access to agricultural technology, securing credit and market prices.

According Nason (2007 : 22), the information resources on crops and agriculture, etc. used by farmers, include "radio and television, publications for farmers and ranchers, libraries, farming co-op services and experimental stations."

Moreover, in 2010, the interest group of agriculture libraries of the International Federation of Library Associations and Institutions (IFLA), in conjunction with the International Association of Agricultural Information (IAALD), provides that the information needs of farmers revolve around issues of fertility, soil erosion, weather conditions, fertilizers, pest and weed control, water management, farm credits, post- harvest issues, shipment, marketing and other associated matters (IFLA , 2010).

In Mexico between 2009 and 2014, four master's degrees and one doctorate, whose dissertations addressed the information needs of farmers, were awarded in the Post-Graduate School of Library and Information Studies. All of these research projects examined wine makers, and their results were in some cases similar to those of the abovementioned research projects.

Blue agave farmers in Tequila, Jalisco: historic antecedents

The earliest blue agave farmers in Tequila, Jalisco

The earliest records of human activity associated with the cultivation of blue agave in the state of Jalisco date to 1500 BC. The tombs of inhabitants often

contain ritual offerings of food and some elements associated with agave cultivation (Colunga et al. 2007). These offering include delicate burnished clay vessels painted with representation of large earthenware caldrons cooking agave *pencas*, or leaves, and persons laden with agave hearts, which are also known as *mezcal*. These painted images are contemporary to agave ovens found in the Lake Sayula basin and in the foothills of Tequila amid a settlement once called *Teochinchán* (Colunga et al., 2007) lying within the modern municipality of Tequila.

The *Teochinchán* tradition,[2] with its characteristic concentric structures known as *Guachimontones* erected in the shadow of the Tequila Volcano, seemed to hold a near commercial monopoly in the exploitation of the blue agave. Over the course of the centuries, it appears this culture carried out significant changes to the flora and fauna in order to adapt the environment to the production of blue agave and other close varieties (Dansac, 2012).

According to some accounts, the first pre-Hispanic people associated with the blue agave culture were the *tiquilos*, who began to domesticate agave in order to exploit diverse products, including the distillate we call tequila.

According to Jose Rogelio Alvarez (1969), the *tiquilos*, hence the eponym *tequila*, were a Nahuatl tribe who used the maguey for purposes as diverse as thatch and making beverages. Regarding the later, the earliest deink derived from agave was *octli poliuhqui*, or *pulque*.

In fact, the tiquilos would need many years to discover that distillation of the agave could make a strong alcoholic drink. It is likely that after cooking the agave, they ground it and let it ferment without actually distilling it. Distillation, of course, is what clarifies the liquid and gives it a higher alcohol content.

Spanish influence in the agave cultivation and the beginnings of mass production

By the eighteenth century, the production process was no longer in the exclusive hands of the indigenous communities in the region and the distillation of *vino-mezcal*, as tequila was originally called, was largely in the hands of the Spaniards. Tequila soon was commercially available throughout New Spain along with a wide array of products shipped in from the old continent. This early commercial boom led to the expansion of agave plantations in the

2 A complex ancient society likely existing from 300 BC to 900 AD in the region north of modern Guadalajara.

municipality of Tequila.

This commercial expansion caused the traditional agave cultivators to lose control of their productive lands, which were taken over by large land owners, who thereafter determined the purchase price of lands from indigenous farmers and prices of the agave harvest. Spaniards also set salaries for farm workers and other conditions of sale and export of agave products. The hegemony of the *latifundio* was so great in this agricultural sector that in the seventeenth and eighteenth centuries it had laid the economic and practical groundwork for an unprecedented agricultural project specialized in the production of agave. This type of productive plantation was unique in New Spain and the greater Americas.

Land distribution and the modernization of blue agave cultivation in Tequila

By the second and third decades of the twentieth century, information on the life of blue agave farmers in Tequila is not entirely clear. In fact, there is a lot of confusion about how this developed in comparison to previous decades. This situation arises because of the political re-accommodations carried forward after the period of armed revolutionary movements, which saw the lifestyle of farmers undergo radical change from the rural life of the grower to life in an industrial setting.

With land distribution during administration of President Lazaro Cardenas, the regional production process led by large land and distillery owners was broken. In this context and in light of the special treatment given to farmers by the state, the public discourse begins to address the creation of an agrarian social pact. In addition to meeting the Mexican Revolution's central demand of redistributing land, this policy was aimed as assimilating rural civil society into the new regime.

As for croplands of these agave farmers, land distribution entailed the organization of landowners and farmers, crop rotation and diversification schemes, introduction of new crops, seed selection, mechanization and fertilizer; and the establishment of institutes, laboratories and experimental farms. The full exploitation of crops was also promoted, and agricultural credits for small landowners and farmers were made more widely available.

Blue agave farmers in the twenty-first century

According to the most recent population and housing census (conducted in 2010), the town of Tequila has 40,697 inhabitants, of which 49.5 % are men

and 50.5 % are women.[3] The percentages of those who work directly or indirectly in the cultivation of blue agave and to what degree are as follows: 20 % cultivate agave exclusively; 40% alternate cultivation with other earning activities, 10% cultivate agave occasionally; while 30% no longer grow or otherwise work in the agave industry or never have. Number of blue agave farmers of the municipality devoted exclusively to the cultivation of blue agave has declined considerably. This phenomenon results from a series of events initiated in the year 1996 during so-called tequila boom. In the following years, this series of events would have direct, significant influence in shaping the informational profile of these farmers.

The tequila boom and the crisis of overexploitation of blue agave

By 1996, the production of tequila within the official Appellation of Origin[4] had peaked, not only within the country but also beyond its borders. As cited in official reports and diverse statistics to September 2012, the production of tequila nationally came to 196.6 million liters. Similarly, export numbers hit 127.4 million liters.[5] This high demand drove production and consumption of blue agave to unprecedented levels. In 2007, the consumption of blue agave to make tequila reached 417,000 tons, a level that grew to 676,100 tons in 2012. The municipality of Tequila led all regional producers that year with 11,000 tons.[6]

Today, blue agave plantations within the official Appellation of Origin comprise a productive inventory of more than four million agave plants, planted between 2000 and 2006. Of this inventory approximately 80,000 tons[7] were produced in the town of Tequila, which is to say that in just two years the production there increased by almost 10 %.

This led to several situations, the first of which, and perhaps most significant, was the crisis of overproduction and over-exploitation of agave.

3 Information obtained from the Sistema de Información Estadística y Geografía de Jalisco (2012: 40).

4 This category included 125 municipalities in Jalisco, eight in Nayarit, seven in Guanajuato, thirty in Michoacan and eleven in Tamaulipas. Michoacan is the is the second largest tequila producer behind Jalisco.

5 Datas obtained from the Tequila Regulatory Council (http://www.crt.org.mx/EstadisticasCRTweb/)

6 *Idem.*

7 *Idem.*

The crisis of over-exploitation and changes in production systems of blue agave farmers: the emergence of the needs for information on the environment

Due to high sales of tequila (today standing at around 10 million liters annually), most agave farmers of the municipality of Tequila joined in to start mass production in order to sell their crop to large tequila houses. To this end, acreage under cultivation in the municipality increased considerably, often in detriment to other crops such as corn and beans. From 1990 to 1997, land devoted to other crops declined sharply from 62,000 to 50,000 acres, and by 2000 to only 45,000 acres. The demand for blue agave even led some farmers to attempt to experiment with shortening ripening time from the normal seven or eight, to only four years.

In the face of this rising demand, most farmers had to alter their habitual production systems. From pre-Hispanic times to the present day, cultivation of blue agave had provided people with rope, needles, fodder, fertilizer, building materials and other products, genuinely constituting an almost unbeatable means of subsistence, independent from growing maize or raising livestock, because agave farmers never had any need to compete for the most productive, flat bottom lands, and there were never any incentives to move away from traditional growing methods. In other words, the age-old task of growing agave was always a family matter handed down from earlier generations.

Before the overexploitation crisis, cultivation of the agave plant required only minimal labor. In most families, work was divided among the members and included such tasks as cutting suckers, hoeing the ground to oxygenate the soil and cultivation of maize, beans and squash. With the need to grow more agave, much of this manual labor was almost completely modernized and mechanized.

A series of phenomena ensued from this situation in agave cultivation that still persist; for example, many of the once seasonal tasks became year-round work performed only by farmers considered skilled specialists working in harvest crews, while other crews worked in clearing land, planting and applying agrochemicals to production fields. Additionally, these changes drove social and economic phenomena such as a growth of skilled labor, which resulted in widening of social difference among farmers, internal and external emigration and immigration, falling salaries for unskilled laborers, truncated social interaction of farmers within their communities, interaction between experts from diverse disciplines, training to improve performance of certain activities, organization of *ejido* groups, unemployment, marginalization, social decay and acculturation, among many others.

As a result of these phenomena, blue agave farmers began to develop series of information needs, which still exist to this day, and a pattern or profile of informational behaviors, as they urgently worked to adapt to the synergy that the new economic and productive environment had brought about. Ultimately, two events would as largely determine the information profile of blue agave farmers. The first was the official designation of the municipality of Tequila as a pueblo magico, or magic town, and the second was the UNESCO declaration of the agave production region as a world heritage site.

From tequila boom to the ruin of the agave farmer

In the context described above, farmers in Tequila and the greater agave growing region planted agave without any significant restriction. Moreover, many craftsmen and industrial workers within the large tequila companies left their jobs to join the ranks of planters. Even some professionals and building and automotive workers were caught up in the so-called "blue-gold fever." Interestingly, many migrant workers who habitually traveled to the United States would choose to remain and work in the agave region. Hearing stories of the money to made from family and friends, others already residing "across the river" came back to swell the ranks of farmhands.

By those years, the price of agave reached $40.00 per kilo,[8] which in view of the many tons of product purchased by tequila producers meant, unprecedented returns for farmers and a significant boost to their purchasing power and lifestyles, while also driving up their expectations for continued high earnings.

The boom times, however, would not last. The large tequila distilleries and local and federal governments teamed up to depress agave prices artificially to no one's benefit but their own.

In 2006 the price of agave fell precipitously to as low as $16.00 per kilo, and currently the price ranges between $0.50 and $3.00, at less than 50% of the previous ten-year average. What's more, bank interest rates rose dramatically, which was very hard on farmers carrying debt.

These factors and the depletion of soil due to over production conspired to put an end to the tequila boom after a ten-year heyday. As agave farming became less profitable, many locals had to return to their former lives, some even selling off portions of their lands or renting it to tenants. Some sold off all of their lands and returned to their former jobs in the large distilleries, while others with fewer options swelled the ranks of the unemployed.

8 Un agave maduro alcanza un peso de hasta 40 kilos. En una hectárea de cultivo llegan a producirse hasta 5 000 plantas.

Tequila, Pueblo Mágico

In 2003 the Mexican Tourism Ministry included the town of Tequila in the official list of *pueblos mágicos*, or magic towns. These towns are considered especially attractive and ripe to for tourism development.

In the first four years after this designation, locals received funding of around 1.5 million dollars from the oversight committee (Gómez Arriola , 2009), for the purpose of renovating the town's downtown district and creating other service oriented infrastructure.

The entry of Tequila into the magic towns program of the Tourism Ministry came about largely due to the efforts of a small group of entrepreneurs, owners of the largest Mexican tequila distilleries (Cuervo, Sauza and Herradura). These business leaders hoped to promote their products by associating the industry more closely with its historical and cultural roots, which in many ways have come to represent the traditions and customs of the nation as a whole.

Some of the most important reconstruction works in the village include the restoration of the urban image, architectural infrastructure works, public lighting, drainage, paving streets, installing underground electric power and telephone wiring, public gardens and trees, artistic lighting of monuments and many other projects. Additionally, the municipal government invested in the construction and renovation of schools, expansion of the Technological Institute and promotion of the *Guachimontones* archaeological ruins and the Cathedral of St. James Apostle.

With its designation as a magic town and the concomitant influx of public monies, Tequila soon became the third most important tourist attraction in the state of Jalisco, behind only the state capital Guadalajara and the seaside resort of Puerto Vallarta. These developments served to spearhead the tequila region's inclusion in the UNESCO list of World Heritage Sites.

UNESCO declaration of the agave landscape as a World Heritage Site

The UNESCO declaration of the agave landscape as a came shortly after Tequila's inclusion in the Tourism Ministry's magic town program and amid the agave over-exploitation crisis. The Agave Landscape World Heritage Site comprises an area of 38,658 hectares of agave plantations lying between the Tequila Volcano and the deep Rio Grande River valley, a rich landscape imbued with history, and cultural and artistic delights. Archeological remains of the *Guachimontones* people and ancient tequila distilleries, known locally as taverns, also lie within the site along side of modern tequila distilleries and diverse colonial buildings, many of which were restored under the *pueb-*

lo mágico program. The Santiago Apostle Cathedral is also a major tourist attraction lying within the site (Gómez Arriola, 2006).

In light of the appeal of the municipality of Tequila, which lends its name to the world-famous distillate, local and state tourism investment began to flow into the region, which seemed especially rich in architectural and natural beauty, and history. Significant investments were made in restoring the town of Tequila and erecting new distilleries, which offer a variety of tours to the swelling ranks of both foreign and national tourists. Other tourist attractions include train and bus tours and even hot air balloon rides.

The regions soon became a magnet not only for national and foreign tourists, but also as for the films, television and advertising industries, which were delighted with the great variety and beauty locations. This development brought is a wave of artists, writers, actors, poets, painters and others who can be seen in the newly opened hotels, restaurants, museums and entertainment centers. With this influx of outsiders, the locals have changed their habits, manner of dress, speech patterns and many other things in a process of acculturation.

In view of these changes and their economic and labor needs, many agave farmers were driven away from their ancestral agave culture and the associated lifestyle, ultimately embracing the emerging changes in social organization occurring all around them. As such, many former agave farmers currently work as taxi drivers, craft sellers, tourist guides, police and hotel staff. Those with more education have found work as authorized tourist guides, bank staff, office workers, cultural promoters, small business operators, receptionists and other kinds of formal employment.

Just as is the case described in the section on the information needs of agave farmer within the new environment, the process of incorporating farmers into their new jobs and into the new tourist-cultural environment led to the emergence of other information needs, which also serve to establish the current information profile of this population group.

The following section provides an analysis of the current condition of blue agave farmers in the municipality of Tequila, Jalisco, and their information profile derived from the events related herein.

Current condition of blue agave farmers in Tequila, Jalisco

Up until only a few years ago, many believed that the blue agave spontaneously grew in the wild without need of any human intervention or farming

techniques. More recently, however, it has become well understood that agave cultivation requires quite a lot of labor both in the field and in the distillery. Very little is known about the lives of agave farm workers, who in the twenty-first century continue to cultivate the agave in the way it was done by the early inhabitants of the region.

While the job market is strong, the living conditions of workers have declined since the heyday of the early 1990s. It seems the large tequila distilleries are happy to maintain a workforce, while doing very little to improve their socio-economic conditions. Some companies, for example, have since 2000 offered woefully underpaid 100-day contracts to distillery workers and agave farmers, without providing benefits such as social security, vacation or Christmas bonus.

In such circumstances, many of these farmers have opted for other forms of paid work, such as selling handicrafts and souvenirs or developing some line of distinct work.

However, some agave farmers have managed to take on the new market conditions and sell their agave production directly to several large tequila companies, thereby escaping the trap of working for low wages. Many of these farmers have achieved better living conditions and better hopes for future security, while becoming key suppliers to the large tequila distilleries.

While the introduction of technology and science to the field of agave cultivation has helped expand the lands under cultivation, improve yields and maximize productivity, the specialized skills of certain agaveros have not been displaced.

In any event, most agave farmers have had to make significant adjustments in order to deal with the changing conditions. Unlike in days past, tequila is big business, which entails everything one might expect from a major industry. In many cases, for example, these agave farmers have had to attend courses and workshops in order to learn about new cultivation techniques, pest control and plant diseases.

Finally, some agave farmers are better-off because they have inherited growing operations that supply agave to new distilleries. These relatively wealthy agave farmers, in contrast to those who can offer only labor, have left off the production of agave to some degree, and have begun employ their specialist colleagues to muster farming crews working under the aforementioned 100-day contracts.

The circumstances of these agave farmers in the context of the social, cultural and economic changes occurring in the town of Tequila, has prompted discussion regarding the socio-economic stratification of the universe of blue agave farmers. This stratification appears to occur along the following fault lines:

a) Landholding;
b) Acreage under cultivation;
c) Commercial relationship with large tequila distilleries;
d) Socio-economic and cultural status of farmers, and
e) Life project

In this light, it appears there are today six distinct types of blue agave farmers:

6. Agave businesses owner;
7. Independent agave producers;
8. Agave farmers who rent out their parcels;
9. Agave farmers who work for tequila distilleries;
10. Day laborers, and
11. Female blue agave farmers

For purposes of this research, only independent farmers and farmers who rent out their plots were considered, since these two types of agave farmers have somehow been able to combine traditional agave production practices with the tools and techniques of modern agriculture. Moreover, these two groups are the best representatives of the foundation of agave production.

In accord with our earlier statements in this section, it appears the information profile of these farmers is more representative of the current state of the overall population of farmers. In light of the elements listed above, the following is a general description of these farmers:

Independent growers:
a) Own their land;
b) Have between 15 and 20 hectares under cultivation;
c) Sell crop directly to the large tequila distilleries;
d) Some have professional studies; high annual incomes; travel frequently; high buying power; belong to some organizations; often attend local events centered on blue agave, etc.
e) They wish to buy more land in order to plant more blue agave and sell it to distilleries.

Farmers who rent out their lands:
a) Most own their lands though some are middle men;
b) They rent out between 5 and 10 hectares;

c) They rent their lands to large tequila distilleries and in some cases to independent growers;
d) Their annual income are in the middle-low range; some raise cattle, other work in the tourism jobs, some have tequila and souvenir stores, others drive taxi, they have mid-level education, they have medium purchasing power; they buy cars; clothes, tequila; they travel to Guadalajara, Colima, Tepic, and other areas in the north of the country, etc.
e) They wish to cultivate their lands themselves and sell the crop directly to large tequila distilleries.

Methodology

Type of research

This research is of the exploratory-descriptive type. In the exploratory phase, an initial visit was made to the municipality of Tequila, Jalisco, and contacts with key sources were established. On the basis the observation and contacts established, the descriptive phase determined the following:

- The economic-labor and socio-cultural context of the municipality of Tequila directly influences the development of a typology or unofficial hierarchy of today's blue agave farmers.
- According to the typology established, the informative profile of the sample of farmers was determined on the basis of their labor, economic and socio-cultural conditions.

Método de investigación

Literature review: A review of the relevant literature was performed.
Field study: Two visits were made to the municipality of Tequila, Jalisco, as follows:

- Second visit: Preliminary interviews with sources were performed and recorded.
- Third visit: The structured instrument (*Appendix*), specifically designed for the target sample of the research universe was applied.

Population

The procedure to identify the population and corresponding sample was achieved by consulting the Statistical and Geographic Information System of Jalisco to extract the number of permanent and temporary individuals working in the agricultural sector in the municipality of Tequila who are registered with the Mexican Social Security Institute. The number of farmers registered in this way came to 285. On the basis of the information above, approximately 80 % of these individuals are devoted to the cultivation of blue agave, a figure of 228.

Sample

Of this population of 228 agave farmers, a total of 180 farmers were actually found (80%). On the basis of the typology established, the number of farmers in each category break down as show in the following table:

Table 1

Type of farmer	Quantity
Agave business owner	30
Independent farmer	25
Farmers who rent out their plots	25
Farmers working for distilleries	35
Day laborers	35
Female agave farmers	30

For the specific effects of this research, only the 25 farmers who rent out their land and the 25 independent farmers were examined.

Results

General data

As stated above, the first step of the methodology entailed locating five key sources for each type of farmer. In this case, we located five independent farmers and five farmers who rent out their plots. Then each of these initial contacts provided the contact information of four additional farmers, bringing the sample total to 50 farmers, as shown in Table 2 below.

Table 2

Independent farmers	Farmers renting out their lands	Total farmers interviewed
25	25	50

Of the 50 farmers interviewed, all were men ranging from 25 to 60 years-old, distributed as shown in the following table:

Table 3

Age range	Number of farmers	Percentage
25 to 30	5	10.00 %
31 to 40	12	24.00 %
41 to 50	21	42.00 %
51 to 60	8	16.00 %
61 or more	4	8.00 %

Of the sample interviewed, all were agave growers in the municipality of Tequila, Jalisco, although some were not originally from the zone. The total number of the sample born within the municipality of Tequila came to 40, while 5 were from Amamtitán, 3 from Guadalajara and one from Arandas (Table 4).

Table 4

Farmers born in Tequila	Farmers born in Amatitán	Farmers born in Guadalajara	Farmers born in Arandas	Total
40	6	3	1	50

As for the level of education of those interviewed, 12 reported having completed primary school, 20 report finishing secondary school, 12 finished high school, while six hold university level degrees, though only three of these hold degrees in fields related with agronomy (Table 5).

Table 5

Educational level	Number of farmers
Primary school	12
Secondary school	20
High school	12
Undergrad degree	6

Moreover, 32 of these farmers engage in some other financially remunerated activity. Twenty-five of these belong to the group farmer who rent out their plots, while seven are from the independent farmer group.

Eighteen farmers are devoted solely to the cultivation of agave: all of these came from the independent farmer group (Table 6).

Table 6

Activity \ Type of farmer	Independent farmer	Farmers renting out their lands	Total
Perform other remunerated activities	7	25	32
Devoted exclusively to agave growing	18	0	18

Analysis of results

After establishing the current status of blue agave farmers in Tequila, Jalisco, and in order to determine the sample population to be analyzed, this section present the analysis of the results obtained from the information gathering instrument (Appendix).

Taking into account the two types of farmers in the sample, each section presents the results obtained in two parts. The first part examines the information needs and behaviors in relation to their activities as blue agave farmers, while the second part

refers to these variables in relation to their daily lives, social context, idiosyncrasies and complementary economic activities. The results will be presented in tables and graphs to facilitate understanding.

Information profile of the independent farmers

Information needs of blue agave farmers

As the results indicate, the most frequent information needs of independent farmers, with 25 registers each, include the application of fertilizers, pest and disease control, and regulations of the Tequila Regulatory Council. This area is followed by farm machinery (23 tallies); organic certification and agricultural legislation (21 tallies); agricultural loans (20 tallies); agriculture and sustainable development (16 registers); intensive agriculture (14 tallies); export and agro-business (10 tallies); agricultural supplies (8 tallies) and miscellaneous (6 tallies). These frequencies are shown in Table 7 and Figure 1 below.

Table 7

Information needs	Frequency
Fertilizer use and application	25
Disease and pest control	25
CRT Regulations	25
Farm machinery	23
Organic certifications	21
Agriculture law	21
Agriculture credits	20
Agriculture and sustainable development	16
Intensive agriculture	14
Exportation and agroindustry	10
Farm supplies	8
Others	6

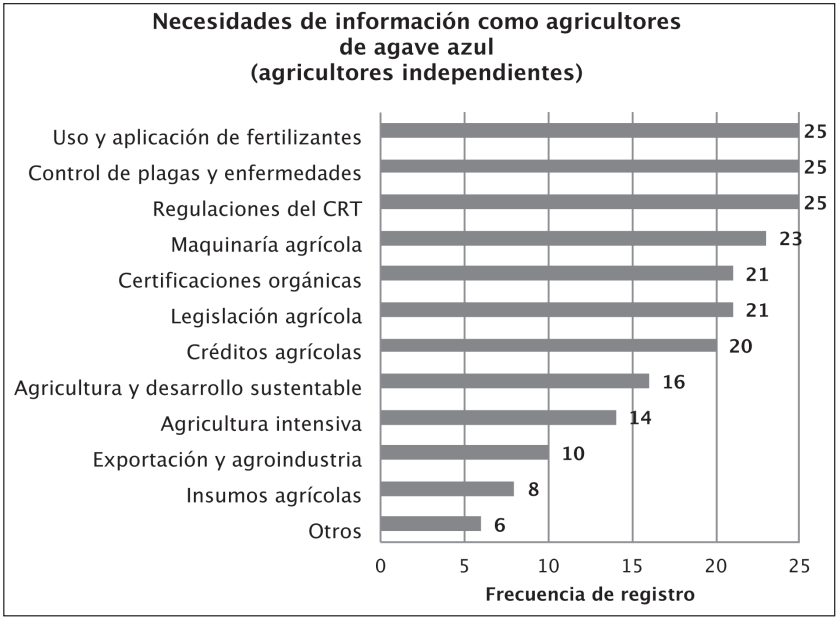


Figure 1

Information sources and resources blue agave farmers consult

Moreover, sources and resources consulted by independent farmers to meet their information needs include the minutes of CRT meetings (25 tallies); farmer colleagues (24 tallies); CRT manuals (22 tallies); internet sources (20 tallies); agrochemical distributors (16 tallies); farm machinery sales agen-

cies (15 tallies); banking institutions (12 tallies); tequila related events (10 tallies); Tecnoagave magazine (8 tallies) and other miscellaneous sources (6 tallies). These results are shown in Table 8 and Figure 2.

Table 8

Sources and resources	Frequency
CRT MEETING MINUTES	25
Farmer colleagues	24
CRT MANUALS	22
Internet sources	20
Agrochemical distributors	16
Farm machinery agencies	15
Banking institutions	12
Tequila events	10
Tecnoagave magazine	8
Others	6

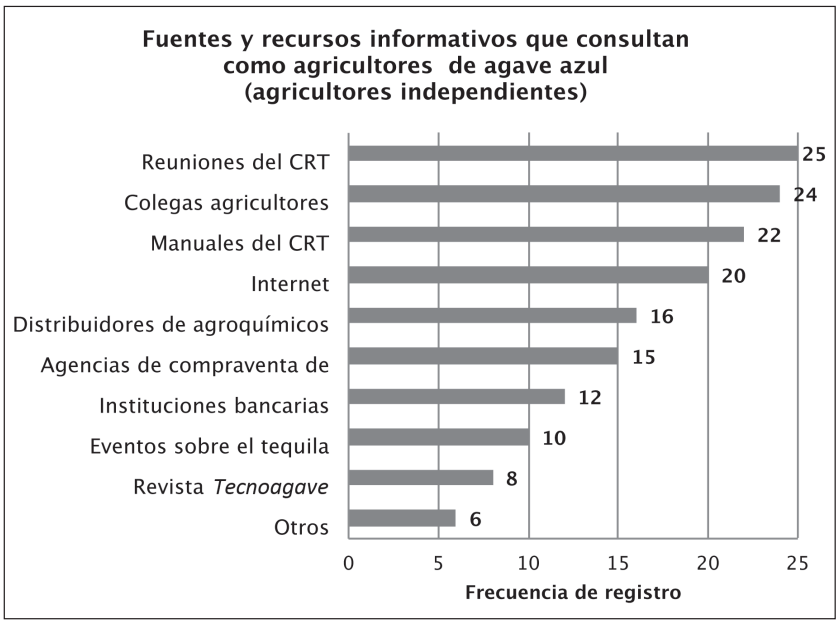


Figure 2

Information needs for daily life

The information needs associated with daily life reported by independent agave farmers include the following areas: Everything associated with the sale of agave

(25 tallies); Basic agronomy concepts (24 tallies); Agronomy training courses (23 tallies); Growing vegetables and rearing animals (each with 22 tallies); Cultivation of other edible plants (21 tallies); Management and accounting (20 tallies); Trucks and parts prices (18 tallies); Prices for new and used cars and spare parts (14 tallies); Entertainment and recreational events (12 tallies); Vacation site for rest and recreation (10 tallies); Cost of hotel accommodations (8 tallies) and Airline and bus tickets (4 tallies). These data are shown in Table 9 and Figure 3.

Table 9

Information needs	Frequency
Everything associated with the sale of agave	25
Basic agronomy concepts	24
Agronomy training courses	23
Growing vegetables	22
Rearing animals	22
Cultivation of other edible plants	21
Management and accounting	20
Truck and parts prices	18
Prices for new and used cars and spare parts	14
Entertainment and recreational events	12
Vacation site for rest and recreation	10
Cost of hotel accommodations	8
Airline and bus tickets	4

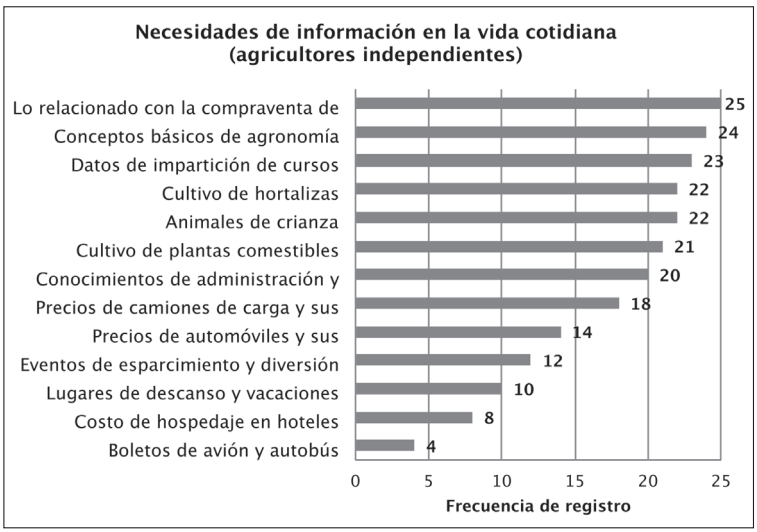


Figure 3

Sources and resources consulted for daily life

To meet these information needs, independent farmers make use of the following sources and/or resources with the following frequencies: CRT resources (25 registers), followed by farmer colleagues (24 tallies); agronomists (20 tallies); experienced workers (19 tallies); internet (18 tallies); cattlemen within the municipality (16 tallies) ; *La Tapatia* radio station (15 tallies); technical trainers (13 tallies); farm machinery agencies (10 tallies); car dealerships (9 tallies); family and/or friends (6 tallies) and dictionaries and/or specialized books (2 tallies). These results are shown in Table 10 and Figure 4.

Table 10

Sources and resources	Frequency
CRT MEETING MINUTES	25
Farmer colleagues	24
Agronomists	20
Experienced workers	19
Internet	18
Cattlemen within the municipality	16
La Tapatía radio station	15
technical trainers	13
Farm machinery agencies	10
Agencias de automóviles	9
Familiares y/o amigos	6
Diccionarios y/o libros especializados	2

Gráfica 4

Information profile of farmers who rent out their plots

Information needs of blue agave farmers

The results of interviews of farmers who rent out their lands, show the following the information needs: use and application of new growing techniques (20 tallies); new agave production processes (18 tallies); use and application of agrochemicals (16 registers); government financing and farm credits (13 tallies each); bank credits (12 tallies); disease and pest control, and CRT regulations (10 tallies each); agrarian legislation (6 tallies); agave prices (4 tallies); cost of farm machinery (3 tallies); cost of farm tools and other supplies (2 tallies each) Table 11 and Chart 5 show the breakdown of these results.

Table 11

Information needs	Frequency
New growing techniques	20
New agave production processes	18
Use and application of agrochemicals	16
Government financing and farm credits	13
Farm credits	13
Bank credits	12
Disease and pest control	10
CRT REGULATIONS	10
Agrarian legislation	6
Agave prices	4
Cost of farm machinery	3
Cost of farm tools and other supplies	2
Others	2

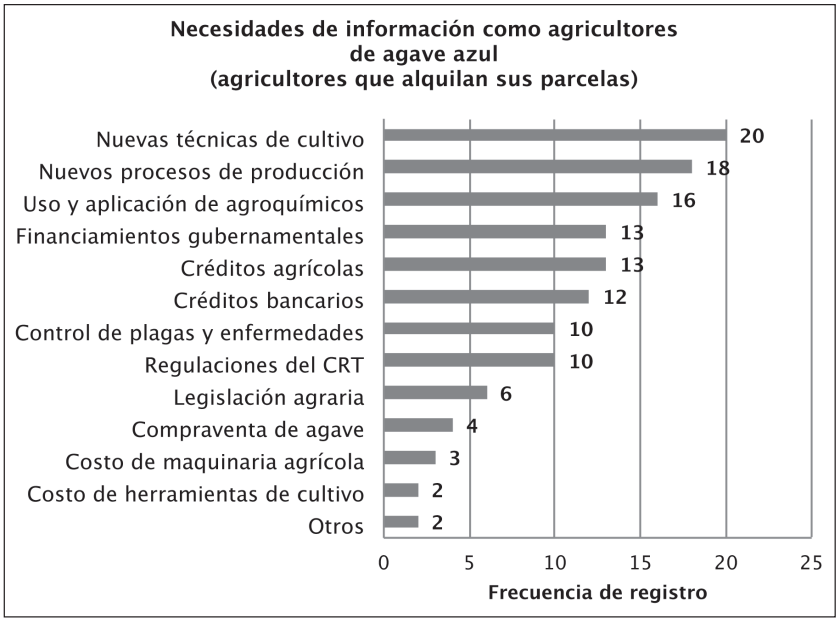


Figure 5

Sources and resources consulted by blue agave farmers

The sources and/or resources these farmers consult with greatest frequency in order to satisfy information needs are as follows: courses and workshops (20 tallies); farmer colleagues (20 tallies); *ejido* assemblies and agave organizations (18 tallies each); the CRT (16 tallies); younger agave grower with agronomy degrees (14 tallies each); banking institutions (12 tallies); farm banks (10 tallies); fertilizer distributors (8 tallies); and tequila distilleries (4 tallies) Table 12 and Chart 6 show these results).

