



What is local research?

Towards a multidimensional framework linking theory and methods

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Abstract

In this research article, we propose a framework of local research, a concept of growing importance due to its far-reaching implications for public policy. Despite being increasingly mentioned in scientific publications and policy documents, there seems to be little agreement on what the concept means and on which phenomena it covers. A clear understanding of it is crucial for informed decision-making when setting research agendas, allocating funds, and evaluating and rewarding scientists. Our goal is to determine how the concept of local research relates to its measurement, highlighting the nuances involved in its theoretical depiction and the risks of applying different empirical methods indiscriminately across regional and disciplinary contexts. We first explore various ideas and approaches to local research found in the literature. Then, we synthesize them into three dimensions – locally situated, informed, and relevant research – and test six approaches – Toponyms, Languages, Authors, Databases, References, and Citations – in 10 million publications from the Dimensions database. Our findings suggest divergences across regional and disciplinary settings. The operational approaches to identify local research operate differently across both the disciplinary landscape and the Global North-South divide. In addition, we observe no complete alignment between theory and practice. This article highlights the complex, multifaceted nature of local research. We propose a framework to facilitate the study of its different dimensions and their intersections, to help mitigate many of the barriers current research evaluation systems face when assessing and supporting local research.

Keywords: local research; scientific knowledge; scientific policy; research evaluation; scientometrics.



Introduction

Local knowledge is central for the development and implementation of efficient policies, which adapt and consider the conditions and needs of different social groups (Stiglitz 1999). This is especially relevant in peripheral communities, where mainstream knowledge, structured around Global North norms and values, may inadequately adapt to local contexts (Cancino et al. 2024; Marginson & Xu 2021). Hence, scientific policy awareness is most needed in order to foster and prioritize local research, ensuring a better distribution of resources (Miguel et al. 2015). However, despite the great interest surrounding it, the linkage between how local research is defined and measured across fields of science is unclear. It is therefore essential to grasp the concept thoroughly in order to make informed decisions when setting research agendas, allocating funds, evaluating scientists, and rewarding them for their work. Conversely, a lack of systematization in defining local research may leave a vacuum that can lead to the imposition of colonizing standards, universalistic criteria, and ranking regimes (Ishikawa 2014; López Piñeiro & Hicks 2015). This can erode the work of local researchers, who provide “the best prospects for deriving policies which are both effective and engender broad-based support” (Stiglitz 1999 p. 3).

The importance of linking theory and practice when defining local research lies in its far-reaching implications for public policy and research evaluation. Although recurrently used (e.g. Cancino et al. 2024; Chavarro et al. 2014; Hicks et al. 2015), researchers seem to disagree both on what the term means —its defining features— and on the phenomena it covers (Hampton 2020). Concrete, unified definitions are scarce, and only recently have partial methods for its measuring been developed, although the approaches’ exemplars do not necessarily reflect those defining features. The most typical method passed on over time uses toponyms for measurement (for instance, in Chavarro et al. 2014; Ordóñez-Matamoros et al. 2010; Zhuang et al. 2020). Other approaches use national languages, journal location, or absence from international databases as proxies for the local (e.g. Gupta & Dhawan 2009; Kulczycki et al. 2020; Tijssen 2007). Besides scientists, other stakeholders like governments and funders have also expressed growing interest in local research, but they avoid clearly stating the concept’s scope (Cancino et al. 2024; Consejo Latinoamericano de Ciencias Sociales 2020; Delgado-López-Cózar et al. 2021; Hicks et al. 2015; United Nations Educational, Scientific and Cultural Organization 2021; Zhang & Sivertsen 2020).

In this article, we explore various definitions and approaches to identify local research found in the literature. Our aim is to elucidate how the concept of local research relates to its measurement, highlighting the nuances involved in its theoretical depiction and the risks of applying different empirical methods indiscriminately across regional and disciplinary contexts. To do so, we first turn to some post-World War II discussions about science’s social goals and universalist framing, which emerged in Global North countries but were counteracted by the Global South’s concern for their own



local challenges. We synthesize these diverse views into three recurring foci, where research is tied to place, knowledge producers, and audiences. Then, we identify the most used methodological approaches to local research, which we compute to more than 10 million Dimensions publications at the disciplinary, country, and world region levels. Considering all theoretical and empirical contributions to the matter, as well as their limitations, we propose a framework of local research that articulates the dimensions we call locally situated, informed, and relevant research. The measurement results suggest, on the one hand, that the approaches operate differently across the Global North-South divide and, on the other, that there is no complete alignment between theory and practice when it comes to local research.

Literature review

Defining local research

Concern for the local in relation to science and technology can be traced back to the aftermath of World War II, when science policy was established as a distinct policy domain under the so-called ‘social contract’ of science (Elzinga & Jamison 1995). In the United States, wartime capacities were redirected towards strategic social goals (Bush 1945), while in Europe, reconstruction and the emerging Cold War fostered new forms of scientific nationalism (Krige 2006; Krige & Barth 2006). Yet, science presented itself as universal and self-governing (Merton 1968; Polanyi 1969), masking its national interests. This universalist framing was exported to the Global South, where it shaped priorities, failing to address local challenges. It is in this context that the notion of local research began to be articulated, in explicit opposition to the ‘global’ agendas promoted from the North (Sábato & Botana 1968; Vessuri 1987).

The contrast between Global North and South is particularly visible in how evaluation cultures have shaped legitimacy of local research. In the North, under Merton’s ideal of universalism, research rooted in specific contexts was rarely identified as local but presented as general knowledge (Sarewitz 1996). Scientometric indicators such as Impact Factors have reinforced this by treating quality as universally comparable, rendering locality invisible (López-Piñero & Hicks 2015; Ràfols et al. 2016). This has become an issue, both in the North as well as the South, calling for more socially robust and participatory knowledge production (Sarewitz 2016; Gibbons et al. 1994) or by explicitly denouncing the clash between imported evaluation systems and developmental needs (Singer et al. 1970; Sutz 2000).

These contrasting trajectories reveal why the concept of local research has remained elusive. In the North, locality was masked under claims of universality; in the South, it was explicitly foregrounded but often delegitimised through evaluation practices. As a result, the term has been used in multiple,



sometimes inconsistent ways. Taken together, these debates point to three recurring foci: where research is produced, by whom it is conducted, and for whom it is intended. Each emphasises a different aspect of how research is tied to place, knowledge producers, and audiences, and each has been supported by different strands of literature.

One of the recurrent ways in which local research has been defined is through its geographical boundedness. Here, the object of study is tied to a specific place, population, or ecosystem, and the locality of the research derives from this explicit geographical anchoring. For instance, Duncan (1989) argues that empirical research should be sensitive to spatial differences. In the same sense, Sommer (1990 p. 205) describes research as local when it is “site-specific, in that the researcher seeks to understand or change conditions in a particular location at a particular time”. In sum, here we see that local research can refer to specific locations with their territorial particularities at different geographical levels.

Another trend of literature considers it especially important to conduct research that acknowledges the unique features of the local, in order to diagnose and develop solutions in line with the expertise of systematically marginalized communities (Moore et al. 2019; Sommer 1990). Here, local research is conceptualised by reference to the individuals, communities, or sources upon which research is produced. Local context and knowledge are seen as key characteristics of this type of research because they help design and direct research priorities in alignment with societal needs and demands. This is reflected in policy actions directed at promoting co-creation and productive interactions, by stressing the need for alliances with local communities to generate knowledge that is both scientifically robust and socially relevant (Spaapen & van Drooge 2011; Trencher et al. 2014). Other examples are those drawing on indigenous or traditional knowledge systems as a foundation for research (Akena 2012; Beigel 2013; Datta 2018).

At the same time, there are limitations to equating provenance with locality. The fact that research is conducted by geographically concentrated authors or references does not guarantee that the work addresses local issues. Conversely, external researchers can contribute to studies that are highly contextualised and responsive to local needs. As several scholars have argued, the orientation and use of knowledge cannot be assumed simply from the institutional or geographic origins of its producers (Beigel 2013; Sutz 2000). This is reflected in the third stream of literature, which focuses on communities, regions, or audiences for whom knowledge is most relevant. From such a view, research can be labelled as local when oriented to address the specific needs or challenges of a bounded community. The literature on the societal impact of research relates to this, as relevance is considered a key characteristic (Bornmann 2013; Vanclay 2002).

