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Global Translation Flows in Ibero-American Periodicals: A Network Science Perspective

1 Introduction

Literary, translation and art history, comparative literature, and intellectual history have been featured in the last two decades by a data-driven perspective and by the purpose of combining both qualitative and quantitative methodologies. Likewise, global studies have faced the idea of connectivity and movement as a real challenge. In this regard, researchers are still struggling to analyze the existence (or lack) of relations, flows, circulation and mobility, concepts that can shed light into processes of cultural, political, economic, or social transformation. The role of connectivity and the relevance of networks as the emerging form of social organization has been at the core of fundamental works (Castells 1996) and historical questions are increasingly analyzed in terms of network analysis, mathematical modeling and visualization techniques. Cultural phenomena related to the concepts of centrality and periphery also arise. Certainly, network science has put social relations and the study of cultural mediators at the center and important endeavors such as the platform Historical Network Research or the *Journal of Historical Network Research* emerged. They provide training, workshops, lectures, research bibliography and an open-access journal to a wide community that is now internationally oriented and work in fields and geographical areas less prone to this approach, including Ibero-America. Many researchers work in large-scale contexts and share this interest for the analysis of global connections and entangled histories (Middell and Naumann 2010; Berg 2013, Conrad 2016, Rotger, Roig-Sanz and Puxán 2019), but this is not yet widespread in all domains, academic traditions, and time periods (Liu 2018). For example, cultural analytics (Manovich 2015, 2020) and knowledge data discovery (Meyer and Schroeder 2015; Borgman 2015) have not been applied sufficiently in many non-European contexts to test assumptions on literary value, institutions, or the position of cultural producers in the cultural field, or to reassess the role of many actors. These shortcomings can be due to the lack of structure and digitalization of many sources and archives (Algee-Hewitt et al. 2016) in non-European contexts for a data mining approach. But also because of the fact that previous research on world literature has placed most of these actors in relation to their "peripheral" origins, or in a

subjugated relation to the center or to the empire. Therefore, the idea of the network as a mere metaphor to describe the existence of relationships among people or objects is no longer sufficient to address the complexity of the information encapsulated in big amounts of data (Carbó-Catalan and Roig-Sanz 2021).

Within this framework, this paper aims at offering some insights regarding methodological issues and practical applications when applying big data to disciplines in the humanities (Schäfer, and van Es 2017). Specifically, it aims at contributing to the analysis of circulation and global translation flows within a big translation history approach (Roig-Sanz and Fólica 2021; Fólica 2021) and a relational perspective (Ashrafi, Hashemi, and Akbari 2019). We advocate for global translation zones, which can be understood as a space of translation that is constituted upon the following criteria: a geographical scale (human and political, but also physical: the Andean mountains, Río de la Plata or the Caucasus), a time and a historical dimension (historical channels of translation), and in terms of agency and networks (Roig-Sanz and Kvirikashvili forth.). This means publishing zones (agreements between publishers, specific languages and literatures, and literary magazines) and circuits of soft power (the role of national or regional institutes in inter-peripheral translation flows or in the emergence of a translation policy). We claim that global translation zones must be explored in the *longue durée* and in the framework of a complex and multilingual history that cannot be overshadowed. In this respect, we aim at addressing the following research questions in the field of translation and literary periodicals in Ibero-America (Fólica, Roig-Sanz and Caristia 2020) in the first half of the twentieth century: 1) What is the level of internationalization of these journals? Which literatures and authors will be translated and circulated? What is the geographical distribution of authors and languages in relation to what we denote as global translation zones? 2) How do we analyze global translation flows through the lenses of network science?, and 3) What profiles can be found in relation to translators and writers and, specifically, to women translators or women writers if we apply a gender perspective?

To this aim, this paper will analyze the literary translations which were published in a corpus of literary magazines already digitized to unearth and restore a less-canonized translation history that is often overshadowed. The research is based on a dataset of contributions published in 42 modernist and avant-garde periodicals from Spain and Hispanic America between 1891 and 1936, cataloged and published by Ehrlicher (2020).[1] In the dataset, a contribution is considered any tex-

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1 The full list of magazines cataloged for the dataset can be consulted in Ehrlicher (2020): Spanish-language Cultural Magazines from Modernismo to Avant-Garde: Processes of Modernization and Transnational Network Formation. Revistas culturales históricas en lengua española desde el modernismo hasta las vanguardias: procesos de modernización y formación de redes transnacionales. 0_Corpus-Overview.pdf. Accompanying Publications. DARIAH-DE. doi:10.20375/0000-

tual or graphical piece published in the journal. In this respect, our results are not exhaustive, yet they can highlight patterns of translation and circulation, as well as translation practices. While one of the principles of creating this corpus has been geographical variety and representation across Spain and Hispanic America, it has to be noted that more than half of the records are from Spanish periodicals, mostly published in Madrid. It is also worth reminding that the magazine as an object of research had a key role in the construction of a collectivity, as it offered a space for collaboration, exchange and collective projects. From a researcher's point of view, it offers the opportunity to trace networks of people and networks of translated literatures, writers, publishers, and translators. To this end, we apply a network science perspective (Barabási 2011) to explore and visualize metadata extracted from these magazines (Fólica, Ikoff, and Roig-Sanz 2018; Fólica, Roig-Sanz and Caristia 2020; Roig-Sanz and Fólica 2021; Lehmann and Ehrlicher 2022).

2 Data: Definition and Dimensions

The dataset contains about 31,500 data records (rows), each representing a contribution and one corresponding contributing author,[2] providing descriptive data such as the title and genre of the contribution, the contributor (author), date of publication, publication language, and for some entries, also the translator and/or the original language. Overall, the dataset is made of 31,500 records of contributions in 26 different languages, corresponding to 4,551 authors and 266 translators from 58 different countries. Table 1 (please see below) provides a summary of the composition of the dataset according to the place of publication, as well as what we have called global translation zones (please see the definition above). In the case of Ibero-America, we have highlighted the following global translation zones: the Iberian Peninsula, Río de la Plata, Andes, the Caribbean, Mexico, which has specific dynamics in relation to publishing, translation flows and the marketplace, and Other, which refers to Spanish-speaking journals published outside Ibero-America (for example, in France). As the magazines in the corpus differ from one another in terms of longevity, format, time of publication and volume, the properties of the corpus

000d-1d02-1. The ERC project Social Networks of the Past. Mapping Hispanic and Lusophone Literary Modernity, 1898–1959 has established a data sharing agreement with Prof. Hanno Ehrlicher from the University of Tübingen. It's also worth mentioning that translation is not at the core of his research, so this chapter aims at filling this gap.

2 This means that a contribution with multiple authors results in multiple records, one for each author, as explained by the authors of the dataset in the accompanying publications (Herzgsell 2020).

are quite heterogeneous. This means that the corpus is made by both periodicals with a high number of contributions, as well as periodicals with only a few of them. Moreover, it has to be said that although most magazines were fully cataloged, there are six for which this was done only partially, due to either the unavailability of the magazine as a digital object, or to limited resources for the cataloging task (Ehrlicher 2020).