Table 12

Sources and resources	Frequency
Courses and workshops	20
Farmer colleagues	20
Ejido assemblies	18
Agave grower organizations	18
The CRT	16
Younger growers	14
Agronomists	14
Banking institutions	12

Farming banks	10
Fertilizer distributors	8
Tequila companies	4

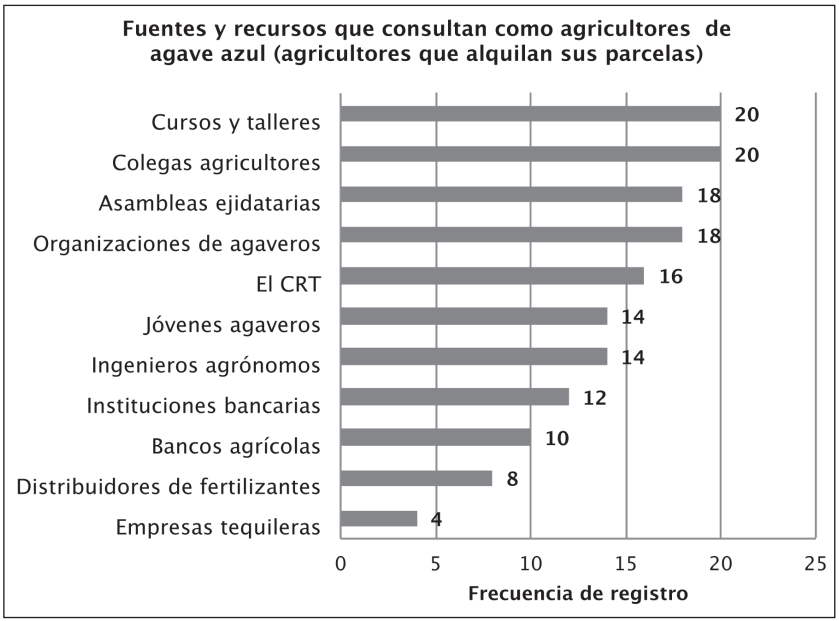


Figure 6

Information needs in daily life and other trades

As was observed in the section of the current status of blue agave farmers in Tequila, Jalisco, nowadays those farmers who rent out their plots do not earn a living exclusively from the harvest of blue agave. In this sense, their lives, idiosyncrasies and aspirations have had to adapt to this new situation. Their most frequent information needs are as follows: distillery statistics, history of the municipality and terms in English (with 25 tallies each); history of tequila (24 tallies); historical data on important sites in town (23 tallies); tequila prices and brands (22 tallies); knowledge of crafts (20 tallies); sites of interests in the region (18 tallies); regional events (16 tallies); festivals (15 tallies); regional news (12 tallies); important civic dates and entertainment and recreational sites (10 tallies each); English language and tourism schools (9 tallies) and others (8 tallies) Table 13 and Chart 7 show these data.

Tabla 13

Information needs	Frequency
Distillery statistics	25
History of the municipality	25
Terms in English	25
History of tequila	24
Historical data on important sites in town	23
Tequila prices and brands	22
Knowledge of crafts	20
Sites of interests in the region	18
Regional events	16
Festivals	15
Regional news	12
Important civic dates	10
Entertainment and recreational sites	10
English language and tourism schools	9
Others	8

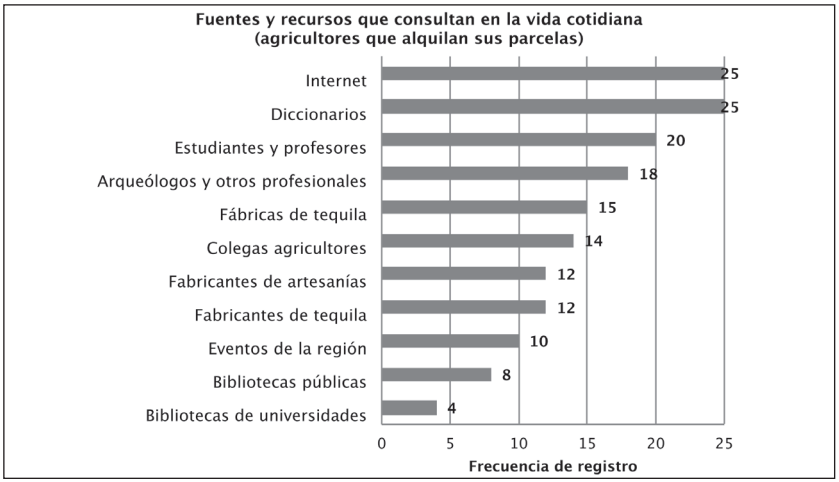
Figure 7

Sources and resources consulted for daily life and other trades

The sources and resources used by these farmers to meet their information needs are from more to least frequent as follows: internet and English - Spanish dictionaries (25 tallies each); students and teachers living of the municipality (20 tallies); archaeologists, anthropologists and historians in the region (18 tallies); tequila distilleries (15 tallies); farmer colleagues (14 tallies); handicrafts and tequila manufacturers (12 tallies each); regional events on agave and tequila (10 tallies); public libraries (8 tallies) and university libraries (4 tallies). Table 14 and Figure 8 show these data.

Table 14

Sources and resources	Frequency
Internet	25
English - Spanish dictionaries	25
Students and teachers	20
Archaeologists and other professionals	18
Tequila distilleries	15
Farmer colleagues	14
Handicrafts manufacturers	12
Tequila manufacturers	12
Regional events	10
Public libraries	8
University libraries	4



Gráfica 8

Conclusions

Currently there are marked differences in the social, economic, labor and cultural levels of the diverse blue agave growers in Tequila, Jalisco. This is especially true for the two sample groups examined in this study.

On one hand, we find the independent farmers, who because of their large land holdings, can compete with large tequila distilleries or, in fact, serve as their sole supplier of agave. This position generates significant earnings, which is closely associated with strong purchasing power. Consequently, these growers have undergone significant changes in terms of lifestyle, social status, idiosyncrasy and life project.

In contrast to the above, are those farmers who rent out their small holdings because they do not have the capital or industrial capacity to exploit forcing them to abandon agave work partly or wholly, and to take on alternate jobs and adapt to the new economic climate brought about by the *pueblo magico* program and the UNESCO's inclusion of the region in the lists of World Heritage Sites. This move away from their traditional agave growing activities has transformed their lifestyle, idiosyncrasy, social status and aspirations, while also exerting an effect on their information needs and behavior.

It is evident that the information needs of independent farmers lie in the area of acquiring skills and knowledge to improve their farm operation and the land itself.

As such, these farmer consult sources and resources that are directly associated with these needs. These resources include persons, manuals, institutions, and secondary and tertiary sources involved in the field, which is to say anything that might be of help.

For the second group, taking on work in alternative areas, with the concomitant change in their social status, has generated information needs that go beyond farming techniques. For example, those agave farmers who work in tourism jobs have had to consult an entirely distinct class of information in order to secure certification.

In this light, it is clear that the information needs generated and subsequently met have provided these farmers with a wealth of new knowledge helping them more effectively cope with the process of adapting to their new environment, lifestyle and idiosyncrasy, among others.

Moreover, while many sources and resources consulted are secondary sources, such as dictionaries, there are also many other resources that are first hand, such as books and libraries, whose information is more reliable.

Finally, one can infer that the information needs in both types of farmers are determined largely by their respective social, economic and cultural

contexts with which they must interact and adapt in order to fully develop all aspects of their lives.

Works cited

Aina, L. 1985. "Information needs and information seeking involvement of farmers in six rural communities in Nigeria". *Quarterly bulletin of international association of agricultural libraries and documentalist* 30: 35-40.

Álvarez, J. R. 1969. *Jalisco: nueve ensayos*. México: Ediciones Tlacuilo.

Bautista-Justo, M. *et al.* 2001. "El Agave Tequilana Weber y la producción de tequila". *Acta Universitaria* 11 (2): 26-30.

Calva González, J. 2004. *Las necesidades de información: fundamentos teóricos y métodos*. México: UNAM.

Colunga, P. *et al.* 2007. *En lo ancestral hay futuro: del tequila a los mezcales y otros agaves*. México: CICY, Conacyt, Conabio, Semarnat, INE.

Consejo Regulador del Tequila. s. a.a. *Estadísticas: Producción total de Tequila y Tequila 100 % de agave.* Disponible en http://www.crt.org.mx/EstadisticasCRTweb/ [Fecha de consulta: 30 de octubre de 2013].

—— s. a.b. *Estadísticas: Consumo de agave para Tequila y Tequila 100 % de agave.* Disponible en http://www.crt.org.mx/EstadisticasCRTweb/ [Fecha de consulta: 30 de octubre de 2013].

Cruz, A. 2012. "Bajo porcentaje de jornaleros agrícolas capacitados en manejo de pesticidas". *La Jornada,* 14 de septiembre, 50.

Dansac, Y. 2012. "Conceptualizaciones nativas y etnoconocimientos sobre vestigios prehispánicos en el folclore rural. Notas de la exploración del patrimonio etnológico de Teochitlán (México)". *Apuntes* 25 (1): 115-125.

Dávalos, I. 2012. "Paisaje agavero: creado por el hombre, amenazado por él mismo". *Milenio Guadalajara,* 9 de abril.

García, J. 1997. *Estudio del cultivo del maguey tequilero, Agave Tequilana Weber y su industrialización en la región centro del estado de Jalisco,* tesis, Ingeniería en Agronomía, Universidad Autónoma de Chapingo.

Gerritsen, P. y J. Morales. 2012. "La maldición del oro azul". *La Jornada del campo* 53, 18 de febrero. Disponible en http://www.jornada.unam.mx/2012/02/18/cam-oro.html [Fecha de consulta: 16 de agosto de 2012].

Gómez Arriola, I. 2006. "Patrimonio mundial: el paisaje agavero y las antiguas instalaciones industriales de Tequila". *Patrimonio cultural y turismo 15. Cuadernos: itinerarios culturales y rutas del patrimonio.* México: CONACULTA, 103-117.

—— 2009. "El plan de manejo para el paisaje agavero y las antiguas instalaciones industriales de Tequila: el patrimonio cultural como detonador del desarrollo regional, antecedentes, compromisos y retos". *Apuntes* 22 (2): 124-141.

González, C. 2003. "En las líneas del tiempo: el tequila. Cápsula 52". *Radio Red. Grupo Radio Centro,* 12 de julio. Disponible en http://radiocentro.com.mx/grc/redam.nsf/vwALL/MALZ-SPFSDN [Fecha de consulta: 23 de octubre de 2010].

González, L. 2010. *Modelo turístico sustentable para el municipio de Tequila, Jalisco, México: una perspectiva del desarrollo local,* tesis, Universidad de Guadalajara. Centro Universitario de Arte, Arquitectura y Diseño.

González, L. 2011. *Turismo y desarrollo local en el paisaje agavero: una mirada al pueblo mágico de Tequila*. México: Editorial Académica Española.

—— y C. Marmolejo. 2011. "El medio sustentable para la actividad turística del municipio de Tequila, Jalisco". *Entorno* 5 (11): 95-102.

Hernández, J. 2005. *Chiapanecos en los campos agaveros. Notas de campo sobre el racismo alteño. Seminario de estudios regionales.* México: Centro Universitario de los Altos, Universidad de Guadalajara.

—— 2006. "Las vinazas del tequila: nuevos usos, viejas prácticas en el tratamiento de las aguas residuales del tequila en los Altos de Jalisco". *Cuadernos de los Altos* 3: 103-118.

—— 2007. "Más tradicional que el agave: la organización social de los agaveros alteños". *Libro Técnico* 4: 1-89.

—— 2009. "Tequila: centro mágico, pueblo tradicional, ¿patrimonialización o privatización?" *Andamios* 6 (12): 41-67.

——2011. "Encontrar el norte en los Altos de Jalisco. La migración de jornaleros chiapanecos a los campos agaveros". *Balance y perspectivas del campo mexicano: a más de una década del TLCAN y del movimiento zapatista. Tomo III. Migraciones y movilidad laboral*. México: UNAM, 223-247.

Hernández, J. 2011. "Los paisajes agaveros y sus transformaciones culturales: expansión, intensificación y estetización". *Entre regiones, historia, sociedad y cultura* 1: 111-132.

—— 2012. "¿El paisaje o los paisajes agaveros?" *Tecnoagave*. Disponible en http://www.tecnoagave.mx/sitio/index.php/es/reportajes/133-el-paisaje-o-los-paisaes-agaveros [Fecha de consulta: 24 de octubre de 2014].

—— *et al*. 2010. *Patrimonio y cultura en América Latina: nuevas vinculaciones con el estado, el mercado, el turismo y sus perspectivas actuales.* México: Universidad de Guadalajara.

Hernández López, José de J. 2008. "Tequila: pueblo mágico. De pueblo rural a desarrollo turístico". *Historia regional y local. Las ciudades, su historia y su proyección en la región*, t. III. México: Universidad de Guadalajara. Centro Universitario de los Altos, 157-185.

Herrera, L. 2011. *El sistema de producción de Agave Tequilana Weber variedad azul y el desarrollo local en Tequila, Jalisco,* tesis, Colegio de Posgraduados.

IFLA. 2010. *Grupo de interés de las bibliotecas de agricultura.* Disponible en http://www.ifla.org//files/hg/annual-conference/ifla76/calls-for-papers/agricultura-libes.pdf [Fecha de consulta: 9 de junio de 2010].

Instituto Nacional de Estadística y Geografía. s. a. *Información nacional por entidad federativa: Tequila, Jalisco.* Disponible en http://www.inegi.org.mx/default.aspx [Fecha de consulta: 30 de agosto de 2012].

López, A. 2002. "Multiplican el agave". *El Universal,* 22 de noviembre, Estilos. Disponible en http://www.eluniversal.com.mx/estilos/24640.html [Fecha de consulta: 20 de octubre de 2014].

Manzanilla, L. y L. López. 2001. *Historia antigua de México.* México: INHA, UNAM, Porrúa.

Molina, T. 2008. "Cedió México a EU control sobre el tequila". *La Jornada,* 24 de marzo, contraportada.

—— 2008. "El auge del tequila propició una migración por relevos". *La Jornada,* 24 de marzo, 16.

—— 2008. "El tequila es el licor con mayor índice de crecimiento en el consumo de Estados Unidos". *La Jornada,* 24 de marzo, 17.

—— 2008. "En materia de tequila a granel, la ley es perversa; sólo se refiere a territorio nacional". *La Jornada,* 24 de marzo, 19.

Nason, L. 2007. "The farmer in the library: information needs of farmers and how the rural public library can fulfill them". *Rural Libraries* 27 (2): 19-45.

Palapa, F. y J. Partida. 2006. "La región tequilera, patrimonio de la humanidad". *La Jornada,* 13 de julio, Sociedad y justicia. Disponible en http://www.jornada.unam.mx/2006/07/13/index.php?section=sociedad&article=048n1soc [Fecha de consulta: 20 de octubre de 2014].

Paredes, R. 2012. "Los desafíos del paisaje agavero, patrimonio de la humanidad". *Incubarte.* Disponible en http://incubarte.mx/blog/los-desafios-del-paisaje-agavero-patrimonio-de-la-humanidad/ [Fecha de consulta: 16 de agosto de 2012].

Parsons, J. 2012. "Los agaves en la economía tradicional". *La Jornada del campo* 53, 18 de febrero. Disponible en http://www.jornada.unam.mx/2012/02/18/cam-economia.html [Fecha de consulta: 16 de agosto de 2012].

Partida, J. 2012. "Productores de agave esperan nuevo auge". *La Jornada,* 21 de mayo, 28.

Pérez, J. y J. del Real. 2007. "Conocimiento y prácticas agronómicas para la producción de Agave Tequilana Weber, en la zona de denominación de origen del tequila". *Libro Técnico* 4: 1-89.

Ramírez, C. 2009. *Necesidades de Información en comunidades indígenas: el caso de la comunidad Tepehua.* México: UNAM, CUIB.

Rodríguez, J. y H. Hernández. 2006. "Plan de manejo", en *Patrimonio cultural y turismo 15. Cuadernos: itinerarios culturales y rutas del patrimonio.* México: CONACULTA, 119-134.

Ruiz-Corral, J., E. Pimienta-Barrios y J. Zañudo. 2011. "Regiones térmicas óptimas y marginales para el consumo de Agave Tequilana Weber". *Acta Universitaria* 11 (2): 41-53.

Hernández López, José de Jesús. 2013. "De pueblo huertero a pueblo tequilero", en *Paisaje y creación de valor. La transformación de los paisajes culturales del agave y del tequila.* Michoacán: El Colegio de Michoacán/Fideicomiso "Felipe Teixidor y Monserrat Alfau de Teixidor", 95-115.

Sistema de Información Estadística y Geográfica de Jalisco. 2012. *Tequila 2012: diagnóstico del municipio*. México.

Soltero, F. 2006. "Relato de una candidatura exitosa", en *Patrimonio cultural y turismo 15. Cuadernos: itinerarios culturales y rutas del patrimonio.* México: Conaculta, 136-143.

Valenzuela, A. 2006. "Agave azul: historia por venir", en *Patrimonio cultural y turismo 15. Cuadernos: itinerarios culturales y rutas del patrimonio.* México: Conaculta, 145-157.

—— 2007. "Diagnóstico del sistema de producción ejidal de Agave Tequilana Weber, variedad azul en la región de origen: 20 años de expansión tequilera", en *Primer Seminario Internacional del Tequila: ambiente, cultura y sociedad.* México: Universidad de Guadalajara, 11-28.

—— y S. Gaytán. 2009. "La expansión tequilera y las mujeres en la industria: del símbolo al testimonio". *Ensayos: sociedades rurales, producción y medio ambiente* 9 (18): 167-195.

Valenzuela, A. e I. López. 2010. "Las insustituibles fibras de agave para las sogas finas de charro". *La Jornada,* La Jornada en la Ciencia, 20 de julio. Disponible en: http://ciencias.jornada.com.mx/investigacion/ciencias-quimicas-y-de-la-vida/investigacion/las-insustituibles-fibras-de-agave-para-las

Villalvazo, A. 1986. *El cultivo del mezcal (Agave Tequilana Weber) en la región de Tequila, Jalisco,* tesis, Universidad Autónoma de Chapingo.

Weitlander, R. y M. Olivera de Vázquez. 1969. *Los grupos indígenas del norte de Oaxaca*. México: Instituto Nacional de Antropología e Historia.

Anexo

Instrumento para entrevista (cuestionario) *

Indique su género
☐ Masculino ☐ Femenino

¿Cuál es su rango de edad?
☐ 25 a 30 años
☐ 31 a 40 años
☐ 41 a 50 años
☐ 51 a 60 años
☐ 61 años o más

Indique cuál es su lugar de origen (nacimiento)

_____

Indique cuál es su nivel de estudios
☐ Primaria
☐ Secundaria
☐ Bachillerato
☐ Licenciatura

Realiza algún otro tipo de actividad económicamente remunerada además del cultivo de agave azul, (en caso afirmativo indique cuál)

_____

Perfil informativo como agricultores

Comúnmente ¿qué tipo de información necesita para el desempeño de sus actividades como agricultor de agave azul? (señale en orden de preferencia del 1 al 10).

_____

Comúnmente ¿a qué tipo de fuentes y/o recursos de información acude para satisfacer las anteriores necesidades de información? (señale en orden de preferencia del 1 al 10).

_____

Perfil informativo dentro de su vida cotidiana o en el desempeño de otras labores aparte del cultivo de agave azul

Comúnmente ¿qué tipo de información necesita en el transcurso de su vida cotidiana o en el desempeño de otro oficio y/o profesión diferente al cultivo de agave azul? (señale en orden de preferencia del 1 al 10).

_____

Comúnmente ¿a qué tipo de fuentes y/o recursos de información acude para satisfacer las anteriores necesidades de información que requiere en su vida cotidiana o en el desempeño de otro oficio y/o profesión diferente al cultivo de agave azul? (señale en orden de preferencia del 1 al 10).

_____

* Cabe señalar que dentro del cuestionario no se solicitó a los entrevistados indicar el tipo de agricultor que se es por razones de empatía con ellos.

Para citar este artículo:
Sánchez Soto, Armando. 2016. "Necesidades de información y comportamiento informativo de los agricultores de agave azul de Tequila, Jalisco: un estudio de caso." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 143-178. http://dx.doi.org/10.1016/j.ibbai.2016.04.016

Production and impact of Peruvian social science journals in the Latinex catalogue

Luís Fernando Morales-Morante*

Article received: August 7, 2014.
Article accepted: Mayo 14, 2015.

Abstract

This paper analyzes the scientific production and leading indicators of international visibility of 25 Peruvian social science journals indexed in Latindex between 2005 and 2013, finding, with respect to other areas of knowledge, that there are more journals in the field of Psychology, Economy and Law and a large, relatively balanced quantity of articles published by both national and foreign authors. Moreover, papers by authors associated with private universities appear more often in the pages of these journals than those from public universities. Some incentive measures are proposed to improve the quality, number of citations and presence in international search engines.

* Universidad Autónoma de Barcelona, Barcelona, España. fernando.morales@uab.es

Keywords: Latindex; Peru; Visibility; Impact; Social Science.

Resumen

Producción e impacto de las revistas peruanas del ámbito de las Ciencias Sociales en el catálogo Latindex
Luís Fernando Morales Morante

En el presente artículo se analiza la producción científica y los principales indicadores de visibilidad internacional de 25 revistas peruanas del campo de las Ciencias Sociales indexadas en el Catálogo Latindex entre los años 2005-2013. Los resultados indican que hay un mayor número de revistas del campo de la Psicología, Economía y Derecho respecto del resto de áreas de conocimiento. Se observa un volumen importante de artículos publicados así como un equilibrio entre artículos a cargo de autores nacionales y extranjeros. Se constata un claro dominio de las universidades privadas frente a las públicas en la tarea editorial de revistas científicas. Se proponen acciones e iniciativas de incentivo para mejorar la calidad, número de citas y la presencia en motores de búsqueda internacional.

Palabras clave: Latindex; Perú; Visibilidad; Impacto; Ciencias Sociales.

Introduction

International figures reflect significant economic growth in some South American countries in recent years. With an average yearly growth rate above 5 % over the last five years, Peru stands at the forefront of this growth. In the field of education, this growth has driven the creation of a significant number of private universities and several public universities. Analysis of the scientific production of Peruvian scientific journals can serve as an objective measure of the consistency of this remarkable economic expansion. This examination will also help us to understand if the expansion of the university market is backed by genuine intellectual work produced by networks of researchers publishing material of quality that enjoys national and international visibility. This examination can also help detect strengths and weaknesses

of current policies, while delineating future actions to correct and improve them. It is especially important to examine these data in the field of Social Sciences, because this area of knowledge is the focus of the greatest number of majors and faculties in the country. These schools include Law, Communications, Economy and Psychology, whose expansion is accompanied by considerable growth of journals indexed in Latindex.

Testing shows that there is no bibliographic research addressing the development or any degree of compliance with quality standards. We believe that an initial exploration of these features can help one attain a general understanding of how scientific output is organized in this field of knowledge and of some of the current objective quality standards.

Theoretical framework

Bibliometric study of field of medical science in Peru

Since the end of the decade of the 1990s, a line of bibliometric research was launched that focused on the parameters of quality and visibility of scientific journals published in Peru. Concretely, these studies have examined the field of medicine and bio-sciences. Huamaní and Pacheco, for example, examine the collaborative scientific output in the medical field (Huamaní and Pacheco-Romero, 2011; Huamaní and Mayta-Tristán, 2010). Other studies analyze the deficiencies and adjustment of editorial policies that serve to improve the international position of the journals (Burstein and Cabezas, 2010; Huamaní and Pacheco-Romero, 2009; Arroyo-Hernández, Zukerán-Medina and Miranda-Soberón, 2009). Romaní and Wong (2009) examine the filtering protocols for searching papers in the Scielo catalogue, and the main indicators of visibility. Cáceres and Mendoza (2009) propose a global analysis of scientific output in the field of medicine. The main conclusions reveal a low level of production and indexation for this class of journals, though it is the highest when compared to journals of other fields (Huamaní and Pacheco-Romero, 2011; Romaní and Wong, 2009; Gerstein, 2005). The likely cause of this low level of output were found in the rigorous, prolonged peer review processes (Cuevas and Mestaza, 2002) that determines whether a paper is to be published or not (Burstein y Cabezas, 2010). A positive datum was revealed in the high degree of online visibility of these journals using internet search engines (Huamaní and Pacheco-Romero, 2009).

Another exploratory line, considerably less prolific than the one cited above, looks at student contributions to medical journals (Taype-Rondán et

al., 2011; Alarcón-Villaverde, Romaní and Gutiérrez, 2010; Mayta-Tristán, Pena-Oscuvilca, 2009; Molina-Ordóñez, Huamaní y Mayta-Tristán, 2008; Huamaní, Chávez-Solís y Mayta-Tristán, 2008; Gutiérrez y Mayta-Tristán, 2003). The results indicate that Peruvian educational and research centers have made considerable efforts to publish research and belong to recognized indexation systems. These efforts comprise a value added in terms of quality to the institutions, while improving their global visibility and establishing new linking mechanisms with research groups that in the future lead to the production of new papers.

The field of Social Sciences in Spain as a Latin American paradigm

In the past decade, Spain has undergone a process of modification of hiring criteria of both tenured and associate professors. The system of examination that candidates must pass in order to secure accreditation has been complemented with a series of international merit objectives for evaluating research activity. This has driven the development of international benchmark models, which apply criteria similar to those used in large classification systems, such as ISI-JCR (Thomson Reuters) and Scopus. In the field of Social Sciences there are diverse tools for measuring the quality of journals, such as the impact factor, on the basis of systematic indexation of citations and other representative criteria. IN-RECS[1] ccalculates the impact of 761 Social Science journals in ten categories. The open access consultation figure to date comes to 878,507 visits. DICE (*Difusión y Calidad Editorial de las Revistas Españolas de Humanidades y Ciencias Sociales y Jurídicas*) [Dissemination and Editorial Quality of Spanish Humanities, Social Science and Law Journals] was established as a collaborative convention between the Consejo Superior de Investigaciones Científicas (CSIC) and la Agencia Nacional de Evaluación de la Calidad y Acreditación (ANECA). DICE provides the indicators *international dissemination value* and *degree of internationality*, which are based on quantifying and evaluating citations and the other data relevant to researchers and publishers. The search can be performed by journal by the field subset. Miar[2] is a system for quantitatively gauging visibility of the periodical journals in Social Sciences as a function of their presence in diverse data bases.

There are several complementary tools that do not specifically supply an impact index or a measure of visibility of journals. They do, however, offer

1 http://ec3.ugr.es/in-recs/informacion/que-es1.htm [Fecha de consulta: 25/10/2014]
2 http://miar.ub.edu/es [Fecha de consulta: 25/10/2014]

other relevant indicators of the quality of publications. The Resh[3] platform systemizes the criteria met by the journals in accord with the quality parameters set by three evaluation institutes: CNEAI, ANECA and Latindex. This platform attempts to supply indicators of editorial quality, a system for evaluating manuscripts, institutional aperture for submissions, internationality and other criteria. Other instruments are also used in Social Sciences when there is no specific quantitative information available. In this group we have systems based on the opinion of experts, who determine quality on a threefold scale, such as the Catalonian system Cahrus+.[4]

Nonetheless, from the Latin American standpoint, it is very difficult to develop an efficient system that brings together these indicators in a way enjoying wide support, without mentioning the difficulties of bringing together the array of journals and making this information assessable from diverse data bases and points of entry. In light of this impossibility, in general terms, the search of journals and papers is performed through three large engines: *Redalyc* (Mexico), *Scielo* and *Dialnet*.

The *Scielo-Perú* engine is coordinated in Peru by the Consejo Nacional de Ciencia, Tecnología e Innovación Tecnológica (CONCYTEC), la Universidad Nacional Mayor de San Marcos and la Representación en Perú de la Organización Panamericana de la Salud. Specifically, in the field of Humanities there are five Social Science journals that total 38 numbers, as follows:

1. *Anthropologica*, 9 numbers
2. *Areté. Revista de Filosofía*, 13 numbers
3. *Journal of Economics, Finance and Administrative Science,* 8 numbers
4. *Liberabit. Revista de Psicología,* 13 numbers
5. *Revista de Psicología* (PUCP), 6 numbers

Several studies have been performed to complement the operation of these procedures and facilitate gathering of results in Social Science journals, thereby securing other comparative indicators that current systems cannot provide to researchers. Lopez Baena, Cases and Barbancho Valcárcel Medina (2005) conducted an evaluation protocol of journals to complement the ISI database. In another line of research, the bibliometric protocols of the Resh catalogue (Alcaín, Roman Toledo Roman and Giménez, 2008) and Latindex (Alcaín and Lascurain, 2002) are presented. Both studies support the quality of the editorial process, peer review, international visibility and impact indexes, among oth-

3 http://epuc.cchs.csic.es/resh/que_es [Fecha de consulta: 25/10/2014]
4 http://www10.gencat.cat/agaur_web/AppJava/castellano/a_info.jsp?contingut=carhus_2014 [Fecha de consulta: 25/10/2014]

er indicators. Borrego and Urbano (2006) examine the difficulties of applying bibliometric impact measures based on citation figures drawn from the Thomson Scientific data bases (formerly ISI). Vázquez, Urdín Caminos and Román Román (2003) examine of performance of Spanish journals in the field of health sciences against the Latindex quality criteria and their degree of online accessibility. In the field of Communications, the work of Fernández Quijada (2010, 2009) analyze the similarities and differences between journals. Román Román, Vázquez Valero and Urdín Camino (2002) analyze the Latindex editorial quality criteria within the framework of the evaluation of Spanish journals in the fields of Humanities and Social Sciences. Alcaín and Lascurain (2002) analyzed 221 Latin American psychology journals. Gamboa (1998) effectuates a prototype of the Latindex Latin American index of scientific journals. However, in the field of Social Sciences there are no studies that describe the production of authors and institutions, while allowing comparisons and evaluation of the impact in accord to objective, validated indicators.

Objectives

This paper proposes the three following objectives:

1. To perform a quantitative and qualitative study on the basis of standardized measures of impact of the scientific production of Peruvian Social Science journals listed in the Latindex catalogue from 2005 to 2013.
2. On the basis of results of analysis of data, to discern a rating scale of the journals and institutions that publish them as a function of their position in the eyes of the international scientific community.
3. To propose measures aimed at improving the quality and degree of international impact of journals.

Methodology

The analysis applied in this study is performed on the basis of a bibliometric count of the papers published in scientific journals from 2005 to 2013. This period was selected because it frames an extensive interval that is sufficient to discern the development of journals and obtain, finally, a longitudinal perspective of the most recent research in this field, which is concurrent with the recent expansion of university market in Peru.

The review of the literature was performed in four phases:

1. *Localization* of the total universe of Social Science journals indexed in the Latindex catalogue. To achieve this, the advanced search was performed as follows: Latindex/Tema: Ciencias Sociales/Indizada-Resumida at: Latindex Catálogo/País: Perú.
2. *Inventory* of the totality of papers published in each journal from 2005 to 2013. This data was gathered from the official web page of each journal and using a specialized search engine such as *Scielo*, Amauta or *Redalyc*.
3. *Construction of a data base* containing thirteen relevant variables of the scientific papers published in journals.
4. *Comparative analysis* of the indicators for the period under study, organizing these into three fields and six categories.

Analytical indicators

The analytical variables are selected in order to obtain information of the journals across three fields:(*Table 1*):

1. *General data.* These indicate number of journals, specialization, publisher and the publication period.
2. *Scientific output.* This field seeks to quantify the scientific output and learn how authorship of papers is organized.
3. *Quality indicators.* This includes the visibility of journals in other search engines, the number of citations in Google Academic (GA), and the Class and number of Latindex criteria met.