The interest in knowledge production, scientific impact, and the localization of research activities is problematized as well by spatial scientometrics, in order to draw attention to the geographically concentrated attributes of research outputs that are normally circumscribed as global (Frenken et al. 2009). The scientometric community generally agrees with a notion of local research



that implies “research related to either local, regional or national contexts, conditions or topics, as opposed to research that is universalistic or decontextualized” (Chavarro et al. 2014 p. 2). As a result of this type of investigation, “relevant knowledge is derived, contributing therefore to the local stock of information necessary to increase local understanding and to produce new knowledge valuable to solve local intellectual, technical, or social issues” (Ordóñez-Matamoros et al. 2010 p. 421). As we will see below, all the ideas about local research discussed so far permeate attempts to measure the phenomenon.

Identifying local research

From an empirical perspective, different bibliometric approaches have been suggested in the literature to explore and analyse ‘underrepresented’ or local research in bibliographic databases. Hence, we find studies focusing on visibility (Tijssen et al. 2006), authorship and collaboration (Ordóñez-Matamoros et al. 2010; Tijssen 2007), interdisciplinarity (Chavarro et al. 2014), publishing dynamics (Ishikawa & Sun 2016; Kulczycki et al. 2020; Mironescu et al. 2023), and topics (Miguel et al. 2015; Zhuang et al. 2020), among others. These studies tend to focus on countries from the Global South. However, the methods used to identify local research tend to vary across studies, with only a few framing their methodological design from a theoretically driven perspective. In most cases, these definitions are pragmatic and context-driven, more the result of technical solutions than of reflection on the proxy used and its capacity to identify research inherently local. Next, we will review the most common operational approaches to identifying local research in the scientific literature, which can be grouped as follows (see Table 1 for a summary):

- 1) Toponym-based methods, which rely on the presence of place names to indicate a geographical focus in research outputs.
- 2) Language-based methods, where the use of non-English languages is taken as an indicator of a domestic orientation in research.
- 3) Journal-based methods, which assume that research published in national journals by local authors and/or indexed in non-mainstream databases inherently reflects domestic concerns or topics.

Toponym-based methods

The starting premise for studies centred on toponyms is that research is locally situated in a particular place or context (Chavarro et al. 2014; Miguel et al. 2015; Ordóñez-Matamoros et al. 2010; Sommer 1990). One of the most commonly used methods for this approach is to identify toponyms and demonyms in titles, abstracts, keywords, and various other sections of publications (Orduña-Malea et al. 2024). It has been used to analyse multiple aspects of local research, like the share of contributions on local issues authored by national and foreign researchers, and the effects of international collaboration on team performance and agenda setting in Global South countries (Ordóñez-Matamoros et al. 2010). Additionally, this method was employed to investigate the relationship between the degree



of interdisciplinarity and the local orientation of publications in Colombia (Chavarro et al. 2014). Other studies focused on the growth rate in different disciplines within Argentina's thematic domain (Miguel et al. 2015) and the interactions of global and local geography topics in China and the United States, especially regarding local responses to global issues and the global performance of local matters (Zhuang et al. 2020).

These studies have contributed to gaining insights into the nature and scope of research addressing local issues (Chavarro et al. 2014; Ordóñez-Matamoros et al. 2010). Still, toponym-based methods pose a series of methodological challenges that can undermine their capacity to identify local research. First, there is an unequal use of toponyms by region in titles and abstracts that emerges from epistemological hegemony rather than numeric dominance in scientific production (Castro Torres & Alburez-Gutierrez 2022; Castro Torres 2024). Authors from the Global North are less likely to include concrete geographical references, particularly country names, in their articles than authors from the Global South (Castro Torres 2024), who end up being more exposed to the evaluation and citation disadvantages of following naming conventions (Kahalon et al. 2022; Miguel et al. 2023; Mongeon et al. 2022). This leads to the reinforcement of the belief that "evidence produced in and about the Global North is assumed to be more 'universal', whereas evidence from or produced in the Global South is considered valid only for specific contexts (i.e. 'localized')" (Castro Torres & Alburez-Gutierrez 2022 p. 1). Second, certain disciplines and even subdisciplines, such as demography or international relations within the Social Sciences, are more geographically bounded; thus containing more explicit geolocation references than others, like general or educational psychology (Castro Torres & Alburez-Gutierrez 2022). Behavioural sciences provide an illustrative case where findings are frequently generalized from predominantly Western, Educated, Industrialized, Rich, and Democratic (WEIRD) samples, highlighting the existence of local research that remains unlabelled as such (Henrich et al. 2010; Kahalon et al. 2022; Miguel et al. 2015). All these differences in localization habits, disciplines, and data sources translate into fewer toponyms' mentions, that is, false negative results.

Furthermore, working with toponyms is complex on a technical level. While their isolation from natural language text might be straightforward when it comes to unique proper nouns, it can produce false positive results when dealing with common place names, anthroponyms, and ordinary nouns. A close example to us is Granada, which in Spanish refers to several cities in Spain, Peru, Nicaragua, and the United States, a province in Spain, a department in Nicaragua, a country in the Caribbean, a fruit (pomegranate), and a weapon (hand-grenade). Similar issues can be found in the coincidence between streets and people's names (Jerônimo et al. 2018) or in the close linkages between toponyms and dermatological conditions (Radhika et al. 2021), just to mention a few examples. As the level of territorial aggregation decreases, these types of scenarios multiply, which could explain the strategy of most studies working with toponyms at the country level only, and hence looking more into national research per se. While novel methodologies using Natural Language Processing (NLP) techniques have the potential to overcome these limitations (Jerônimo et al. 2018; Mongeon et al. 2022),



there is space for improvement, especially due to the risk of false positives and false negatives in the obtained results.

Language-based methods

Studies using language to identify local research usually take English as a proxy for global research. This is because English has, for many decades now, been broadly considered the lingua franca of science (Garfield 1967), with mainstream databases primarily covering publications in this language (van Leeuwen et al. 2001). Added to this is the notion that publishing in the English language allows research to potentially reach broader audiences, achieve greater impact and, therefore, gain wider recognition and reward (Buela-Casal & Zych 2012; López-Navarro et al. 2015). This has led many non-Anglophone countries to implement national policies that promote publishing in English as a strategy to boost internationalization and enhance their scientific impact (Robinson-Garcia & Ràfols 2020).

Fields that are especially affected by this linkage between language and internationalization are those of the Social Sciences and the Humanities. Researchers will attempt to address different audiences: global or national. Depending on their goal, they will publish in their own language in order to reach local communities (Nederhof 2006). This is evidenced by the resistance researchers in these areas pose to policies pushing them towards publishing in the English language (Ishikawa & Sun 2016), highlighting the importance of their national language as a means to reach local audiences (Kulczycki et al. 2020; Mironescu et al. 2023).

Another example of the use of language as a proxy for identifying local or global research is found in the CWTS Leiden Ranking (<https://www.leidenranking.com/>), which aims at analysing the scientific performance of over 1,500 universities worldwide. This ranking is based on bibliometric data derived from Web of Science¹. However, they exclude publications in non-English languages (CWTS 2024) and do not consider them as core publications suitable for analysis, thus reinforcing a double bias: one related to the predominance of Global North coverage within WOS, and another to the preference for English language publications. Given that languages other than English also contribute to knowledge advancement, the main problem with language-based methods is that they overshadow and underrate non-English scientific outputs (van Leeuwen et al. 2001).

From a technical perspective, language can be a problematic variable to identify local research on a large scale. Many of them, like English, Arabic, or Spanish, are official or co-official in several countries, which means they cannot be indicative of a single place. Even if this approach is controlled for geographical affiliation, working at lower levels of territorial aggregation would generally not be possible, since most regions and cities share a national language. Especially difficult is to extrapolate the method to Anglophone countries, as it would not be possible to distinguish between local and global scientific outputs based solely on their language of publication.

¹ Although since 2024 it also includes an open version based on OpenAlex data.