Table 1: Number of journals, issues and records per global translation zone and city of publication.[3]

Region	Place of Publication	Magazines	Issues	Records	Records, %
Iberian Peninsula	Madrid	13	448	14276	45.32%
	Barcelona	4	39	1144	3.63%
	Sevilla	1	50	1063	3.37%
	A Coruña	1	11	348	1.10%
	Málaga	2	9	181	0.57%
	Santander	1	5	71	0.23%
TOTAL		**22**	**562**	**17083**	**54.24%**
Río de la Plata	Buenos Aires	4	174	5545	17.60%
	Montevideo	1	2	57	0.18%
TOTAL		**5**	**176**	**5602**	**17.79%**
Andes	Lima	1	32	1569	4.98%
	Santiago de Chile	2	47	998	3.17%
	Puno	2	35	420	1.33%
TOTAL		**5**	**114**	**2987**	**9.48%**
Caribbean	La Habana	3	90	2884	9.16%
TOTAL		**3**	**90**	**2884**	**9.16%**
Mexico	Mexico City	4	170	2382	7.56%
	Jalapa	1	10	488	1.55%
TOTAL		**5**	**180**	**2870**	**9.11%**
Other	Madrid-Paris	1	3	44	0.14%
	Paris	1	2	27	0.09%
TOTAL		**2**	**5**	**71**	**0.23%**
TOTAL corpus		**42**	**1127**	**31497**	**100.00%**

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3 The dataset does not include magazines from Andean countries such as Ecuador or Bolivia, as well as Caribbean countries such as Puerto Rico and Venezuela. We hope to fill this gap in the future.

As we are interested in translation, i.e., textual contributions, we take into account all the records except for those classified as "image," leaving us with approximately 81% of all the records. Moreover, we also discard those records whose author is either unidentifiable (e.g., "R.A.C.") or does not correspond to a person (e.g., "Redacción"), as our research is mainly interested in authors/writers, translators or cultural mediators overall (Roig-Sanz and Meylaerts 2018). To this aim, we manually curated a list of 296 "bad authors' names" to exclude them from our corpus, leaving us with only 20,663 records to analyze, corresponding to the 65.51% of the raw data. The list of "bad authors' names" is available online[4]. On the other hand, as we are also mostly interested in translation, we have designed a criterion to discriminate those records corresponding to translations from the rest of them. According to such criterion, data record can be considered a translation either if the values of the *"original language"* and *"publication language"* fields are different (e.g., English and Spanish), or if the *"translator"* field is not empty (e.g., "Maseras, Alfons" or "Villaurrutia, Xavier"). By applying this criterion we split the dataset into a subset of "certified translations" (made of 981 records), and a subset containing all the other records (19,682 records).

3 The Internationalization of Ibero-American Literary Magazines Through Translation

Global translation flows and the international circulation of literature has played a historical role in the institutionalization of national cultures (Thiesse 2001; D'Hulst 2012), especially in contexts characterized by a significant backwardness compared to other spaces, or in contexts historically considered as "peripheral" despite being at the forefront of many innovative literary or translation projects. As we know, for translation in periodicals many important works were published first in journals and literary magazines, the latter being especially important in the Ibero-American context. Journals were the center of new movements, trends, and intellectual debates related to any issue in relation to culture. They also made visible the national (or international) recognition of an author, or a new literary genre being discussed in this media. At the same time, journals were an essential means by which literary and artistic groups staged public appearances, and connections among them reinforced their mediating role between the global, the regional, and the local scale of literary knowledge.

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4 The complete list of "bad authors' names" is available at: https://cardillo.web.bifi.es/datasets/translation-list_bad_names.txt.

Within this general framework, this section seeks to analyze and measure the internationalization of Ibero-American literary magazines through translation with a twofold aim: 1) to analyze which kind of books, literatures, and authors were channeled through translation, as well as which is the geographical distribution of authors and languages in relation to what we understand as global translation zones, and 2) to find out how literary magazines worked on a global scale and set up a dialogue with other international periodicals. We can already confirm that Spanish-speaking literary magazines participated in a cosmopolitan community (Gramuglio 2013), and followed contemporary trends, which legitimated them as modern institutions in both Europe and the world. In Spain, literary journals also fostered regional identities (the Catalan *La Revista* or the Galician *Nos*) and also aimed to connect with the transatlantic world (the Galician and Uruguayan *Alfar*). Indeed, it has to be said that the international circulation of literatures in translation has pushed forward the emergence of the first public translation policies to standardize translation practices (Carbó-Catalan 2022). It has also helped to promote translation and cultural development (Pegenaute 2018) and to institutionalize the profession of the translator. Translation in periodicals also encouraged the inclusion of non-European writers in an international network of culture.

In Latin America, cosmopolitan purposes also coexisted with national cultural projects (Fólica 2022), indigenism, and revolutionary ideals (the Peruvian *Amauta*). In that respect, modernist journals contributed to enhance a newly stratified Ibero-American market by conferring prestige and symbolic capital to writers eager to reach an international audience. Apart from the cultural projection of their own countries abroad, writers with diplomatic careers also made a living as authors or translators, increasing their literary prestige. Translations in magazines were also crucial for the popularization and democratization of culture, and they acted as a shared space for both the dissemination of the various national literary and aesthetical projects, and for the increasing cosmopolitanism of Spanish-speaking literatures in the international literary field, (Willson 2004).

In this respect, our research shows that international contact, as well as the intensification of connections among various countries and global translation zones around the world throughout the period that some authors have called the first globalization (Rosenberg 2012) affected multiple realms in the social field, including the cultural one. These connections had close ties to the reinforcing of national identities. Indeed, while the national space provides a scale of reference, the analysis of translation flows in Ibero-American periodicals actually includes many scales: the local, national, regional, and global (Bender 2006). In this sense, translated literature constitutes a privileged object with which to view the selection of various authors that multiple editors made within a myriad of magazines. Simultaneously, they also cast light on the construction of a literary and transla-

tion canon – which was not homogenous across the region, despite sharing certain similarities in some cases. Thus, translation emerges as a way of contributing to the construction of the nation, but is also a way of positioning the nation within the world through the Other. Works by Thiesse (2001) and Wilfert (2020) have demonstrated the complexity of this relationship – and we may add that, through translation, a set of texts can become cultural heritage. In this sense, the magazines in our corpus show how these publications situate themselves within an international debate that cannot be taken separately from the many battles for legitimacy and consecration taking place on multiple scales.