Table 1. Indicadores de análisis

Field	Variables		Descriptor
General data	1	Number of journals	Indicates the distribution of the editorial output of journals in accord with specialization, centers and period of publication
	2	Specialization	
	3	Institution	
	4	Nature of the institution	
	5	Publication period	
Scientific output	1	Papers published	Shows the volume of papers, the distribution of authors and the internationality of the contributions
	2	National authors	
	3	Foreign authors	
	4	Multiple authorship	
	5	Int. of the contributions	

Quality indicator	1	Indexation in other search engines	Assesses quality on the basis of indexation of other search engines, citations and Latindex criteria met
	2	Number of citations in GA	
		Latindex Criteria met	

Results

Without initial discrimination, the result of the search shows a total of 45 journals, which were analyzed individually. These data are entered into an XLS format special file in order to build a basic statistical results tables. From an initial review, we find that the engineering journal *Ingemmet*, appears somewhat incongruously on this list. Since this journal does not fall within the scope of this study, it was excluded. We observe that 10 journals were not available online. As such, we could not include this information in the analysis. Once the data on each journal was gathered, it was found that several of these began to be published sometime after 2005, while others ceased to be published before 2013. Still others several exhibits gaps in periodicity (*Appendix 1*). If we include such journals, it could create an incorrect picture of the output when compared to publications that have been published with regular periodicity. As such, we decided to set an inclusion criterion. We limited the sample to those journal publishing up to three times per year, because this level of presence is acceptable for the period of eight years under study. This is a reasonable approach in order not to affect the comparative reading of the subset and because this periodicity can contemplate situations that involve an involuntary interruption or simple lag time in the release of numbers online. After filtering, we proceeded to perform the comparative analysis of 25 journals which yielded the results shown in *Table 2*.

Field 1. General data

Number of journals

25

Specializations

Chart 1 shows the field of Psychology leads all other with a total of six indexed journals, followed by ADE/Economy; and Archeology, Anthropology and History with five each. Next is Law with four, followed by Communica-

tions with two and several fields with only one journal each, i.e., Librarianship, Education and Sociology.

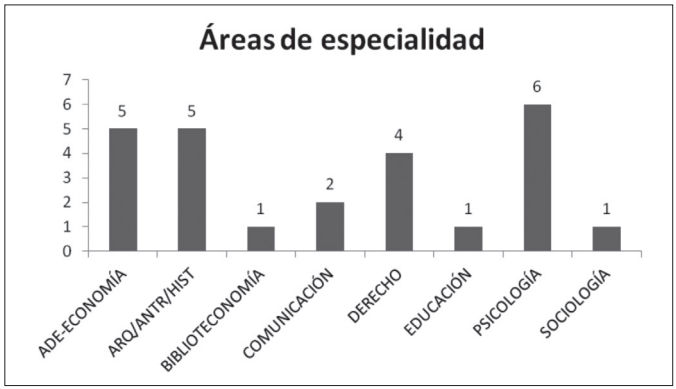


Chart 1. Distribution by field

Institution

Here we can see the editorial production by institutions (Figure 2). We note that the center with the highest number of indexed journals is the Pontificia Universidad Catolica del Peru with 9 journals, followed by the National University of San Marcos with 3 publications, and the Lima University and the University of Piura with 2 each. The latter two universities are alsoprivate. The other centers publishing only one jurnal each are as follows: Biblios, Esan, Instituto de Estudios Amazónicos, Instituto Nacional de Defensa de la Competencia y de la Protección de la Propiedad Intelectual, Onpe, Universidad César Vallejo, Universidad Femenina, Universidad del Pacífico and Universidad San Martín de Porres.

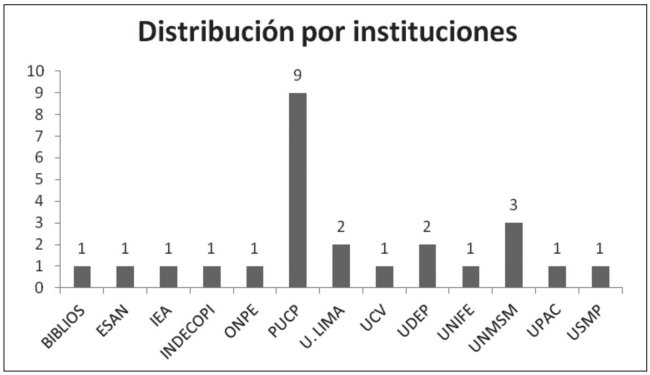


Figure 2. Distribution by insitution

Of the total sample of journals (Figure 3), 18 are published by private universities, three by the public university Mayor de San Marcos; two by private publishers (Biblios and the Institute of Amazonian Studies), which publish journals of the same name. Finally, the National Office of Electoral Processes (ONPE) publishes by the magazine *Elecciones*; and the National Institute for the Defense of Competition and Protection of Intellectual Property publishes the *Revista de la Competencia y la Propiedad Intelectual* (Journal of Competition and Intellectual Property).

Periodicity

Fourteen journals are published on a yearly basis, while eleven come out twice per year.

Table 2 shows the breakdown of this first section of the analysis.

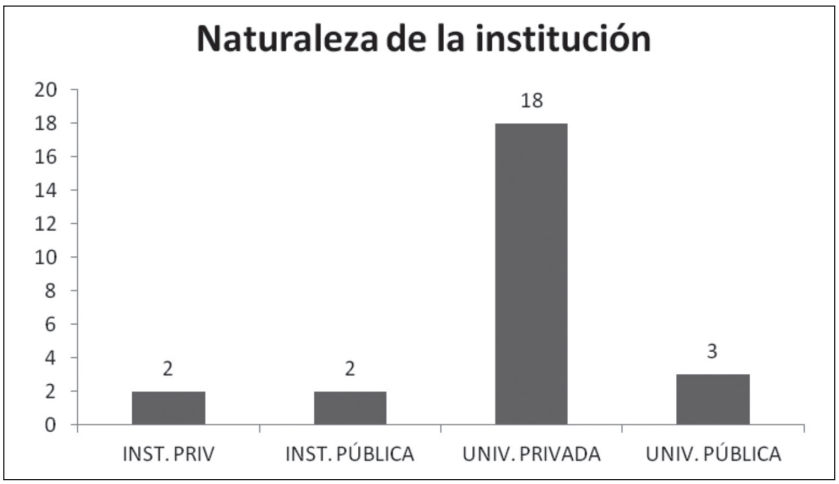


Figure 3. Type of institution

Table 2. Datos generales

	Journal	Field	Institution	Type	Period
1	*Anthropologica*	Archeo/Anthrop/Hist	U. Católica	Private U.	Yearly
2	*Apuntes*	ADE-Economía	U. Pacífico	Private U.	Semestral
3	*Arqueología y Sociedad*	Archeo/Anthrop/Hist	U. San Marcos	Public U.	Yearly
4	*Avances en psicología*	Psicología	U. Femenina	Private U.	Yearly
5	*Biblios*	Biblioteconomia	Grupo Biblios	Private Inst.	Twice per year
6	*Boletín de Arqueología*	Archeo/Anthrop/Hist	U. Católica	Private U.	Yearly
7	*Contabilidad y Negocios*	ADE-Economía	U. Católica	Private U.	Twice per year
8	*Contratexto*	Comunicación	U. de Lima	Private U.	Yearly

9	*CD J. of Economics*	ADE-Economía	E. Negocios	Private U.	Twice per year
10	*Debates de Sociología*	Sociología	U. Católica	Private U.	Yearly
11	*Derecho PUCP*	Derecho	U. Católica	Private U.	Yearly
12	*Economía*	ADE-Economía	U. Católica	Private U.	Yearly
13	*Elecciones*	Derecho	ONPE	Public Inst.	Yearly
14	*Estudios Amazónicos*	Archeo/Anthrop/Hist	IEA	Private Inst.	Yearly
15	*Histórica*	Archeo/Anthrop/Hist	U. Católica	Private U.	Twice per year
16	*Investigación Educativa*	Educación	U. San Marcos	Private U.	Twice per year
17	*J. of CENTRUM Cathedra*	ADE-Economía	U. Católica	Private U.	Twice per year
18	*Liberabit*	Psicología	U. San Martín	Private U.	Twice per year
19	*Persona*	Psicología	U. de Lima	Private U.	Yearly
20	*Comunicación*	Comunicación	U. de Piura	Private U.	Yearly
21	*Revista de Derecho*	Derecho	U. de Piura	Private U.	Yearly
22	*Revista de la Prop. Int.*	Derecho	INDECOPI	Public Inst.	Yearly
23	*Inv. en psicología*	Psicología	U. San Marcos	Public U.	Twice per year
24	*Revista de Psic. PUCP*	Psicología	U. Católica	Private U.	Yearly
25	*Revista de Psic. UCV*	Psicología	U. C. Vallejo	Private U.	Twice per year

Field 2. Scientific output

A total of 2,475 papers published from 2005 to 2013 were counted.

Papers published

As shown in Chart 4, *Derecho* (Law), printed by the Pontifical Catholic University of Peru, has published the most papers, with a total of 206 contributions. *Investigación Psicológica* (Psychological Research) was next with 179 and *Biblios* third with 141. *Liberabit*, also a psychology journal, of the University San Martin de Porres, was next with 135 papers. *Arqueología y Sociedad* (Archaeology and Society) of the University of San Marcos also tallies 135 papers. Other journals topping 100 articles in the period were: *Boletín de Arqueología* with 119, and *Cuadernos de Difusión*, which in 2009 changed its name to Journal of Economics and is published by Esan, came in at 118. *Revista de Derecho*, of Universidad de Piura tallied 110, and *Investigación Educativa* of Universidad Nacional Mayor de San Marcos tallied 109. In a tightly packed group we find 11 journals with output ranging from 70 to 90 papers over the eight-year period under study. This group is followed by *Debates de Sociología* with 42 papers and *Histórica* with 57, both of which are published by Universidad Católica. *Chart 5* shows the development of all journals under study over the eight-year window of the study.

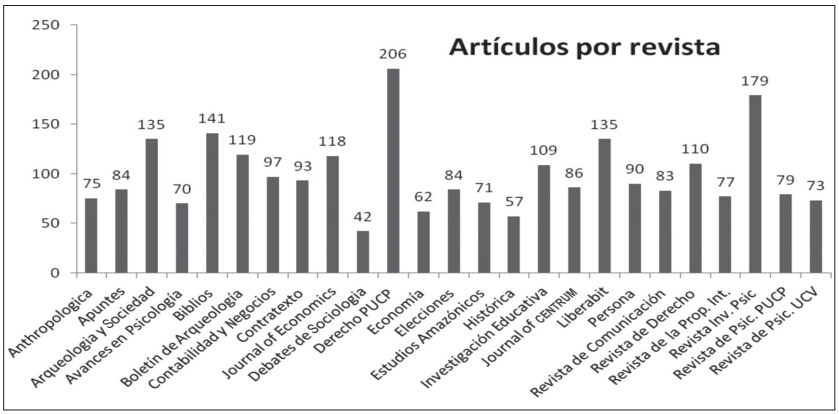


Gráfico 4. Número de artículos por revista

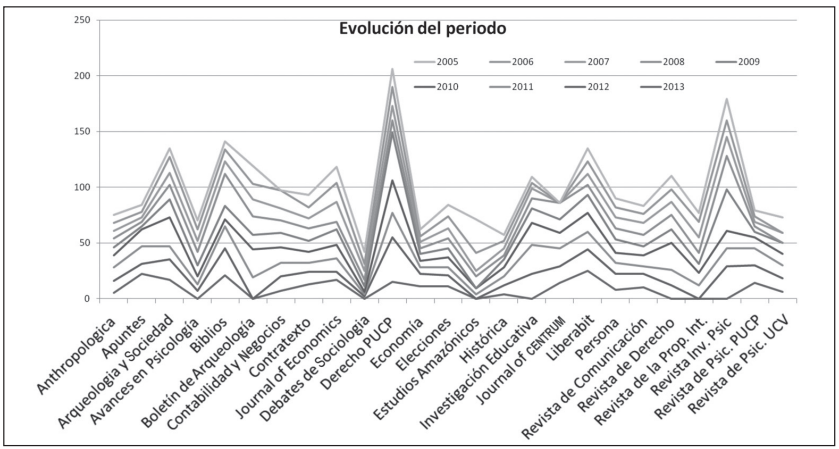


Chart 5. Comparative development

National authors

Of a total of 3,262 authors, 1,789 (54.2 %) are Peruvian nationals and 1,473 (45.8 %) are foreigners. The journal publishing the most national authors is *Investigación en Psicología* with 363 papers, at a rate of 45.3 per year. The following journals published more than 100: *Arqueología y Sociedad e Investigación Educativa*, both with 135; and *Derecho* with 114. Those publishing the fewest Peruvian authors are *Antrophologica* with 24, followed by *Histórica* with 21 and *Comunicación* and *Biblios*, with 20 each. The variance of this indicator between two journals in the same filed is noteworthy. While, *Boletín de Arqueología* published 38.7 % Peruvian authors, *Arqueología y Sociedad*

published 70.3 %. In the case of *Derecho*, we observe a similar pattern, with 64 % Peruvian national authors published. For *Debates de Sociología* this rate reaches 75 %, but with only 33 papers. The higher rates of papers published by Peruvian authors could obey both the customary practice of the journal and the fact that the field these journals address do not particularly attract foreign researchers. This pattern is most evident in journals such as *Investigación Educativa* and *Derecho*, which focus largely on matters of Peruvian law. We should also mention that both of these journals publish a high number of papers authored by faculty. In contrast to this tendency, the journals *ADE-ECONOMÍA*, *Journal of Economics* and *Journal of CENTRUM Cathedra* publish far fewer papers by Peruvian authors, as shown in Table 3.

Foreign authors

We counted 1,473 foreign authors. *Biblios* published the highest number of foreign authors with 170 (89.5 %), followed by Jouranal of *CENTRUM Cathedra* with 132 (82.5 %). A second grouping came in as follows: *Revista de Psicología* of Pontificia Universidad Católica del Perú with 121 (66.5 %), *Boletín de Arqueología* with 106 (61.3 %) and *Liberabit* with 83 (61.1 %) of the total. *Avances en Psicología*, of Universidad Femenina, published only 23 foreign authored papers, or 21.7 % of the total authors published over the eight-year period. *Revista de Psicología* of Universidad César Vallejo scored slightly higher in this area, with 35 papers published by foreign authors, or 33.4 %. While this is a small number, it reflects an effort to internationalize in this recently founded university. Journals publishing the fewest foreign authors are *Debates de Sociología* and *Investigación Educativa*, with 11 papers each. *Estudios Amazónicos* is the only journal that did not publish a foreign author. The journal that has struck the best balance is *Contabilidad y Negocios* with 69 Peruvian national authors and 68 foreigners. Eleven of the 25 journals published more foreign authors than national researchers. These figures appear in *Tabla 3*.

Internationality of submissions

Another relevant indicator of the quality of a journal is the volume of papers that are co-written by local and foreign authors. The *Boletín de Arqueología* published the most co-authorships of this kind, with 18 papers authored by a mix of Peruvian and foreign authors. In this regard, *Arqueología y Sociedad* has published 7 papers, *Revista de Psicología* of PUCP follows with 6 and *Liberabit* with only 4. *Anthropologica, Contabilidad y Negocios, Contratexto,*

Journal of Economics and Histórica each tallied only one. Thirteen journals of the sample have not published any co-authored papers of this kind. These figures are shown in Table 3.

Tabla 3. Producción por autores

Journal	A N	%	A EX	%	AN + AEX
Anthropologica	24	34.2	46	75.8	1
Apuntes	60	60	40	40	3
Arqueología y Sociedad	135	70.3	57	29.7	7
Avances en Psicología	47	78.3	23	21.7	0
Biblios	20	10.5	170	89.5	0
Boletín de Arqueología	67	38.7	106	61.3	18
Contabilidad y Negocios	69	50.3	68	49.7	1
Contratexto	43	41.7	60	58.3	1
CD J.of Eonomics	55	43.3	72	56.7	1
Debates de Sociología	33	75	11	25	0
Derecho PUCP	114	64	64	36	3
Economía	47	69.1	21	30.9	0
Elecciones	27	31.7	58	68.3	0
Estudios Amazónicos	71	100	0	0	0
Histórica	21	36.8	36	63.2	1
Investigación educativa	135	92.4	11	7.6	0
J. of CENTRUM Cathedra	28	17.5	132	82.5	0
Liberabit	53	38.9	83	61.1	4
Persona	50	44.6	62	55.4	2
Comunicación	20	24	63	76	0
Revista de Derecho	58	53.2	51	46.8	0
Revista de la Prop. Int.	79	81.4	17	18.6	0
Inv. en Psicología	363	84.6	66	15.4	0
Revista de Psic. PUCP	61	33.5	121	66.5	6
Revista de Psic. UCV	70	66.6	35	33.4	0
Total Revistas: 25	1789	54.2	1473	45.8	48

Multiple authors

This section presents authorship involving two or more authors and co-authored works by Peruvian national and foreign authors. The volume of papers by two authors comes to 338, with *Biblios* leading the way with 48 co-authorships, followed by *Journal of CENTRUM Cathedra* with 27 co-authorships, *Arqueología y Sociedad* with 22, *Liberabit* with 21 and *Persona* with 20. As for papers written by three authors, *Biblios* leads the way with 19, followed by *Liberabit* with 17, *Revista de Psicología* of PUCP and *Persona*

with 12, and *Investigación en Psicología* with 10. Finally, *Investigación en Psicología* is the most flexible in terms of co-authorships involving four or more authors with 45 papers. This journal has, in fact, published one article with twelve Peruvian authors and two papers with eleven authors. *Liberabit* has published 17, two of which were authored by six authors. *Boletín de Arqueología* published eleven multiple-authorships, one signed by ten authors and two signed by nine authors. Eleven journals did not publish any papers with more than four or more authors.

With regard to co-authored research involving authors from two countries, *Boletín de Arqueología* published 16 papers as follows: Peru/United States, Peru/Japan, Peru/United Kingdom, Peru/Germany. *Journal of CENTRUM Cathedra* has eight as follows: Peru/Spain, Peru/ United States, India/ Malaysia, United States /New Zeeland. *Liberabit* published six papers by Latin American co-authors as follows: Argentina/Peru, Colombia/Chile. Finally, *Revista de Psicología* of PUCP published four.

As for papers with authors from three or more countries, we have *Boletín de Arqueología* with two and *Journal of CENTRUM Cathedra* also with two. Finally, *Arqueología y Sociedad* and *Contabilidad y Negocios* came in with one each. Twenty journals from the sample, did not publish any papers by authors from three or more countries.

En la *Tabla 4* se resumen los datos de autorías múltiples.

Table 4. Scientific output by multiple authors

Journal	2A	3A	4+A	2P	3+P
Anthropologica	5	0	0	4	0
Apuntes	17	3	1	6	0
Arqueología y Sociedad	22	8	7	7	1
Avances en Psicología	10	3	4	1	0
Biblios	48	19	9	0	0
Boletín de Arqueología	8	2	11	16	2
Contabilidad y Negocios	8	8	0	2	1
Contratexto	8	1	1	3	0
CD J.of Economics	19	7	5	6	0
Debates de Sociología	1	0	0	1	0
Derecho PUCP	15	3	0	4	0
Economía	14	0	0	1	0
Elecciones	8	0	0	2	0
Estudios Amazónicos	3	0	0	0	0
Histórica	3	0	0	0	0
Investigación Educativa	0	0	0	0	0
J. of CENTRUM Cathedra	27	8	7	8	2

Liberabit	21	17	17	6	0
Persona	20	12	3	3	0
Comunicación	13	5	3	0	0
Revista de Derecho	2	0	0	0	0
Revista de la Prop. Int.	13	4	0	1	0
Inv. en Psicología	19	10	45	0	0
Revista de Psic. PUCP	16	12	12	4	1
Revista de Psic. UCV	18	7	8	1	0
Total Journals: 25	338	129	133	76	8

Field 3. Quality indicators

In this section, we analyze the citations of papers published within the analysis window. We employed two citation visibility indicators: Google Academic and citations in the Class search engine: Latin American Citations in Social Science and Humanities. Table 5 shows these figures.

The journal with the largest number of citations in Google Academic is *Revista Investigación Psicológica* of the Universidad de San Marcos, with 404 citations. In fact, this journal has more citations of different papers. Among these, we find a paper by Martínez, M. (2006) "La investigación cualitativa: síntesis conceptual", 9 (1), 123-146, with 154; Riveros, Q., V. Hernández and B. Rivera (2007): "Niveles de depresión y ansiedad en estudiantes universitarios de Lima metropolitana", 10 (1), 91-102, with 39. We find that *Journal of CENTRUM Cathedra* is also cited frequently in this search engine, with 149 citations. The most frequently cited article is Zhu, J. 2011. "Airlines performance via two-stage network DEA approach", 4 (2), 260-269, with 13 citations, followed by Sumner, S., R. Johnsony L. Soenen (2010): "Spillover effects among gold, stocks, and bonds", 3 (2), 106-120, with 12. In third place we find *Revista de Psicología* of PUCP with 100 citations, whose most frequently cited paper is Zubieta, E., M. Beramendi, F. Sosa y J. A. Torres. 2011. "Sexismo ambivalente, estereotipos y valores en el ámbito militar", 29 (1), 101-130, with 5 citations. *Biblios* also stand out with two papers with 23 citations each.

Different citation figures come back from papers stored in Clase. These data do not correlate with the Google Academic data. The most frequently cited journal is *Histórica*, with 431 citations, followed by *Economía* with 139, *Boletín de Arqueología* with 136 and *Debates de Sociología* with 134, which in Google Academic only has two citation entries. Only *Apuntes* meets Latindex criteria with a total of 33, while *Biblios, Contabilidad y Negocios, Derecho* (PUCP), *Liberabit*, *Persona*, *Revista de Comunicación* and *Revista de Psicología* (PUCP) stand at 32 each. Those journals with the lowest scores are *Estudios*

Amazónicos and *Revista de la Competencia Intelectual*, which meet only 25 criteria each. *Histórica*, which fulfills 26 criteria, exhibits 431 citations in Clase, while *Economía* also fulfills 26 Latindex criteria and notches 139 entries in Clase.

Table 5. Citations and Latindex criteria

Journal	GA	CLASE	C.LI.
Anthropologica	34	0	31
Apuntes	23	0	33
Arqueología y Sociedad	17	0	26
Avances en Psicología	1	0	29
Biblios	46	0	32
Boletín de Arqueología	43	136	29
Contabilidad y Negocios	1	63	32
Contratexto	20	0	30
Journal of Economics	9	0	27
Debates de Sociología	2	134	29
Derecho PUCP	29	111	32
Economía	2	139	26
Elecciones	0	0	30
Estudios Amazónicos	0	0	25
Histórica	4	431	26
Investigación Educativa	0	21	31
J. of CENTRUM Cathedra	149	0	29
Liberabit	9	99	32
Persona	14	0	32
Revista de Comunicación	15	0	32
Revista de Derecho	0	0	31
Revista Comp. intelectual	14	0	25
Revista Inv. Psicológica	404	0	30
R.de Psicología PUCP	100	0	32
R. de Psicología UCV	6	0	31

Indexation in other search engines and the Open Access

Finally, we examine the visibility of these journals in other search engines (*Table 6*). Eleven journals are visible in *Dialnet*, three in *Scielo* and four in *Redalyc*. Fifteen journals employ the Open Access (OA) publishing system. All of the journals from Pontificia Universidad Católica del Perú are gathered in the PUCP journal portal, while those of the Universidad de San Marcos are accessible through the Libraries Digital System.

Table 6. Indexation in other search engines

	Dialnet	*Scielo*	*Redalyc*	OA
Anthropologica	X	X		X
Apuntes				
Arqueología y Sociedad				
Avances en Psicología				
Biblios	X		X	X
Boletín de Arqueología	X			X
Contabilidad y Negocios			X	X
Contratexto	X			
Journal of Economics		X		X
Debates de Sociología				X
Derecho PUCP				X
Economía				X
Elecciones	X			
Estudios Amazónicos				
Histórica	X			X
Investigación Educativa				X
J. of CENTRUM Cathedra				X
Liberabit	X		X	X
Persona	X		X	X
Revista de Comunicación	X			
Revista de Derecho				
Revista Comp. Intelectual				
Revista Inv. Psic	X			X
Revista de Psic. PUCP	X	X		X
Revista de Psic. UCV				
	11	3	4	16

Discussion

With regard to the work methodology, we believe the data collection system we have used for this research has worked properly for the purpose of securing data on the diverse variables analyzed herein. This has been a long and hard task because localization of the data corresponding to variables of each of the indexed journals has had to be entered manually on an individual basis into the data base. Since there really is no tool for filtering the searches that is capable of automatically displaying results, some data entry errors may have occurred that could affect tallies. Nonetheless, this procedure was

the only possible way to map of scientific output, insofar as there are no instruments available for doing this.

It would be interesting if Latindex incorporated more exact information in its system for users. Useful information might include: which evaluation criteria were fulfilled by the journal; more exact filter systems in the Catalogue option; and additional tools for searching citations and versions of the same paper or to perform specific searches by journal, institution and author. Finally, the integration of the platform with other similar search engines, such as Clase or *Scielo* would be a great aid in continuing along this line.

The analysis of the figures points to different interpretations in accord to how we approach the data. In general terms we have been able to corroborate the existence of a significant number of papers (2,475), equal to an average of 100 papers per journal during the eight-year study window. We cannot say, however, that output and volume of citations are homogenous across all journals, despite somewhat insular institutional efforts to cover and project their interests among their target public or simply to report the research activities of faculty. This situation is exemplified in the work of Universidad Católica, whose nine journals are published regularly. All of these journals maintain a corporate style in the design of both web portals and print versions. The differences between these journals, however, become clear when we examine the volume and variety of papers they publish. Even though it lies somewhat beyond the parameters of this paper, we could say that the same phenomenon occurs in other publications, whose power indicator is set by the quality of the researchers they publish, the facilities and contacts provided by the publishing department and in general terms by their corporate dimension. In practical terms, this means the result is that which we have verified: more or less papers, greater or lesser presence of international authors previously referenced, citations, etc. There are some journals that have ceased publication in the last two years, although these interruptions do not necessarily affect the citation rates.

The second case to be highlighted is that of the Universidad de San Marcos, a publically funded university that has been able to sustain the position of three journals with 423 papers even in the midst of tight budgetary constraints. *Investigación Psicológica* is the journal receiving the most citation in Google Academic with 404. The remaining university publishers are private institutions and do not publish more than two journals each. These private universities include Universidad de Lima and Universidad de Piura. In these cases, it is either a matter of insular initiatives evidencing scant interest in participating in the university circuit or their unwillingness to assume the rigorous tasks entailed in maintaining editorial boards, peer review processes and the commitment to publish regularly.

The librarianship journal *Biblios*, published by a private company, earns special recognition for attaining some of the best general indicators, the highest number of foreign authors (170) and the highest number of papers by two authors (48), while garnering 46 international citations.

In a comparison by fields shown in Table 7, journals in the fields of archeology, anthropology and history are the most frequently cited (665), even when these are third in the number of journals with five. Psychology journals stand in second place with six, with 626 papers and 633 citations. The field of ADE-Economy publishes important data in five journals with 386 citations. The field of Law boasts four journals, 477 papers and 154 citations. Those fields contributing less than 50 citations include Communications, Sociology, Education and Librarianship, the latter of which is represented by a single journal that received zero citations.

Table 7. Citation comparison

		Nº R	Arts.	AN	AEXT	Citas
1	Archeo/Anthro/Hist	5	457	318	245	665
2	Psychology	6	626	644	390	633
3	ADE-Economy	5	447	259	333	386
4	Law	4	477	317	190	154
5	Librarianship	1	141	20	170	46
6	Communication	2	176	63	123	35
7	Sociology	1	42	33	11	2
8	Education	1	109	135	11	0

Conclusions and recommendations

The results of this study indicate that a greater number of journals and authors are affiliated private with universities than with public universities. All told, there are 18 journals belonging to private universities, half of these to the Pontificia Universidad Catolica del Peru. These nine journals are titled as follows: *Anthropologica, Bulletin of Archaeology, Accounting and Business, Debates Sociology, Law, Economics, Historical, Journal of CENTRUM Cathedra and Magazine Psychology*. The only public university in the inventory is the National University of San Marcos, which publishes three journals. These journals are: *Archaeology and Society, Educational Research and Research in Psychology*. (English translations of the journal titles are provided for convenience in this instance) The remaining institutions publish one or two journals each. An analysis of the data shows that there has been significant growth in the number of journals produced largely in private universities to the detriment of public

universities. This is evidenced by growth of papers, and internationality of submissions, as well as in the implementation of higher editorial standards and peer review. Moreover, the visibility of papers in international search engine has also increased.

This study has revealed the irregularity of some journals. We have found several that are released rather erratically, which disqualified them from this study. The same holds true for newly launched journals. Our results are not enough to tie the scientific output of journals directly to research groups, concrete lines of research or relationships with other institutions. Perhaps where we can most clearly see this aspect of journals is in the field of Librarianship, Economy and Archeology, whose published authors are largely affiliated with a variety of national and international institutions and research centers in a way that resembles the co-authorship practices seen in other leading journals.

Publishers still need to increase efforts to enhance the visibility of journals internationality. Very few journals are indexed in other regional catalogues such as Clase or *Redalyc*. None of the sample journals are indexed in SJR Scopus or in ISI. The journals of the Pontificia Universidad Católica del Perú uphold the highest quality standards. These journals are managed with the support of a private publishing service. The Universidad de San Marcos manages its own platform similar to the *Scielo*-Perú search engine; but it is limited to searching for papers. The Amauta web represents the national archive and does not locate papers, nor does it offer impact indexes for journals or citations by authors.

Additionally, librarians need more extensive training in order to understand how to implement technical improvements to existing search engines and platforms and facilitate the implementation of Open Access. Likewise, international search engines are needed in conjunction with efforts to optimize review and publication processes in order to promote the participation of Peruvian national and more foreign authors. As already mentioned, some authors in the field of Medicine (Huamaní and Pacheco Romero, 2009; Cabezas and Mayta-Tristán, 2008) believe that meeting these standards could enhance the international presence, at least with regard to the Latin American region.

Finally, the implementation of these apparently simple actions requires funding, specific knowledge and training of personnel. This is a good basis upon which to build understanding on how the improvement of the quality of journals represents added value to authors, programs and research centers. Without a doubt this phenomenon is difficult to manage, but it must be faced seriously by the state and university institutions that are in charge of

setting policies. Only when serious, ongoing actions are implemented will we see positive results in coming years.

Referencias

Alarcón-Villaverde, J., F. Romaní y C. Gutiérrez. 2010. "Publicaciones científicas estudiantiles producidas en el curso de Epidemiología de la Facultad de Medicina de la Universidad Nacional Mayor de San Marcos durante el periodo 2003-2009". *Anales de la Facultad de Medicina* 71 (2) (abril): 111-116. UNMSM. Facultad de Medicina.

Alarcon, J., J. Murillo, J. Piscoya, C. Castro y C. Isasi. 1996. "Evolución y características de las publicaciones biomédicas peruanas, 1985-1993". *Anales Facultad Medicina (Perú)* 57 (3): 158-173.

Alarcón, R. 1980. "Desarrollo y estado actual de la psicología en el Perú (Parte C)". *Revista latinoamericana de Psicología* 12 (2): 225-235.

Alcain, María Dolores, Adelaida Román Román y Elea Giménez Toledo. 2008. "Categorización de las revistas españolas de Ciencias Sociales y Humanas en RESH". *Revista Española de Documentación Científica* 31 (1) (enero-marzo): 85-95.

—— y M. Luisa Lascurain. 2002. "Análisis de las revistas latinoamericanas de psicología incluidas en el "Directorio Latindex". *Papeles del Psicólogo* 83: 34-43.

Arroyo-Hernández, C. H., E. B. Zukerán-Medina y U. E. Miranda-Soberón. 2009. "Características de la producción científica biomédica en Ica, Perú 1998-2007". *Revista Peruana de Medicina Experimental y Salud Pública* 26 (2): 203-206.

Borrego, Ángel y Cristóbal Urbano. 2006. "La evaluación de revistas científicas en Ciencias Sociales y Humanidades". *Información, cultura y sociedad* 14 (enero-junio): 11-27. Ciudad Autónoma de Buenos Aires.

Burstein, Z. y C. Cabezas. 2010. "Advances and challenges of the Revista Peruana de Medicina Experimental y Salud Pública in the year 2010". *Revista Peruana de Medicina Experimental y Salud Pública* 27 (1): 3-5.

Cabezas, César y Percy Mayta-Tristán. 2008. "Evolución y perspectivas de la Revista Peruana de Medicina Experimental y Salud Pública, 1945-2008". *Revista Peruana de Medicina Experimental y Salud Pública* 25 (2) (abril-junio): 167-168. ISSN 1726-4634.

Cáceres, C. F. y W. Mendoza. 2009. "Globalized research and "national science": the case of Peru". *American Journal of Public Health* 99 (10): 1792-1798.

Cuevas, R. F. y M. Mestaza. 2002. "La evaluación científica y el sistema de revisión por pares". *CSI Boletín* 46: 1-5.

Fernández-Quijada, D. 2010. "El perfil de las revistas españolas de comunicación (2007-2008)". *Revista española de documentación científica* 33 (4): 553-581.

—— 2009. "Revistas científicas e índices de impacto: A propósito de "Hacer saber". *Área abierta* 20: 1-10.

Gamboa, J. O. 1998. "Acceso a revistas latinoamericanas en Internet: opción a través de las bases de datos Clase y Periódica". *Ciência da informação* 27 (1), 0-0.