Journal-based methods

Studies on the origin of journals often assume that research published in nationally oriented sources inherently reflects local concerns (e.g. López Piñero & Hicks 2015; Miguel et al. 2015; Navas-Fernández et al. 2018; Tijssen 2007). In contrast, international journals are typically defined by criteria such as being produced by large editorial conglomerates, affiliated with renowned institutions, edited by internationally diverse committees, selected by authors worldwide, published in English, or indexed in mainstream databases (Buela-Casal et al. 2006). In this sense, one common approach focuses on the geographical affiliations of key actors involved in the journals' production, including publishers, editors, reviewers, and authors. This method has been applied in studies on African journals, where their relevance and performance are investigated within the global research landscape but are still considered local (Tijssen 2007; Tijssen et al. 2006). However, these methods face challenges, as the mere geographical location of a journal or its contributors does not necessarily indicate that the knowledge produced is related to the context in which it is generated. Mainstream journals, often owned by large academic publishing companies in the United Kingdom, the Netherlands, or the United States, publish research internationally. This understanding of locality reflects the assumption that Western, Anglophone journals are largely deemed global, while those edited in peripheral countries must meet several extra criteria to gain the same recognition (Navas-Fernández et al. 2018).

Although many different citing behaviours have been identified (Borgman & Furner 2002), several studies also suggest looking into the geographical location of citations to define international or national journals, thus adding another perspective into locality: that which is used or consumed by individuals geographically located in a single place (Grančay et al. 2017; Hladchenko & Moed 2021; Moed et al. 2021; Pajić 2015). This citation approach is further developed in combination with journal indexing in order to investigate two sets of highly cited papers within Spanish sociology according to two databases: an international one (Web of Science) and a national one (In-RECS). As a result, citation differences by language are revealed, pointing towards a relation between journal, citation impact, language, and topics (López Piñero & Hicks 2015).

The use of database indexing as a criterion to identify local journals is based on the notion that WOS (and Scopus by extension) index only those journals that constitute the core of each specialty. This premise dates back to Bradford's Law of Scattering and its application by Garfield to abstracting services (Bensman 2012). Garfield based the inclusion of journals in WOS on universalistic criteria, such as editorial standards and scientific impact. But over time, the selection procedure² has been modified as other products and citation indexes have been added, revealing a disciplinary and geographical bias in its coverage (Chavarro et al. 2018; van Leeuwen et al. 2001). Furthermore, an additional source of bias in what is considered to be the mainstream lies in the referencing practices of

² More information on the journal selection process available at <https://clarivate.com/products/scientific-and-academic-research/research-discovery-and-workflow-solutions/webofscience-platform/web-of-science-core-collection/editorial-selection-process/editorial-selection-process/>.

elite journals which, by disproportionately citing research from a few dominant countries, reproduce existing global hierarchies (Bornmann et al. 2018).

Journal indexing is used in many countries as an evaluation criterion, enforcing scholars to publish in journals included in mainstream databases as a strategy to internationalize their research. We find examples of such an approach in countries such as Spain, Colombia, and Brazil (Chavarro et al. 2018). In the case of the former, we even find categorizations of journals based on a combination of indexing and journal impact metrics (Torres-Salinas et al. 2010). By presenting mainstream database content as universally representative, the presence of local research in the Global North is obscured. More broadly, the dangers of using these biased and incomplete sources as proxies for global science are significant. They provide a distorted view of the volume and nature of research agendas worldwide, reinforce the notion that only science from the Global North constitutes international mainstream research, and risk informing policy decisions that undervalue local contributions. This is particularly problematic when assessing researchers' performance, as it can lead to the marginalization of local research efforts (Torres-Salinas et al. 2010).

Table 1. Summary of operational approaches to identify local research.

Operational approaches		Proxies of local research	Units of analysis	References
Toponym-based	Toponyms	Toponyms and demonyms mentioned in scientific publications	Articles	E.g. Castro Torres & Alburez-Gutierrez 2022; Chavarro et al. 2014; Miguel et al. 2015; Mongeon et al. 2022; Ordóñez-Matamoros et al. 2010
			Conference papers	E.g. Zhuang et al. 2020
Language-based	Languages	Non-English languages of scientific publications	Articles	E.g. CWTS 2024; Ishikawa & Sun 2016; Kulczycki et al. 2020; Miguel et al. 2023
			Journals	E.g. Chavarro et al. 2018; Mironescu et al. 2023; Navas-Fernández et al. 2018
Journal-based	Authors	Geographical affiliation of publishing authors	Articles	E.g. López Piñeiro & Hicks 2015; Miguel et al. 2015
			Journals	E.g. Hladchenko & Moed 2021; Moed et al. 2021; Navas-Fernández et al. 2018; Pajić 2015; Tijssen 2007
	Databases	Non-mainstream indexing of scientific publications	Articles	E.g. López Piñeiro & Hicks 2015
			Journals	E.g. Navas-Fernández et al. 2018; Tijssen et al. 2006; Torres-Salinas et al. 2010
	References		Articles	E.g. Bornmann et al. 2018

	Geographical affiliation of referenced authors	Journals	E.g. Tijssen 2007
		Articles	E.g. López Piñero & Hicks 2015
Citations	Geographical affiliation of citing authors	Journals	E.g. Grančay et al. 2017; Hladchenko & Moed 2021; Moed et al. 2021; Pajić 2015; Tijssen et al. 2006

Towards a framework of local research

As we have seen in the literature, the notion of local research is constructed around three recurrent dimensions. The first one concerns the territory, defining local research as work whose object of study is geographically bounded. The second one relates to producers, framing local research as that which is grounded in local knowledge and expertise. The third dimension emphasises the recipient, considering local research as that which addresses or is relevant to specific communities. While these definitions capture the main ways in which the term has been used, they are often treated in the literature as interchangeable. This conflation risks misleading interpretations, as studies grouped under the label of local research may operationalise it differently, analysing dissimilar dimensions of the phenomenon. We argue instead that they reflect different aspects of locality that must be addressed distinctively when studying local research.

To do so, we propose framing local research around the concepts of territory, producers, and recipients. Figure 1 shows the three conceptualizations and summarizes their main characteristics. Territory ties locality to the object of study, which can be a specific place, population, ecosystem, or context. It highlights that certain forms of knowledge cannot be detached from their spatial environment, thereby challenging universalistic assumptions about the generalisability of research findings. The aforementioned example on the use of WEIRD populations in behavioural studies (Henrich et al. 2010) shows how these types of investigations can be framed as universal. Conversely, research explicitly naming or delimiting a territory may be quickly categorised as local, even when its questions and implications extend beyond that context. Treating territorial boundedness as the sole definition of local research, therefore, risks both overlooking the situatedness of supposedly universal knowledge and undervaluing the broader contributions of territorially explicit studies. To capture this aspect distinctly from the following two dimensions, we refer to it as locally situated research.

On other occasions, the locality of research may not be defined by the object of study but by the expertise or knowledge base from which it is derived. Here, research is characterised by the need to introduce a unique perspective which is specific to a particular community, by acknowledging that knowledge is partial and situated (Haraway 1988). In some cases, research may be conducted entirely through these particular lenses, by drawing from indigenous or traditional knowledge (Akena 2012;

Beigel 2013; Datta 2018). The need to count on communities and individuals as knowledge producers rooted in the territory is the underlying principle of the university being an anchor institution (Goddard et al. 2014), that is, universities and other research institutions embedded within their region in order to serve local development. In other cases, this local expertise needs to be integrated with broader perspectives through co-creation processes or productive interactions (Spaapen & van Drooge 2011; Trencher et al. 2014), leading to alliances between researchers and other stakeholders. When the produced knowledge relies heavily on local communities and expertise, we refer to it as locally informed research.

This perspective is central to debates on epistemic sovereignty and the recognition of knowledge traditions that may be overshadowed by dominant, often Global North, perspectives (Pradier et al. 2025). At the same time, producer-based definitions of local research carry risks. The mere affiliation of authors or the geographical concentration of references does not guarantee that the work addresses local issues or audiences. Local researchers may produce research oriented to global debates, just as external researchers may contribute to deeply contextualised studies. Without careful conceptualisation, the locally informed dimension risks conflating the provenance of research with its orientation or relevance.