In what follows, we offer some quantitative insights that help us give an overview of the cultural phenomena we just briefly described above. Within a distant reading approach (Moretti 1998, 2005, 2013), we have identified in our corpus the presence of literary translations and the first observation that comes out is that the fraction of contributions explicitly labelled as translations – identified via either the name of the translator or the original language – tends to be small, given that recognizing a contribution as translated or acknowledging the translator was not common practice. For instance, in our dataset of the 31,497 records, 10,864 belong to unidentifiable authors. Thus, translations in our dataset represent a small proportion of all publications, about 4.6% across the six global translation zones that we have defined. As displayed in Figure 1, the most frequent languages are Spanish, French, Catalan, English, German, Italian, Portuguese, and Galician.
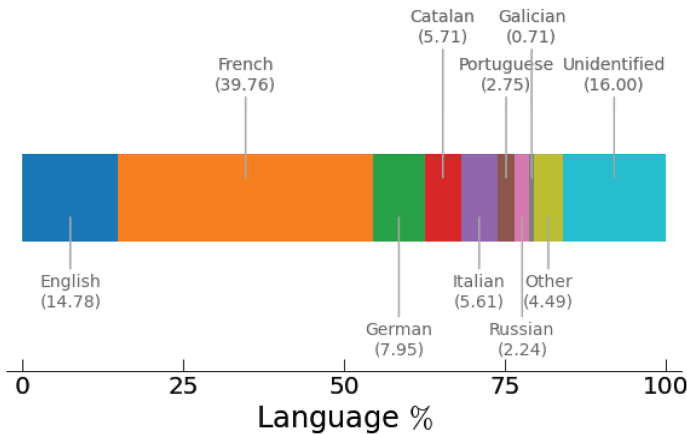

Figure 1: Fraction of records according to their original language. We report the eight most translated languages in our dataset. We also display the fraction of records whose language is not among the most translated ones (Other), or it is not available (Unidentified).

If we analyze the nationalities of authors' writing languages different from Spanish (Figure 1), we notice the presence of a non-negligible fraction of Italian, Catalan, and Galician authors. In fact, the role of the Galician, Catalan, and Italian migrant communities in the Río de la Plata's region is fundamental and multilingual practices appear in those magazines. In this respect, it is important to acknowledge that this research has only considered as translations those texts with information on the translator or the original language, but for the purpose of identifying translations which are not explicitly marked as such in the periodical, the idea that the authors' nationality or country of birth may be used to infer the language of their works does not always stand up to scrutiny. For instance, we are aware that some authors with foreign names were able to express themselves in languages other than their mother tongue. Thus, we are legitimate to believe that some of these authors wrote in Spanish as a consequence of people's transnational movements. This is the case of the French national Paul Groussac, director of *La Biblioteca*, and director of the Argentinean National Library between 1885 and 1929, or Israel Zeitlin, who also lived in Argentina and wrote in Spanish despite being from Russian origins. Hence, in our corpus the contributions of these authors are considered as normal contributions, not translations.

If we now examine the place of origin of all foreign authors published or translated in the global translation zones that we have proposed for this chapter (i.e., Andes, Caribbean, Río de la Plata, Mexico, Iberian Peninsula, and Others), the results suggest significant differences between them (see Table 2 below). For the Río de la Plata, about 62% of the translations were made from French, mostly from authors of French origin (e.g., Henri Barbusse or Romain Rolland). However, there are also French-Latin American authors such as Jules Supervielle (French Uruguayan), or other authors with East European origin. If we examine the number of articles by authors identified as foreign in a small sample of four Argentine magazines (*La Biblioteca*, *Proa*, *Martín Fierro*, and *Claridad*), we already see (Figure 2, see below) that most of them come from France, Russia, and Italy. Of the 131 translations identified, 80% of them belong to French, Russian, and Italian authors, relegating English-speaking authors (i.e., those from the United States, United Kingdom, Ireland, and Canada) and Portuguese language authors to marginal roles.

Similarly, literary magazines from the Iberian Peninsula and the Andes also contain many translations from French. About 50% in the case of the Iberian Peninsula with authors like Émile Zola, Paul Verlaine, or Guillaume Apollinaire being some of the most translated. In the Andes, translations from French (e.g., Panaït Istrati, or Paul Verlaine) just about edge those from English (e.g., the American writer Waldo Frank or the British Romantic poet P. B. Shelly), and Russian (e.g., Anatoli Lunacharsky or Isaac Babel) languages. Overall these three groups make

Table 2: Distribution of languages across global translation zones. For each translation zone, we report the percentage of records written in each of the three most common original languages in each region together with the same quantity computed for all other languages (Other languages).

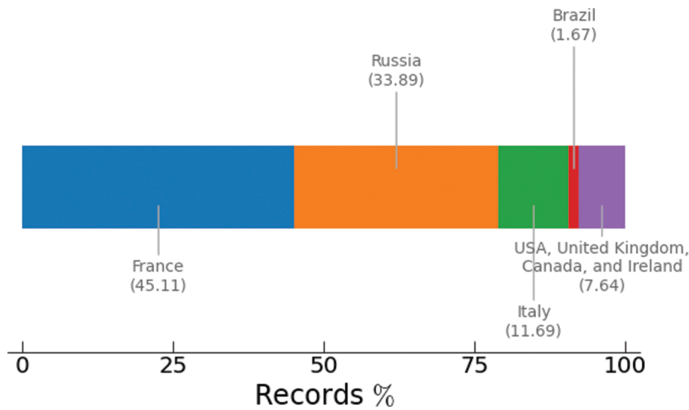| Region	1st Language	2nd Language	3rd Language	Other Languages
Iberian Peninsula	French 50.28	English 12.01	German 9.19	28.52
Andes	French 26.09	English 21.74	Russian 19.57	32.61
Rio de la Plata	French 61.97	Italian 11.27	English 8.45	18.31
Caribbean	English 47.12	French 26.92	Catalan 9.62	16.35
Mexico	French 46.15	English 41.03	Italian 7.69	5.13
Other	French 100	– 0	– 0	0

Figure 2: Percentage of records by authors belonging to certain foreign countries, published in four Argentine magazines (La Biblioteca, Proa, Martín Fierro, and Claridad).

up 67.4% of the whole translations, leaving a 32.6% of translations to other languages, thus suggesting a greater variety of translated literatures. These examples also show an interest in the Russian Revolution (e.g., the short stories by Babel or the works by Lunacharsky), the Soviet Union and communism (e.g., Barbusse, Frank), but also the fight against fascism and their interest in pacifism (e.g., Roll-

and). We can also identify some authors writing in socialist periodicals (e.g., Istrati) and Nobel Prize nominated or winning authors (e.g., Zola, Supervielle, or Rolland).

In the Caribbean region the most translated authors proceeded from English speaking countries (47%), mainly from the US (for example, the writer and journalist Christopher Morley) and the United Kingdom (e.g., Rudyard Kipling and the philosopher Bertrand Russell being the most translated). The second largest group, corresponding to 27% of the records, is made of a set of authors from France with no more than a couple of contributions each.