Gerstein, N. B. 2005. *Calidad de las revistas científicas biomédicas peruanas*. Academia Nacional de Medicina del Perú. Disponible en: http://www.acadnacmedicina.org.pe/publicaciones/anal_agodic04/03sesordinaria/02Naldo_Balarezo.pdf

Gutiérrez, C. y P. Mayta-Tristán. 2003. "Publicación desde el pregrado en Latinoamérica: importancia, limitaciones y alternativas de solución". *Cimel* 8 (1): 54-60.

Huamaní, C. y J. Pacheco-Romero. 2011. "Colaboración científica en artículos de revistas biomédicas peruanas". *Anales de la Facultad de Medicina* 72 (4) (diciembre): 261-268. UNMSM. Facultad de Medicina.

Huamaní, C. y P. Mayta-Tristán. 2008. "Factor de impacto modificado de las revistas médicas indizadas en SciELO Perú, 2006". *Revista Peruana de Medicina Experimental y Salud Pública* 25 (3): 349-350.

Huamaní, C. y J. Pacheco-Romero. 2009. "Visibilidad y producción de las revistas biomédicas peruanas". *Revista de Gastroenterología del Perú* 29 (2): 132-139.

Huamaní, C., P. Chávez-Solís y P. Mayta-Tristán. 2008. "Aporte estudiantil en la publicación de artículos científicos en revistas médicas indizadas en Scielo-Perú, 1997-2005". *Anales de la Facultad de Medicina* 69 (1): 42-45. UNMSM. Facultad de Medicina.

Huamaní, C. y P. Mayta-Tristán. 2010. "Producción científica peruana en medicina y redes de colaboración, análisis del Science Citation Index 2000-2009". *Revista Peruana de Medicina Experimental y Salud Pública* 27 (3): 315-325.

López Baena, A. J., M. Valcárcel Cases y M. Barbancho Medina. 2005. "Propuesta de un sistema de evaluación de revistas científica en las áreas de Ciencias Humanas y Sociales". *Revista española de documentación científica* 28 (1): 22-48.

Lluch Osca, Julia y María Elena Mateo Marquina. 2003. "Difusión de las revistas españolas de ciencias sociales y humanidades. Acercamiento bibliométrico". *Revista General de Información y Documentación* 13 (1): 115-132.

Mayta-Tristán, Percy y Américo Pena-Oscuvilca. 2009. "Importancia de la publicación en las sociedades científicas de estudiantes de medicina del Perú: estudio preliminar". *CIMEL* 14 (1): 27-34. ISSN 1680-8398.

Miguel, S. 2011. "Revistas y producción científica de América Latina y el Caribe: su visibilidad en SciELO, RedALyC y SCOPUS". *Revista Interamericana de Bibliotecología* 34 (2): 187-199.

Miguel Villamón-Herrera, José Devís-Devís, Alexandra Valencia-Peris y Javier Valenciano-Valcárcel. 2007. "Características y difusión de las revistas científico-técnicas españolas de ciencias de la actividad física y el deporte". *El Profesional de la Información* 16 (6) (noviembre-diciembre): 605-615.

Miyahira Arakaki, J. M. 2008. "Criterios de calidad de las revistas científicas". *Revista Médica Herediana* 19 (1): 01-04.

Molina-Ordóñez, J., C. Huamaní y P. Mayta-Tristán, P. 2008. "Apreciación estudiantil sobre la capacitación universitaria en investigación: estudio preliminar". *Revista Peruana de Medicina Experimental y Salud Pública* 25 (3): 325-329.

Pamo Reyna, O. G. 2005. "Estado actual de las publicaciones periódicas científicas médicas del Perú". *Revista Médica Herediana* 16 (1): 65-73.

Román Román, Adelaida, Manuela Vázquez Valero y Carmen Urdín Camino. 2003. "Las Revistas Españolas de Ciencias de la salud frente a los criterios de calidad editorial Latindex". *Revista Española de Documentación Científica* 26 (4): 418-432.

—— Manuela Vázquez Valero y Carmen Urdín Camino. 2002. "Los criterios de calidad editorial Latindex en el marco de la evaluación de las revistas españolas de humanidades y ciencias sociales". *Revista Española de Documentación Científica* 25 (3): 286-307.

Romaní, F. y P. Wong. 2009. "Reporte y serie de casos en el Perú: situación de un tipo de publicación subestimada. Análisis de las revistas médicas peruanas indizadas en SciELO-Perú, 1997-2008". *Revista Perú Epidemiology* 13 (3): 1-7.

Taype-Rondán, Á., Y. Lajo-Aurazo, R. Gutiérrez-Brown, N. Zamalloa-Masías y M. Saldaña-Gonzales. 2011. "Aporte de las sociedades estudiantiles en la publicación científica en SciELO-Perú, 2009-2010". *Revista Peruana de Medicina Experimental y Salud Pública* 28 (4): 691-692.

Varela Pinedo, L., P. J. Ortiz Saavedra y H. Chávez Jimeno. 2003. "Características de los trabajos científicos nacionales en geriatría y gerontología. 1980-2001". *Revista Médica Herediana* 14 (1): 18-25.

Vázquez Valero, M., C. Urdín Caminos y A. Román Román. 2003. "Las revistas españolas de ciencias de la salud frente a los criterios de calidad editorial LATINDEX". *Revista española de documentación científica* 26 (4): 56-73.

Appendix 1

Journal	2013	2012	2011	2010	2009	2008	2007	2006	2005
Boletín de la Academia Peruana de la Lengua	0	0	0	0	0	9	9	10	0
Comunicacción	6	12	13	9	0	0	0	0	0
Comunifé	0	0	0	8	0	8	9	7	11
Educación	0	0	0	12	0	0	0	35	40
Ius et veritas	Not available								
La Tribuna del abogado	0	219	166	24	0	0	0	0	0
Lex	28	0	0	0	0	0	0	0	0
Nuevos paradigmas	Not available								
Pacarina del sur									
R. de la Comp. Intelectual	0	0	12	11	8	10	14	14	8
R. Ingemmet	Not in the area of social science								
Revista de Psicología de la Universidad Católica Santa María	0	0	0	0	7	7	6	6	5
Revista de Psicología (Arequipa)	0	0	8	0	0	0	0	0	0
Revista Estrategias	5	15	0	0	0	0	0	0	0
R. Juridica del IPEF	Not available								
Revista Peruana de Psicología y Trabajo Social									
R. Psicológica Herediana									
Tzhoecoen	0	0	21	21	13	10	0	0	0
Zonas áridas							22	15	8

Para citar este artículo:
Morales Morante, Luís Fernando. 2016. "Producción e impacto de las revistas peruanas del ámbito de las Ciencias Sociales en el catálogo Latindex." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 179-204. http://dx.doi.org/10.1016/j.ibbai.2016.04.017

A bibliometric analysis of collaboration between Brazil and Spain in the field of medical research from 2002 to 2011

Adolfo Alonso-Arroyo *
Ely Francina-Tannuri de Oliveira
Maria Cláudia Cabrini-Grácio **
Andrés Pandiella ***
Rafael Aleixandre-Benavent ****

Article received: May 19, 2014.
Article accepted: May 14, 2015.

Abstract

This study analyzes the development of Spanish-Brazilian collaborative scientific production in the field of medical research between 2002 and 2011, identifying the most productive institutions, the proportion of researchers from each country and bi-lateral collaborative networks. Data were gathered from the Scopus database, which offers broad, international coverage of multidisciplinary research. A study sample of 1,121 original scientific articles signed by 13,906 researchers were retrieved, on the basis of which the annual

* Universidad de Valencia, España. adolfo.alonso@uv.es
** Ambas autoras pertenecen a la Universidade Estadual Paulista "Júlio de Mesquita Filho"-UNESP-Marília, Brasil. (etannuri@marilia.unesp.br); (cabrini@marilia.unesp.br)
*** Universidad Carlos III de Madrid, España. apandiella@gmail.com
**** Unidad de Información e Investigación Social y Sanitaria. Universidad de Valencia-CSIC. IHMC López Piñero, Valencia. España. rafael.aleixandre@uv.es

growth rate of Spanish-Brazilian medical research was calculated. A remarkably high degree of internationalization was found, with 121 countries participating in the papers sampled. Moreover, Fully 51 countries in this international network boast at least 15 contributions. The study finds a high degree of collaboration between Spain and Brazil, and significant growth of collaboration in the area of medical research, including collaborations with other countries, with fully 58 % of the sample involving a third country.

Keywords: Collaboration networks; scientific collaboration; Brazil; Spain; Medicine.

Resumen

Un análisis bibliométrico en el área de la Medicina: colaboración científica entre Brasil y España (2002-2011)
Adolfo Alonso-Arroyo, Ely Francina-Tannuri de Oliveira, Maria Cláudia Cabrini-Grácio, Andrés Pandiella and *Rafael Aleixandre-Benavent*

Esta investigación tiene por objetivo analizar la evolución temporal de la producción científica en colaboración entre Brasil y España en el área de la Medicina, en el periodo 2002-2011, además de identificar las instituciones y países más productivos y representar y analizar las redes de colaboración institucional entre los países colaboradores. Como fuente de información se utilizó Scopus, por considerarla como la principal base de datos multidisciplinar y con mayor cobertura geográfica. Los documentos analizados se han limitado a los artículos originales. Se recuperaron 1 121 artículos científicos, con un total de 13 906 firmas. Se calculó, para cada año, la tasa de crecimiento anual de la colaboración científica entre Brasil y España. Es significativo reseñar que han participado instituciones de 121 países diferentes, lo que demuestra el alto grado de internacionalización de los trabajos recogidos, y una red de colaboración científica en la que participan 51 países con al menos 15 contribuciones. Se constata el alto grado de colaboración entre estos dos países y el aumento significativo desarrollado a lo largo de los años en el área de la Medicina, así como su participación con otros países, si bien resulta importante resaltar que en más de la mitad de los trabajos (58 %) se ve

implicado un tercer país, impulsando la cooperación internacional.

Palabras clave: Redes de Colaboración; Colaboración Científica; Brasil; España; Medicina.

Introducción

By the end of the 1990s and into the early twenty-first century, Brazil and Spain were among the eleven countries exhibiting the largest growth in scientific activity (Glänzel, Leta and Thijs, 2006). The participation of Brazil from 2002 to 2006 increased across all fields of knowledge, taking the lead in Latin America while accounting for 50% of scientific output from the region. In Brazil, medicine is one of three fields exhibiting the greatest growth in scientific output, featuring intense collaboration across Latin America, North America and Europe, and especially with Spain (IRD e IEDCYT-CSIC, 2009).

Consequently, Brazilian output that is internationally indexed has grown by 38.4 % in the study window. This figure vastly outperformed the world-wide rate of 19%. Brazilian output from the field of medicine has been significant, while botany and zoology have grown considerably across Latin America (IRD and IEDCYT-CSIC, 2009; FAPESP, 2011).

The development of Spain on the international stage has seen scientific output double from 2000 to 2010. In 2001, we find 28,062 documents and by 2010 this figure grew to 66,655. Spanish scientific production has grown considerably in recent years, moving from 2.5% of world output between 2003 and 2007 to 2.8% in the period of 2006-2010. Since 2008, Spanish scientific output has approached 3.0% of world output, and it has diversified into more fields. Despite this increase in output, Spain slipped from ninth place to tenth in the world rankings of scientific production, largely because of rapid growth of other emerging countries such as India.

Spain has diversified in terms of the scientific field in which it publishes, especially since 2006. By 2010, Spanish researchers had published in 288 distinct scientific areas. As has been the case in previous years, Medicine outperformed other field with 21.4% of all Spanish output in 2010, followed by Agriculture and Biological Sciences (8.8 %), Biochemical and Molecular Biology (8.3 %), Chemistry (6.8 %) and Psychology (6.6 %) (Moya-Anegón, 2013).

According to the Scopus data base and others associated to the cited questions, from 1996-2011 Brazil and Spain are the leading producers in

the field of medicine in the Portuguese- and Spanish-speaking world (Elsevier B.V. 2014). In this context, the growth rate of collaborative scientific output between Brazil and Spain is in general higher than the growth rate of each country alone during study window, as can be seen in data from SCImago (2013).

Scientific collaboration between countries has served to consolidate the internationalization of new knowledge and the science produced (Glänzel, 2003). This author studied the relationship between productivity and scientific collaboration, showing that both are related, especially in some fields such as biomedicine and chemistry.

According to studies examining scientific output world-wide, international collaborative research papers have more impact and visibility in the scientific community, a situation that motivates governments to propose initiatives aimed at encouraging collaboration among researchers (Glänzel and Lange, 2002; Persson, Glänzel and Dannell, 2004; Iribarren-Maestro, Lascurain-Sánchez and Sanz-Casado, 2009).

At the extramural level, mainly among countries, scientific collaboration has become an indispensable practice for achieving a critical mass capable of impelling and consolidating the internationalization of new knowledge and the analysis of science produced (Katz y Martin, 1997; Glänzel, 2003).

Scientific collaboration among authors, institutions or countries reflects the role of the exchange of ideas, in which a set of central objectives of a project are identified, which implies division of labor among researchers, as well as fluid communication of information, thereby broadening the likelihood of establishing new foci and tools that encourage construction networks in which collaborators interact (Balancieri et al., 2005; Olmeda-Gómez, Perianes-Rodríguez and Ovalle-Perandones, 2008).

Co-authorship serves as an indicator of scientific collaboration. An advantage of this indicator is that it is comprised of objective data that can be verified by other researchers. Moreover, it represents an accessible, friendly way to quantify collaboration, allowing researchers to work with a large universe of data that yields statistically significant results without the weakness inherent in the "case study" approach (Katz y Martin, 1997). The analysis of co-authorship suggests the possible role of sharing among researchers and, as gauged by the number of co-authored papers enjoying the support of diverse institutions and countries, constitutes a useful approach for identifying and mapping regional, national or international cooperation. Therefore, the analysis of co-authorships allows us to describe and incorporate the structure of the group that can be represented by a social network. According to Wasserman and Faust (1994), the term "social network" refers to the subset

of authors and relationships existing among them. The analysis of networks aims to develop a model of the relationships between authors, in order to make a descriptive portrait of the group structure.

According to Otte and Rousseau (2002), the analysis of social networks is an interdisciplinary procedure whose aim is to examine social structures. Moreover, they stress that analysis of social networks focuses on the relationship between authors; however, both relationship links and individual features are required in order to attain a complete picture of a social phenomenon. Bibliometrics studies collaboration networks, citations and other forms of social interaction to be implemented and observed using a graphic representation. These studies group a broad array of indicators that can be classified in indicators of output, citations, impact and relationships (Narin, Olivastro and Stevens, 1994; Callon, Courtial and Penan, 1995; Okubo, 1997; Spinak, 1998).

The output indicators are based upon the frequency of publication of a researcher, research group, institution or country. The purpose of these indicators is to reflect their insertion in the scientific community, evidencing those that are most productive, the most prominent topic areas within a field and the leading journals publishing such research.

The indicators of relationships, based on authorship or shared citations, are used in the construction and display of the scientific collaboration and in co-citation networks comprised of researchers, institutions or countries. This is achieved through the confluent application of analytical statistical, mathematical of computational techniques. In this study, output and relationship indicators are used by means of analysis of scientific collaboration.

It is important to stress the growing importance of evaluation studies of science in medicine, taking into account the history of scientific development, the great incentives provided by funding organizations, the speed of production with regard to the high volume of scientific literature and the consolidation of the medical field in the scientific world.

The aim of this study is to analyze the development of collaborative scientific production performed by Brazilian and Spanish researchers in the field of medicine from 2002 to 2011. We will also strive to identify the most highly productive institutions and countries and represent and analyze these institutional collaborative networks. We seek to enhance the picture of the development of scientific collaboration in the field of medicine performed by researchers from Brazil and Spain, while underlining the major institutional players contributing to the consolidation of the collaborative scientific network and analyzing the main areas of scientific research by the researchers of each country. This approach provides an important update to the state of

the art in this area of study in Latin America, and can serve as a tool in science policy decision making.

Methods

The data examined were downloaded from the Sciverse Scopus data base on October 21, 2012. The search strategy included the following condition: at least one Spanish and one Brazilian researcher had to participate in the paper. This was achieved using the following search entries: Spain OR espanha or España and brasil or Brazil. Moreover, all papers included in the research sample had to be original research, published in the window from 2002-2011 and address the field of medicine.

The 1,121 papers retrieved were loaded to *Bibliométricos*, an ad hoc data base using Microsoft Access software. From there, standardization processes were performed on the imported data in order to extract results.

The names of the institutions were standardized to the level of macro-institution (university, hospital, hospital complex, company, etc.), thereby eliminating redundancies in order to secure an accurate count of institutional collaboration. For those papers signed by an author with multiple institutional affiliations, these macro-institutions were duly included in order to accurately reflect the scientific output of each.

In order to evaluate the annual proportional development of the general and collaborative scientific output of the two countries, the following formula was employed:

$$T_C(X_t) = \frac{X_t - X_{t-1}}{X_{t-1}} * 100$$

Where $T_C(X_t)$ is the growth rate of scientific output in year t; X_t is scientific production in year t and t y X_{t-1} is scientific production in year *t-1*.

The analysis of topic area was performed by identifying the nuclear journals available through the portal Scimago Journal & Country Rank created by Elsevier B.V. (SCImago, 2013).

In order to treat all of the information, calculate the bibliometric indicators and the social networks, and build the graphic representations of the institutional and country clusters, Pajek open code analysis and display software was used (Batagelj and Mrvar, 2008).

Results

Table 1 shows the annual variation in the number of papers produced in collaborations involving Brazil and Spain, the yearly percentages and the annual growth rate. We can see that the absolute number of collaborative papers published is growing, reaching a level in 2011 that is six times the output seen in 2002. The final three years of the study period contains fully 50% of the collaborative output of these two countries.

Table 1. Collaborative research between Brazil and Spain over the period 2002-2011

Year	No. of collaborative papers in Medicine (Brazil and Spain)	%	CGR Medicine	General CGR (Brazil and Spain)	General growth rate (Brazil)	General growth rate (Spain)
2002	33	2,90%	-	195	13.210	23.973
2003	45	4,00%	36,40%	219 (12%)	14.253 (8%)	25.887 (8%)
2004	51	4,60%	13,30%	264 (21%)	16.085 (13%)	27.803 (7%)
2005	64	5,70%	25,50%	292 (11%)	17.470 (9%)	29.851 (7%)
2006	85	7,60%	32,80%	439 (50%)	24.636 (41%)	35.184 (18%)
2007	102	9,10%	20,00%	484 (10%)	27.572 (12%)	38.443 (9%)
2008	137	12,20%	34,30%	589 (22%)	31.016 (12%)	41.168 (7%)
2009	161	14,40%	17,50%	626 (6%)	34.107 (10%)	44.575 (8%)
2010	222	19,80%	37,90%	812 (30%)	37.311 (9%)	47.923 (8%)
2011	221	19,70%	-0,50%	978 (20%)	40.480 (8%)	52.367 (9%)
Total	1.121	100,00%		4.891	256.130	367.174
Growth rate 2002-2011			569,69%	401,00%	206,43%	118,44%

* CGR = Collaborative growth rate; Br = Brasil; Esp = España

The growth rate of Brazilian-Spanish collaborative research over the course of the study window is positive and above the total growth rate of these countries, especially in the years 2003, 2004, 2006, 2010 and 2011, while excepting 2007 and 2009, where we see the inverse. The growth rates of each

country show how, except for the year 2011, Brazilian scientific output has been out in front of Spanish output for the entire study window, especially in 2010 when the collaboration growth rate is at least three times higher than the output rates of these countries. Of the 1,121 papers analyzed, 474 (42.2 %) were written exclusively by Brazilian and Spanish authors. Of these, 204 (43 %) papers were indexed solely in the field of Medicine, without interaction with associated areas.

Scientific collaboration is expanding, though it varies from field to field. In our study, this collaboration is latent in 100% of the works, since we started from the premise that they were signed by at least one author /a Spanish/a and other/a Brazilian/a.

The premise of this study provides at least one Spanish and one Brazilian researcher. As such, all of the sample papers are signed by at least two researchers. The 1,121 papers contained 13,906 researcher signatures. Those signed by five led all other configurations, comprising 10.44% of the sample, while those signed by six and seven authors comprised 9.55%. Table 2 breaks down the papers by number of authors, with papers signed by an excessive number of researcher lumped into one group. Interestingly, the sample include papers signed by 246, 149, 129 and 115 authors.

Tabla 2. Numero de autores firmantes por trabajos (2002-2011)

No. Of signing authors / paper	Papers	% Papers	Total Signature	% Signature
1*	8	0,71%	8	0,06%
2	34	3,03%	68	0,49%
3	53	4,73%	159	1,14%
4	74	6,60%	296	2,13%
5	117	10,44%	585	4,21%
6	107	9,55%	642	4,62%
7	107	9,55%	749	5,39%
8	88	7,85%	704	5,06%
9	74	6,60%	666	4,79%
10	64	5,71%	640	4,60%
11	40	3,57%	440	3,16%
12	33	2,94%	396	2,85%
13	32	2,85%	416	2,99%

14	21	1,87%	294	2,11%
15	21	1,87%	315	2,27%
16	13	1,16%	208	1,50%
17	12	1,07%	204	1,47%
18	20	1,78%	360	2,59%
19	17	1,52%	323	2,32%
20	17	1,52%	340	2,44%
21	14	1,25%	294	2,11%
22	13	1,16%	286	2,06%
23	8	0,71%	184	1,32%
24	11	0,98%	264	1,90%
25	9	0,80%	225	1,62%
26	4	0,36%	104	0,75%
27	6	0,54%	162	1,16%
28	9	0,80%	252	1,81%
29	12	1,07%	348	2,50%
30	9	0,80%	270	1,94%
31-50	55	4,91%	2.103	15,12%
51-100	15	1,34%	962	6,92%
> 100	4	0,36%	639	4,60%
Total	1.121	100,00%	13.906	100,00%

* These 8 originals are signed by authors as a group and have been counted as a single author.

The collaboration index in the ten-year study window is 12.4 authors per paper. The collaboration index was between nine and twelve authors during the first eight years of the study window and grew rapidly over the remaining two years to 13.72 in 2010 and 15.09 in 2011. The aforementioned papers with exorbitant numbers of signing authors were found in this two-year segment.

Papers with Brazilian-Spanish collaboration were published in 581 distinct journals. Those areas with the highest proportions were immunology (92 journals), General Medicine (73), Oncology (48), Endocrinology (38), followed by Neurology and Public Health, Environment and Occupational

Health each with 35 journals. The journals publishing the highest number of Brazil-Spain collaborative papers are *Plos One* and *New England Journal of Medicine*, each with 18; *Annals of the Rheumatic Diseases* and *Journal of Clinical MIcrobiology* with 12 each; and *Arquivos de Neuro-Psiquitaria* with 10. We find that Brazil-Spain collaborative papers are most frequently published in journals from the United States of America and the United Kingdom. Moreover, these collaborative works account for the percentages of all papers published in the following journals: United Kingdom participates with 179 journals (31%) and 307 papers (27,4 %); the United States contributes 178 journals (30 %) but with a larger number of papers at 389 (34.7 %). Meanwhile, Spain contributes 49 journals (8.4 %) and 102 papers (9 %), and Brazil pitches in with 43 journals (7.4 %) but with 112 papers (10 %). Fully 23 % of the balance of journals are spread among 24 countries, accounting for 211 papers (18.9 %).

Institutional collaboration, in which at least one Brazilian and one Spanish intuition are credited, s found in 2,897 distinct institutions. There 178 papers (15.88%) were signed by the minimum of one Brazilian and one Spanish institution, while 212 (18.91%) were signed by three and 151 (13.74%) by four. At the other extreme, one paper was found that credited 138 distinct institutions.

Viewing the data in terms of the country affiliations, we find a different picture, with 484 papers, or 43.18 % of the sample, signed by two countries (in this case Brazil and Spain), 161 signed by three countries (14.36%) and so on until we reach one paper signed by 42 distinct countries. Of the 2,897 institutions credited in the sample, 411 are Spanish and 299 are Brazilian. Table 3 provides a breakdown by country of institutions credited in twenty or more papers. Interestingly, there are several institutions with more than 100 credits, with Universidade de São Paulo (USP) boasting 222 papers followed by Hospital Clínic i Provincial de Barcelona with 102 papers. Other outstanding institutions in this sphere are Universidad de Buenos Aires with 48 papers and University of Toronto with 36 papers. The data shows a slight preponderance of universities over research hospitals, health centers and research institutes.

Table 3. Most productive institutions by country (Spain, Brazil and others) least 20 documents (2002-2011)

Country	Institution	Nº Doc.
Brazil	Universidade de São Paulo (USP)	222
	Fundação Oswaldo Cruz (FIOCRUZ)	97
	Universidade Federal de São Paulo (UNIFESP)	95
	Universidade Federal do Rio de Janeiro (UFRJ)	94
	Universidade Federal do Rio Grande do Sul (UFRGS)	82
	Hospital de Clínicas de Porto Alegre (HCPA)	79
	Universidade Estadual de Campinas (UNICAMP)	51
	Universidade Estadual Paulista (UNESP)	47
	Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP)	47
	Universidade Federal de Minas Gerais (UFMG)	44
	Universidade Federal de Pelotas (UFPEL)	24
	Santa Casa de Misericórdia de Porto Alegre	24
	Pontifícia Universidade Católica Do Rio Grande Do Sul (PUCRS)	21
Spain	Hospital Clínic i Provincial de Barcelona	102
	Universitat de Barcelona	92
	Universitat Autònoma de Barcelona	62
	Instituto de Salud Carlos III	54
	Universidad Complutense de Madrid	51
	Complejo Universitario La Paz	51
	Universidad Autónoma de Madrid	45
	Hospitals Vall d'Hebron	40
	Universitat de València	39
	Universidad de Granada	38
	Universidad de Santiago de Compostela	37
	Universitat Rovira i Virgili	37
	Institut Català d'Oncologia (ICO)	35
	Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)	31
	Hospital Ramón y Cajal	27
	Hospital de la Santa Creu i Sant Pau	26
	Complejo Univesitario de San Carlos	25
	Hospital General Universitario Gregorio Marañón	24
	Universidad de León	23
	Universitat Pompeu Fabra	23
	Universidad de Salamanca	22
	Hospital de Sant Joan de Déu	22
	Hospital Universitari de Bellvitge	22
	Consorcio de Investigación Biomédica de Epidemiología y Salud Pública (CIBERESP) de Barcelona	22
Argentina	Universidad de Buenos Aires (UBA)	48
Canada	University of Toronto	36
Austria	Medical University of Vienna	32
Belgium	University Hospitals Leuven	30

United States	Duke University Medical Center	30
France	Université Paris V René Descartes	29
France	Institut National de la Santé et de la Recherche Médicale (INSERM)	28
Germany	Charité – University Hospital Berlin	26
United States	University of North Carolina	26
Sweden	Karolinska Institutet	26
Italy	Università degli Studi di Padova	25
United States	University of Michigan	24
United States	Harvard Medical School	24
Portugal	Instituto de Patología e Inmunología Molecular (IPATIMUP)	24
France	International Agency for Research on Cancer (IARC)	23
Australia	University of Melbourne	22
Belgium	Université Catholique de Louvain	22
Italy	Università degli Studi di Milano	22
Nether-lands	University Medical Center Groningen	21
United Kingdom	University College London	21

Figure 1 represents the institutional participation network. Using a threshold of 10 or more collaborations, we can identify a nucleus or tightly woven network of institutional collaboration comprised of 64 closely linked entities. Amid this complex network, Universidade de São Paulo (USP) stands as a major hub whose links radiate to all other institutions. The participation of 10 Brazilian and 17 Spanish institutions can be observed, indicated by squares and triangles, respectively. These institutions are linked to 64 distinct countries, including most notably Universidad de Buenos Aires (uba); Instituto Catalán de Oncología (ICO); Hospital Clínic i Provincial de Barcelona; the federal universities of Sao Paulo and Rio de Janeiro, and Fundação Oswaldo Cruz (Fiocruz), which establish links between Universidade de São Paulo and the remaining participating institutions.

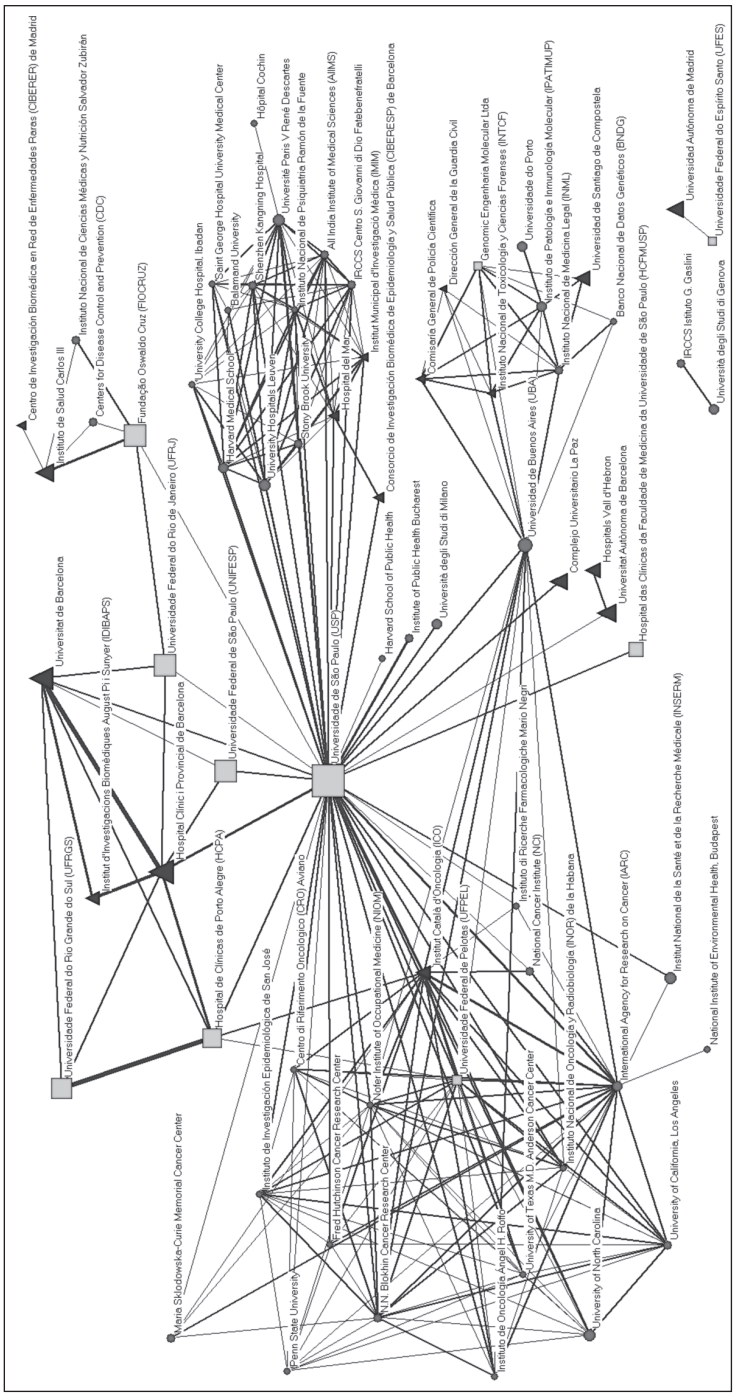


Figure 1. Institutional scientific collaboration network (at least 10 papers)

The most intensive collaborative work in this network is established by Hospital de Clínicas de Porto Alegre (HCPA) and Universidad Federal do Rio Grade do Sul (UFRGS) (n=40 jointly-signed papers); el Hospital Clínic i Provincial de Barcelona and Universitat de Barcelona (at n=39) and the former with Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS) (at n=27); Fundação Oswaldo Cruz (FIOCRUZ) and Instituto de Salud Carlos III (at n=22); and again Hospital Clínic i Provincial de Barcelona and el Hospital de Clínicas de Porto Alegre (HCPA) (at n=21).

In the lower portion of *Figure 1*, one can observe two rather isolated nuclei representing Universidad Autónoma de Madrid and Universidad Federal do Espírito Santo (UFES) and two Italian institutions: la Universitá degli Studi di Genova and IRCCS Istituto G. Gaslini.

The distribution of papers by country in collaboration with Brazilian and Spanish institutions is shown in Table 4. The 2,897 distinct Brazilian and Spanish institutions have appeared 5,994 times and correspond to 121 distinct countries on five continents. The United States of America is the country publishing the most papers with 357 papers and 389 distinct institutions, followed by France with 231 documents and 117 institutions, while Italy, United Kingdom, Germany and Argentina follow. Spain contributes 411 distinct institutions and Brazil 299.