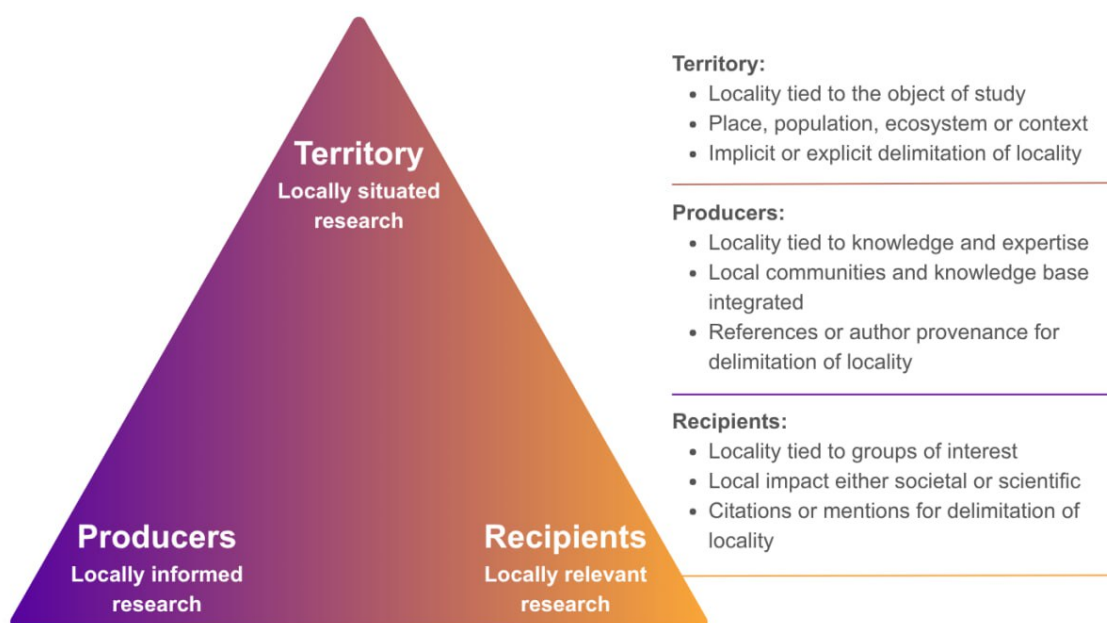


Figure 1. Conceptual framework for studying local research.

In many cases, the goal behind this reliance on local knowledge is to better serve local needs and priorities. Whether knowledge is drawn from local or foreign sources and experts, the expected impact will be limited to specific regions or communities. This third dimension of local research, which focuses on the recipients of knowledge, is what we refer to as locally relevant research. The perspective shifts attention from the production of knowledge to its circulation and uptake. It highlights that research may be considered local not because of its object of study, authorship, or knowledge base, but because



its primary audience is closely bounded. This resonates with broader discussions on societal impact where relevance to specific communities is a key criterion (Bornmann 2013; Vancley 2002). Yet challenges arise in conceptualising this dimension, as impact and attention are not always observable. In fact, influence may occur through informal or tacit channels. Nevertheless, the locally relevant dimension is crucial because it acknowledges that the meaning of local research is inseparable from the social worlds in which it is received and used.

In sum, local research can be framed by any of these dimensions, which take into consideration both their overlaps and divergences. Each dimension captures a complementary yet distinct aspect of what makes research local. Although they may intersect in practice, they are not interchangeable. Moreover, the salience of each dimension varies across disciplines, as can already be observed in the reviewed literature. Proxies tied to the territory, such as toponyms or language use, are prevalent in fields like Developmental Studies, Demography, Political Science, Humanities, and Linguistics (Castro-Torres & Alburez-Gutiérrez 2022; Ishikawa & Sun 2016; Kulczycki et al. 2020; Mironescu et al. 2023). Proxies tied to knowledge producers, such as the geographic concentration of authors, are particularly salient in fields like Health Sciences, Arts, and Humanities (Hladchenko & Moed 2021; Navas-Fernández et al. 2018; Tijssen 2007). Finally, proxies tied to knowledge recipients and visibility, such as database coverage and citations, highlight Agricultural Sciences, Social Sciences, Humanities, and Health Sciences (Chavarro et al. 2018; Hladchenko & Moed 2021; Råfols et al. 2015; Torres-Salinas et al. 2010). Such disciplinary variability is compounded as well by regional differences in how locality is signalled: while in many Global South contexts local research is explicitly marked through toponyms or other geographic references, research in Global North contexts often remains unmarked, presented as universal despite relying on highly specific populations or settings. These disciplinary and regional variations illustrate that, while the three dimensions often intersect, they remain distinct vertices of our framework (Figure 1), each representing a different pathway through which research can be considered local. Furthermore, this framework emphasises that local research should not be seen as a binary condition (where research is, for instance, locally relevant or not), but rather as a continuum within the triangle's spectrum, along which research may display varying gradients of locality.

Methodology

Considering the different operational approaches we have found in the literature, next we compute and contrast their proxies of local research. To allow for a global comparison across measures, we make two concessions. First, we focus on the national level but acknowledge that this methodology could be adapted to smaller geographical units, such as subnational regions or cities. Second, we produce all computations at the journal level, just like several other authors have done in the past, as summarized in Table 1. Given that communities form around journals to discuss and foster topics, they

reflect the cognitive structure of science and constitute a dynamic way of detecting its internal organization into disciplines, fields, specialties, etc. (Leydesdorff 1987; Leydesdorff & Cozzens 1993). This methodological decision particularly affects the Toponyms approach, where we first trace the presence of toponyms in articles' titles, but then aggregate the result at the journal level. Therefore, we consider a publication to be local as long as it is published in a journal that presents a high share of papers with toponyms in their titles. We do this for two reasons: 1) to apply a comparable methodology with the rest of the approaches that already work at the journal level, and 2) to minimize Global North-South differences in the use of toponyms (Mongeon et al. 2022).

We work with Dimensions data for the 2017-2019 period. We identified a total of 36,482 journals publishing 10,338,372 publications. We established a minimum threshold of 30 articles published within the 3-year period and obtained a total of 25,220 journals that had published 10,205,767 articles. Adapting local research proxies already established in previous studies (Table 1), we computed six measures of locality for each journal as reported in Table 2. The binary variables related to language and journal indexing were computed after combining the information extracted from Dimensions with the Web of Science master journal list, the Scopus list of journals, and the Directory of Open Access Journals (DOAJ). For non-binary variables, we computed the share of papers identified as local in a given journal. For practical purposes, we set a cut-off threshold at the third quartile of the continuous variables' distributions to label journals as local. Dichotomous variables were used for journal indexing and publication language.

Table 2. Definition of variables.

Operational approaches	Variables	Definitions
Toponyms	Toponyms proportion	Proportion of appearance of country level toponyms mentioned in papers' titles per journal, selected in the most preponderant languages of the dataset: English, Japanese, Portuguese, German, Spanish, Indonesian, French and Russian
Languages	Non-English publishing	Whether the journal publishes in languages other than English according to WOS, Scopus and DOAJ data, and to papers titles language recognition
Authors	Publishing proportion	Proportion of appearance of the maximum publishing country per journal according to the geographical affiliation of publishing authors
Databases	Non-mainstream indexing	Whether the journal is indexed in databases other than WOS or Scopus
References	Referenced proportion	Proportion of appearance of the maximum referenced country per journal according to the geographical affiliation of referenced authors
Citations	Citing proportion	Proportion of appearance of the maximum citing country per journal according to the geographical affiliation of citing authors



Table 3 summarizes the construction of variables and subsets of data per operational approach. The full dataset (Di Césare & Robinson-Garcia 2025) and R code (Di Césare 2024) developed to compute the calculations and visualizations are freely available online. Next, we present the results of this analysis and compare how all operationalizations perform in local journals at the disciplinary category, field³, country, and world region levels. A Principal Component Analysis (PCA) conducted on countries that published at least 3,000 articles within the 3-year period provides insights consistent with the Global North-South divide.

Table 3. Summary of variables and subsets construction.