Finally, Mexican magazines published mainly translations from French (46%) and English (41%). In the case of French, we have identified translations from Guillaume Apollinaire, Jean Cocteau, and Paul Éluard, but also from Valéry Larbaud, Paul Morand, and the French Mexican author Ramon Fernández. Other writers such as the French philosopher in science and religion Emilio Boutrox, Louis Farigoule (better known as Jules Romains), Émile Salomon Wilhelm Herzog (better known as André Maurois), Alexis Leger (better known as Saint-John Perse), Maxime Leroy, Gaston Sevrette, and Adolphe Ferrière also appear. In the case of English, it is worth highlighting the translations of William Blake, David Herbert Lawrence, John Masefield, Alice Meynell, Nathan Asch, Aaron Copland, T.S. Eliot, John Gould Flecher, Waldo David Frank, Langston Hughes, Edgar Allan Poe, Dorothy Schons, Carl Van Doren, and Thornton Wilder. As it happened in other Ibero-American global translation zones, Mexican literary magazines were interested in Romantic writers such as Blake and Poe, avant-garde authors and, more specifically, cubist and surrealist writers such as Apollinaire, Cocteau, and Éluard. However, they were also interested in other modernist literary movements such as the Anglo-American imaginism of the poet John Gould Flecher, or the French imagist Paul Morand. The analysis of translation flows in Mexican literary magazines also gives a dominant place to poetry (e.g., Apollinaire, Cocteau, Éluard, Blake, Flecher, Eliot). Unlike magazines in the Andean mountains, Mexican periodicals also translated the writings of women who were close to the feminist mouvement. For example, Alice Meynell (a British writer, publisher, critic and suffragist) and Dorothy Schons, who authored the first English-language novel on the Mexican Sor Juana Inés de la Cruz placing her as one of the earliest American feminists. There was also an interest in the translation of works by authors close to the Communist party (e.g., Paul Éluard and Ramon Fernández). We can also stress some interest in philosophy (e.g., the French Émile Boutroux), education (e.g., the Swiss Adolphe Ferrière) and music (a translation into Spanish of an essay originally written in English by the American composer Aaron Copland on the Mexican composer Carlos Chávez).

Finally, we perform the analysis of the overall flows of translation occurring between countries, languages, and regions. To this aim, Figure 3 portrays the flows of translations via a so-called Sankey diagram[5] (Wilke 2019).
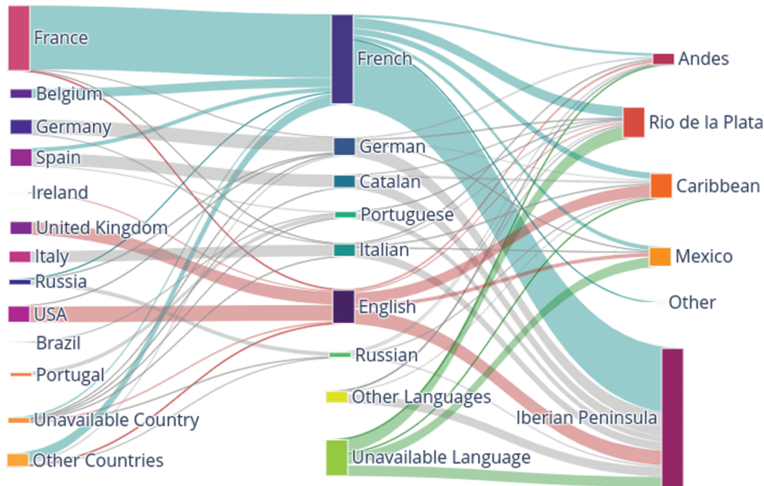

Figure 3: Overview of the flux of translations between countries, languages, and regions. This Sankey diagram displays the number of translation records between the authors' countries of origin (left column) and the most common original languages (middle column), as well as between the original languages and the translation regions (right column). The height of each box denotes its total number of records. In this diagram, each box corresponds to some feature, and a line connecting two boxes indicates the existence of a "flux" between them. We highlight the translation flows involving the English, French, and Unavailable languages.

The size of a box denotes the amount of elements with that feature, whereas the thickness of the line connecting two boxes denotes the amount of elements possessing both features. In our case, translated contributions can be classified according to three features: the author's country of origin, the contribution's original language, and the global translation's zone where the translation has been published. The boxes corresponding to each of the aforementioned features' groups are aligned horizontally, with the left column corresponding to the countries of origin, the middle column to the original languages, and the right column to the translation's regions. For simplicity, we display only the most important languages/countries and group

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5 Sankey diagrams are named after Irish Captain Matthew Henry Phineas Riall Sankey, who used this type of diagram in 1898 in a classic figure showing the energy efficiency of a steam engine (see https://en.wikipedia.org/wiki/Sankey_diagram).

all the other languages/countries into the "Other Languages" and "Other Countries" categories. The "Unavailable Language" and "Unavailable Country" boxes correspond, instead, to those records for which information on the original language or author's country of origin are missing. Thus, a quick analysis of Figure 3 reveals that French and English are the two most translated languages, with the former constituting the bulk of our corpus. Also, French is the main translated language in the magazines of the Iberian Peninsula, albeit it plays an important role also in the region of Rio de la Plata. Authors writing in French come mainly from France but, we also observe the presence of other countries like Belgium, and a non-negligible fraction of authors from Spain and the "Other Countries." Regarding the English language, authors writing in such a language are mostly from the USA and the United Kingdom. Interestingly, the Sankey diagram highlights how English plays a significant role for translation only in journals of Caribbean and Mexico zones as we have also highlighted above with specific examples of translated authors, while it is more marginal in all the other regions (including the Iberian Peninsula).

Likewise, we want to highlight the case of contributions for which the information on the original language is missing (i.e., those corresponding to the "Unavailable Language" box). These contributions have been identified as translation due to the availability in their records of the information on the translator's name. They constitute a significant fraction of translations made within the Mexico and the Rio de la Plata regions and highlight the importance of identifying translations using a criterion based not exclusively on the analysis of the languages' information.

Finally, indigenous literary production was also present in Ibero-American journals. In the case of indigenous languages, we can highlight the work by Eustaquio Rodríguez Aweranka and Inocencio Mamani. *Tres Poemas* by Rodríguez Aweranka, Mamani and Manuel Zúñiga Camacho Allqa were published in Quechua and Aymara in issue 34 (1930) of *Boletín Titikaka* (1926–1930) to honor José Carlos Mariátegui, who had recently passed away. In the case of poetry in vernacular languages, we also find texts in the Quechua original, accompanied by a Spanish translation in the case of Mamani (editorial, *Boletín Titikaka*, num. 19, in Quechua and Spanish; also in num. 27 in Quechua and Spanish) and Aweranka (*Boletín Titikaka*, num. 32, in Quechua and Spanish). However, we should not consider them as translations, as Rodríguez Aweranka, Mamani and Zúñiga Camacho Allqa were authors themselves (poets and playwrights), and Spanish was their second mother tongue. Indeed, it is worth mentioning that the number of records for Quechua-Spanish translations is very low: the already mentioned 3 records over more than 31.000 entries. Yet, such types of cases are relevant as they highlight the presence of indigenous languages and multilingualism in Ibero-American literary magazines. Moreover, the specific case of *Boletín Titkika* is a great example to see how to combine the vernacular and the cosmopolitan.