Table 4. Number of documents and institutions by country (2002-2011)

Country	Nº Inst.	Nº Doc	Country	Nº Inst.	Nº Doc
Albania	2	1	Israel	18	73
Germany	115	191	Italia	141	206
Angola	1	1	Japan	66	59
Saudi Arabia	4	8	Kenia	2	3
Argentina	1	1	Kirghizstan	1	1
Algeria	2	4	Kuwait	1	1
Argentina	79	155	Latonia	5	14
Australia	60	100	Lebanon	6	22
Austria	18	59	Lithuania	5	11
Bangladesh	2	2	Luxemburg	3	4
Belgium	29	96	Madagascar	1	2
Bolivia	10	11	Malaysia	4	5
Bosnia y Herzegovina	1	1	Malawi	2	2
Botswana	1	1	Mali	1	1
Brazil	299	1.121	Malta	2	2
Bulgaria	9	23	Morocco	6	6
Burkina Faso	1	1	México	66	117
Cambodia	1	1	Mozambique	2	2

Cameroon	1	1	Nepal	1	1
Canada	88	148	Nicaragua	1	1
Chile	23	48	Nigeria	5	17
Cyprus	1	1	Norway	26	41
Colombia	41	79	New Zealand	10	27
Congo	1	1	Netherlands	31	124
South Korea	17	20	Pakistan	1	1
Costa Rica	12	38	Palestine	1	1
Croatia	10	18	Panama	7	6
Cuba	14	25	Papua New Guinea	1	1
Denmark	17	45	Paraguay	9	11
Ecuador	16	18	Peru	25	40
Egypt	6	6	Poland	25	65
El Salvador	5	4	Portugal	35	70
U. Arab Emirates	6	8	Puerto Rico	5	10
Slovakia	12	29	Qatar	1	1
Slovenia	2	7	United Kingdom	129	197
Spain	411	1.121	Czech Republic	15	40
United States	389	357	Republic of Chad	1	1
Estonia	5	9	Dominican Republic	4	4
Ethiopia	2	2	China	20	44
Filipinas	3	8	Rumania	12	42
Finland	28	49	Russia	14	38
France	117	231	Senegal	1	1
Gambia	1	2	Serbia y Montenegro	8	13
Georgia	2	2	Singapore	9	22
Ghana	2	2	Syria	1	1
Greece	25	45	South Africa	18	44
Guadalupe	1	3	Sweden	20	67
Guatemala	8	7	Switzerland	30	90
French Guiana	2	3	Thailand	10	20
Guyana	1	1	Taiwan	15	22
Haiti	1	1	Tanzania	4	3
Honduras	4	7	Tunis	5	5
Hong Kong	5	28	Turkey	20	34
Hungary	21	46	Ukraine	5	9
India	35	52	Uganda	1	2
Indonesia	2	1	Uruguay	16	27
Iran	7	5	Venezuela	22	33
Iraq	1	2	Vietnam	2	2
Ireland	13	22	Zambia	1	1
Iceland	2	8	Zimbabwe	2	2
Faeroe Island	1	1			

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, No. 69, May/August, 2016, México, ISSN: 0187-358X, pp. 197-221

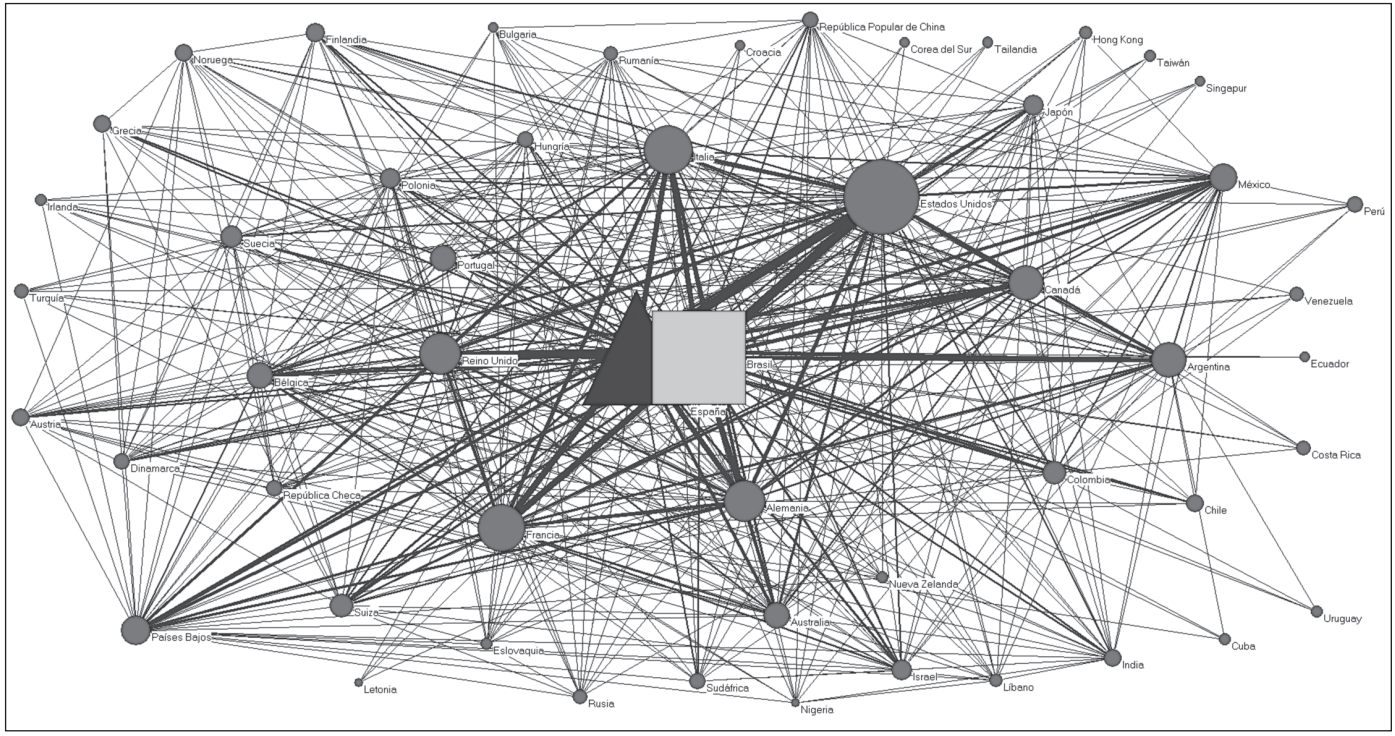


Figure 2. Network of countries collaborating with Brazilian-Spanish collaborative scientific research (at least 15 papers)

Figure 2 illustrates the collaboration network by country among institutions with at least 15 collaborative papers. Since this study brings together Brazilian and Spanish collaboration, this network occupies the center region of the chart depicting 1,121 papers. In additional to Brazil and Spain, there are 51 countries boasting at least 15 collaborative papers.

The United States, Canada, Japan, China, Australia, New Zealand, Germany, Italy, United Kingdom, France India and Mexico stand out with regard to scientific output. Proximity also plays a role in the collaboration network of ten countries in South and Central America, and twenty-two counties of the EU. These data reveal a high degree of collaboration that is constantly growing, as well as the growing internationalization of Brazilian and Spanish research in the field of Health Sciences.

Discussion

This paper provides a comprehensive picture of Brazilian-Spanish scientific collaboration that integrates bibliometric and social network analyses. A key result of our research shows that the collaboration between these two countries increased seven-fold during the study window (2002-2011). Additionally, the growth rate of this collaboration was greater than the growth rates of either country alone.

Several previous analyses show Clinical Medicine as the most highly productive field of Latin American research, accounting for nearly a fourth of the papers published in this field (De Filippo and Gómez, 2011). The individual growth of Brazil is in line with the results of previous research. These studies include: Leta and Chaimovich (2002), Leta, Glänzel and Thijs (2006) and Glänzel, Leta and Thijs (2006), which show that Brazil moved from a collaboration rate of 21.6% in the 1980s to 26.7% in the decade of the 1990s. Meanwhile, Brazil maintains its lead in overall Latin American research, with an annual growth rate of 8.0%, although this growth is behind that of Mexico (Glänzel, Leta and Thijs, 2006). Brazil's leadership exists also in the fields of Public Health, where it is first among Latin American countries and sixth in the world overall, followed by Mexico, Cuba, Colombia and Argentina (Zacca *et al*., 2014).

Brazil's leadership can be explained by the fact that investment in research and development accounts for 60% of such investment in the entire region (Babini, 2011). This has driven Brazil into the lead in terms of international collaboration and an enviable strategic position while enjoying a high number of relationships (Chinchilla-Rodríguez, Benavent-Pérez and

Moya-Anegón, 2012). Brazil's output is also growing across several other fields, including ceramics (Rojas-Sola and Jordá-Albiñana, 2009), psychology (Sánchez-Sosa, 2008; Vera-Villarroel *et al*, 2011) and sanitation technology (Pichon-Riviere, Ceballos and Briones, 2009). With regard to Spain, recent studies have shown sustained growth in areas such as Neurology (González-Alcaide et al, 2008), Bronchial-Pulmonology (Granda Orive *et al*., 2009),Cardiology (Aleixandre-Benavent et al., 2009) and Pediatrics (Alonso-Arroyo *et al*., 2013).

The slackening of the diaspora of Brazilian scientists, which occurred during the dictatorships, and new incentives to speed up scientific production have also aided the growth of Brazilian science. This growth creates a need to evaluate (Gracio and Oliveira, 2012) the number of students in higher education and development of new plans for channeling human resources into scientific activities, especially by the introduction of master's and doctoral degree programs and specific research initiatives, such as the Fellowship Initiation in Science (Leta, Glänzel and Thijs, 2006). These efforts have led to the formation of more highly qualified researchers (Glänzel, Leta and Thijs, 2006). Other factors driving this growth is the increasing number of Latin American science journals included in bibliographic data bases over the last decade. In several countries, such as Argentina, Chile, Mexico and Venezuela, the number of journals has increased threefold. The coverage of Latin American journals in international bibliographic data bases, however, is still quite low and, consequently, high quality work from Latin America is generally published in the United States of America or in European journals (Aleixandre *et al*., 2013).

Despite this growth in the number of papers published, some problems persist in terms of instability in the budgetary allocations for research issued by public agencies. According to the World Bank, the gross domestic product (GDP) devoted to Brazilian research in 2011 was 1.21 %, which is higher than that reported in other Latin American countries, such as Chile (0.42 %), Mexico (0.43 %) and Argentina (0.65 %); but still quite a bit lower than that seen in developed countries. In Spain, this figure is 1.36 %, which is one of the lowest in the EU, with the UK at 1.78% and Germany at 2.89%, according to the World Bank (2011). Despite these factors, in the decade of 1999 to 2008, Spain and Brazil increased R&D investment more than any other country in the Iberian world. Similarly, they have the highest number of researchers in the region, according to full-time equivalent calculations (Albornoz, 2010).

Collaboration is fundamental for scientific development, in that it promotes efficiency in national research, development and innovation by

allowing researchers to integrate international teams that share resources and new techniques (Cunningham and Dillon, 1997; Katz and Martin, 1997; Newman, 2004). The phenomenon of collaboration is heterogeneous and this has been shown by numerous researchers, such as Beaver (2004), Newman (2004), Glänzel and Schubert (2001), and others. The weightiest factors in its genesis and maintenance are economic, geopolitical and intra-scientific (Glänzel and Schubert, 2001). International collaboration can reflect individual mobility, the interests of individual scientists, or the economic or political dependence of a country or region; but also the need to ensure access to special equipment for multinational research projects. In the health sciences, this can even be owing to biological factors, such as the prevalence of certain diseases in a given country.

The creation of networks and groups of scientists and technicians from diverse countries is a key aspect of cooperation strategies, because they promote the march of knowledge, while enhancing quality and impelling innovation and competitiveness (Cunningham and Dillon, 1997; Aleixandre et al., 2013). Moreover, international collaboration is a positive sign that indicates a country is opening up to foreign research. It has been reported, moreover, that collaborative research produces results with significantly greater authority, which is reflected in frequency of citations and longer duration of influence (Beaver, 2004).

An earlier study by Mugnaini *et al.* (2014) analyzed the collaboration between Brazil and Spain by field, showing that this collaboration centered mostly on clinical and experimental medicine in accord with the classification proposed by Glänzel and Schubert (2003). Their approach groups the Web of Science field into 15 large categories. Brazil collaborates most often with the EU, Central America and the United States of America, which accounts for 40.5% of their international collaboration. Collaboration also grew with other countries in the region, including Mexico and Argentina, as shown in a study performed by Glanzel, Leta and Thijs (2006). These data serve to ratify the results presented by IRD and IEDCYT-CSIC (2009) in the period from 2002 to 2006, which also reveals a broad collaboration network involving Latin America and Europe. One earlier study shows that most of the collaboration in the field of clinical medicine is occurring between Brazil-United Kingdom, followed by Brazil-Italy and Brazil-France. Collaboration with Spain came in sixth place (De Filippo and Gómez, 2011). According to the Thomson Reuters Global Research Report for Brazil, drafted on the basis of Web of Science data bases (Adams and King, 2009), the United States of America is the main collaborator of Brazil, followed by France, United Kingdom, Germany, Italy and Canada. Spain stands in seventh place in

said study, but doubled its collaboration tally from the five-year windows of 1998-2002 to 2003-2007, moving from 1,245 to 2,382 papers, respectively, with latter window accounting for 19% of Brazil's total output.

Government policies promoting collaborative research in both countries must lie at the foundation of this growth. Scientific collaboration between Spain and Brazil has also brought broad participation of researchers from 121 countries, led by the United States of America and followed by EU countries such as France, Italy, United Kingdom, Germany and Argentina. This is to be expected, since it is a consequence of EU policies that seek cohesion in the research efforts of its member countries.

Brazil's scientific capacity in the field under study is concentrated in certain institutions, largely in the wealthiest states. It is evident that other states should have research centers, but so far such efforts are best termed incipient. We stress the key role of Universidade de São Paulo in the scientific collaboration network and another ten Brazilian and seventeen Spanish institutions that collaborate with sixteen countries. We may also stress institutions such as Universidad de Buenos Aires, Instituto Catalán de Oncología, Hospital Clínic i Provincial de Barcelona, the federal universities of São Paulo and de Rio de Janeiro, and Fundação Oswaldo Cruz.

Limitations of the study

This study has some limitations that should be discussed. In the first place, Scopus does not include all of the scientific medical literature published. As such, other bibliographic data bases that gather Latin American scientific journals could have been used alternately or in a complementary way. We opted to use Scopus, however, because of the following advantages: a) It is used widely in studies of scientific activity, since it includes the major journals published around the world (Rojas-Sola and Jordá-Albiñana, 2009; Michán and Llorente-Bousquets, 2010); b) It provides the names of all the institutional affiliations participating in the papers, which allows us to determine the cooperation indicators between institutions and countries. In the second place, this study does not show the scientific contribution of the collaboration between Brazil and Spain, because it does not provide a conceptual analysis of results. This limitation, however, offers fertile ground for additional research.

Conclusiones

This study provides an indication of the status of scientific collaboration between Brazil and Spain in the field of medicine. Our conclusions are based on published papers that are indexed in Scopus. The results show significant growth in the number of papers published in collaboration by Brazil and Spain, their collaboration with EU and Latin American countries and with the United States of America. Our report also shows that Brazil's R&D budgets are expanding significantly in tandem with Mexico's Collaboration between Latin America and Spain will likely continue to grow in terms of intellectual and economic development. Europe and Spain have benefitted from their exports to Latin America in the past; as such they should integrate their knowledge by means of international collaboration, while ensuring full participation and guarding against marginalization. Future research in this area might identify groups of researchers who are responsible for this collaboration and the main lines of research performed in collaboration between these two countries.

Bibliografía

Adams, J. y Ch. King. 2009. *Global Research Report, Brazil. Research and collaboration in the new geography of science, June 2009.* Leeds: Evidence Ltd.

Albornoz, M., dir. 2010. *El estado de la ciencia: principales indicadores de Ciencia y Tecnología Iberoamericanos / Interamericanos.* Argentina: REDES - Centro de Estudios sobre Ciencia, Desarrollo y Educación Superior.

Aleixandre, J. A., E. Bordeu, J. L. Aleixandre-Tudó, M. Bolaños y R. Aleixandre-Benavent. 2013. "Scientific productivity and collaboration in viticulture and enology in Latin American countries". *Ciencia e Investigación Agraria* 40 (2): 429-443.

Aleixandre-Benavent, R., A. Alonso-Arroyo, F. J. Chorro-Gascó, F. Alfonso-Manterola, G. González-Alcaide, M. J. Salvador-Taboada *et al.* 2009. "La producción científica cardiovascular en España y en el contexto europeo y mundial (2003-2007)". *Revista Española de Cardiología* 62 (12): 1404-1417.

Alonso-Arroyo, A., J. González de Dios, M. Bolaños Pizarro, L. Castelló Cogollos, G. González Alcaide, C. Navarro Molina *et al.* 2013. "Análisis de la productividad e impacto científico de la pediatría española (2006-2010)". *Anales de Pediatría* 78 (6): 409.e1-409.e17.

Babini, D. 2011. "Acceso abierto a la producción científica de América Latina y el Caribe". *Revista Iberoamericana de Ciencia, Tecnología y Sociedad* 6 (17): 1-24.

Balancieri, R., A. Botelho Bovo, V. Medina Kern, R. C. Santos Pacheco y R. Miranda Barcia. 2005. "A análise de redes de colaboração científica sob as novas tecnologias da informação e comunicação: um estudo na Plataforma Lattes". *Ciência da Informação* 34 (1): 64-77.

Batagelj, V. y A. Mrvar. 2008. "*Pajek. Program for Large Network Analysis. Slovenia*". University of Ljubljana. Disponible en: http://vlado.fmf.uni-lj.si/pub/networks/pajek/ [Fecha de consulta: 20 de junio de 2013].

Beaver, D. 2004. "Does collaborative research have greater epistemic authority?" *Scientometrics* 60 (3): 399-408.

Callon, M., J. P. Courtial y H. Penan. 1995. *Cienciometría: la medición de la actividad científica: de la bibliometría a la vigilancia tecnológica.* Asturias: Trea.

Chinchilla-Rodríguez, Z., M. Benavent-Pérez y F. Moya-Anegón. 2012. "International Collaboration in Medical Research in Latin America and the Caribbean (2003–2007)". *Journal of the American Society for Information Science and Technology* 63 (11): 2223-2238.

Cunningham, S. J. y S. M. Dillon. 1997. "Authorship patterns in information systems". *Scientometrics* 39 (1): 19-27.

De Filippo, D. e I. Gómez. 2011. "Influencia de la colaboración internacional para los países latinoamericanos. Análisis de la cooperación España-Latinoamérica por área temática (WoS 2002-2006)". En M. Albornoz y L. Plaza, ed., *Agenda 2011: temas de indicadores de ciencia y tecnología*. Buenos Aires: Red Iberoamericana de indicadores de Ciencia y Tecnología, 243-260.

Elsevier B. V. SciVerse Scopus. 2014. *Base de datos*. Disponible en: http://www.scopus.com/home.url [Fecha de consulta: 29 de abril de 2014].

FAPESP. 2011. *Fundação de Amparo à Pesquisa do Estado de São Paulo. Relatório de atividades científicas 2010.* Brasil: Produção Editorial da Gerência de Comunicação da FAPESP.

Glänzel, W. 2003. *Bibliometrics as a research field: a course on theory and application of bibliometric indicators.* Belgium: Katholieke Universiteit Leuven.

Glänzel, W. y C. A. Lange. 2002. "Distributional approach to multinationality measures of international scientific collaboration". *Scientometrics* 54 (1): 75-89.

Glänzel, W. y A. Schubert. 2001. "Double effort = Double impact? A critical view at international co-authorship in chemistry". *Scientometrics* 50 (2): 199-214.

—— y A. Schubert. 2003. "A new classification scheme of science fields and subfields designed for scientometric evaluation purposes". *Scientometrics* 56 (3): 357-367.

Glänzel, W., J. Leta y B. Thijs. 2006. "Science in Brazil. Part 1: A macro-level comparative study". *Scientometrics* 67 (1): 67-86.

González-Alcaide, G., A. Alonso-Arroyo, J. González de Dios, A. P. Sempere, J. C. Valderrama-Zurián y R. Aleixandre-Benavent. 2008. "Redes de coautoría y colaboración institucional en Revista de Neurología". *Revista de Neurología* 46 (11): 642-651.

Gracio, M. C. C. y E. F. T. Oliveira. 2012. "A inserção e o impacto internacional da pesquisa brasileira em "estudos métricos": uma análise na base Scopus". *Tendências da Pesquisa Brasileira em Ciência da Informação* 5 (1): 1-19.

Granda Orive, J. I., S. Villanueva Serrano, R. Aleixandre-Benavent, J.C. Valderrama-Zurían, A. Alonso-Arroyo y F. García Río. 2009. "Redes de colaboración científica internacional en tabaquismo. Análisis de co-autorías a través del Science Citation Index durante el período 1999-2003". *Gaceta Sanitaria* 23: 222.e34-222.e43.

IRD e IEDCYT-CSIC. 2009. *Coordinating the European Union and Latin American research and Innovation Networks. Deliverable 1.2. Report on indicators of bi-regional S&T activities February 2009*. Disponible en: http://s3.amazonaws.com/zanran_storage/www.s2lat.eu/ContentPages/44567013.pdf. [Fecha de consulta: 4 de abril de 2016].

Iribarren-Maestro, I., M. L. Lascurain-Sánchez y E. Sanz-Casado. 2009. "Are multi-authorship and visibility related? Study of ten research areas at Carlos III University of Madrid". *Scientometrics* 79 (1): 191-200.

Katz, J. S. y B. R. Martin. 1997. "What is research collaboration?" *Research Policy* 26: 1-18.

Leta, J. y H. Chaimovich. 2002. "Recognition and international collaboration: the Brazilian case". *Scientometrics* 53 (2): 325-335.

Leta, J., W. Glänzel y B. Thijs. 2006. "Science in Brazil. Part 2: Sectoral and institutional research profiles". *Scientometrics* 67 (1): 87-105.

Michán, L. y J. Llorente-Bousquets. 2010. "Análisis bibliométrico de la sistemática biológica sobre América Latina durante el siglo XX en tres bases de datos mundiales". *Revista de Biología Tropical* 58 (2): 531-545.

Moya-Anegón, F., dir. 2013. *Indicadores bibliométricos de la actividad científica Española 2010: publicación 2013*. Madrid: Fundación Española para la Ciencia y la Tecnología (FECyT).

Mugnaini, R., D. De Filippo, S. A. Souza Vanz, S. Marugán, I. D. Chittó Stumpf y E. Sanz Casado. 2014. "Representatividade da colaboração entre Brasil e Espanha na Web of Science (2006-2012)". *EBBC Encontro Brasileiro de Bibliometria o Cientometria*, Recife.

Narin, F., D. Olivastro y K. S. Stevens. 1994. "Bibliometric theory, practice and problem". *Evaluation Review* 18 (1): 65-76.

Newman, M. E. J. 2004. "Coauthorship networks and patterns of scientific collaboration". *Proceedings of the National Academy of Sciences of the United States of America* 101 (1): 5200-5205.

Okubo, Y. 1997. *Bibliometric indicators and analysis of research systems: methods and examples*, Paris: OECD.

Olmeda-Gómez, C., A. Perianes-Rodríguez y M. A. Ovalle-Perandones. 2008. "Estructura de las redes de colaboración científica entre las universidades españolas". *Ibersid* 3: 129-140.

Otte. E. y R. Roussesu. 2002. "Social network analysis: a powerful strategy, also for the information sciences". *Journal of Information Science* 28 (6): 441-453.

Persson, O., W. Glänzel y R. Dannell. 2004. "Inflationary bibliometric values: the role of scientific collaboration and the need for relative indicators in evaluative studies". *Scientometrics* 60 (3): 421-432.

Pichon-Riviere, A., R. M. Ceballos y E. Briones. 2009. "Health technology assessment in Latin-america and the Caribbean, facilitators and barriers for international collaboration: a survey". *Value in Health* 12 (7): A488.

Rojas-Sola, J. I. y B. Jordá-Albiñana. 2009. "Análisis bibliométrico de las publicaciones científicas españolas en la categoría materials science, ceramics de la base de datos JCR (SCI) (1997-2008)". *Boletín de la Sociedad Española de Cerámica y Vidrio* 48 (5): 255-260.

Sánchez Sosa, J. J. 2008. "Professional collaboration between psychologists and other health professionals in healthcare settings in Latin America". *International Journal of Psychology* 43: 171.

SCImago Lab. 2013. *SCImago Journal & Country Rank (SJR).* Disponible en: http://www.scimagojr.com [Fecha de consulta: 08 de abril de 2013].

Spinak, E. 1998. "Indicadores cienciométricos". *Ciência da Informação* 27 (2): 141-48.

Vera-Villarroel, P., W. López-López, S. Lillo y L. Silva. 2011. "La producción científica en psicología latinoamericana: un análisis de la investigación por países". *Revista Latinoamericana de Psicología* 43 (1): 95-104.

Wasserman, S. y K. Faust. 1994. *Social network analysis: methods and applications.* Cambridge: Cambridge University Press.

World Bank. 2011. *Data Word Bank.* Disponible en: http://data.worldbank.org/indicator/NY.GDP.MKTP.CD [Fecha de consulta: 15 de noviembre de 2014].

Zacca-González, G., Z. Chinchilla-Rodríguez, B. Vargas-Quesada y F. Moya-Anegón. 2014. "Bibliometric analysis of regional Latin America's scientific output in Public Health through SCImago Journal & Country Rank". *BMC Public Health* 14: 632.

Para citar este artículo:

Alonso Arroyo, Adolfo *et al*. 2016. "Un análisis bibliométrico en el área de la Medicina: colaboración científica entre Brasil y España (2002-2011)." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 205-229. http://dx.doi.org/10.1016/j.ibbai.2016.04.018

The origins of the Spanish library system: features and usefulness of the bibliographic holdings of the first public libraries in the middle decades of the nineteenth century

Genaro Luis García-López*

Article received: September 25, 2014.
Article accepted: June 9, 2015.

Abstract

The study offers a historical analysis of the liberal library system in Spain during the middle decades of the nineteenth century, while describing the library holdings, the diverse functions of provincial libraries and their usefulness to society. Finally, we outline the typology of the library that arose from policies hampered by various inherent shortcomings. We conclude that the resources available were insufficient to achieve stated objectives, resulting in deployment of centers that resembled depositories of cultural heritage, rather than places for reading.

* Universidad de Salamanca, España. genaroluis@usal.es

Keywords: Library System; Library Policy; Provincial Public Libraries; Spain; Nineteenth Century.

Resumen

El origen del sistema bibliotecario español: características y utilidad de los fondos bibliográficos que conformaron las primeras bibliotecas públicas en el segundo tercio del siglo XIX
Genaro Luis García López

Se presenta un análisis histórico del sistema bibliotecario liberal en España durante el segundo tercio del siglo XIX. Se estudian las características del fondo bibliográfico, las distintas funciones de las bibliotecas provinciales y la utilidad que tenían estos centros en la sociedad; finalmente se esboza una tipología bibliotecaria que fue el resultado de la política que realmente se llevó a cabo, lastrada por las distintas carencias inherentes a los problemas asociados a la misma. Se concluye que los medios disponibles no eran los adecuados para conseguir los objetivos inicialmente planteados, por lo que los centros creados no se ajustaban por completo a las funciones que se habían previsto sirviendo como depósitos del patrimonio cultural más que como centros activos de lectura.

Palabras clave: Sistema Bibliotecario; Política Bibliotecaria; Bibliotecas Públicas Provinciales; España; Siglo XIX.

Introduction

This paper aims to identify the main functions of the public library within the window of the study, while pointing out the main features of the bibliographic collection that should exist in provincial libraries and highlighting the existing incongruences in the Spanish model library.

This study employs a methodology consisting of identifying the sources that will allow development of the proposed objectives on the basis of the knowledge that authors had of them derived from previous research on re-

cent historical periods and locating the pertinent documentation in diverse archives. Through an analysis of the correspondence existing between the diverse organs, in accord with the provincial administration divisions put in place with the establishment of the national liberal political system, said documentation, original and unpublished, reflects the operation of the Spanish administration in the study window.

Most of the information has been gathered from the Historical Archives of the Real Academia de Bellas Artes de San Fernando (ARABASF) located in Madrid, because the academy was responsible for implementing the country's heritage protection policy in the second half of the nineteenth century. As such, the relevant documentation is currently held there, even though it is not strictly an organism of the the Central Administration. We also gathered information from the Historical Archives of the National Library of Spain (ABN) and the General Archive of the Spanish Central Administration (AGA), the latter located in the town of Alcala de Henares.

The national library system was born during a period when the State, wishing to preserve the cultural and literary assets of religious communities suppressed in the 1830s, was forced to develop a nationalization policy to protect bibliographic collections of the orders of the regular clergy. A such, we are interested in understanding the process of the founding of the system of provincial public libraries, the collections existing at the time and the kind of funding this enterprise enjoyed. Moreover, we wish to learn about the extent to which the needs of the society at that historical moment were being met, in view of the funds available, and to develop an effective library policy. As warranted, we will also identify problems or deficiencies that impeded development of these policies and attainment of objectives.

The honorary administration as manager of cultural policy. The process of gathering and cataloging library disentailed

The royal decree of July 25, 1835 (Gaceta de Madrid, no. 211, July 29, 1835), cancelled the exception enjoyed by those monasteries and convents with less than twelve members to retain property, such property, including "[...] archives, libraries, paintings and other goods that may be useful to science institutes and arts [...]" were confiscated by the state: although it was not until the royal decree of March 9, 1836 (Gazette Madrid , no. 444, March 10, 1836), that the final disposal of to these objects was proposed and we find the first mention of provincial libraries.

By royal order of July 29, 1835 (ARABASF, leg 55-2 / 2) civilian committees were created tasked with performing inventories of literary and artistic property. Once these inventories were taken, the properties were to be moved to the provincial capital for storage in "comfortable and safe sites" to await final disposition. The problem was that no funding was provided to ship these assets, and those working these commission were expected to work out of a sense of "[...] pure patriotism and love of the arts."

Attempting to address this situation, royal decree of May 27, 1837 (Gaceta de Madrid, no. 907, May 28, 1837), created the scientific and artistic commissions, which was the result of the observations of various political leaders regarding "[...] obstacles to full compliance [...] "of the previous legislation. The most significant departure in this decree was the provision allowing the sale at public auction of the works not considered valuable enough to be preserved in order to raise funds to take inventories, ship objects and create libraries.

The difficulties faced, however were numerous. In order to facilitate the creation of these centers, royal decree of 22 of September 1838 (Gaceta de Madrid, no. 1407, 23 of September of 1838) allowed provincial universities to assume the functions of these commissions and create libraries in accord with the Valencia model (Muñoz Feliu, 2006). Despite these measures, very little changed on the ground, according to the survey of July 1842 (Gaceta de Madrid, no. 2834, 14 of July 1842; García López, 2003: 133-157).

Finally, royal decree of 13 of June of 1844 (*Colección…*, 1847: 292-298) created the commission of historical and artistic monuments, whose aim was take action in order to "[...] contain the devastation and loss of precious objects […] with the knowledge, method and regularity that is warranted." In a novel approach, the decree created the Central Commission to act as a central organ, but without authority or power of execution over the provinces.

Early reports from the provinces were encouraging: all of the commission seemed to be working diligently and full of purpose. The commissioners, moreover, appeared to be duly educated and apprised of the world of arts and letters. Despite this early optimism, these commissions also failed to meet objectives fully.

In light of these instances, it is clear that the task of disentailing cultural assets was not approached through a genuinely planned legal process, but rather were quite reactionary in nature, with decrees being issued in response to the sudden closure of convents and monasteries. (García López, 2003). As observed by Hernández Hernández (2002), the government's takeover of convents and monasteries was not sufficiently planned, a situation that would bring negative consequences to the sphere of art. One must keep in mind that extrinsic and intrinsic problems faced by the state, such as the lack

of cooperation on the part of religious orders, the improvised approach to the closure of convents and monasteries, ongoing war, lack of political will to invest in conservation of assets, lack of logistical coordination and lack of funding would be constant obstacles in this process.[1]

In addition to the organizational aspects of this body charged with cultural management, in order to study the foundational bibliographic holdings of the first national library system, we must first examine certain aspects of the procurement process of these holdings. Public libraries established during the liberal stage were founded with the books belonging to the libraries of the suppressed religious communities. The first step, therefore, was to gather the books from the buildings that were formerly convents and monasteries. To do this, inventories were needed of the bibliographic holdings and other valuable cultural assets not previously sold off.

The provisions issued in order to carry out these tasks, however, were flawed from the start, in that it was not possible to seat a commission of suitably competent members to perform the inventories or appraise the works to be preserved and determine what could be sold off in every provincial convent and monastery throughout the country. Because of this this lack of planning, the result was predictable: the commissioners of the Tax Ministry (Hacienda) were mostly involved in gathering legal documentation needed for transfer of ownership, meaning their management of the disentailment of libraries, and other artistic assets was rather expedient and without depth.[2]

Moreover, the descriptions of the collections contained in the original inventories were woefully inadequate. This circumstance was exacerbated by the time lapse of up to ten years between the confiscation of the church properties and the actual shipment of the books, during which time the care of these books was sadly neglected. In these circumstances, it was very difficult to ascertain if a given collection were complete or to track down any tomes that might have been removed.