Variables	Units of analysis	Thresholds	Subsets
Toponyms proportion	Country names in papers titles	3°Q	6,572 local journals
Non-English publishing	Languages of publication other than English	English	1,514 local journals
Publishing proportion	Maximum publishing country	3°Q	5,571 local journals
Non-mainstream indexing	Indexing databases other than WOS or Scopus	WOS or Scopus	9,517 local journals
Referenced proportion	Maximum referenced country	3°Q	5,811 local journals
Citing proportion	Maximum citing country	3°Q	5,923 local journals

Results

Local research through local journals

Table 4 shows descriptive values of the six variables computed, each one of them corresponding to an operational approach. The average values vary significantly from one variable to the other. While Toponyms proportion barely exceeds 10% of papers' titles with country names per journal, Publishing proportion identifies more than half the papers per journal as produced by authors affiliated with a single country. In between, we find similar averages in Referenced proportion and Citing proportion, where 34% of the references and 37% of the citations per journal are made to and received by sources from the same geographical origin. In other words, more than a third of the information sources and audiences per journal are concentrated in a single country. In Non-English publishing we see that only 0.06% of the journals publish in languages other than English, whereas in Non-mainstream indexing almost 40% of the journals are covered by databases other than WOS or Scopus.

Table 4. Descriptive measures of the variables at the journal level.

Measures	Continuous variables			
	Toponyms proportion	Publishing proportion	Referenced proportion	Citing proportion

³ The assignment of journals by field and category is based on the Fields of Research subject classification followed by Dimensions, as shown in Table A1 (Appendix).

Mean	0.11	0.54	0.34	0.37
Median	0.05	0.53	0.31	0.27
Minimum	0	0.06	0.04	0.04
Maximum	0.99	1	1	1
1° quartile	0.01	0.28	0.24	0.18
3° quartile	0.14	0.82	0.40	0.50
Standard deviation	0.14	0.29	0.16	0.25

Dichotomous variables		
	Non-English publishing	Non-mainstream indexing
Frequency	1,503	9,517
Relative frequency	0.06	0.38

From here on, we present results focused only on the journals identified as local according to each operational approach and their specific thresholds. Figure 2 shows the overlaps across the resulting subsets of local journals. On the left-hand horizontal bars, we see the total number of local journals that constitute each subset per approach, with Databases being the largest (9,517 local journals not indexed in WOS or Scopus) and Languages being the smallest (1,514 local journals not published in English). To the right, the grey lines with dots represent all possible intersections between the subsets, that is the number of local journals that two or more approaches have in common. In the first coincidence between approaches, we observe that Databases, Citations and Authors possess 1,548 local journals in common, as indicated by the grey vertical bar above. Further to the right, Figure 2 displays more intersections between approaches and their journals' subsets, which gradually decrease in size. The orange dots and vertical bars denote the number of local journals that do not intersect, meaning they are unique to a given approach. While some approaches converge on the same local research outputs, others reveal little overlap. In Toponyms, References and Databases, 3,056 (47%), 2,158 (37%), and 1,964 (21%) of their respective journals are unique to their own subsets and not labelled as local by any other approach. The opposite happens in Authors (233), Citations (233), and Languages (52), whose values without overlap barely range from 3% to 4%.

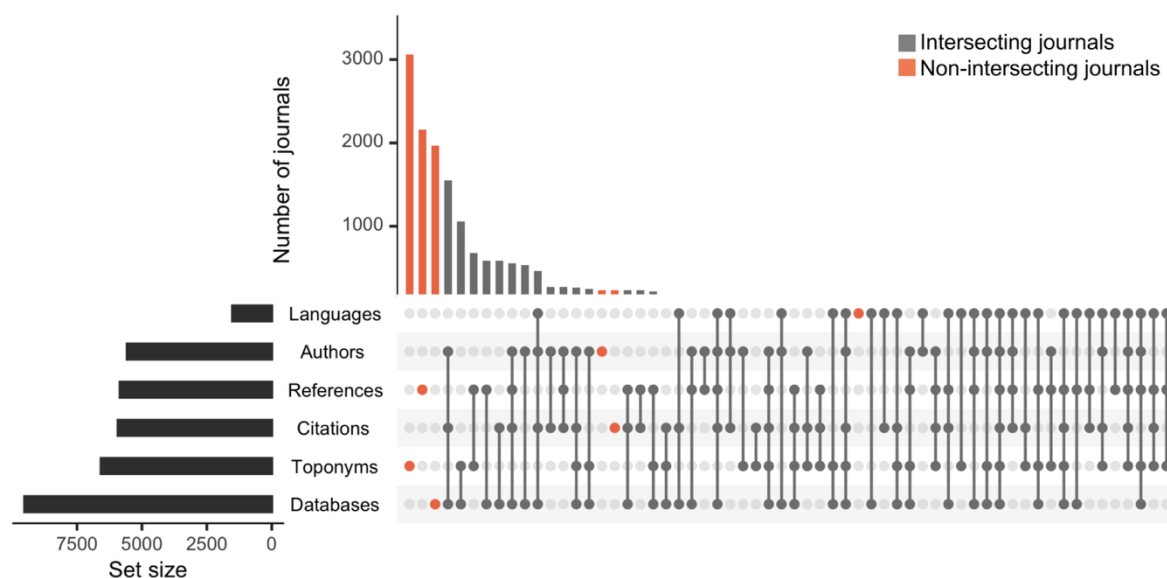


Figure 2. Intersection of local journal sets across operational approaches.

Figure 3 delves into field and category differences within the subsets of local journals according to each operational approach. The colour scale represents the proportion of local journals that belong to each disciplinary category, grouped by Dimensions fields. In general, most shares are low, and any pronounced differences are hard to observe. The Social and Health Sciences are the only fields with categories that exceed 10% of journals identified as local by the various operational approaches. In the first case, a few highlights can be seen in the Toponyms and References approaches for Human Society (HumSoc, 0.18 and 0.13 respectively), and in the Languages and Citations approaches for Education (Edu, 0.13 and 0.12). In the second case, Health Sciences informs some of the highest shares, especially in Authors and Databases for the Biomedical and Clinical Sciences category (BiomClinSci, 0.22 and 0.20). As for the Humanities, Life and Physical Sciences, the proportions remain low across all categories and approaches. This distribution becomes more informative when looking at the values by country and world region in the next Figures.