4 Global Translation Flows in Ibero-America Through the Lenses of Network Science

One way to measure the role played by each magazine/region for translation is to analyze the data through the lenses of network science: an emerging discipline mixing together the methods of graph theory, mathematical modeling, physics, computer science, and statistics (Barabasi 2011). For this reason, we represent the data as *bipartite networks*, and analyze their properties.

A bipartite – or, more in general, *multipartite* – network/graph is a network having two (or $m > 2$) kinds of vertices/nodes, and in which an edge can exist only between vertices of different kinds (Latora 2017). For instance, in our case vertices can be either authors or magazines, and an edge connecting author i and magazine j, $e(i, j)$, encodes the fact that such an author has published a contribution in that magazine. Moreover, author vertices can be further distinguished according to the *gender* attribute (M, F, or NA). The *weight* attribute of an edge connecting vertices i and j, w_{ij}, can denote either the mere existence of a relationship between them (i.e., $w_{ij} = 1$) or its intensity (*i.e.*, $w_{ij} = a$ with $a \geq 1 \in R^+$). In the former case the network is said to be *unweighted*, whereas in the latter case the network is said to be *weighted*. Here, the weight of an edge can denote, for instance, the number of contributions one author has published in a given magazine. Given a graph G with N vertices, its structure is mathematically encoded into the so-called *adjacency matrix* $\mathcal{A}$. Such a matrix is an $(N \times N)$ array whose elements a_{ij} are equal to one if an edge exists between vertices i and j, and zero otherwise. The weighted counterpart of the adjacency matrix $\mathcal{A}$ is called *weight matrix*, $\mathcal{W}$, and its elements w_{ij} are nothing but the weights of the edges. One indicator used to measure the importance of a vertex is its *degree*, which counts the number of edges incident with it. Using the information encoded in the adjacency matrix $\mathcal{A}$, the degree of a vertex i, k_i, can be written as:

$$k_i = \sum_{j=1}^{N} a_{ij}. \tag{1}$$

The weighted counterpart of the degree is called *strength*, s, and can be obtained from Eq. (1) by replacing a_{ij} with w_{ij}.

In our work, we have considered –basically– two kinds of bipartite networks: that of author-magazine relationships, and that of language-magazine ones. It is possible to build two networks for each kind of relationship: one extracted from the certified translation records G_{ct}, and another obtained from all the other records, G_{ot}. Eventually, we can also generate a network obtained by merging together the aforementioned networks, G_{merge}. Finally, magazine vertices can be

collapsed into "regions," thus enabling a macroscale level analysis of the system. Table 3 summarizes the main features of the author–magazine relationships' networks.

Table 3: Summary of the main features of the author–magazine networks. For each network, we report its number of vertices N, of edges K, the number of magazine N^{magz} and author N^{auth} vertices. We report the number of men, women, and "unavailable gender" authors N_m^{auth}, N_w^{auth}, and N_o^{auth}. We present also the average edge weight, $\langle w \rangle$, as well as the average values of the degree, $\langle k \rangle$, of magazine and author vertices, and of men and women vertices. The symbol $\langle x \rangle = \frac{1}{N} \sum_i^N x_i$ denotes the arithmetic average of quantity x.

	G_{ct}	G_{ot}	G_{merge}
K	598	5699	6146
N	485	4341	4593
N^{magz}	38	41	41
N^{auth}	447	4300	4552
N_m^{auth}	405	3516	3730
N_w^{auth}	19	159	177
N_o^{auth}	23	625	645
$\langle w \rangle$	1.59	3.46	3.36
$\langle k \rangle$	0.41	0.38	0.37
$\langle k \rangle^{magz}$	15.74	136.98	147.68
$\langle k \rangle^{auth}$	1.34	1.34	1.37
$\langle k \rangle_m^{auth}$	1.37	1.38	1.41
$\langle k \rangle_w^{auth}$	1.0	1.35	1.32

Figure 4 presents a visual representation of the G_{ct} network. As edges in bipartite networks can only connect vertices of different types, it is convenient to draw each group of vertices on one side of the figure. In our case, magazines are arranged on the figure's left side whereas authors are arranged on the right side. Moreover, we have used distinct shapes to denote vertices' types (squares for magazines and circles for authors), and colors to encode attributes like the magazine's region or the author's gender. A quick glance at the intricate web of connections between authors and magazines does not reveal any remarkable feature. However, a closer look highlights that the size of the magazine vertices is not the same for all of them. Such sizes' heterogeneity is due to the fact that the size of a magazine vertex is equal to its degree, k_i (i.e., the number of distinct authors who have published a contribution in such a magazine), and highlights the presence of magazines which
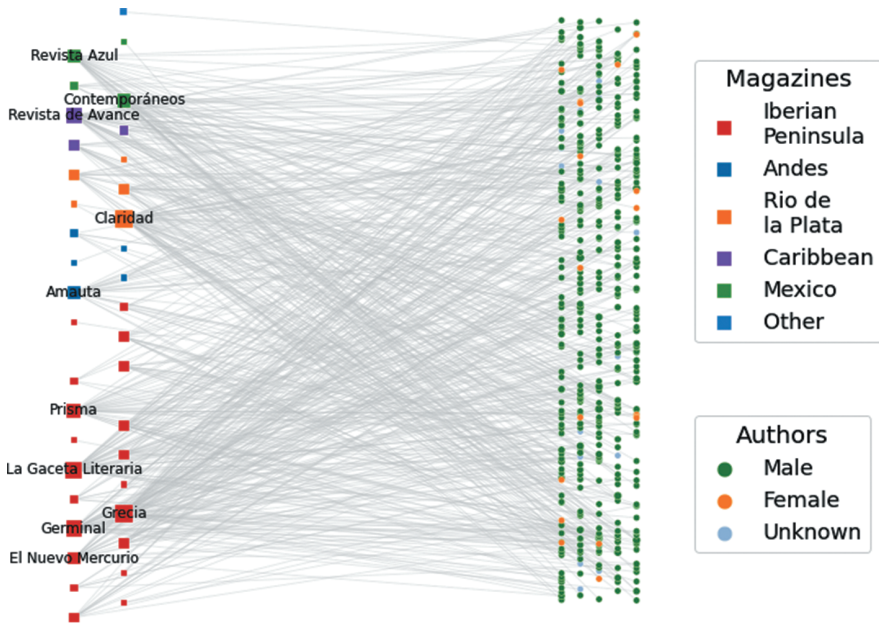
Figure 4: Visual representation of the bipartite network of magazines–author relationships obtained using only translations' data, G_{ct}. An edge between a magazine vertex (left side) and an author vertex (right side) exists if the latter has published a contribution on such a magazine. The size of magazine vertices' denotes their degree, whereas its color denotes the region to which the magazine belongs to. We display the names of those magazines whose degree is higher than the average. Authors' vertices, instead, are colored according to their gender attributes.

published the contributions of many authors (e.g., the Mexican *Contemporáneos*, the Argentinean *Claridad* and *Prisma*, and the Peruvian *Amauta*). On the other hand, the color of authors' vertices helps to grasp the huge disproportion existing between the amounts of men and women authors.