1 For additional information on these matters, see García López (2003).

2 This point is very important in the process of disentitlement, because these documents serve as ownership title to the objects and the acceptance of the old owners (Burón Castro, 1995). This aspect of the process was not, however, emphasized appropriately. This meant that when the science and arts commissions moved to take possession of these assets, they found that the documents needed to guarantee their delivery did not exist (Bello, 1997). This negligence was caused by the lack of funding, indifference and management disorganization. As stated by García López (2003, Chapter 4), on some occasions detailed inventories were in fact made, but these often only provided a lists with the number of books and their weight. which Infantes (1997) has called the "devalued library." These generally individual and/or damaged tome. In other instances, the inventories were never made because of lack of personnel needed to sit on the civil commissions.

The elements required to produce inventories were: qualified personnel, time, a workspace and economic resources. The problem was to gather all the items together. Qualified staff soon tired of working without pay, and they gradually abandoned their activities. For the books, time was running out because of poor storage conditions. Securing rent-free storage and work sites not in need of improvements or additional authorizations was not easy, as many commissions had no operating budgets. If they had had funds, the three aforementioned impediments probably could have been overcome. Lack of funding, then, would drag down the development of all these efforts.

The sale of expendable objects in situ to raise funds for establishing the library was a good idea, but once put in practice it caused more problems than benefits. Many books were sold off without proper appraisals, likely out of ignorance and the wish to discharge unremunerated commission duties as soon as possible. Moreover, even when sales were closed and monies secured, these funds were often frittered away, while commissions, including the central commission, insisted on compliance with established standards.[3] In order to standardize indexes, the central commission established the model of minimum indexing fields for provincial the commissions to fill in, insisting they follow it to the letter. Many provincial commissions, however, found this model index too time consuming and they often failed to comply with it.

Additionally, many more problem occurred when collections were to be picked up and shipped to the provincial capitals, where the libraries were to be established. While many collections were gathered and shipped from the suppressed monasteries and convents, many more were never picked up at all.[4] These collections were lost to pillaging by the monks who had been turned out, by persons working in the disentailing process and other persons somehow having gained access to them. Furthermore, many valuable items that should have been preserved were legally or illegally sold off, whether through ignorance or in knowing acts of malfeasance. The Carlist War also took a toll, destroying many works, and this was exacerbated by the inaction, inertia and general ignorance of provincial authorities in conjunction with the general impotence of these honorary commissions.

3 In a letter to the Ministry of Commerce, Instruction and Public Works dated January 20, 1848, the Central Commission petitioned for the proceeds of the sale of artistic objects that occurred more than ten years earlier. "The Central cannot do other than use the occasion of this letter to remind the V.E that on 1837 460,000 *reales* entered the treasury from the sale of six original paintings by Zurbaran, which were sold in the province of Cádiz at that time (as shown in documents filed in this Secretariat), an amount which be allocated by Rl. orders were providing to the erection of Museums and Libraries." [sic] (ARABASF, leg. 49-7/2).

4 García López (2002) puts this loss at about three quarters of the total bibliographic collection held by the suppressed religious orders. .

The idea of the public library in the nineteenth century

One of the most important aspects to keep in mind when examining the public libraries created in the nineteenth century is that the concept of the public library has undergone significant change since those times.[5] As such, current ideas in this regard are not valid in this study. According to García López (2007: 12), the concept of the library has had distinct meanings throughout history:

> More than anything else, it was about breaking the legal barriers which by "law" or by conferring exclusive "rights" reserved library access to only a select community. That is, to make the library "public" under the law, even as the public library was still in fact inaccessible to the illiterate farmer who, moreover, had little use for it. In this sense, the public library was open to only a minority consisting of the elite learned and the studious scientist.

A determining factor in the public libraries that were created in this period is the source of the collections. Except for a very low portion of purchased acquisitions, donations or materials on legal deposit, the books came from the suppressed convents and monasteries. This means that the collections were largely religious works, many of them written in Latin. These collections ran far afield of the cultural level and interests of the majority of the mid-nineteenth century Spanish population. The lack of any real social demand for this kind of collection is one of the main reasons the liberal library system failed.[6]

Moreover, Spanish society did not view the public library as an institution for leisure or instruction through reading, since reading was most often

5 For example, as in the IFLA/UNESCO: "A public library is an organization established, supported and funded by the community, either through local, regional or national government or through some other form of community organization. It provides access to knowledge, information and works of the imagination through a range of resources and services and is equally available to all members of the community regardless of race, nationality, age, gender, religion, language, disability, economic and employment status and educational attainment" (IFLA, 2001: 8). The purpose of the library shall be "[...]to provide resources and services in a variety of media to meet the needs of individuals and groups for education, information and personal development including recreation and leisure. They have an important role in the development and maintenance of a democratic society by giving the individual access to a wide and varied range of knowledge, ideas and opinions" (IFLA, 2001: 8).

6 For example, the report by Navarrete to the Central Commission dated December 26, 1845, in which tells Logroño that "[...] since his neighbors, framers or tradesmen mostly, cannot devote time to reading, there will be no shortage of people opposing investment [in libraries], monies they believe would be better spent on matters more urgent to the people, rather than on things that they view as useless luxuries [...]" (ARABASF, leg. 49-1/2).

a collective activity done aloud in the home.[7] New reading habits become more widespread throughout the century with the rising literacy of the population; although reading was still largely an "exceptional activity" done in reading rooms or as public reading, often involving acquisition of books second-hand (Romero Tobar, 1976). These years also saw the rise of serialized print matter,[8] which served to secure income for publishers, while providing affordable, accessible reading materials for the public (Botrel, 1996a).

Illustrated, encyclopedic periodicals also experienced a boom across Europe in the mid nineteenth century. In Spain, titles such as *El Laberinto, Periódico Universal*, 1843; *El Siglo Pintoresco, Periódico Universal*, 1845; *La Ilustración, Periódico Universal*, 1849, or *El Panorama Español*, and *Crónica Contemporánea*, published between 1842 y 1845, addressed relevant political developments during the Carlist War. Because printing illustrations was somewhat costly, these publications were more expensive, though not prohibitively, and they soon were very popular among the better off (Ferrer, 2012).

In addition to informing the text, these images also encouraged sales of these periodicals as collectors' items" [...] providing an easy visual representation of something that despite the wealth of dramatic details remains abstract" (Botrel, 1996a: 56).[9]

Another key for arriving at an understanding the prevailing concept of the public library appears in royal order of August 28, 1843 (Gaceta de Madrid , no. 3303 , October 5, 1843), setting attendance schedules in the National Library and the San Isidro Library of Studies. The text of this order indi-

7 "Even today, many people get their news from television broadcasters. Television could be less of a break from the past than commonly believed. In any case, for most people throughout history, books have had more listeners than readers. More than being read, books were heard" (Darnton, 1994: 191). In this regard, when addressing the question of reading aloud, one must not lose sight of the important role of the blind studied by Botrel (1993). In order to reinforce the change in attitude regarding reading aloud, it serves to consider the anecdote discussed by Martínez Martín (2003), where he explains how the behavior of the Countess Espoz y Mina, governess of the infants Isabel and Luisa Fernanda, was criticized for political motives, for reading aloud to her charges when they took rides in a carriage. These criticisms asserted that reading was for one's own edification, and that reading aloud was irreverent and offensive. This event situation was actually addressed in the official gazette, explaining the governess read aloud to the children at their express request and as part of their education. This incident shows, according to the author, that "[...] it was understood by the Church as fomenting passion and as such of a dangerous nature. The society of literate women, as new categories of readers, was the most susceptible to literature, especially the novel, which were read when alone in a private place and in silence. This contrasts to the type of reading that was done collectively aloud, generally associated with sacred texts of religious liturgy […] Reading aloud to share a text was the logical way to relate to the written word. And it had a sacred nature. Also of entertainment and, in fact, it was by its very definition a way of teaching reading" (Martínez Martín, 2003: 141).

8 For additional information, see Baulo (2003). Additionally, once finished these were often collected in a single volume for sale. For further study, see Carrillo (1974).

9 For additional study on the relationship between text and image in the nineteenth century press, see Fontbona (2003).

cates that libraries were "[...] a place of study and consultation, and in no way reading rooms for recreation and pastimes [...]." The order also goes on to forbid lending. In the same vein, National Library head librarian Eugenio de Tapia expressed his disapproval certain uses of the library (ABN , 0106/03). He believed young people reading novels, which he considered frivolous and somewhat immoral, should be barred from using libraries.[10]

In short, the concept of public library was very different from what it is today. Additionally, when assessing libraries founded in the decade under study, one must be aware of the problems and shortcomings faced and overcome at the time, which were determining factors in the organization of collections and development of associated library services.

Functions attributed to public libraries

Another aspect examined in this paper are the functions of public libraries versus the type of available collections. We have analyzed documents of the time establishing the central functions of public libraries. Directives reflect the discourses held by those responsible for cultural and library policy, and intentions are expressed through actual policy. Also, one must not lose sight of the difference between the mid-nineteenth century notions of these institutions and those existing today. As indicated previously, one must consider the change produced in the mentality of potential users of public libraries regarding the usefulness of the library and its impact on their lives. On the basis of a review of the literature and analyses of the diverse cases in the Spanish provinces, we have in this way identified the following four central functions of public libraries:

- Depositories of cultural heritage
- Social control
- Public instruction and professional training
- Services to the community of teachers and students

Public libraries were conceived and built as depositories of the cultural heritage of the country, largely devoted to conservation tasks of the innumerable antique works they held and really not particularly useful to a potential user public. They were, no doubt, extremely important because of the artis-

10 For further information on criticism and moral censure of the novel, see López (1998).

tic and historical objects in the collections. In the context of European development, Fernández Abad (2006: 102) points out that because these centers held antique collections, they were largely devoted to conservation and organization, turning them into "library-museums." In line with this observation, Fernández Prado (1991) holds that the creation of libraries and museums answered the need to conserve cultural heritage, rather than the need to provide popular education.

Starting with the Central Commission, there are many examples in which the various commissions described the role of public libraries as repositories of cultural heritage, collector cultural artifacts, and organizer and safe-keeper of such historical objects for archaeological or paleographic purposes. For example, a report citing the poor performance of the Provincial Commission of Almeria, clearly indicates that the main objective of the honorary administration creating the public libraries was not only the conservation of libraries but also preserving buildings.[11]

The Provincial Commission of Oviedo held a similar view in its proposal to gather accurate information expediently on the remarkable Asturian-style architecture that should be preserved, citing also the need "[...] to take steps conducive to the acquisition or taking possession of manuscripts of interest in historical or paleontological pursuits, an area in which important progress has been made to date" (ARABASF, leg. 50-1/2 Personal- Organization...). Thus, the Provincial Commission made it clear that its vision for libraries was not based on services to the public, but rather on the preservation of documents deemed valuable.

In his opening speech of the Provincial Library, the political chief of Baleares, called these libraries "[...] a kind of temples [...]" devoted to safeguarding human knowledge in order to keep it available to the sages of the day so they are better equipped to enlighten society at large. He called libraries monuments of knowledge and depositories of enlightenment (ARABASF, sig. F7881). The same idea, albeit with a nationalistic overtone, is seen in the province of Burgos, in statement indicating that the expropriated property

11 "The prevailing thought before the creation of the monuments commissions and the subsequent formation of museums and libraries. This thought is not so much about gathering and conserving what exists, but rather about establishing an artistic, literary center in each province for known works and those to come, where new acquisitions are gathered as the zeal of the commissions and their resources allows. Add to this consideration that museums and libraries sometimes serve as a means of conserving buildings in which things are kept, thereby freeing them from the ruin that threatens them. The central, guided always by this outlook, has advised that the most noteworthy buildings in each province be provided to house museums and libraries." Report issued on June 16, 1847, by the Central Commission of the Ministry of Commerce (ARABASF, leg. 44-1/2).

would give the public an idea of "[...] the glories and fond memories of Castile" (ARABASF, leg. 46-7 / 2).

There was a marked tendency on the part of the educated elites to consider public libraries as a "healthy" and "dignified" option for the lower classes, which were often fond of taverns, to invest their leisure time. This paternalistic vision arose from the desire to employ the public library as a tool of social control. The vision of the public library as an instrument of social control was shared by Eugenio de Tapia (ABN 0106/03), who when applying to acquire a new building for the National Library stated that this transfer provided the opportunity to "[...] reduce the bother caused to library employees by the many young, rude, demanding readers of novels." Tapia's proposal was to retain only the works of the highest "merit and reputation" and hide the rest in a separate room, because they were "[...] frivolous and otherwise morally dubious".[12]

Explaining the origin of the Library of the College of Santa Cruz in the province of Valladolid (ARABASF , leg. 54-7 / 2), the political chief indicated that it was founded by Cardinal Pedro Gonzalez de Mendoza in 1492, who motivated by the contemporary constitutions established by the government for both the center and the College: "[...] felt great sorrow than many libraries never materialized as stated because of lack of funding, despite their importance to general public good of Spain, and to arts and letters [...]". Additionally, he was motivated by "[...] the honor and authority of Valladolid and its University."

As explained San Segundo Manuel (1996), the rising bourgeoisie tried to establish its hegemony by means of cultural control and anchoring its ideology in the medieval universities, just as the nobility had done in the past. Fernandez Prado (1991 : 82) explains how by increasing its involvement in art and culture (albeit in a traditionalist and conservative way), the state "becomes the protector of a cultural forms linked to the social dominance of the aristocracy and adapted to the new structure of bourgeois consumerism." Thus, libraries, rather than addressing a social need, were devices for social control.[13]

12 Lending libraries that began to take shape in Europe after 1750 received criticism similar to that expressed by Eugenio de Tapia. These libraries were used by students, trades apprentices, women at the fringes of the academic world (as preceptors), military men or secretaries. Their readings consisted of "[...] stories of knights, bandoleers and ghosts; romantic tear-jerkers and family sagas [...]", and they were written off as "'sellers of moral poison and brothels' that served their 'spiritual arsenic' to young and old, and rich and poor alike". (Wittmann, 2011: 379-380).

13 Viñao Frago (1991: 312), concurs with this outlook, stating that in the transition from absolutism to bourgeois liberalism, education policy was focused on "[...] training vassals or subjects, not citizens, who would be loyal and hard-working, with a love of king and nation, disciplined, useful and productive, without questioning the established hierarchy, while ensuring the preeminence of the new middle class legitimized by their service to the nation, the king and the state; that is, by the creation of culture, power and wealth." Upon analyzing the

The next stage in the library's practical use to society, the public library function associated with public education and vocational training, is very close to the function of controlling the entertainment of popular sectors, steering them away from "pernicious leisure" and toward culture. The natural evolution was to leverage the investment in this center to improve training of a more prepared and skilled staff, which was necessary in the new industrial society that was unfolding.[14] As indicated by Trias and Elorza (1975) for the Catalan case, the key lay in moral control and vocational training.

The bourgeoisie, however, tried to find a delicate educational balance that would allow them achieve their goals. In this sense, Ponce (1987) draws attention to the double edged sword entailed in the growing educational tasks undertaken by the emerging middle class. The need to offer more educational opportunities to the masses, helping them acquire skills needed for industrial production, was acknowledged, but it was feared that this instruction could also serve to emancipate them.

The role of the book in this training process was reinforced by changes in the publishing field, which moved from conceiving the book as a "[...] sumptuary and novel object [...]" (Fernandez, 2003: 672) to a tool for permanent consultation, reinforcing ongoing training in the new industrial context, in which progress in these fields supplied by the books became "[...] necessary in the gear box of a changing society that stood amazed by the news of progress in all spheres" (Fernandez, 2003: 672).

Among the defenders of the public library as an educational institution independent of the library-museum model, the Director of the Secondary School of Orense offered arguments for the use of the school library for training and public education (AGA, Educación y Cultura, caja núm. 6.738, car-

new education derived from the triumph of political moderantismo, Puelles Benítez (1999) points out that in order to make education universal and free, the focus changed from trying to achieve the enlightenment ideal of equality to an education favoring the primacy of private property. This shift in the focus of education, which was not the same for all, necessarily introduced conceptions of inequality. Thus, education would move from being a force for democratization r revolution to an instrument of power.

14 "The regional market was based on subsistence agriculture that provided some excess to trade (after the tithe and feudal tax were deducted) for locally produced crafts produced by men who also did some amount of farming. In the national market, in contrast, the social division of labor has intensified: diverse branches of production have become separate from farming and this has taken on a new character, in the sense that there is a tendency to make merchandise to trade for industrial products" (Fontana, 1973: 15). Moreover, with the loss of the colonial market that depended exclusively on Spanish trade, the industrial bourgeoisie realized there many possibilities to develop it, since it was prostrate from the exploitation by the feudal oligarchy: "The ideas in banned books stopped being general principles and became instruments for understanding the world they lived in. Despotism had lost the varnish of enlightenment and had become a brake on progress. Thus, it is understandable that by breaking the long tradition of cooperation with the monarchy, the bourgeoisie of Catalonia now were participants in tentative insurrection aimed at tumbling absolutism and restoring the constitution" (Fontana, 1973: 15).

peta núm. 6.584-80).[15] In Navarra (ARABASF, leg. 50-4/2), upon examining the works available, the Provincial Commission charged with establishing a library concluded that the collection was unfit for public use, since they were all religious in nature. The commission stated, moreover, that there were very few works that could serve public enlightenment in the fields of arts and sciences, which were main objectives set for the libraries at that time.

Finally, one must consider the use of public libraries by the community of teachers and students. On one hand, many enjoyed easier intellectual access to the holdings of these centers; while on the other, most libraries, despite being provincial, public, would up in universities or secondary schools, which also put then in physical proximity to these groups.[16] First we must consider the promotion liberal politicians afforded to education in general. According to Ruiz Berrio (1970: 13-14), education was viewed by politicians, economists, intellectuals and religious authorities as the solution to all the ills of the early nineteenth century.[17]

Viñao Frago (1991) points out how classroom attendance of students between six and thirteen years-old years increased very slightly from 1797, when it was 23%, up to 1831, when it touched 24%. Hernandez Diaz (1986) highlights the period of 1840-1860, when the increase in primary school enrollment increased in line with the literacy rate and the number of elementary schools, which rose from 12,719 in 1830 to 20,743 in 1855, with the number of people with reading and writing skills moving from 1,290,257 in 1841 to 3,129,921 in 1860, according to available data.

15 "It was of little importance that the monuments commissions have an interest in preserving books as simple archeological artifacts; because the truth is that books, because of their specialty, have another feature beyond their relative rarity, which is the property of serving and being in continuous by those who wish or need to consult them; as such, from the moment books are brought together in a more or less established library, they change from being objects into books, and they move out of the domain of archeology to become humble servants to those who need them".

16 Notwithstanding the fact that the library existed in the heart of an educational institution, this did not ensure easy access to its holdings for the student community, as was the case in Valencia, according to Paz (1913: 364): "The University Library opened in 1840, keeping hours of 9:00 to 12:00 and 15:00 to 17:00 (or 16:00 to 18:00, in summer); it was closed all afternoon during the month of July and on rainy days in order to prevent students from taking shelter there while waiting for classes. As a consequence of these restrictions, students seldom frequented it. It was rare to see more than 10 or 12 readers. As such the vision of the library's founder regarding its availability to students was far from being accomplished".

17 Gil de Zárate (1995, t. I: V-VI) stated that "For those people who can appreciate the benefits [of public instruction], it is without a doubt the first and foremost because of the huge influence it exerts, not only on individuals, but also on the general fate of states. Without good teaching, commerce falters, the arts do not exist, agriculture is pure routine and nothing prospers to enhance the nation. Projects and enterprises are launched in vain; one speaks of public works, of armies, squadrons; nothing is done that is not rickety, miserable; or resources, thus from the government and private parties, sterile efforts are spent that serve only to demonstrate the impotence of a society whose members are paralyzed by ignorance […] In other ti-

However, this author does not lose sight of the proselytizing aspect offered by the control of education,[18] although, as he explains, they were unable to achieve the political objectives fully in such matters. Although the gains were widespread and numerous, because work began at a very basic level, the political objective of promoting bourgeois interests was not achieved. This objective sought to implement "[...] education and a school for everyone, but not at the same time, in the same form or degree" (Hernandez Diaz, 1986:79). As indicated by Carr (1982), it was believed that control of education, as in other areas, could be achieved through highly centralized, government oversight.

According to Ponce (1987), the so-called liberal educational reform would constitute a revolution in education. The difference between reform and revolution is that the former occurs through non-traumatic social changes, allowing changes in class dynamics without breaking down its structure. therefore, reforms are a "[...] backlash within education of an economic process by which an aristocratic and agricultural society receded against the advances of a merchant and industrial society" (Ponce, 1987: 165-166). The author calls attention, however, to two revolutions in the history of education: class division of primitive society and the replacement of feudalism by the bourgeoisie.

Regarding the role of libraries in education, Cruz Solis (2008) indicates that they were first cited as an educational resource in 1845, when Gil de Zarate said he believed a library was essential in all secondary schools, in the same way science curricula had experimental laboratories. Budgetary problems, however, prevented this idea from being developed. The influence of the education system on libraries is crucial when these are understood as part of the education and training system, as indicated by San Segundo Manuel (1996). Nonetheless, one must consider the other tasks entrusted to libraries created in the mid-nineteenth century in order to grasp their essence.[19]

mes, barbarian might have overcome civilization: today victory obeys science, and the most enlightened people are also the most powerful." [sic].

18 "It is important to keep in mind, however, that one of the priority functions of schools in the social structure of nineteenth century Spain is the inculcation of values and authoritarian models of disciplined behavior in order to sustain the prevailing social system" Hernández Díaz (1986: 75); Peset and Peset (1974: 436) agree, stating with regard to the Pidal Plan of 1845 that Gil de Zárate designed a well-articulated system that promoted control of the education system by "[...] the social class that had set brought the moderates to power".

19 "In this sense, the reforms did no come in response to pressure from the social base or from popular initiatives, but rather, they were driven by a literate, liberal minority that had seized power and was pretending to develop education. These liberal policies drove the creation of the public libraries [...] The diverse educational models have led to the creation of different

Despite provisions to ensure public access to the library, the university library of Zaragoza, which housed books from the suppressed orders, made these available exclusively to professors and students (AGA, Educación y Cultura, caja núm. 6.735, carpeta núm. 6.581-2). In Salamanca, the president tried to encourage students to consult the works from convents and monasteries, which the university held in another building.[20]

The same view is echoed by the Provincial Commission of Badajoz (ARABASF, leg. 44-5/2), which stated that the library and the museum to be established were of vital importance, because there had never been any institutions of this kind in the province, despite a great need for such institutions in that demarcation and throughout the country to promote literature and the arts. Regarding the condition of books, the commission reported incomplete works and a collection of inadequate scope to serve the illustration of the public, adding that children would not open "even out of curiosity" books so old and battered.

As we have observed, the criteria for setting objectives varied from one province to another depending on the opinion of those in charge of the provincial commissions or their commissioners. Moreover, these objectives were not laid out in the regulatory guidelines nor did the Central Commission provide any clarity regarding the ends of the centers to be created. Thus, as in other aspects of the process, the functions of public libraries were determined by each province as the went along and without the benefit of planning, simply, rather, by adapting to new conditions as they emerged.

kinds of libraries. In the nineteenth century, the liberal educational model precipitated the creation of popular public libraries [the author is referring to those created before 1868], though previously the scholastic model had prevailed and were the model informing the creation of university based libraries reserved for the bourgeoisie and clergy. In this way, enlightenment ideas attempted to implement a new approach to teaching, and they had enjoyed the support of the new liberal state born in the image of the French model after the French revolution. Thus, an educational system diametrically opposed to the scholastic model was adopted. This system was at the service of liberal capitalism and was comprised of intellectuals and the new cultivated classes, which would therefore exert influence in library policies. On the basis of these ideas, it is important to point out that the nineteenth century initiatives to establish public libraries hoped to develop an educational model and policies to eradicate illiteracy, which at that time ranged from 80 to 100 percent of the population, and this goal took precedence over any pretention to spread culture or reading" (San Segundo Manuel, 1996: 228).

20 "Near the great hall of the library, there are places quite suited for these to be shelved at little or no cost, using the shelving that is already in place. Once these are placed there, a single glance will awaken curiosity of the youth who visit this ancient University Center hungry for knowledge and learning about science, and these young people will be able to satisfy their noble desire of enlightenment"" (AGA, Educación y Cultura, caja núm. 6.739, carpeta núm. 6.585-37).

Government provisions, therefore, were very vague regarding the role of public libraries: regulations and provisions issued spoke of creating "centers of provincial literary and artistic wealth" or "conserving the heritage to the benefit of the public." These expressions were so unspecific and broad that the functions of provincial centers were left to be determined by the provincial commissions. Because of the ambiguity of state guidelines, the individual provincial authorities each came up with widely disparate approaches instead of the uniformity originally desired.

Features and utility of the nationalized bibliographic collection

As for the disposition and use of this newly acquired bibliography from the suppressed orders, there were several possibilities. These could be the basis for an entirely separate provincial library or they could be integrated into another library based in a university, institute, secondary school, society or academy. Alternately, these could be placed in the archiepiscopal or episcopal library, or with a seminary or other religious institution. Considering the nature of the books, the latter was the most logical choice, as will be explained later.

The expropriated works were mostly religious subjects, although books on subjects such as philosophy, law or history were also quite common. However, there were very few examples of other kinds of collections, such as in the provinces of Oviedo, Segovia and Soria (ARABASF, leg. 50-1/2, leg. 52-4/2, and leg. 53-4/2), which contained literary works, books on geography and exact and applied sciences, most of which were written in Latin. In Oviedo and Segovia there is evidence of acquisitions, suggesting that these works were not part of the original expropriation. The collection was totally outdated, consisting mostly of old and outdated editions of the sixteenth, seventeenth and eighteenth centuries. In fact, there were very few works from the nineteenth century. All of this was further aggravated by a large number of damaged works and incomplete sets.

Whether there was any usefulness to be found in the works confiscated from convents and monasteries, therefore, was somewhat questionable. In view of the costs entailed in their preservation and treatment, which in most cases was prohibitive, these collections were more hindrance than asset. In this context, the decision was often made to donate them the libraries of religious centers, as was a case in the Baleares, Santander and Toledo (ARABASF, leg. 45-1/2 , leg. 7-5/2 and leg. 53-1/2).

As for the number of national heritage volumes confiscated from suppressed orders, these were not included in their entirety in the collections of the state-supported provincial libraries for the following reasons:

- The lack of thoroughness in the gathering process, as not all books were collected at the same time and were therefore moved to the capital gradually. On many occasions these collections were not gathered in their entirety, but they remained in the buildings of the convents and monasteries for years. On several occasions the books were not collected until the properties were sold off.
- The estimated number of volumes in a given depository and the actual number found through inventories varied downward and upward. This variability was more pronounced as the time between storage and inventory was more prolonged. Moreover, in many cases there were book depositories belonging to several different bodies or authorities that did not recognize such holdings in their management objectives.
- Books that were stolen, hidden, sold, lost or otherwise destroyed were not included in this count. Such books very likely comprised the majority of the pre-inventoried collections.

Acquisitions are added to the seized collections, but these make up only a very small percentage of holdings. Donations were a common method of growing collections, especially in school-based libraries.[21] In other cases, donations had little impact because of the small size of the donation or the scant relevance of the donated works for a public school. Legal guardianship led to a similar situation: collections obtained through this system held scant interest for a public library and were hardly worth the effort required to meet legal standards to hold such books, which, moreover, often required special handling.[22]

Purchases were the best method of acquisition for the library, since purchases were executed in line with the library's specific needs. The endemic shortage of funds in the state treasury, however, limited allocations for such purposes. Only university based and a few provincial libraries, such as the ones in Guadalajara, Leon, (ARABASF, leg. 48-3/2 and leg. 48-8/2) or Segovia (AGA, Education and Culture, case No. 6,735, folder No. 6581-2; ARABASF,

21 For example, the provinces of Zaragoza or Teruel (ARABASF, leg. 54-4/2, y AGA, Educación y Cultura, caja núm. 6.739, carpeta núm. 6.585-4).

22 In Valencia many difficulties encumbered the collection of the books. As such, the National Library had to invoke the power of the Ministry of the Interior, because the Secretariat of the Civil Government refused to hand the books over. Insofar as the usefulness of the books, both the Granada and Orense commission reported that they were of little use (ABN, 0448/8).

leg 52-4/2) had money to acquire books. An annual budget for secondary school laboratories and libraries of 2,000 reales de vellón, did in fact benefit provincial libraries existing in these centers.

As for the sale of works held in public libraries done to secure financial resources, this created more problems than it solved, despite being viewed as a viable alternative to direct state funding. In most provinces divestitures were carried out irregularly, until the government issued regulations and guidelines at the request of the Provincial Commission of Caceres.[23] The problem lay in the provinces' view that the old religious-themed books were of no use to the public library, and their preservation and conservation used up scare funds. By selling off these works, they wished to acquire funds for the purchase more modern, relevant works.[24]

The Central Commission, however, set increasingly stricter conservation compliance standards and oversight, which aroused criticism from the provinces. These criticisms were justified because the commissions were forced to assume the costs associated with preserving books they considered essentially useless. While the government failed to provide the necessary funds for conservation of these collections, the meager revenues from the sale of books and other articles considered expendable were woefully insufficient to cover the costs of handling library collections.

Finally, regarding books that did not enter public libraries, it is important to highlight certain matters. Such works might be hidden in the same building or off site. It should be noted that books were often hidden in walls and buried in stables. Books hidden in such a way generally deteriorate faster than those held by the state. This suggests an appalling lack of foresight and even spitefulness

23 Predicable works were not to be sold off unless they existed in triplicate. Regarding Bibles, historical Works, literature and Antique objects, only duplicates a given edition could be sold off. Single tomes of these material were to be preserved in order to complete sets from the assets of several provinces. The reasons for preserving these works included "[…] for enlightenment on history of literature, typography , for philological study, and for sources of political history in the times when such works were printed." Finally, on October 1, 1847, a royal order was issued through the auspices of the Ministry of Commerce, Instruction and Public Works that reads as follows: "[…] the commissions of Caseres and all of the other commissions of the country are hereby authorized to sell off all duplicates of a given edition that exist in their libraries, providing proof of sale. To sell off any other work or volume, special authorization must first be secured" (ARABASF, leg. 46-5/2).

24 In this sense, some provincial managers of the assets acquired from the confiscation of religious property had something to say. For example, Juan Guerra, political chief of Caceres wrote to the Central Commission (letter dated August 27, 1846) as follows: "The commission reiterates that it is not inclined to dispose of any type of work however insignificant. There is a big difference between this and wasting time and money in conserving useless duplicate books (which can only serve as wrapping paper in the chemist shop), including them in indexes, shelving them in space needed for other more useful works. The sale of such books could provide funds for binding important books and the purchase of others that cannot be found in the suppressed convents. Nothing of economy, politics, natural history, mathematics, agriculture, etc. is to be found in these tomes [...]" (ARABASF, leg. 46-5/2).

on the part of those responsible for hiding these materials. Moreover, such persons may well have believed the expropriation of the convents and monasteries would be reversed at some near future time, as had in fact already happened within recent memory. Under this assumption, they perhaps thought books would not be kept in hiding for any significant period of time. Still others, might have thought it better to destroy books before turning them over to the state, since the hiding places they chose in manure strewn stables, caves or behind bricks in damp walls effectively consigned these works to the trash heap.[25]

The second matter to be discussed is theft. These thefts were committed immediately after the secularization of convents and monasteries by corrupt commissioners or by unassociated individuals who knew of valuable works in libraries and conspired with commission officials to make off with them, which was not difficult, since most buildings did not have guards of any kind. These books generally found their way into private collections. Books stolen well after the confiscation of church property, were sometimes sold for paper recycling. Finally, the lack of means and resources during shipment also led to the removal of a considerable number of works. Those works that finally reached the provincial capital entered another holding situation subject to similar predations.[26]

The third matter is the destruction of books and even entire libraries, which accounts for a significant loss of the literary and artistic heritage secured through confiscation. In every provincial library, convent and monastery, some portion of books were damaged or completely destroyed. The causes of this damage includes negligence and accidents occurring in the library buildings, during shipment to provincial depositories, and because of the effects of humidity, insects, rodents and human mishandling and omission.[27]

25 Both example come from Toledo, a province with two hidden book depositories, one occurring through chance circumstances and the other thanks to the collaboration of clergy members. Those found buried in dung in stables were found by the buyer of the property when he was carrying out works. Those found in a cave were found thanks to information provided by two clergymen. In both instances, the books were seriously damaged (ARABASF, leg. 53-1/2). In Guipúzcoa, most of the books were destroyed in a fire in the village where they were hidden by a Jesuit after the signing of the Vergara Accord (AGA, Educación y Cultura, caja núm. 6.735, carpeta núm. 6.581-2).