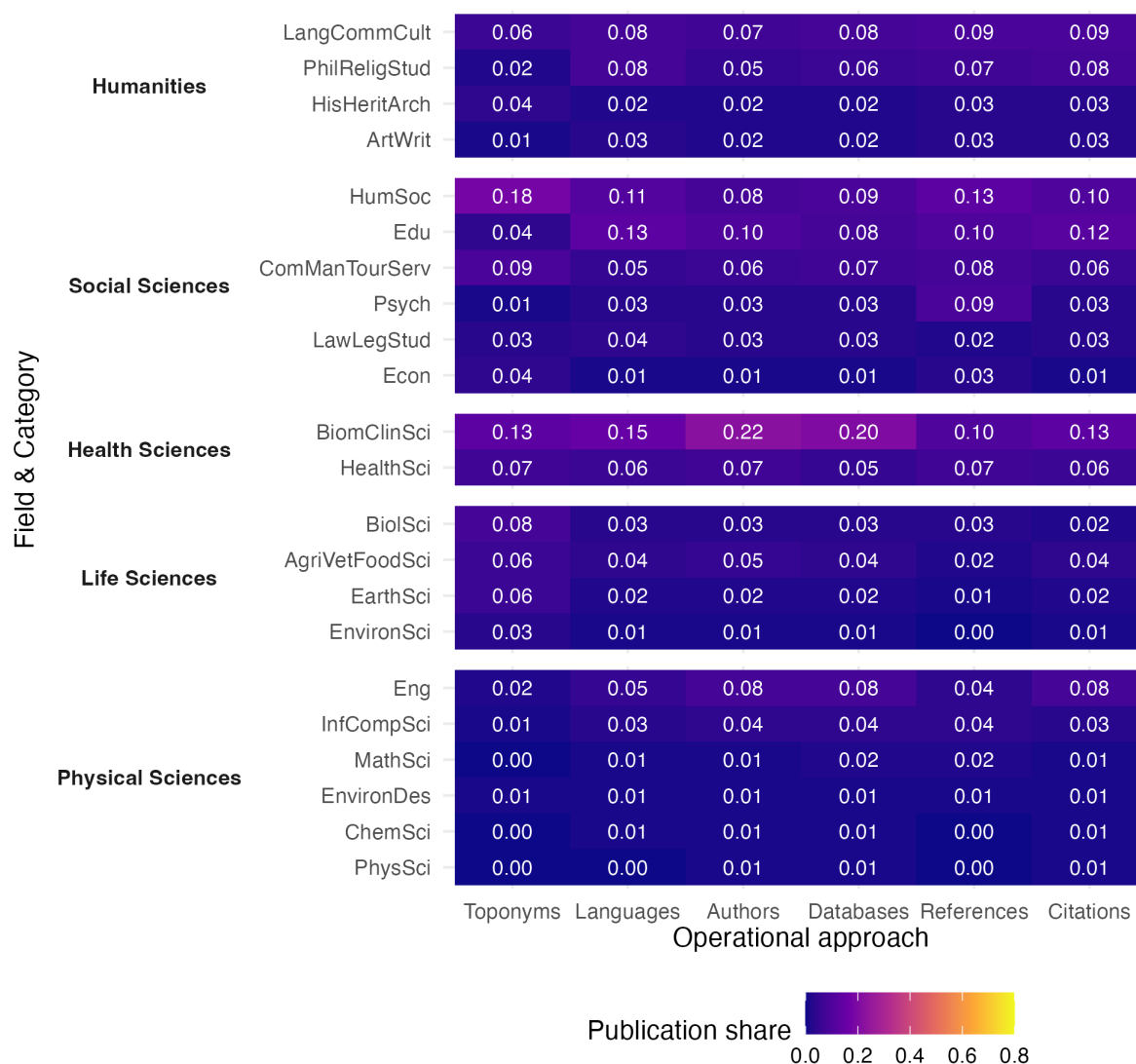




Figure 3. Share of local journals according to each operational approach by field and disciplinary category.

Local research at the country and world region levels

In Figure 4, we show six different world maps, each one of them corresponding to an operational approach. The colour scale represents each country's proportion of papers published in local journals with respect to their total number of publications during the period of study. The darker hues indicate a low share of publications in local journals, whereas the lighter shades reveal higher proportions. Countries coloured in grey present no values. Overall, Toponyms stands out because it presents the highest proportions. Approximately 50% to 80% of the papers produced in parts of Africa, Southeast Asia, and Latin America and the Caribbean are published in local journals according to this approach. Databases also presents medium to high proportions, particularly in Southeast Asia, Eastern Europe, and Latin America and the Caribbean. Indonesia stands out because 85% of its papers are not indexed in mainstream databases. Most parts of the Citations map show low shares of local research except for countries like Indonesia (0.52), Ukraine (0.50), Russia (0.40), and Brazil (0.30). From an audience point of view, these countries publish around 30% to 50% of their papers in local journals. These same countries stand out in Authors, with 30% to 45% of their papers being published in sources that mostly disseminate articles by researchers declaring the same geographical affiliation. The References approach, in contrast, highlights cases like the United States (0.30) and Canada (0.18). From an information source perspective, around 20% to 30% of their output is published in journals referencing papers that are geographically constrained. Finally, Languages reports that almost all countries publish in journals operating in English, although most of Latin America and the Caribbean exhibit slightly lighter hues than the rest of the world.

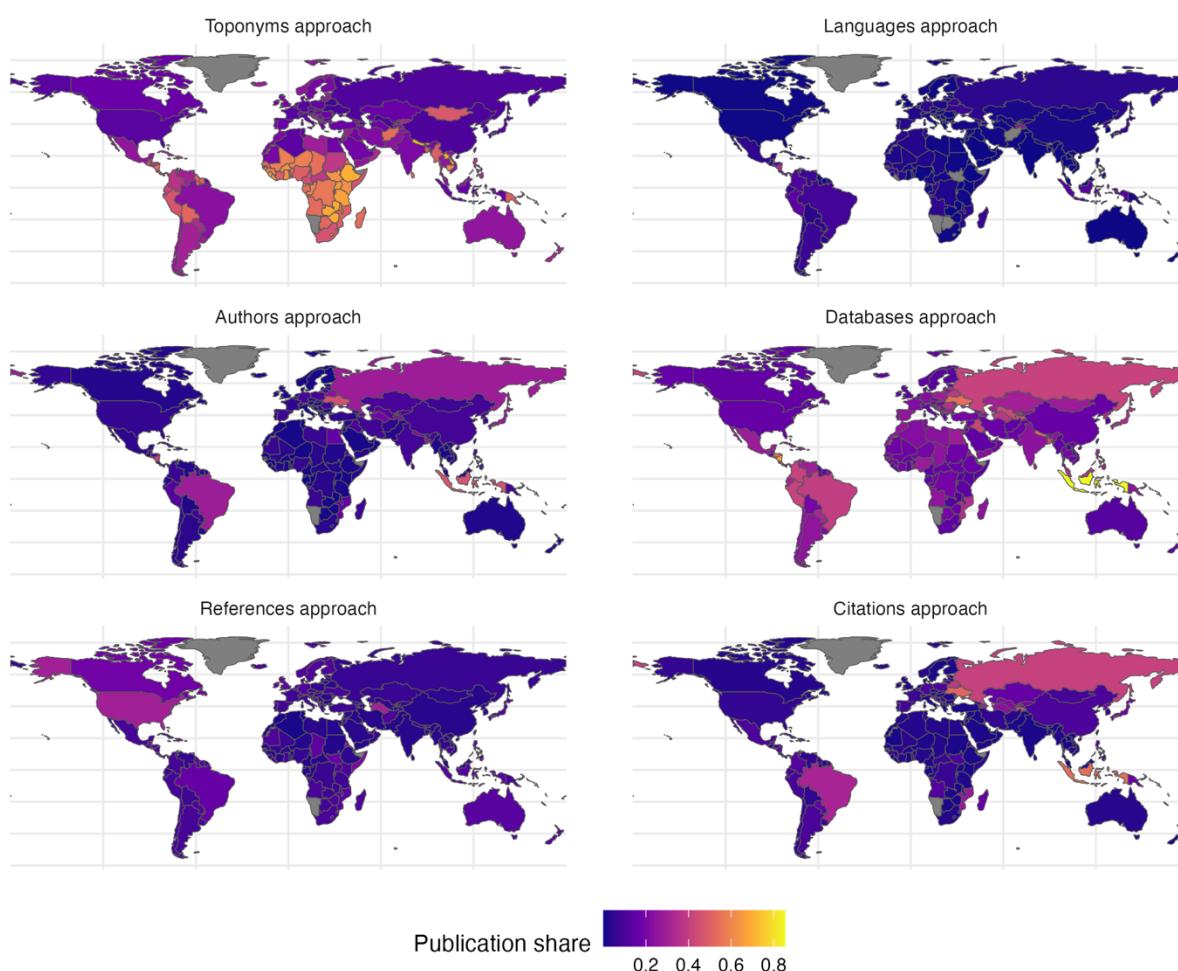


Figure 4. Countries' publication share in local journals by operational approach.

Figure 5 delves into category differences per operational approach at the regional level. Again, the colour scale represents the proportion of papers published in local journals with respect to each world region's total number of publications during the period of study. The lighter the shade, the higher the proportion, which allows us to observe that Latin America and the Caribbean have the most locally oriented scientific production of all regions, across all fields and approaches. Africa and Oceania report their higher proportional values in Toponyms, whereas the United States and Canada's most noticeable column is References. Asia and Europe display quite similar patterns of high to moderate values, especially in Toponyms and Databases. Overall, Figure 5 informs that the highest publication shares in local journals tend to concentrate towards Global South regions, and that one or several combined approaches successfully detect the local in those more peripheral parts of the world. Still, despite their differences per approach, all regions share two lighter-coloured sections that spread across the Social Sciences and Humanities, including a couple of disciplinary categories from the Life Sciences.