After analyzing the network of author–magazine relationships, one can ask how wide a magazine's languages portfolio is. To measure the level of "internationalization" of a magazine i, we consider two indicators. One is the degree of the magazine, k_i (see Eq. (1)), computed in the language–magazine network. The other indicator, η, accounts instead for multiple aspects simultaneously and is defined as:

$$\eta_i = \frac{1}{\Delta T_i} \left(\frac{k_i}{N_{\text{lang}}} + \frac{s_i}{W_{\text{TOT}}} \right), \tag{2}$$

where ΔT_i is the magazine's *age* (computed as the difference between the publication dates of the first and last issues available in our corpus). N_{lang} is the number of original languages available in the whole corpus, and W_{TOT} is the total weight of the network (i.e., the sum of the weights, w_{ij}, of all the edges in the network). In particular, the term $1/\Delta T_i$ in Eq. (2) accounts for the magazine's longevity by dividing the other quantities by the magazine's age ΔT_i (i.e., converts them into the average unit time counterparts). The term $k_i/N_{lang} \in [\varepsilon, 1]$, instead, accounts for the *language diversity* of contributions with $\varepsilon = 1/N_{lang}$ corresponding to the least diverse case (corresponding to translating contributions only of one original language), and 1 (i.e., $k_i = N_{lang}$) denoting the most diverse one. Finally, the term $s_i/W_{TOT} \in [\varphi, 1]$ accounts for the volume of contributions translated by a magazine, with $\varphi = 1/W_{TOT}$ denoting a magazine publishing a single translation, and 1 (i.e., $s_i = W_{TOT}$) the case of a magazine publishing all the translations in the whole corpus. Table 4 collects the values of both indicators for all the magazines computed in the magazine–language network built using only translation records. For each region, we highlight the magazine with the highest value of k and η.

Table 4: Estimating magazines' internationalization. For each magazine, we report its internationalization score computed either using Eq. (1) (column k), or Eq. (2) (column η). We highlight the row corresponding to the most international magazine according to each score. Scores indicated with "–" corresponds to those magazines which do not have any translation.

Global translation zone	Magazine Name	k	η
Iberian Peninsula	Alfar	6	0.039058
	Alma Española	2	0.01787
	Arte Joven	4	0.002832
	Carmen	2	0.023826
	El Nuevo Mercurio	4	0.02609
	Gente Vieja	5	0.006177
	Germinal	7	0.0219
	Grecia	8	0.024013
	Helios	3	0.011308
	Horizonte (Madrid)	1	0.035841
	La Gaceta Literaria	11	0.012342
	La Vida Literaria	7	0.083503
	Litoral	1	0.002306
	Luz	6	0.033159
	Prisma	7	0.072038
	Reflector	–	–
	Renacimiento	1	0.007942
	Revista Nueva (Spain)	6	0.047749

Table 4 (continued)

Global translation zone	Magazine Name	k	η
	Sur	–	–
	Ultra	2	0.011102
	Vida Americana	1	0.071479
	Vida Nueva	4	0.14306
Andes	Amauta	5	0.007634
	Boletín Titikaka	2	0.011001
	Editorial Titikaka	1	0.002978
	Instantáneas	1	0.014296
	Luz i Sombra	2	0.028653
Rio de la Plata	Claridad	7	0.009466
	La Bibliotéca	2	0.006216
	Martín Fierro	4	0.006827
	Proa	4	0.016858
	Vanguardia	0	0
Caribbean	Cuba contemporánea	3	0.001485
	La Habana Literaria	4	0.095407
	Revista de Avance	7	0.011993
Mexico	Contemporáneos	4	0.007007
	Horizonte (Jalapa)	4	0.023839
	Irradiador	–	–
	Revista Azul	0	0
	Revista Nueva (México)	1	0.071479
Other	Creación	–	–
	Favorables Paris Poema	1	0.023843

The results highlighted above can make us think about how to empirically quantify the international character of Ibero-American journals and, more generally, the circulation of translation in periodicals. If we take into account linguistic diversity (i.e., the number of translated languages and literatures), we are focusing on the degree of magazines (given by Eq. (1)), and rank them according to it (blue filled rows of Table 4). Specifically, we have, *La Gaceta Literaria* for the Iberian Peninsula, *Contemporáneos* in the case of Mexico, the Cuban *Revista de Avance* for the Caribbean, the Peruvian *Amauta* for the Andes, and the Argentinean *Claridad* for the Río de la Plata. All of them were avant-garde magazines, and tried to combine aesthetics and politics, socialism and cosmopolitanism. The translation of socialist authors, within the reference of the Russian Revolution, was also remarkable and these magazines channeled through translation the re-

lationship between the artistic avant-garde of the interwar period, and the proletariat movement. Without going too much in depth, let us only remind that the translation of socialist authors in the Mexican magazines *Contemporáneos* also contributed to the consecration of the novel of the Mexican Revolution, which also circulated internationally[6]. If we, instead, rank the entries of Table 4 using Eq. (2) (which accounts simultaneously for linguistic diversity, volume of translations, and the longevity of the magazine) the most international magazine of each region (corresponding to the rows of Table 4 highlighted in yellow) changes. Specifically, we notice the presence of a group of magazines established at the end of the nineteenth century: *La Habana Literaria* (1891–1893), the Spanish *Vida Nueva* (1898), or the Chilean *Luz i Sombra* (1900). All of them are characterized by a shorter longevity compared to the group of magazines mentioned previously, albeit they possess a similar linguistic diversity and international scope. For the twentieth century, this is also the case of the Mexican *Horizonte*, which appears to be more international than *Contemporáneos*, the latter having a four times longer lifespan, despite having a slightly larger number of translations. We observe a similar phenomenon for the case of the Argentinean *Martín Fierro* and *Proa*. Whereas the first one lasts longer and has more contributions (translated texts), the internationalization of the second one according to Eq. (2) is higher.