26 For example, the provincial governor of Leon wrote (letter dated March 12, 1845) that: "[...] in the constant mobility and in carelessness of their governors, there has been every imaginable consequence of genuine sacking and atrocious and barbarous vandalism [...]" (ARABASF, leg. 48-8/2, Asuntos de carácter general). In a letter dated August 14, 1842, the political head of Gerona excused himself before the commission for being unable to locate books removed from the convents during the process of their closing, saying: "[...] the long years that have passed that have been fraught with political turmoil has made it impossible for this commission's diligences to find any of the sought after objects" (ARABASF, leg. 47-6/2). Finally, in a letter dated January 27, 1844, to the Ministry of the Interior one Ventura Tien, the political head of the province of Pontevedra, made the following observation that sums up this situation prevailing across the entire country, stating that books seem to be "[...] covered by an impenetrable veil [...]" (ARABASF, leg. 7-6/2).

27 In Cádiz, a cry was raised over the condition of 10,000 tomes, "[...] including many valuable literary works, which are lying about at the mercy of vermin, a situation that has been reported

Typology of public libraries as a function of collections and available resources

Before moving on to describe the various types of libraries created with the collections available (which should be done in accord with Spanish nineteenth-century society), it is interesting to ponder an isolated example of the recreational use of the public library, occurring when a tax collector by the name of Joseph Leis visited Archiepiscopal Public Library in Toledo. Leis viewed these rounds as a sort of leisure, something not generally available to most people. On one particular occasion, he complained of the librarian's refusal to lend him a work, arguing on religious grounds[28] and that it had been banned at that time by the then defunct inquisition.[29]

In addition to observing a rare case of the recreational use of the public library, it is interesting to note how the Church's leading role in culture continued to hold back the development of educational and training entities, leaving these efforts helpless before the majority ultramontane current of the ecclesiastical authorities, which despite its backwardness was still embraced by society at large.[30]

to higher authorities." The letter provided further details of the storage conditions of these books in the same building: "[...] Because of the poor, abandoned state of the building and accumulation of dust, leaky roof and debris falling from the ceiling directly onto and burying them, many of these books are rotting away and becoming completely useless in ever growing numbers [...]" (ARABASF, leg. 46-3/2, Monumentos en general). In Logroño, Eustaquio Fernández Navarrete reported on the damage to the Library of San Millán de la Cogolla, which he had visited personally, as follows: "[...] I was filled with sorrow to see many rare, precious books tossed about the beautiful hall of the library. The local people told me they had no idea or their value or merit, and they often used such books to light their fires, or they sold off the books at the price of paper, or the otherwise made use of the scrolls and hard cover boards. Moreover, this looting is done stupidly, causing damage not only to the things they destroy, but also leaving behind the useless remnants of their pillaging" (ARABASF, leg. 49-1/2).

28 My sole activity in times of leisure is to visit the Public Archdiocese Library, where yesterday morning I made a request to the head librarian, one Presbyter Don Pedro Hernandez, to examine the work of Gerundio in order to read one of his critical sermons that interests e quite particularly. I was denied access to the work in no uncertain terms, despite the fact that there are two volumes in the library's holdings, on grounds that the works were banned under the edicts of the defunct Holy Inquisition, and that if I had had one of the special permits to read forbidden works, Presbyter Hernandez would have cancelled it on the spot. Dear Exmo., I deeply respect the religion of my parents and the priesthood that serves it, as the most powerful agency for taming the popular ferocity when its will is aligned with the government in order to all resources in concert and thereby produce the result, but when this backward mode of public instruction of a previous generation and those who are still capable of discussion, and especially those who lend service to the state, resort to the caprices of moaning presbyter, who very likely despises us because of his opinion regarding reciprocal interests, one can imagine disastrous consequences with regard to enlightenment and wisdom sought by Your Highness, whom I humbly obey" (ABN, 0007/02).

29 According to Gil de Zárate (1995: t. 1, VI), "The slab laid upon us by the Inquisition was so heavy that we have not yet been able to throw it off completely: The Holy Office, which has been removed from our institutions, still exerts a malignant influence in our customs, and its ideas still project perniciously and resist taking the road to civilized modernity".

30 García López has stated (2002: 129): "Nineteen century society is undergoing a slow evolution, in which the old ways of thought and behavior still had deep roots. With great difficulty,

According to Fernandez Abad (2006: 101), public libraries in the nineteenth century went from performing religious and moral functions to other functions associated with instruction and dissemination of culture. This shift in focus was carried out by changing the nature of collections. As a result, two aspects in the training objectives of libraries were born, the "[...] social-moral and professional–technical."

This idea is interesting, because libraries holdings in Spain were primarily religious in nature having come from the suppressed orders. As such, changes in the functions of such centers had to wait until economic resources were allocated for the purchase of more modern and appropriate collections in line with the new national and international objectives, as exemplified, according to Fernández Abad (2006), by the UK and US. Escolar Sobrino (1983: 324-325), meanwhile, indicates that public libraries in these two countries were created as "[...] instruments of redemption of the popular classes, for which they should provide healthy entertainment, while keeping them away from vice and improving their job training and performance."

These arguments also appeared in the formation of liberal library system, which however lacked the funding needed to pursue these objectives. In the American case, public libraries could serve to reinforce democracy, because reading and studying various viewpoints on an issue contribute to the formation of judgment needed to understand issues up for vote (Sobrino School, 1983). Although these principles served to inspire the creation of libraries seeking the formation of informed and socially responsible citizens, in the case of Spain the most widespread conception of public reading centers was quite paternalistically focused on providing an alternative to other forms of leisure considered "pernicious." As stated by Escolar Sobrino (1983), the library is not an end in itself, but rather a "political weapon" serving to further a social agenda.

As for the study of library typology, these centers have been divided into several categories. While it is true that those that have been analyzed as adequately established libraries exhibited serious shortcomings that have not been ignored when making this classification, several of these centers have

science is overcoming the traditional religious mentality of Catholicism unaccustomed to philosophic reflection, a religiosity that was superficial, or in any case acritical of its own essence".

31 Esta función de la biblioteca pública tendría relación con la diferencia que señala Botrel (1996b: 275) entre la visión y el concepto del uso del libro y la lectura entre las clases medias y bajas y la alta sociedad letrada y erudita: "Le divorce entre le goût populaire est consommé […] Autant l'indignation et les condamnations de Campomanes ou d'Iriarte vis-à-vis de leur utilisation pour l'apprentissage de la lecture que les mesures prises les «esprits éclairés» sont impuissantes à contenir -et, a *fortiori*, abolir- ce qui apparaît comme un véritable phénomène".

been included under this heading, because they have been viewed not only in the context of their time, but in comparison to other libraries; that is, these provinces are viewed, on one hand, as responsible for the creation of independent, well-staffed centers as per the criteria used in the mid-nineteenth century by an indebted state at war and, on the other, in accord with a comparison against other provinces, where the deficiencies were much more severe or where they were never established.

As for school-based libraries and those libraries under other agencies, this road was opened by universities. Pursuant to royal order of September 22, 1838, the State transferred powers of management of artistic and literary property (confiscated from the suppressed religious communities) held by scientific and artistic commissions to the universities (in the provinces where these existed). This measure was implemented to minimize the impact of problems such as the state's inability to care for church assets, which without proper handling were likely to deteriorate quickly. Moreover, the literary and art objects were no longer commonly used by religious communities, and by that time had become part of the national heritage. Nonetheless, there was scant social benefit to be derived from holding them, especially since the state did not have the ability to conserve them.

Although the law was apparently clear, sometimes squabbles and disagreements arose regarding the ownership and custody of the books from convents and suppressed monasteries. The biggest problem, however, was that despite the theory that the library was public and open to any user, the fact that it was located within an institution deemed in elite the nineteenth century made the public's access to such collections more difficult than the access offered by independently established libraries. Finally, when a college takes over the collections derived from the confiscations, this did not guarantee better management than that exercised by the commissions.

The state continued to turn over management of the confiscated collections to other centers. Secondary schools were the first keys in the process of founding libraries in the Spanish library system, because as these educational centers grew throughout Spain, the libraries also grew in importance. On the opposite end of the spectrum, we find the declining economic societies of friends of the country, which nonetheless took charge in some provinces and were responsible for the management of collections derived from convents and monasteries. Finally, there are the episcopal and archbishopric libraries, which were the best option for the management of books of a religious nature and making them available an interested public.

Moreover, there is a category of provinces whose management of literary goods from suppressed monasteries and convents was poor or ineffective.

This category includes those provinces that never established libraries, where books were kept in depositories or in the ex-convents and –monasteries. "Library" is the term used for these depositaries: some of these were staffed and had operating budgets, but such funding was not sufficient to open the facility to the general public. Occasionally, even where a library was established, the lack of operational budgets made it impossible for them to actually function as such. This category also included libraries which perhaps on paper were established, but for which there is no tangible evidence that they ever were.

In any case, there are abundant examples of mismanagement, lack of interest of the authorities, administrative disorganization at all levels and economic problems of varying severity. There are examples in which energetic commissioners managed to make progress despite the many limitations. At other times, they succumbed to the inertia of the overall situation and activity gradually languished. The situation in these provinces, with shortages and problems of all kinds, ultimately marked the general trend in the formation of liberal library system.

Conclusions

Regarding the social functions of the library, studies have found that the concept of the public library was alien to the vast majority of nineteenth-century society that regarded them unnecessary. Hence the centers created during this period, usually under the auspices of public secondary and higher education institutions, exerted a limited impact and were generally ignored by potential users. Actual users were a small minority who belonged to an elite group of enlightened teachers, students or scholars.

Even while nineteenth-century society at large remained largely Catholic, the bibliographic collections available of a marked religious bent did not meet the characteristic functions of a public library. Regulations issued during the process set a number of objectives to be met in accord with the theoretical liberal proposal; however, budgetary constraints rendered these objectives untenable.

Studies have identified the following features of the nineteenth-century public library: depositories of cultural heritage, social control, public education and vocational training, and community service of teachers and students. It is concluded that provincial public libraries actually served as bibliographic heritage depositories, serving secondary schools and universities. Thus, the resulting library system did not respond to the latent social need of the majority of the population, or to the requirements of the enligh-

tened minority that wanted libraries to be allies in vocational training of the popular sectors. The attitude of the latter was decidedly informed by paternalism and a desire to use libraries, by limiting access to reading material, in a program for social control.

The result was quite short from the initial objectives, and equally short of objectives set during the period of their reformulation. Additionally, the potential of an enormous newly acquired wealth of literary and artistic heritage was never properly exploited. The type of library created was not the result of prior planning, but rather of the management approaches that differed widely from province to province, and which were of an ad hoc nature that merely reacted to conditions on the ground.

References

ABN, 0007/02, Comunicación de 7 de junio de 1810 de José de Leis, Administrador de Rentas de Toledo, al Ministro de Interior

ABN, 0097/12, Secretaría general H01-Actividades Bibliotecarias 04

ABN, 0106/03, Oficio de 23 de agosto de 1843 de Eugenio de Tapia, bibliotecario de la Biblioteca Nacional al Ministro de Gobernación

ABN, 0448/8, Secretaría general H01-Incorporaciones y adquisiciones 05

AGA, Educación y Cultura, caja núm. 6.735, carpeta núm. 6.581-2, Oficio con fecha 10 de marzo de 1849 del Rector de la Universidad de Zaragoza al Ministro de Instrucción Pública

AGA, Educación y Cultura, caja núm. 6.738, carpeta núm. 6.584-80, Oficio con fecha 8 de julio de 1848 de Dimas Corral, director del Instituto de Secundaria al Director General de Instrucción Pública

AGA, Educación y Cultura, caja núm. 6.739, carpeta núm. 6.585-37, Oficio con fecha 11 de diciembre de 1868 del Rector de la Universidad de Salamanca al Ministro de Fomento

AGA, Educación y Cultura, caja núm. 6.739, carpeta núm. 6.585-4

ARABASF, leg. 3/2, Monumentos en general

ARABASF, leg. 4/2, Asuntos de carácter general

ARABASF, leg. 7-5/2, Museo-Biblioteca

ARABASF, leg. 7-6/2, Museo-Biblioteca

ARABASF, leg. 44-1/2, Museo-Biblioteca, Informe evacuado con fecha 16 de junio de 1847 por la Comisión Central al Ministro de Comercio

ARABASF, leg. 44-4/2, Monumentos en general

ARABASF, leg. 44-5/2, Monumentos en general, Presupuesto elaborado por la Comisión Provincial y enviado a la Central el 11 de febrero de 1845

ARABASF, leg. 44-7/2, Objetos procedentes de conventos suprimidos

ARABASF, leg. 45-1/2, Museo-Biblioteca

ARABASF, leg. 46-3/2, Museo-Biblioteca
ARABASF, leg. 46-3/2, Monumentos en general, 20 de junio de 1844
ARABASF, leg. 46-5/2, Museo-Biblioteca
ARABASF, leg. 46-7/2, Museo-Biblioteca, Actas de la sesión con fecha 9 de julio de 1843 de la Junta de Gobierno Provisional
ARABASF, leg. 47-6/2, Museo-Biblioteca
ARABASF, leg. 48-3/2, Museo-Biblioteca
ARABASF, leg. 48-8/2, Museo-Biblioteca
ARABASF, leg. 48-8/2, Asuntos de carácter general
ARABASF, leg. 49-1/2, Museo-Biblioteca
ARABASF, leg. 49-7/2, Asuntos de carácter general y administrativo. Atribuciones. Reglamentos
ARABASF, leg. 50-1/2, Museo-Biblioteca
ARABASF, leg. 50-1/2, Personal-Organización de la Comisión, Oficio de 27 de julio de 1844 remitido por Juan Ruiz, el presidente, y Pedro Armada Valdés, vocal secretario, al Presidente de la Central informando acerca de su constitución
ARABASF, leg. 50-4/2, Museo-Biblioteca, Comunicación de 29 de marzo de 1845 de la Comisión Provincial a la Central
ARABASF, leg. 52-4/2, Museo-Biblioteca, Asuntos de carácter general para Segovia
ARABASF, leg. 52-5/2, Museo-Biblioteca
ARABASF, leg. 53-1/2, Museo-Biblioteca
ARABASF, leg. 53-4/2, Objetos procedentes de conventos suprimidos
ARABASF, leg. 54-1/2, Museo-Biblioteca
ARABASF, leg. 54-7/2, Museo-Biblioteca, Respuesta de Laureano de Arrieta, del Gobierno Político, a la circular de 14 de enero de 1844
ARABASF, leg. 54-4/2, Museo-Biblioteca
ARABASF, leg. 55-2/2, Real orden de 29 de julio de 1835 dirigida a los gobernadores civiles mandando que se crearan comisiones en cada provincia para inventariar y recoger los bienes nacionales y estableciendo los procedimientos de su actuación
ARABASF, leg. 55-5/2
ARABASF, leg. 7-5/2, Museo-Biblioteca
ARABASF, leg. 7-6/2, Museo-Biblioteca
ARABASF, sig. F7881, Discurso pronunciado en el solemne acto de la apertura de la Biblioteca Provincial y del Instituto de Segunda Enseñanza de las Baleares, que tuvo lugar el día 1.º de octubre de 1847; por el muy ilustre señor D. Joaquin Maximiliano Gibert […] gefe superior político de la misma provincia. Palma: imprenta á cargo de D. Juan Guasp, 1847
Baulo, Sylvie. 2003. "La producción por entregas y las colecciones semanales", en Víctor Infantes *et al.* (dirs.), *Historia de la edición y de la lectura en España (1472-1914).* Madrid: Fundación Germán Sánchez Ruipérez. 581-590.
Bello, Josefina. 1997. *Frailes, intendentes y políticos. Los bienes nacionales 1835-1850.* Madrid: Taurus.

Botrel, Jean-François. 1993. *Libros, prensa y lectura en la España del siglo XIX*. Madrid: Fundación Germán Sánchez Ruipérez, Pirámide

—— 1996a. "Los nuevos lectores en la España del siglo XIX", *Siglo diecinueve (Literatura hispánica)* 2: 47-64.

—— 1996b. "La littérature *de cordel* en Espagne. Essai de sythèse", en Roger Chartier y Hans-Jürgen Lüsebrink, *Colportage et lecture populaire: Imprimés de large circulation en Europe XVIE-XIXE siècles. Actes du colloque des 21-24 avril 1991. Wolfenbüttel.* París: IMEC Éditions; Éditions de la Maison des Sciences de l'Homme, 271-281.

Burón Castro, Taurino. 1995. "Los inventarios de desamortización: recurso para el seguimiento del patrimonio documental", *Boletín de la ANABAD* XLV (4): 25-50.

Carr, Raymond. 1982. *España 1808-1975.* Barcelona: Ariel.

Carrillo, Víctor. 1974. "Radiografía de una colección de novelas a mediados del siglo XIX («El Novelista Universal», de la Sociedad Literaria)", en Manuel Tuñón de Lara y Jean-François Botrel (eds.), *Movimiento obrero, política y literatura en la España contemporánea*. Madrid: Cuadernos para el diálogo, 159-177.

Colección de órdenes generales y especiales relativas á los diferentes ramos de la Instrucción pública secundaria y superior desde 1º de enero de 1834 hasta fin de Junio de 1847. 1847. T. II. Madrid: s.n. [Imprenta Nacional].

Cruz Solís, Antonio de la. 2008. "Bibliotecas y educación básica: los inicios de una relación imprescindible", *Documentación de las ciencias de la información* 31: 129-160.

Darnton, Robert. 1994. "Historia de la lectura", en Peter Burke (ed.), *Formas de hacer historia.* Madrid: Alianza, 177-208.

Escolar Sobrino, Hipólito. 1983. "Lectura y política bibliotecaria", en Fernando Lázaro Carreter (coord.), *La cultura del libro*. Madrid: Fundación Germán Sánchez Ruipérez, 321-334.

Fernández Abad, Francisco Javier. 2006. "Evolución histórica de la función social de las bibliotecas públicas", *Revista General de Información y Documentación* 16 (2): 93-110.

Fernández Prado, Emiliano. 1991. *La política cultural, qué es y para qué sirve*. Gijón: Trea.

Fernández, Pura. 2003. "Lecturas instructivas y útiles", en Víctor Infantes *et al.* (dirs.), *Historia de la edición y de la lectura en España (1472-1914).* Madrid: Fundación Germán Sánchez Ruipérez, 672-679.

Ferrer, José María. 2012. *La monarquía isabelina 1833-1868: crónica ilustrada de Madrid.* Madrid: Ediciones La Librería.

Fontana, Josep. 1973. *La crisis del Antiguo Régimen, 1808-1833*. Barcelona: Ariel.

Fontbona, Francesc. 2003. "Texto e imagen", en Víctor Infantes *et al.* (dirs.), *Historia de la edición y de la lectura en España (1472-1914).* Madrid: Fundación Germán Sánchez Ruipérez, 705-710.

García López, Genaro Luis. 2002. "Nacimiento y desarrollo de la Biblioteca Pública de Cuenca durante el siglo XIX", *Archivo conquense* 5: 111-145.

—— 2003. *Libros para no leer: el nacimiento de la política documental en España.* Gijón: Trea.

—— 2007. "Evolución histórica de los conceptos de biblioteca pública, sistema de bibliotecas y política bibliotecaria", *Códice, Revista de la Facultad de Sistemas de Información y Documentación* 3 (2): 9-20.

Gil de Zárate, Antonio. 1995. *De la Instrucción Pública en España*. Oviedo: Pentalfa.

Hernández Díaz, José María. 1986. "Los alumnos de segunda enseñanza en el siglo XIX", *Historia de la Educación. Revista interuniversitaria* 5: 251-273.

—— 1992. "Alfabetización y sociedad en la revolución liberal española", en *Leer y escribir en España: doscientos años de alfabetización*. Salamanca: Fundación Germán Sánchez Ruipérez; Madrid: Pirámide, 69-89.

Hernández Hernández, Francisca. 2002. *El patrimonio cultural: la memoria recuperada*. Gijón: Trea.

IFLA, Sección de Bibliotecas Públicas. 2001. *Directrices IFLA/Unesco para el desarrollo del servicio de bibliotecas públicas,* Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura. Federación Internacional de Bibliotecarios y Bibliotecas. Sección de bibliotecas. Disponible en unesdoc.unesco.org/images/0012/001246/124654s.pdf [Fecha de consulta: 21 de noviembre de 2012].

Infantes, Víctor. 1997. "Las ausencias en los inventarios de libros y bibliotecas", *Bulletin Hispanique* 1: 281-292.

Lopez, François. 1998. "Las malas lecturas. Apuntes para una historia de lo novelesco", *Bulletin Hispanique* 2: 475-514.

Martínez Martín, Jesús A. 2003. "La lectura irreverente o la educación descuidada. Un episodio de historia cultural", *Cuadernos de Historia Contemporánea* núm. extraordinario: 137-144.

Muñoz Feliu, Miguel C. 2006. "Liberalismo, desamortización y política bibliotecaria. El caso valenciano", *Anales de documentación* 9: 133-141.

Paz, Julián. 1913. "Los archivos y las bibliotecas de Valencia en 1842", *Revista de Archivos, Bibliotecas y Museos* XVII (11-12): 353-373.

Peset, Mariano y J. Luis Peset. 1974. *La Universidad española (siglos XVIII y XIX). Despotismo ilustrado y revolución liberal*. Madrid: Tecnos.

Ponce, Aníbal. 1987. *Educación y lucha de clases.* Madrid: Akal.

Puelles Benítez, Manuel de. 1999. *Educación e ideología en la España contemporánea.* Madrid: Tecnos.

Romero Tobar, Leonardo. 1976. "Un gabinete de lectura en el Madrid del siglo XIX", en *Anales del Instituto de Estudios Madrileños*, t. XII, 205-211.

Ruiz Berrio, Julio. 1970. *Política escolar de España en el siglo XIX (1808-1833)*. Madrid: Consejo Superior de Investigaciones Científicas.

San Segundo Manuel, Rosa. 1996. *Sistemas de organización del conocimiento. La organización del conocimiento en las bibliotecas españolas*. Madrid: Universidad Carlos III de Madrid, Boletín Oficial del Estado.

Trías, Juan J. y Antonio Elorza. 1975. *Federalismo y reforma social en España (1840-1870)*. Madrid: Seminarios y Ediciones.

Viñao Frago, Antonio. 1991. "Sistema educativo nacional e ilustración: un análisis comparativo de la política educativa ilustrada", en *Sociedad, cultura y educación. Homenaje a Carlos Lerena Alesón.* Madrid: Universidad Complutense, CIDE, 283-313.

Wittmann, Reinhard. 2011. "¿Hubo una revolución en la lectura a finales del siglo XVIII?", en Guglielmo Cavallo y Roger Chartier (dirs.), *Historia de la lectura en el mundo occidental*. Madrid: Santillana, 353-385.

Anexo 1

Provincias que enviaron inventarios a la comisión central,
fecha en que lo hicieron y volúmenes inventariados

Provincia	Fecha de envío de inventarios	Núm. De volúmenes
Álava	26 de junio de 1846	951
Albacete	23 de julio de 1846	1 259
Almería	22 de [octubre o diciembre] de 1845 y 22 de junio de 1846	1 358
Badajoz	15 de junio de 1846	925
Ciudad Real	3 de julio de 1846	165
Guadalajara	16 de marzo de 1846	1 261
Huesca	22 de junio de 1846	8 226
León	4 de julio de 1846	2 832
Logroño	2 de julio de 1846	862
Oviedo	9 de octubre de 1845	44
Palencia	3 de [junio o julio] de 1846	772
Santander	9 de julio de 1845	2 858
Soria	12 de noviembre de 1845	1 035
Vizcaya	11 de julio de 1846	4 214
Total		26 762

Fuente: ARABASF, leg. 94-7/2, Circulares y disposiciones generales. Interrogatorios

Para citar este artículo:
García López, Genaro Luis. 2016. "El origen del sistema bibliotecario español: características y utilidad de los fondos bibliográficos que conformaron las primeras bibliotecas públicas en el segundo tercio del siglo XIX." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 231-262. http://dx.doi.org/10.1016/j.ibbai.2016.04.019

The collection as a reading device of political violence in children's literature in Argentina

Laura Rafaela-García *

Article received:
April 15, 2015.
Article accepted:
Junio 9, 2015.

Abstract

This paper discusses the concept of collection based on themes or objects as an approach to reading and organizing an analysis corpus. The methodological problem involving selection and interpretation of the objects of study is exemplified in the topic of political violence during Argentina's last military dictatorship (1976-1983) and representations of violence in children's literature in Argentina. On the bias of postulates forwarded by Elizabeth Jelin (2002), who defines stories of the past as communicable narratives that serve to build meaning in the future, we propose an examination of the contact points between the field of memory and modes from the appropriation of the

* INVELEC-UNT-CONICET, Tucumán, Argentina. lau2garcia@hotmail.com

past. Collections of children's readings published between 1970 and 1990 and organized in terms of the representation of violence stand as a legacy for future generations who did not experience the events. Even today the collection as a reading device challenges the selection and organization practices of material from this literary sub-genre existing at the margins of the dominant cultural system.

Keywords: Collection; Topic; Political Violence; Argentina Children's Literature.

Resumen

La colección como dispositivo de lectura de la violencia política en la literatura infantil argentina
Laura Rafaela García

Este artículo aborda el concepto de colección como un modo de leer y organizar un corpus de análisis a partir de temas u objetos determinados. El problema metodológico que implica seleccionar e interpretar los componentes del corpus de estudio se ve ejemplificado en este caso a partir del abordaje del tema de la violencia política de la última dictadura militar argentina (1976-1983) y la exploración de las representaciones de la violencia política en la literatura infanto-juvenil argentina. Proponemos realizar un recorrido por los puntos de contacto entre el campo de las memorias y los modos de apropiación del pasado a partir de los postulados de Elizabeth Jelin (2002), que define las narrativas del pasado como relatos comunicables que contribuyen a la construcción de sentidos para el futuro. Las colecciones de lecturas organizadas a partir de las formas de representar la violencia en los textos destinados a niños publicados entre 1970 y 1990 se presentan como un legado para las nuevas generaciones que no vivieron los hechos y, al mismo tiempo, muestra que la colección como dispositivo de lectura aun hoy interpela las prácticas de selección y organización de material de una zona literaria marginada por el sistema cultural.

Palabras claves: Colección; Tema; Violencia Política; Literatura infantil argentina.

Introduction

The prologue of the text *Oliverio junta preguntas* (Oliviero collects questions) by Silvia Schujer (2006) introduces the protagonist as someone who collects questions.[1] The particular quest of the young man is simple, but it nonetheless makes him stand out from his peers because, in contrast to those who collect figurines, Oliviero cannot simply buy questions in the news stand or trade them in the school yard. This situation shows that his album of questions is infinite. First he gathered only his own questions, but soon his friends began to pitch in until such time that some questions were repeated This caused Oliviero's collecting to stall, seemingly having reached a limit. This impasse causes Oliviero to change his approach and begin to try to find answers to the questions he has collected.

This story interests us because Oliviero is a great collector and the text seems to suggest that those who collect are faced with an interminable job. In this vein, we take stock in order to reflect on the task of the reader and the collector in the endless quest for meanings. This approach views the child as an active reader joining the game of literature described by Walter Benjamin (1989), a passionate book collector. In *"El panorama del libro infantil"* (Overview of children's literature), the author introduces two ideas with respect to the relationship between literature and childhood that are key to our quest to understand children's literature.[2] On one hand, there is the perception of an experience in contact with books in which the child as a reader is an active protagonist; and on the other, it alludes to the many manifestation of this form of itinerancy that a genuine exploration of literature can provide. Benjamin is not only a great collector, but also extremely interested in literature deemed fit for women and children only. Benjamin was busy preserving old children's books as a legacy of the past, in which he sought to find the duty of the future.

This study stands at the crossroads of memory of the recent past and literature. Its objective is to reflect on the modalities of reading in institution-

1 "Oliverio collected question like some collect figurines.
Questions of all kinds.
Bign and small, such as: Where is the river out of which the last Phoenician ship set sail before Roman civilization came to an end? Or: How are you? Eas and hard,such as: What color was the white horse of Saint Martin? Or: What is the square root of two million eight-hundred fifty thousand and one?
Until one day he met María Laura. Or he ran out of ink. And since then, without really trying, another notebook began to fill with answers" (Schujer, 2006:10-11).

2 "In this permeable world, adorned with colors, where everything changes place with every step, the boy is received as an actor. With costumes of every color that he collects while reading and looking, the reader enters a masquerade. He participates in it by reading." (Benjamin, 1989: 73).

al spaces. On this point, the proposition transcends the matter of reading in schools and seeks to advance toward library spaces where it is possible to conceive of reading modalities that take into account operations of selection and organization of reading material.

To exemplify our proposal, we examine the topic of political violence associated with the military dictatorship in Argentina in power from 1976 to 1983, and the ways the recent past is handed down for the purpose of ensuring that lessons are not lost by successive generations

With this purpose in mind, we combed out references to political violence in the Argentine literature targeted to children and young people between 1970 and 1990. We aim to identify current literary practices that reflect on the child as a reader. We also hope to raise the question regarding the place children's literature has in library science studies and in open access archives.

This paper is part of a larger research project whose aim is to examine memory studies in accord with the postulates put forth by Elizabeth Jelin (2002) and generally in the Argentine children's literature field.[3] This exploration led us to examine the constitutional tensions of children's and adolescent literature, and the marginality of this area of literature (Díaz Rönner, 2000), which often finds itself on the fringes of the cultural system.

In the selection of children's literature in Argentina, we can discern a series of stories that challenge the reader from the standpoint of fiction and which we call narratives. We take this concept from Jelin, who has grasped the importance of these stories in the process of the re-signification of the past. As pointed out by the author, the confluence of certain events of a private order framed in shared social contexts drives the search for meaning. In this order of events, remembered or memorable, it shall be expressed in a narrative form, becoming the way in which the subject builds meaning from the past, a memory that is expressed in a communicable story (Jelin, 2002: 27). Jelin addresses two fundamental elements: the past that takes on meaning through its links to the present, and the intention of communicating this experience that emerges from a subjective process.

The texts in our corpus provide memory studies new modulations for examining the past from the standpoint of fictional narratives. These stories feature certain scenes or situations in which the characters and action

3 We are referring to the PhD dissertation: *Narrativas de la violencia política en la literatura infantil argentina. Los trabajos de la memoria para contar la violencia política* (1970-1990) [Stories of political violence in Argentine children's literature. Works to memory to tell about political violence]; advisor: Rossana Nofal (INVELEC-UNT-CONICET), which was supported by a grant from the Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICET).

address topics associated with the political life of society, such as hierarchy relationships, the forms of domination and conflict resolution, the construction of legitimacy of power, among other matters. Our study starts from the question of how to tell new generations of things that occurred during the times of political violence that prevailed during in the last military dictatorship in Argentina. One form of responding to this question is to organize collections and identify in this practice the will to transmit and remember the past through the forms of representing violence in children's literature.

In the field of Argentine children's literature, the emergence of author Maria Elena Walsh in the 1970s launched a new generation of writers who employed new poetic forms exploiting humor and playful language in order to appeal to the imaginations of children. Outstanding among these authors are Laura Devetach and Elsa Bornemann. From the 1960s through the 1970s, this group of children's book writers began to introduce political elements in their fiction, which serves to challenge the reader with regard to certain aspects of social life. It is not about recognizing a set of values in texts, an exercise that would entails making the field retreat to positions held before the 1960s, but rather showing through the collection how the authors provide tools to the readers to learn about the world and challenge them about the way of intervening in it. Recognition of these movements of the narrative of the field toward literary arbitrariness signals the way in which the fiction of authors articulate empirical and imaginary elements, a fact that evidences the desire to transmit a certain view of the world. In the field of children's literature, this responsibility is manifested in the act of telling, understood as a long-standing literary tradition, which is why this study addresses the genre of narrative published in the study window.

At this point, our research brings together a certain topic linked to the transmission of the past and a zone that literary study has explored hardly at all, which allows reflection on the possibility of organizing collections of readings as a access way to the field of Argentine children's literature and a way of teaching the representations of political violence by a group of authors, which stands out not only for their use of symbolic language, but also for their contribution to a collective world view. In this regard, in the full bloom of the "memory boom" in Argentina in the first decade of the new millennium, Jelin stresses the cultural mechanism by which memory has a fundamental role in building the sense of belonging, and which relates it to

the activity of the collector in a world that wants to interpret its past.[4] Collecting is presented as a currently valid cultural practice that is significant in the construction of subjectivity itself.

At this point, understanding the collection as an approach to reading implies making a place for the specific interests of the reader, who wishes to quell a doubt by exploring multiple approaches to a topic or object. We define the collection as a reading device by which each subject organizes its own itineraries and selects the texts that on the basis of their personal interests serve to configure a given topic area. In this reading operation, which has an empirical basis, we can discern at least two movements: one is the selection by means of which the object is distinguished from the rest on the basis of a particular feature, and the other is by inclusion, in which this singularity re-signifies a collective and contributes to a larger group that at the same time stands apart from the whole.

The organization of a collection implies two positions taken by the collector: on one hand, the search attitude that assumes the action of tracking something, which can take the form of a question that the subject carries forward and attempts to answer through this activity; while on the other, there is the repetition of something that calls attention to itself and whose permanence marks the continuity or unity among the parties that wind up composing the whole. In this same way, collections hold a specific place in both public and private spheres, since they establish fundamental links between distinct generations, and are inherited and preserved not only for the value of their components, but also for the affective weight that imbues them a special meaning.