Focusing on the operational approaches, Toponyms shows medium to high proportions in most categories from the Humanities, Social, and Life Sciences. They are particularly evident in Africa (Human Society = 0.88) and Oceania (History, Heritage and Archaeology = 0.84). On the contrary, Languages is barely present in Latin America and the Caribbean (Education = 0.34) and Asia (Creative



Arts and Writing = 0.24). Authors appears quite muted in most regions but Latin America and the Caribbean (Language, Communication and Culture = 0.58) and Asia (Education = 0.56). Next to it, Databases has some of the brightest areas in Latin America and the Caribbean around Social Sciences (Education = 0.85) and Humanities (Creative Arts and Writing = 0.89), with several categories also standing out for Asia (Philosophy and Religious Studies = 0.77). The References approach informs considerable shares in the United States and Canada across the Social Sciences (Education = 0.79), Humanities (Philosophy and Religious Studies = 0.72), and even part of the Health Sciences. A few Humanities categories are also quite noticeable from this approach's perspective in Oceania, Africa, and Europe. Lastly, Citations is almost only highlighted in Latin America and the Caribbean's Social Sciences (Law and Legal Studies = 0.72) and Humanities (Language, Communication and Culture = 0.73), along with a few light-colored categories in Asia (Philosophy and Religious Studies = 0.71).

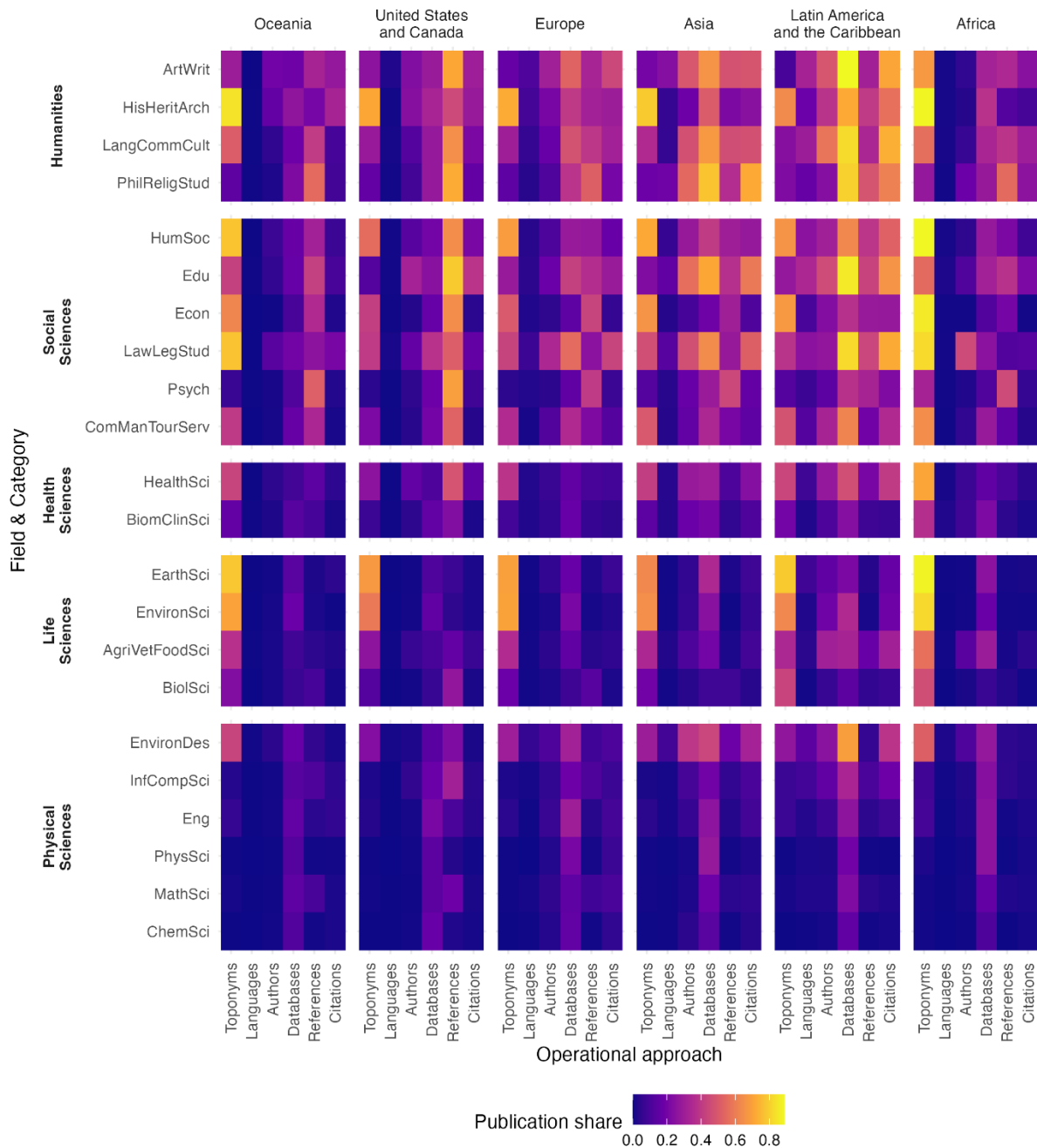


Figure 5. World regions' publication share in local journals according to each operational approach by field and disciplinary category.

Finally, Figure 6 displays the results of a PCA conducted on the operational approaches at the country level and grouped by world region (see Appendix, Table A2 for more details). The analysis includes countries with at least 3,000 articles published within the 3-year period of study. Each dot represents a country marked with its corresponding two-letter ISO code although, for readability reasons, the least productive ones are left unlabelled. The colours group countries by world region. The arrows show that, on the one hand, the Toponyms and the References approaches are inversely related. This means that the countries where toponyms work best for signalling local research tend to exhibit less geographically concentrated references, and vice versa. On the other hand, Databases, Authors,

Languages, and Citations point in similar directions and are more closely correlated, as supported by Figure A1 (Appendix). The countries located on the right-hand side of the biplot are therefore positively associated with higher coverage in non-mainstream databases, more diverse linguistic practices, and more geographically concentrated authorship and readership.

The colour pattern reveals that the United States, Canada (in dark blue), and Oceania countries (in purple) cluster to the bottom-left of References. Close to them, and extending towards the centre of the biplot, appears most of Europe (dark magenta) together with several Asian countries (bright orange), like Singapore (SG), the United Arab Emirates (AE), and South Korea (KR). Asia also spreads around Toponyms, where a stronger presence of Africa (light orange) can be observed. Latin America and the Caribbean (yellow) lean towards the four approaches shaping PC1, especially Databases. Further along the x-axis, Russia (RU), Brazil (BR), Ukraine (UA), and Indonesia (ID) seem to behave like outliers within this main structure of operational approaches. Overall, Global North countries cluster more densely towards the bottom-left quadrant of Figure 6, suggesting that almost all approaches to measuring local research have little explanatory power over them. In contrast, Global South countries appear to be clearly characterized by most approaches, although regional differences persist within this group.