5 Global Translation Flows in Ibero-America within a Gender Perspective

The use of big data and network science methods can unveil under-studied cultural mediators, less-studied geographical scales, and world literary fields. The latter is a much-needed methodology to explore how particular cultural developments were undertaken by less well-known agents in less-studied geographical settings and, at the same time, avoid simplifications like that a whole region can be represented in translation by single authors (for example, Neruda or Borges in the case of Latin America). Hispanic cultural mediators contributed to foreign journals, and non-Spanish speaking critics and writers also published in Ibero-American periodicals. Likewise, Hispanic periodicals advertised other journals, allowing us to examine the networks of their alliance or rivalry relationships. Adding a gender perspective to the analysis of

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6 For example, the novel *Los de Abajo*, by Mariano Azuela, was translated into English by Enrique Munguía (*The Underdogs*, 1929), into French by Joaquín Maurín (*L'Ouragan*) and into German by Hans Dietrich Diesselhoff (*Die Rotte*, 1930).

global translation flows could help us in shedding light on a shadowed canon which has suffered little recognition despite being popular at the time, and not very acknowledged today or even completely forgotten. In this respect, the focus on Ibero-American women (both writers and translators) is twice as rebellious as they have been considered as the "periphery of the periphery." Within this framework, a network science approach can verify the cultural mediator's profile and corroborate or question prevailing conceptions regarding ethnicity, class, and the contribution of women in intercultural networks. For example, it can unearth cultural mediators who were overshadowed by mainstream history and may appear in the center of the network showing a more significant role. Or, quite the contrary, a network science approach can show the peripheral position of well-known authors in cultural mediating processes. Network analysis can also restore the presence of women, contest their upper class and white ethnicity, and address how women joined forces on a transatlantic scale through their professional and personal relationships, as well as their travels and stays abroad, showing how they not only contributed to the building of the Ibero-American modernity, but also to a modern treatment of gender issues, (Roig-Sanz 2023).

In fact, the turn of the 20th century brought in the Ibero-American field important transformations in the traditional relation of women in the private sphere. The emergence of women's rights movements brought to light the collective identity of women in many fields, and women writers, and feminist periodicals gave voice to a wide range of concerns. However, most Spanish, Portuguese, and Latin American literary histories disregard women in Ibero-American modernisms, and even major figures are rarely included. Thus, we lack a clear understanding of their public and mediating role beyond national borders, calling us to examine how Ibero-American women contributed to the shift of women's roles in the modern world through their work as diplomats, journalists, editors, cultural animators, radio speakers and, ultimately, translators.

Concerning translation, we have extracted from our data a total of 266 translators. Beside their names, no other meta information is available on these translators, so we do not have data on their gender, unless a translator is also considered as an author in our database. In such a case, information about the translator's gender could be available. Although the aim of this paper is not to retrieve the gender of all the translators, it is worth noting that data on translators is often lacking or hard to find. At present time, our preliminary results show the following regarding the presence of women translated authors. Mexican literary magazines are those translating in proportion more English speaking women writers. In the Caribbean and Iberian Peninsula, women authors represent 7.69% and 8.82%. For French speaking authors, only the Iberian Peninsula, Río de la Plata, and Caribbean magazines translated a small amount (< 4%) of women. Surprisingly, as Figure 5 attests (see below), there are no translated women writers in the Andean mountains and Other regions.
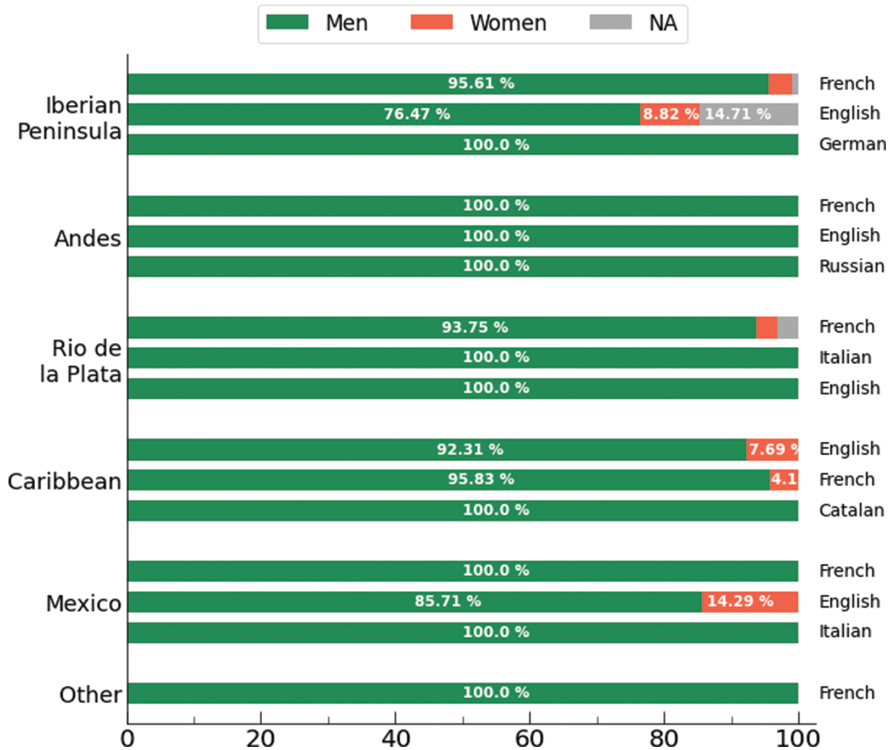
Figure 5: Percentage of authors per gender group (men, women, and "unavailable gender information" (NA)) across global translation regions. In each region, we compute the percentage of authors per group for each of the three most translated languages.

Among the 266 translators that appear in our dataset, we can only find 14 different names of women translators (13 as two of them are the same person) for the six translation zones of our choice (Caribbean, Andes, Mexico, Iberian Peninsula, Río de la Plata, and Other). The list is the following: for the Río de la Plata, the Argentinean Adelina del Carril, Luisa Díaz Sáenz-Valiente, and Gràcia B. Llorens, pseudonym of the Catalan poet, journalist and translator Maria Gràcia Bassa i Rocas. Adelina del Carril, Ricardo Güiralde's wife, was a translator for *Proa*; Díaz Sáenz-Valiente was the translator of Pierre Reverdy in the Spanish literary magazine *La Gaceta Litera-ria*, and Gràcia B. Llorens translates from Catalan into Spanish in the Argentinean journal *Claridad*. For the region Mexico, Antonieta Rivas Mercado, feminist writer, translator and artist, and Luz Murguía de Ramírez, who founded the journal *Viole-tas* with Mateana Murguía; for the the Caribbean zone the Cubans Emilia Bernal, Esther Lucila Vázquez, Mary Antiga Caballero, Mary Caballero de Ichaso, and Aure-lia Castillo de González, and Carmela Eulate Sanjurjo from Puerto Rico. Emilia Ber-

nal, Mary Caballero Antiga, and Mary Caballero de Ichaso are translators in the Cuban journal *Revista de Avance*, whereas Aurelia Castillo González, in *Cuba Contemporánea* and *La Habana Literaria*. Caballero Antiga and Caballero de Ichaso were the same person, signing the latter one with the family name of his husband, the well-known Cuban intellectual Francisco Ichaso.