Let us return to Oliverio and his question collection, which is a representative figure of what each reader as heir can do with reading as they exercise the freedom to put together their own collections of texts. At the juncture of text and reader, multiple meanings and alternatives are unchained, such as in the case of the character Schujer, who transforms his initial amazing question into a collection of answers as a way of making it possible to re-appropriate objects. In this sense, we take up the concept of appropriation posited by Analía Gerbaudo (2011), who starts with the concepts of Jacques Derrida

4 "We live in the age of collectors. We record and store everything: childhood photos and the mementos of our grandmothers in the private sphere of family life. Collections of newspapers and magazines (or clippings) referring to topics or periods of history that interest us; the official and private archives of all kinds. The is a cult to the past, which is expressed in the consumption and merchandising of diverse "retro" fashions, in the antiquarian boom and the historical novel. In the public sphere, archives grow, the date to be commemorated multiply, the demand for commemorating plaques and monuments never ceases. Moreover, the communication media structure and organize the presence of the past in every sphere of daily life" (Jelin, 2002:10)

in literary discourse, and we reflect on the possibilities of understanding the reader as an heir capable of re-signifying the texts in their quest for meaning.[5] The narratives found in children's and adolescent literature collections constitute a legacy that open an unpredictable route into the subject experience of the reader and with regard to their time and place, while contributing to the construction of new understandings of the past.

The collection as a reading device

To organize a collection, it is important to start from the intention of gathering a subset of elements around a spinal axis, which can be a topic area or object that is determined in the examination of a given field, theme or segment of time, and which serves to imbue the collection with meaning. It is important to clarify that the reader shall have a rhythm of appropriation and organization of the stories in collection that is distinct from that of a reader who is just starting out in the field and in practice, since that latter must invest time in gathering and selection.

The concept of theme is operative to the organization of a collection of literary works. At this point we point to Raymond Williams in *Marxism and literature*, who asserts this term as a determinant variable, which in conjunction with the *position* or the choice of a mode of text organization and *mode of formal composition* define the concept of gender (1980: 210). As a constitutive feature of the gender category, the theme is a variable associated to the different forms of the material social process and the literary system; therefore, it arises from the scope of action, from the quality of the object or from the particular process.

Williams notes that theme is subject to social, cultural and historical variations in such a way that the emergence of studies on memory of the recent past start from an interdisciplinary approach to perform a review of the horrors of the dictatorship, which makes it possible to cross reference it with literature. In our case, this motivates our examination of how authors writing during the dictatorship allude to political violence and what kind of references can be discerned during the subsequent early years of democracy.

In this regard, we wish to stress that the collection as a reading device is determined by the features of the problem at hand, and the definition of theme is the starting point for organizing the *corpus* of work under study.

5 Gerbaudo expresses it in the following terms: "He inherits, or is ‚worthy of being considered an heir, he who is partially unfaithful, that is, he who *appropriates*, he who can make something new with that which he carries " (2011: 22).

The collection locks into the fragmentary nature of the field of memories in order to account for the injuries of the past. This includes interfering factors and memory gaps, but also tools for creating new meanings in the future. The fragmentary nature of the collection makes the story of the past bearable. In the subjective framework of the collection, the transmission process is found. Jelin and Kaufman (2006: 9) claim that subjectivity relates to processes and dynamics that are fundamental features of human existence, providing and creating meanings, while articulating experiences, representations and affiliations in a unique way. Memory specialists argue that this process is both individual and social, because experiences and emotions are always present in social relations.

Moreover, the profusion of themes and texts in Argentine children's literature in recent decades is such that the field can be addressed from the perspective of the collection, a device around which other distinct collections on diverse themes can be organized. The collection provides a Derridean way of understanding reading that according to Gerbaudo is like a journey that begins with the text one chooses and leads to other texts and toward representations holding the memory of other texts, without any certainty about all the texts involved in the work (Gerbaudo, 2007: 259). On the basis of this idea, it is possible to set up diverse itineraries based on objects or any given thread one wishes to follow. The organization of collections addresses another of the interests of our research, which is to examine the modes of fiction dealing with political violence in children's and adolescent literature, and which has been largely overlooked. In this line and in order to lend continuity to the logic of the collection as a doorway to exploring and learning about a field, we might examine representations of childhood in children´s literature, the manifestations of fear or modalities of animal characters in order to propose feasible and attractive themes that are attractive to reading and knowledge of this literary genre.

In the tasks of identification and construction of the corpus of this study, the contributions of Miguel Dalmaroni (2009) are essential, for by making the *corpus* the overt device in the domain, he makes certain questions explicit and this contributes in the direction of out assertions.[6] This operation inevitably involves symbolic violence, since it entails mechanisms of domination and exclusion that are part of the historical dispute between canon and *corpus*. It also introduces dialogue with authors from other times and poses the question about which the collection imposed order to certain subjects

6 "Is the order of the subset the condition for recognizing a collection? Who collects, and on what basis?" (Dalmaroni, 2009: 70)

in any given past (Dalmaroni, 2009: 74). Finally, in light of the philosophical and epistemological dilemma, we face the problem of building a historical-narrative and critical *corpus*, which seeks to produce and experience something new. In our case, this serves to explore representations of political violence in the field of Argentine children's literature. To this end we position ourselves as critics in order to provide new ways to re-signify the past that go beyond the historical facts or witness testimonies. We also position ourselves as readers searching for certain tracks or hidden clues that allow us to respond to the initial question of our research, which is how to relate the horrors of the dictatorship to younger generations who did not experience it.

To organize the corpus of our work, we started by reading the article "Literature for children and memories: collection of readings" by Rossana Nofal (2006), who organized the first collection telling of political violence. This collection was based on series of stories for children orbiting around the fantasy work of Rosmary Jackson (1986). This paper describes the author's survey of children's literature and her questions arising from the ways the dictatorship is depicted in Argentine children's and adolescent literature.[7] Among the things we examine in our analysis, we have the object as a common denominator of a collection, which in our case is stories, as determined by the subjectivity of the collector, the uniqueness of the individual and the object's contribution to the whole, as well as the collector's imprint on the object selected to be included in the collection, which matches, once again, the subjective value and the potential movement of the object to the periphery, where it occupies a new place among things strange or exclusive.

These conditions motivate our proposal to examine the narratives of children's literature, as the authors mount their challenge from the field of children's literature, while defying adult expectations in terms of themes and genres. The first movement consists 0f tracking the figures in this field that make the recent past conveyable, while potentiating the capacity of the children's literature field to address political violence through the act of bringing together these stories. We understand that each of these stories finds its place in the collection, and by tracking this movement we find that each has its own way of alluding to violence. At the same time, however, these stories could be part of other series, because the topics addressed and their narratives allow it to be so. In each story we recognize the unique imprint of an author, and as fiction readers we find a modulation of the past in the fictional

7 Regarding the organization of collections, Nofal provides some keys: What makes a subset of objects constitute a collection? The coherence and individuality of each element, the same class, techniques and logic for ordering them, the standard, the interest in its special value and the seduction of things strange." (2006: 115)

account. In that gesture, the story enters the public domain and becomes part of the collective logic of the collection. This is where the movement of interpretation resides, contributing to the construction of ways to think about the question at hand.

The confluence of the proposals of Jelin, stressing the need to appropriate the recent past and assign new meaning to the stories, the organization of a corpus that represents a new contribution to literary research --as Dalmaroni posits—reading as part of an experience that arises from a personal survey of a field, frm the inconceivable semantic saturation and the possibility of understanding the work of the reader or critic as unfaithful heir of longstanding tradition --as suggested by Nofal and Gerbaudo—have contributed to the organization of three collections of readings, which we believe can serve to relate political violence in literary discourse.

Itineraries of elephants, toads and monsters

We have stated that the concept of theme is essential to organizing an excursion of the field of readings that comprise by the collection. Objects or figures, however, are also important because their reoccurrence in the texts makes it possible to place them in a series and grasp their continuity and importance. In this section we intend to present a brief overview of the collections, stressing some key moments in its organization. We will also provide a general review of the texts included in each collection in order to illustrate some possible compositional movements.[8]

The first collection was called "memory of an elephant." It sets up a game alluding to the popular association of elephants with memory and the importance of memory. This idea is repeated in series of stories gathered in the study window.

The first text that drew our attention was the story "An elephant takes up a lot of space" by Elsa Bornemann (2008 [1975]),[9] which was published in a children's collection that was banned during the last dictatorship that claimed it was a threat to Christian moral values. This text and the central character, who promotes an uprising of circus animals to protest their abuse by animal tamers, provided a structure for a series stories orbiting this figure in accord with the order of appearance.

8 These collections were developed in detail in the doctoral dissertation, in several published papers (García, 2010; 2012; 2013) and in diverse conferences.

9 The initial date of publication and the importance of the production context of the texts included in our historical review shall appear in square brackets. [sic]

The stories' symbolic content and the role of the elephant as protagonist in the collection is based on the rhetorical device of metaphor referring to political forms in the adult world. The story led us to review earlier stories featuring elephants. We found the novel *Dailan Kifki* by Maria Elena Walsh (2007 [1966]). In this story, the protagonist wishes to adopt a pet elephant. This provides fodder for a crazy adventure that challenges the institutional order of society. In a tone of parody, it exposes how difficult is it for adults to respond to the situation.

We also found the story "Guy" by Laura Devetach included in *Monigote in the Arena* (2008 [1975]), which explores the elephant's fear of disappearing when it sees it reflection vanish in a pool of water. In the context of the first disappearances of persons at the hand of the dictatorship, this story posits a suggestive image. In the chronological order of the collection, the next story, "An elephant takes up a lot of space," features the protagonist Victor. The title of this story reiterates the phrase that Guy repeats to express his fear of vanishing. Victor's proposal has to do with the freedom of life in the jungle, which most circus animals have never known. In the key of fiction, there is a social proposal to oppose the oppression of Argentine society in general at that time.

In 1984, when democracy had been reestablished, Gustavo Roldan published the story "Who knows the elephant?" in the collection *The mountain was a party* (2008a). In the conversation between Sapo and Vizcacha, this text employs the figure of the elephant and some of its features, which in the logic of the collection makes sense and can be understood as the will to replace this figure on the basis of the censorship of Bornemann's text. The next story by the same author is titled "Elephant Forbidden" (Roldan, 1999 [1988]), which relates the confrontation between the Pumas and the Jaguars, the former saying the elephant is the size of a horse and the latter claiming it is the size of a mouse. This is solved by means of elections, which is knotted in a tie, and eventually resolved with a compromise position stating the elephant does not exist. Throughout the text we witness the reaction of the flea, who truly knows the elephant exists, because he lived in the circus. The flea is forbidden to speak because of his small size and the accepted view that the largest animal in the jungle does not really exist.

Finally, we included in our first collection the story "The genie of the midden", which belongs to *The hero and other stories* by Ricardo Mariño (2008 [1995]); It tells the story of a boy who lives in a garbage dump and finds a rusty teapot, a kind of magic lamp containing a grumpy genie, who nonetheless grants the boy's wish to have an elephant. The existence of an exotic elephant in a world of material deprivation generates a series of adven-

tures. At the close of this journey, this story symbolizes the will of memory as a subject's chosen means for appropriating the past. If you go into more detail in the narrative situations of texts included in this collection, you will likely discover the symbolic meaning of each of the elephants. These meanings enrich the allegory of both man's ability and impotence before authoritarianism. These symbolic meanings also echo in terms of ideological differences and hierarchies, as well as in regard to the importance of collective action that does not resort to subordinating or subjugating others. It is about political practices that cut across social life and the figure of the elephant which empowers and multiplies as it progresses along the route.

Rounding out this first collection is the story "El genio del basural" (The genie of the refuse midden), which first appeared in *El héroe y otros cuentos* (The hero and other stories) by Ricardo Mariño (2008 [1995]). It is a story of a child living in a garbage dump who find a rusty magic teapot, from which a grumpy genie emerges, who nonetheless grants the child's first wish, which is for an elephant. The arrival of the exotic elephant on the scene drives a series of adventures amid a landscape of deprivation. Closing out the collection, this adventure symbolizes the individual's willful choice to remember and appropriate the past.

A closer look at the situations posited in the narrative included in this collection reveals the symbolic meaning of each of the elephants, enhancing the allegory of the possibilities and impossibilities of acting against authoritarianism, ideological differences and hierarchies, etc., as well as the importance of collective action, without resorting to subordination and subjugation of any another party. These are political practices that traverse social life, and the figure of the elephant empowers and multiplies as it move forward.

The unifying element of second collection is Sapo (Toad), a character in the stories of Gustavo Roldan that holds a special link with the past. He is the narrator of the group and his favorite tool is the spoken word. Therefore, among the group of animals of the Chaco Forest, Toad is positioned as the legitimate representative of the voice of all animals. In the prologue to *Cada cual se divierte como puede* (Everyone makes their own fun) (Roldan, 2007a [1984]), Toad intervenes to denounce the author and claim authorship of the stories Roldán is telling. Throughout this poetic foray, we recognize the author's identification or projection into the Toad character, which allows him to become a link between past and present, and to address the issue of violence and others matters from foundation of experience. In this collection, the first stories establish Toad's status as a mediator between the life of the mountain and the city, and between past and present; while the subsequent stories focus more on the topic of political violence.

The first story in which Toad makes his appearance is "On rain and toads," where he is the victim of the superstitions held by other animals, who believe he must be held prisoner in a belly up position. The action moves forward through the dialogues involving several characters, a device that highlights spoken language and will remain a distinctive feature of the author's poetics. The particular tone of these interactions is derived from the counterpoint of voices, especially that of Toad, who manages to escape through his cunning speech. The second text that contributes to the construction of the character is the title story of *The Mountain was a party* (Roldan, 2008a [1984]) This story describes the mountain bisected by a river, with large and small animals living on either side. The narrator speaks from "this side of the river" and as the story progresses the reader leans about life on this side of the river. In the story "Who knows an elephant?" Toad manifests his ability to represent and demonstrates the power of his words to assist in the construction of the world view on the mountain, because by describing the elephants to the other animals they are able to reformulate its appearance. In contrast, the third major story in this collection, "In the olden days it really rained," Toad takes us back to his origin, thereby legitimizing his authority and knowledge on the foundation of his long experience reaching as back to the time of the flood.

On the other hand, the short story "A mountain for living," from the collection *Everyone makes their own fun* (Roldan, 2007a [1984]), reveals the collective poetic project in which the characters exist. We find the first references to political violence, such as banning and persecution under laws imposed by the Tiger, whom many animals obey. This results in silence and fear among many animals in the bush, some of which move to live on the other side of the river in a clear allusion to exile. Another important story in this collection revealing the importance of the Toad's word and role as mediator of intergenerational dialogue is *As if noise can really disturbs* (Roldan, 2007b [1986]). As good storyteller, Toad speaks the truth to the smallest animals of the mountain about the death of Tatu. The title story of the collection alludes to the discomfort of death and the void caused by the silence of absence. Toad's account shows the hostility of death as part of life. The character's farewell is an act of remembrance in which the joy of Tatu's life and all of his adventures are retold.

The story "The size of fear" tells the tale of Coati's encounter with fear. In the first part of the story, the narrator builds suspense through the device of spoken counterpoint, because Coati never states who is chasing him; but he gradually describes his tormentor as he responds to Toad's questions. This reveals that the supposed monster does not exist and is rather a prod-

uct of Coati's imagination. Thereafter, Toad deftly helps Coati face this monstrous image and dismantle it.

The auditorium filled with animals asks Toad how he recognized the threat, and Toad responds that he has faced it many times. The story closes with Toad wisely assuring all the animals that one's fear is just like the fear of others. In this scene, subjectivity is presented as a part of the construction of each subject needed for facing the challenges; and it is accepted as a trait of the personal and shared collective identity.

Roldan's (2008b [1989]), collection *Toad in Buenos Aires* is his fundamental vehicle for addressing political violence. It includes the key stories: "Likes are likes" and "The rules of the game". In the former story, Toad describes life in the big city and he tells the animals of the jungle of the daily hustle-bustle, the crowding, the polluted river, the people's interest in learning about animals from other lands, etc. The allusions to prohibitions, censorship and police intervention as a way of life are critiques of society's illogical order. Toad acts as if these things are perfectly natural, but the animals are indignant at his suggestion that such are "The rules of the game." The story speaks of the political organization of the city. The game known as elections has several stages, involving posting campaign posters on all of the walls of the city, casting ballots and other associated activities. Toad explains all of this in an objective way despite the bafflement of the animals, who speak out appalled at all of the abuses they learn about. When Toad describes the military class, he uses a shared code and is able to transmit the very real danger such people represent. Toad tells them of all the people who spoke out against the system and tried to change the rules of the game.

In this reading tour, we conclude that the objections of the animals of the jungle reveal the operation of a system of norms and codes distinct from the ethical and political project guiding the lives of the animals. In Roldan's poetics we see an alternative to political violence based on collective actions. This collection addressing political violence is built on the figure of analogy, which allows the reader to recognize similarities between two social organization represented by the way of life in the jungle and the ways on the other side of the river. In this context, the mediator between the distinct parties and the distinct time frames is Toad. Roldan shows the reader situations that are similar to the Argentine social reality, and he shifts these into his stories of life in the jungle in order to highlight the irony of the positions taken and the variants employed to resolve problems.

The third collection is organized around the figure of the monsters and their potential modalities. This is why we decided to call this collection "The monstrous." This collection consists of stories published in the decade of

the 1980s and the first half of the 1990s, during the early years of the democratic reorganization. We stress this context for two reasons: on one hand, it allows us to highlight the emergence of the fantasy genre in the field of Argentine children's literature, while on the other being mindful of the public's growing demand for authorities to account for the disappearance of persons during the dirty war. In this regard, the climate of the those times was informed not only by the experience of violence, but also by the voices of victims and other directly affected parties, which served to mobilize the outrage of certain social groups.

Recall that in these years the National Commission on Disappeared Persons (CONADEP) is established, and in 1984 it published a report titled *Never Again*, gathering the testimonies of witnesses and survivors of the killing centers.

With the conception of monstrousness, emerging from the appropriation of the fantastic and especially from children's fantasy literature, we allude to a narrative field that addresses the strangeness found in situations that cause deformation of the familiar, what Freud called sinister, the involvement of monsters and ghosts as protagonists that recreate "the other" --both distant and near to the world of the reader-- and sensibility that moves beyond the story to give rise to a subjective experience built within the limits of the unspeakable and representable. The uniqueness of the experience of violence influences the authors in the field, and they employ the fantasy genre to subvert and attack the establishment cultural order by undoing its structures and meanings.

To define this concept we appeal to Rosmary Jackson (1986), whose work employs three central features of the fantasy genre: its disruption and undermining what is representable and "real" in literature; its hostility towards static units by juxtaposing incongruous elements while resisting fixedness, and, finally, its ability to dissolve the basic notions of time, space and character in conjunction with the appropriation of language and syntax in order to raise questions about the social order and the meaning of life (Jackson , 1986 : 12-13) . Fantasy modalities make it possible to address issues relating to the fragmentation of personality, the natural fear of formlessness, absence, death, while also offering ways to resist and react against the arbitrary social order.

The monstrousness recognizable in the singular figure of the monster assumes the symbolic form of fear in stories that speak from the position of fear and the things fear can produce. The latter aspect of fear is illustrated in the first story of our collection, titled *Irulana and ogronte (A Tale of plentiful fear)*, by Graciela Montes (1991). This story contrasts the exceptional size

of the monster and the tininess of the protagonist. The device exploits two manifestations of fear, as the protagonist is paralyzed at the sight of the monster and the people are emotionally subjugated to the monster's foul moods. The arbitrariness of power depicted in the story addresses not only political violence, but also touches on the relationships between adults and children. Early in the story we learn the protagonist's name is Irenita, the narrator, however, gives her the nickname Irulana thanks to her courage and other twists and turns of the story. In the final scene in the dark of night, Irulana is faced with the sleeping monster; she builds up her courage and shouts out her name. The importance of this scene lies in the power of the word, in this case the proper name. Moreover, the scene informs other scenes contained in the collection, while providing clues on how to face fear.

The flip side of the monster is parodied in the prologue of the collection titled *Help! (12 stories to collapse in fear)* (Bornemann, 2004 [1988]), which is signed by none other than the infamous Frankenstein. In the poetics of Elsa Bornemann, the modes of addressing terror are mediated by humor. In this case parody is achieved intertextually through the allusion to Gothic literature. In an amiable tone, Frankenstein usurps the role of author to confess his fears and express his desire to be liked. The humanization of the character serves to appeal to the reader and his choice readings within the terror genre. The collection *Help! (12 stories to collapse in fear)* understands the torments stirred by fear. The fear of death that haunts us as children is addressed in diverse childhood situations. In the story "The lady in 11-J," a perverse grandmother comes back after death in the things her only granddaughter has inherited, and ultimately makes the little girl disappear. In the story "The Sleeve" a strange neighbor turns into a spider and kidnaps children and kills them in his web. The animation of inanimate objects, strange unfolding of time and space, transformations and duplication of the characters are some of the motifs of the fantasy genre that appear throughout the stories in this collection. These strange event occur on a backdrop of ordinariness, thereby creating an atmosphere fraught with ambiguity as the characters are forced to interpret the world from their subjective standpoints.

Another inflection of this collection can be found in the first children's novella titled *I have a monster in my pocket* by Graciela Montes (2003 [1988]). The protagonist Ines projects feelings and desires onto the monster that lives in her apron pocket. Narrating in first person, Ines provides the facts and presents situations that touch on how to face and solve personal fears with regard to physical appearance, shyness and difficulties encountered in school and with family during the transition into adolescence. In this case, the monster acts as a projection of Ines' thoughts, and reacts in

diverse ways. At first, Ines was a little surprised and at the same time amused with the monster that seemed to grow and shrink at will. However, there comes a day when she wanted to break free of the monster, which had increasingly taken more and more space. Since she cannot rid herself of the monster that is soon destroying everything, she becomes very frightened. The conflict is resolved when she manages to cope with certain personal situations and is able to tell her grandmother Julia about the secret monster. Julia takes it in all very naturally, telling Ines that we all have a hidden monster, and that the best way to make it go away is to talk about it.

Another facet of the monster figure appears in the novel *Maruja* by Ema Wolf (2011 [1989]), which parodies the life of monsters. The story tells of Veremundo a hideous, disheveled monster that hates children. The plot is launched when one day his aunt, a ghost called Maruja, who is dispossessed by a flood in the local graveyard, arrives to his mansion and takes up residence. Veremundo experiences an invasion of his personal space and sees his lifestyle altered, which unleashes a series of mishaps as he vainly tries to get Maruja to move back to the cemetery. This parody of domestic life first entices the reader to sympathize with the monster, but soon the high jinx of Maruja, who is a box of surprises, begins to win the reader over.

This collection also offers several stories with a naturalistic tone that through subjective experiences of violence show the disturbing power of sinister secrets, while at the same time positing themes that are often muzzled in the contemporary society. Bornemann's story "Never visit Maladony" from the collection *Help! (12 stories to collapse with fear* (2004 [1988]), relates the tale of Timothy Orwell, a youngster of thirteen who wakes up to find one day that his neighbors and family do not know him. As the reader ponders this situation, the story explores the unlikely fate of the boy who inhabits a once familiar world that suddenly turns strange and hostile.

When Tim comes home after school, he finds himself cut off from his familiar world and the new homeowners and neighbors believe he is crazy. The youngster wakes up in a hospice room, tied to the bed, and in a nightmarish twist he finds that his caregivers are his family members. He is held there for forty years and finally discharged when he stops identifying the people around him as his family, who by that time are all deceased. The narrator, an Argentine student on scholarship in London, questions Tim, who tells his story, giving his own version of the facts. Tim then disappears into the London crowd and the narrator decides to return to his country. The ending poses the paradox of the situation through a direct reference to the year 1978, when the dictatorship was at its most repressive. The feeling of estrangement envelopoing the entire story is also a modulation of the violent intrusion that

disrupts the daily life of the protagonist, who suffers captivity, oblivion or the outright rejection of his community.

The last text is the collection, *Otherness: Latest news from the underworld* by Graciela Montes (2007 [1991]), manifests the need for transgressing the order of reality through the representation of the underworld. In this story, the institutional order of the clandestine life of a group of youngsters and the violent threat posed by Patota is reasserted, in a likely allusion to the militancy of the 1970s and the procedures of the armed forces during the dictatorship. These elements are also mixed with the meta-literary discourse introduced by the narrator to tells how the story is put together and his relationship with those witnesses who eventually dare to speak. The importance of this text lies in the way it represents the weak and blurred boundaries between private and public spheres that are threatened by violence, addressing issues such as the underground and its persecution that serves to create a climate of constant intimidation.

This general overview of the fantasy themes in children's literature shows that violence can also be conveyed from subjective states unfolding in certain scenes in which fear, silence, oblivion and estrangement are experienced. The device on which this collection is organized is cause-consequence, the first being fear, which results in multiple manifestations of subjectivity issuing through the modalities of fantasy.

Concluding the tour of our collections, we can say that literature does not directly cite the violent events of the past: there are other discourses for that. Our collections challenge the reader's sensibilities through situations give an account of the ways in which violence affects the subject; and, therefore, the approach of these texts transcends their context of production and the issue of political violence. As Nofal (2006) states, violence is conveyable in children's literature through fantasy. In our collections, we recognize three themes that serve to tell about the recent past: the abuses of power and the unveiling of political forms belonging to the adult world revealed in certain scenes of the first and second collection; the power of collective action led by Toad and the revolutionary thought of the elephant that leads to change and intergenerational dialogue; and, finally, the experience of fear as a modulation of the private wounds and public trauma cause by political violence.

The fictional pact assumed between reader and literary work that occurs when one begins reading and the continuity of the characters proposed in each collection contribute to the construction of the reader's subjectivity, so that during the course of reading ideas are introduced inviting the reader to identify with a character, situation or subject. Moreover, as readers, we know that after reading, the outlook of the subject is never the same. In this line of

thinking, a sojourn in the poetic texts included in our collections place the reader before new conditions for questioning the world and defining how to live in it.

Final reflections

In view of these considerations, we can conclude that literature rehearses actions, valuations and considerations that dispute the reader's subjectivity; and the act of reading creates a space where manifold imaginative variants can be tested (Ricoeur, 1999). The relationship we raised between reading collections, the continuity of a theme or object, and the subjective processes in play to draw meaning out are potentiated in the collection as a reading device allowing many issues to be addressed simultaneously.

Literature can create a watershed by providing readers opportunities to practice the task of interpretation, where the authors of children's literature grant the reader the power to question the world. Stories and narrative situations making up these collections articulate a willingness to bestow experience through reading. At this point, the practice of collecting is associated with the intergenerational transmission of experience while acknowledging the individual's needs to make his own imprint. According to Jelin:

> In order to transmit the meaning from the past, there are at least two requirements: the first requires the existence of foundation for a process of identification to achieve an intergeneration expansion of the concept of "we". The second requirement is to open up the possibility of those who "receive" to make their own meanings and to practice interpretation and signification on their own terms, without resorting to rote memorization (2002: 126)

In this line of thinking, Jacques Hassoun says in *Los contrabandistas de memoria* (Smugglers of memory) (1996) that we are all caretakers and conveyors of an inherited legacy built actively from generation to generation, because it does not happen on its own. In these stories, children's authors work as mediators between past and present, performing the role of social agents who employ their knowledge of the past and their belief that children are capable of attaining autonomy through contact with literature that excites the imagination.

The collection as literary device reveals that Argentine children's writers have a lot to offer regarding the ways of representing the world, and their mastery of aesthetic forms serves to bring the reader into closer contact with this world. On the other hand, the cultural system needs to provide more

support to the field of children's literature, because there are still broad aesthetic areas to be explored to bring children closer to literature. In general, this literary genre is viewed with some prejudice. The approaches presented herein seem to respond to a personal interests of certain authors, such as Walter Benjamin. Finally, highlighting the attributes of the collection as a literary device leaves out the occlusions entailed in this approach. To show the potential of the field of children's literature, however, we first prefer to concentrate on this modality of reading which grants autonomy to the reader, who must make choices and decisions in the knowledge that by doing so he foregoes other readings and interpretations.

Works cited

Benjamin, Walter (1989). *Escritos. La literatura infantil, los niños y los jóvenes*. Buenos Aires: Ediciones Nueva Visión.

Bornemann, Elsa (2004). *¡Socorro! (12 cuentos para caerse de miedo).* Buenos Aires: Alfaguara.

Bornemann, Elsa (2008). *Un elefante ocupa mucho espacio.* Buenos Aires: Alfaguara.

Dalmaroni, Miguel (dir.) (2009). "1.Discusiones preliminares: el campo y el corpus", en *La investigación literaria. Problemas iniciales de una práctica.* Santa Fe: Ediciones UNL, 61-79.

Devetach, Laura (2008). *Monigote en la arena*. Buenos Aires: Ediciones Colihue.

Díaz Rönner, María A. (2000). "Literatura infantil de "menor" a "mayor", en Noe Jitrik (dir.), *Historia Crítica de la literatura argentina,* t. 11, Buenos Aires: Emecé, 511-531.

García, Laura R. (2010). "Memoria de elefantes para la violencia política", *El hilo de la fábula. Revista anual del Centro de Estudios Comparados* 8, Santa Fe: Universidad Nacional del Litoral, 75-84.

—— (2012). "La poética de Gustavo Roldán: un colectivo de personajes" en Valeria Sardi y Cristina Blake (comp.), *Un territorio en construcción: la literatura argentina para niños.* La Plata: Universidad Nacional de La Plata, 133-143.

—— (2013). "*Lo monstruoso* en la literatura argentina para niños. Colección de lecturas para contar la violencia política", *Telar. Revista del Instituto Interdisciplinario de Estudios Latinoamericanos* 13, Tucumán: Facultad de Filosofía y Letras-UNT. (En prensa)

Gerbaudo, Analía (2007). *Derrida y la construcción de un nuevo canon crítico para las obras literarias.* Córdoba: Jorge Sarmiento Editor-Universitaslibros/Ed. FFyH (UNC).

—— (2011). "El docente como *autor* del currículum: una reinstalación política y teórica necesaria", en Analía Gerbaudo (dir.), *La lengua y la literatura en la escuela secundaria*. Santa Fe: Homo Sapiens Ediciones, 17-27.
Hassoun, Jacques (1996). *Los contrabandistas de la memoria.* Buenos Aires: Ediciones de la Flor.
Jackson, Rosmary (1986). *Fantasy. Literatura y subversión.* Buenos Aires: Catálogos.
Jelin, Elizabeth (2002). *Los trabajos de la memoria, memorias de la represión*. Buenos Aires: Siglo XXI Editores.

Jelin, Elizabeth y Susana Kaufman (comp.) (2006), "Introducción", en *Subjetividad y figuras de la memoria.* Buenos Aires: Siglo XXI Editores, 9-15.
Mariño, Ricardo (2008). "El genio del basural", en *El héroe y otros cuentos.* Buenos Aires: Alfaguara Infantil.
Montes, Graciela (1991). *Irulana y el ogronte (Un cuento de mucho miedo).* Buenos Aires: Libros del Quirquincho.
—— (2003). *Tengo un monstruo en el bolsillo*. Buenos Aires: Editorial Sudamericana.
—— (2007). *Otroso. Últimas noticias del mundo subterráneo.* Buenos Aires: Alfaguara.
Nofal, Rossana (2006). "Literatura para chicos y memorias: colección de lecturas" en E. Jelin y S. Kaufman (comp.), *Subjetividad y figuras de la memoria.* Buenos Aires: Siglo XXI Editores, 111-129.
Ricoeur, Paul (1999). *La lectura del tiempo pasado: memoria y olvido.* Madrid: Arrecife.
Ritvo, Juan Bautista (1988). "Walter Benjamin y la retórica de la ciudad", *Revista Paradoxa. Literatura/Filosofía* 3 (3) (diciembre). Disponible en: http://bit.ly/15jcp2H
Roldán, Gustavo (1999). *Prohibido el elefante.* Buenos Aires: Editorial Sudamericana.
—— (2007a). *Cada cual se divierte como puede.* Buenos Aires: Ediciones Colihue.
—— (2007b). *Como si el ruido pudiera molestar.* Buenos Aires: Editorial Norma.
—— (2008a). *El monte era una fiesta.* Buenos Aires: Ediciones Colihue.
—— (2008b). *Sapo en Buenos Aires*. Buenos Aires: Ediciones Colihue.
Schujer, Silvia (2006). *Oliverio junta preguntas.* Buenos Aires: Editorial Sudamericana.
Walsh, María Elena (2007). *Dailan Kifki.* Buenos Aires: Alfaguara.
Williams, Raymond (1980). *Marxismo y literatura.* Barcelona: Península.
Wolf, Ema (2011). *Maruja*. Buenos Aires: Editorial Sudamericana.

Para citar este artículo:
García, Laura Rafaela. 2016. "La colección como dispositivo de lectura de la violencia política en la literatura infantil argentina." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información* 69: 263-284. http://dx.doi.org/10.1016/j.ibbai.2016.04.020