For the Iberian Peninsula, Zenobia de Camprubí, Juan Ramón Jimenez's wife and the first translator of Rabindranath Tagore into Spanish, María Teresa León, who translates in our corpus with her husband Rafael Alberti, Carmina Colomé, and Tatiana Enco de Valero, an exiled translator of Russian origin living in Madrid who translates from Russian into Spanish a short-story by Ievgueni Zamatin in *La Gaceta Literaria*. We have not included in this list the case of Kaethe Lewy. Even though there is no reference to the translator, she probably translated from German into Spanish some excerpts of a long interview with Jacques Maritain published in *La Gaceta Literaria* ("Catolicismo en el extranjero. Francia. Neotomismo. Conversación con Jacques Maritain"), which was originally translated from French into German by Käthe Lewy and published in the German literary magazine *Die Literarische Welt*. The name of Käthe Lewy might be one potential variation of the name Ketty Levy, Enriqueta Levy de Rodríguez, a Spanish translator of German language. If this holds true, then we could analyze an interesting case of triangular translation between French, German and Spanish. Among Spanish women translators, we must also highlight the fundamental role of Zenobia Camprubí, who was the translator of some prose by Rabindranath Tagore in the literary magazine *Grecia*. She translates from English into Spanish and it is well-known that despite signing many of these translations together with her husband Juan Ramón Jiménez she was the main translator. Unfortunately, her name does not appear in the sole dictionary of translation for Spain (*Diccionario histórico de la traducción en España*, 2009), it does the name of her husband. A great interest in the translation of poetry and in the translation of other women's work is also noticeable. For example, Carmina Colomé translates some poems by Cora Laparcerie, a French poet and actress, in the magazine *Grecia*, whereas the Cuban Aurelia Castillo de González translates poetry from Gregh Fernand and Alphonse Lamartine in *Cuba contemporánea* and *La Habana literaria*, the Mexican Luz Murguía de Ramírez translated poems by Victor Hugo in *Revista Azul*, or the Argentinean Díaz Sáenz-Valiente translates prose poetry by Revery.

Regarding the socio-biographical profile of these women translators, we can expect high society and educated women such as Zenobia Camprubí, but also feminist writers such as the Catalan Llorens, the Mexican Rivas Mercado, or the Cuban Caballero de Ichaso, who was involved in the foundation of the Lyceum Club in La Habana, and Castillo González, who was also concerned by the situation of black and mulatto Cuban women. There were also women translators who

were close to communist ideology (for example, Enco de Valero) and women translators who also had fundamental and transforming experiences of traveling (for example, Zenobia de Camprubí or Llorens) or exile (for example, Enco de Valero). Some of them were also Jews (for example, the above-mentioned potential translator Lewy). The variety of languages they translate is also broad, being French the most common. Beyond French and English, we can also highlight German and Russian. As said above, there are no women translators in the journals published in the Andean mountains and Other regions. In our dataset there are other women in the role of authors who were translators too. This is the case of the French Mathilde Pomès.

6 Conclusions

In this chapter, we have analyzed a large scale collection of scattered translations and circulation of world literature in the Ibero-American literary press using methods of network and data science and a perspective of big translation history (BTH) (Roig-Sanz and Fólica 2021). Specifically, we have selected a sample of journals published in what we have called global translation zones: the Iberian Peninsula, the Andean Mountains (Chile and Perú), the Río de la Plata (Argentina and Uruguay), the Caribbean (Cuba), Mexico, and Other (France). By focusing on these zones, we show that by examining units of analysis other than nation states, we escape from central languages (English or French) and more common disciplinary approaches, and succeed in locating cultural transfers in other spaces, such as a wider region or among minorities and small languages. Thus, we have provided some examples to compare how looking at the data at different scales can change our perspective and highlight similarities and differences between translation zones. In the case of a vast region like Ibero-America, the information available within the corpus analyzed here can be leveraged to shed light on the role played by apparently less prominent localities for translation or intercultural exchange, and not only in Madrid, Buenos Aires, Mexico City, or São Paulo. This is the case of Puno, in Peru, where *Boletín Titikaka* was published, or Barcelona, in Catalonia, Spain, for *Luz* and *Prisma*. These cities hosted many seminars, lectures, poetry readings, and a wide range of other cultural productions with the purpose of breaking with the elitist idea of culture established, for instance, in Lima; or with both cosmopolitan and nationalistic goals as in Barcelona. Thus, both Puno and Barcelona were vibrant places of intellectual discussion, cultural, political and artistic renewal and global translation flows.

Likewise, by understanding translation as an essential element of literary geography, we may also seek to investigate relevant differences between translation practices established in port cities and the mountain capitals, as well as specific challenges when analyzing cultural translation in periodical publications. In the journals of our dataset, with different periodicity and published at different time periods, we have identified their level of internationalization through the analysis of translations, and literary excerpts of world literature mainly published in Spanish, but also in other languages. By analyzing the publications' records we pinpoint those contributions associated with translations and, then, build bipartite networks of relationships between either authors and magazines or between magazines and languages. Journals and literary magazines tried to increase their prestige and relevance through the connections with international: through the publication of a wide range of translations in their pages, or via a wide network of international relationships. In particular, the analysis of the structural properties of the network of magazines–languages relationships has proved to be useful to quantify the degree of internationalization of those magazines. Indeed, the data on translations and their original languages allowed us to calculate an index to measure the international character of a literary magazine. Such an index can be used as a comparison metric, particularly when studying magazines participating in international literary networks. While at first glance the overall results might mismatch with the expectations of literary historians, a closer inspection suggests that such a measurement may be promising. Further development of Eq. (2) could include a more refined calculation accounting for other variables like the number of issues or contributions over time, or the ratio of translations vs. original works, and also be fine-tuned by including factors to weight the contribution of each term.

In future endeavors, we would like to push forward other potential lines of interest. These new research avenues include i) to amplify and balance the dataset by adding more magazines from Ibero-America (including the Lusophone area) and from different time periods within the general time frame of our interest (1898–1959), ii) to provide comparisons on a lower level, e.g., between magazines or between cities. The current approach assumes translation zones as homogenic, while a detailed analysis of the magazines could confirm or disprove this idea. And iii) to consider the chronological factor, which means, on the one hand, to compare magazines, cities, regions horizontally in discrete time periods, and consider the specificities of each period, and, on the other, to compare the evolution within a magazine, city, region longitudinally, i.e., across different discrete periods of time. Finally, we would like to delve more into the gender perspective, and offer new knowledge on the socio-biographical profile of women translators and authors. In this regard, we envision two potential paths: Named

Entity Recognition (NER) using machine learning algorithms or a combination of techniques including NER and complementary cross-validation of the information via platforms like VIAF, or customized analysis of the contribution's type. We can also identify Ibero-American women translators in projects such as the WikiProject Women in Red.

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