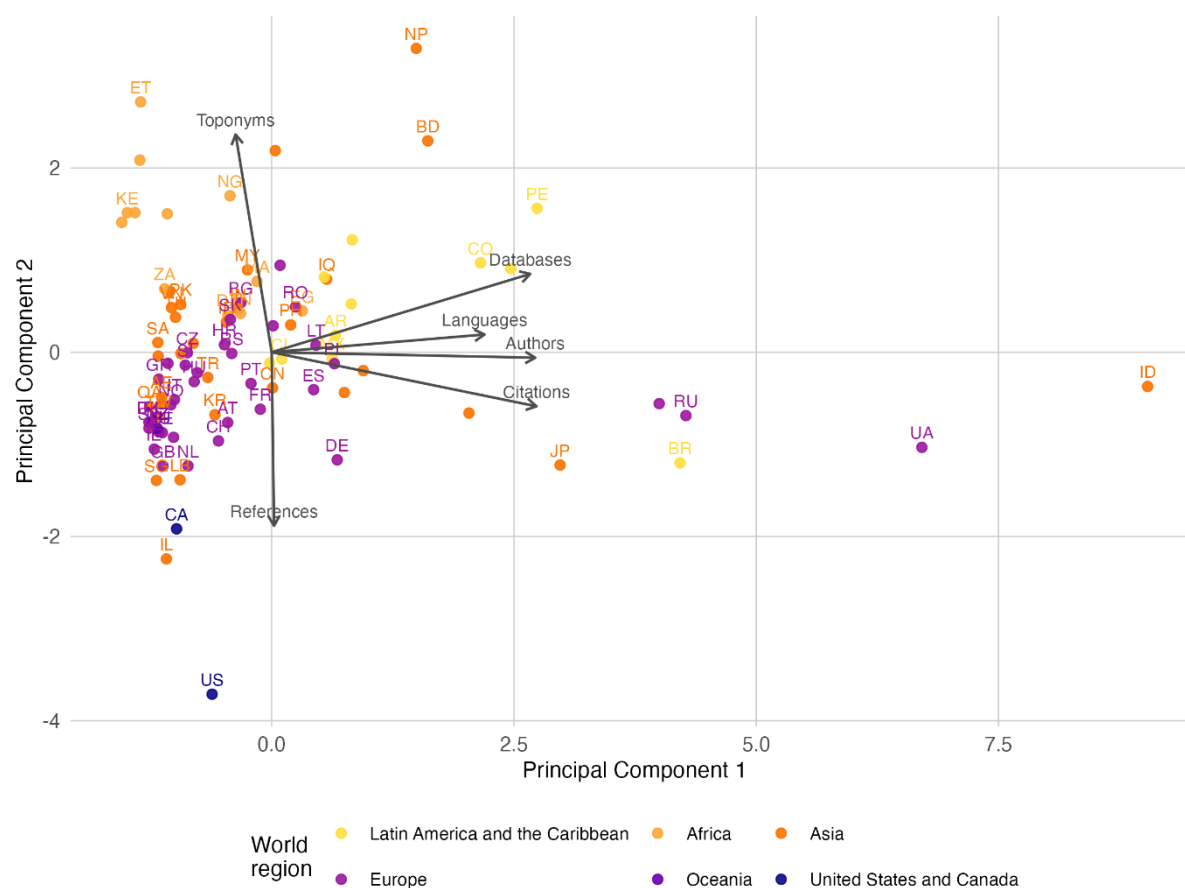


Figure 6. PCA of local research operational approaches at the country level, grouped by world region.



Discussion

In this article, we propose a framework of local research. Although the term is increasingly mentioned in the scientific literature, it is often used indistinctively to denote different forms of locality: the territorial scope of a study, the use of local knowledge or the targeting to specific audiences. Our goal is to determine how the concept of local research relates to its measurement, highlighting the nuances involved in its theoretical depiction and the risks of applying different empirical methods indiscriminately across regional and disciplinary contexts. To address this, we first review how the concept of local research has been addressed, both theoretically as well as empirically. Based on our literature review, we identify three dimensions – locally situated, informed, and relevant research – and six scientometric approaches to analyse it – Toponyms, Languages, Authors, Databases, References, and Citations. We then compare these approaches and examine how the link to the three theoretical dimensions identified.

Our main findings suggest divergences across regional and disciplinary settings by operational approach. Except References, where the United States and Canada stand out, most other approaches are more prevalent in Global South regions alongside a few Eastern European countries. Toponyms and Databases stand out, although they are based on problematic assumptions that give a heightened impression of locality in certain places while hiding this quality in others. The Authors and Citations approaches display similar world patterns, while Languages yields almost no information at the country level other than emphasizing English as the lingua franca of science. In this regard, we acknowledge that Dimensions' skewed coverage could be interfering with the finding. The use of larger and more comprehensive databases, such as OpenAlex, could potentially unveil language differences and their link to local research (Céspedes et al. 2025).

When combining this geographic data with fields and disciplinary categories, we see that the Social Sciences and Humanities from the Global South have a stronger tendency towards the local. Latin America and the Caribbean are most successfully captured by approaches like Databases, Citations, and Authors. Whereas for African countries, the Toponyms approach is more prevalent in those areas, alongside the Health Sciences. These results align with those of previous studies (e.g. Castro-Torres & Alburez-Gutiérrez 2022; Hladchenko & Moed 2021; Navas-Fernández et al. 2018; Tijssen 2007; Torres-Salinas et al. 2010). On the contrary, Life Sciences remains constant across approaches and regions, and Physical Sciences are barely captured by any method. In sum, this initial testing of the operational approaches to identify local research indicates that they operate quite differently across both the disciplinary landscape and the Global North-South divide.

While the PCA supports our findings on regional differences, it also suggests that the approaches' behaviour does not fully match the theoretical views on local research. The approaches tied to territory, such as Toponyms and Languages, do not align with a unified locally situated dimension,



although they help capture the local for many African, Asian, and Latin American countries. The same happens with the approaches linked to knowledge producers, like Authors and References, which do not converge in the locally informed dimension. The most present countries in the former approach are Latin American and Asian, whereas the latter displays a closer correspondence to the Global North. This last group is formed by many of the largest scientific producers worldwide, so it is difficult to conclude whether the method is capturing local research from the Global North, or global research led by these world scientific powers. On the contrary, the approaches tied to knowledge recipients, such as Databases and Citations, seem to better explain the locally relevant dimension. This is especially visible for most of Latin America and the Caribbean, as well as for a few Asian and Eastern European countries. On the whole, these findings reveal that there is no complete alignment between theory and practice when it comes to local research.

Concluding remarks

Our findings suggest that no individual approach entirely captures a dimension of local research in every context. Nor are these existing measurements free from technical limitations and geographical biases, as we have pointed out. This means that studies analysing or assessing the impact or production of local research need to adopt nuanced methodological designs which adapt to the geographic region and disciplines being analysed. Still, analysing to what extent what we capture with scientometric methods is the phenomenon we aim to analyse is something that remains contested. Therefore, we see great potential in their combination to help seize such a complex, multidimensional phenomenon. Complementarity between approaches and dimensions may be key to harnessing all their potential while minimizing their limitations when addressing the local. This framework could prove useful to study not only the different dimensions that comprise local research, but also their intersections. Further research using field-specific PCAs would prove useful in detecting homogeneity or heterogeneity patterns between countries' scientific specializations. Other possible instances of analysis could be, for instance, the role of non-mainstream journals as communicating vessels between global and local scientific circles (Chavarro et al. 2017; Di Césare et al., 2025), or the evolution of research fronts that emerge to respond to localized problems but then expand when the issue acquires a global scale (i.e. the spread of vector-borne diseases, as in Simon et al. 2008). Despite the challenges described at length, we believe this contribution can serve as a starting point for integrating theoretically informed conceptions with empirical approaches of local research, potentially helping to mitigate many of the barriers current research evaluation systems face when assessing and supporting this type of scientific research.



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Appendix

Table A1. Dimensions category names and acronyms grouped by fields.

Fields	Category names	Acronyms
Humanities	Creative Arts and Writing	ArtWrit
	History, Heritage and Archaeology	HisHeritArch
	Language, Communication and Culture	LangCommCult
	Philosophy and Religious Studies	PhilReligStud
Social Sciences	Commerce, Management, Tourism and Services	ComManTourServ
	Economics	Econ
	Education	Edu
	Human Society	HumSoc
	Law and Legal Studies	LawLegStud
	Psychology	Psych
Health Sciences	Biomedical and Clinical Sciences	BiomClinSci
	Health Sciences	HealthSci
Life Sciences	Agricultural, Veterinary and Food Sciences	AgriVetFoodSci
	Biological Sciences	BiolSci
	Earth Sciences	EarthSci
	Environmental Sciences	EnvironSci
Physical Sciences	Built Environment and Design	EnvironDes
	Chemical Sciences	ChemSci
	Engineering	Eng
	Information and Computing Sciences	InfCompSci
	Mathematical Sciences	MathSci
	Physical Sciences	PhysSci

Table A2. Eigenvalues and explained variance of the PCA's principal components.

Measures	Components					
	PC1	PC2	PC3	PC4	PC5	PC6
Eigenvalue	2.99	1.14	1.00	0.55	0.22	0.07
Variance	49.90%	18.98%	16.80%	9.19%	3.82%	1.29%
Cumulative variance	49.90%	68.88%	85.68%	94.87%	98.70%	100%

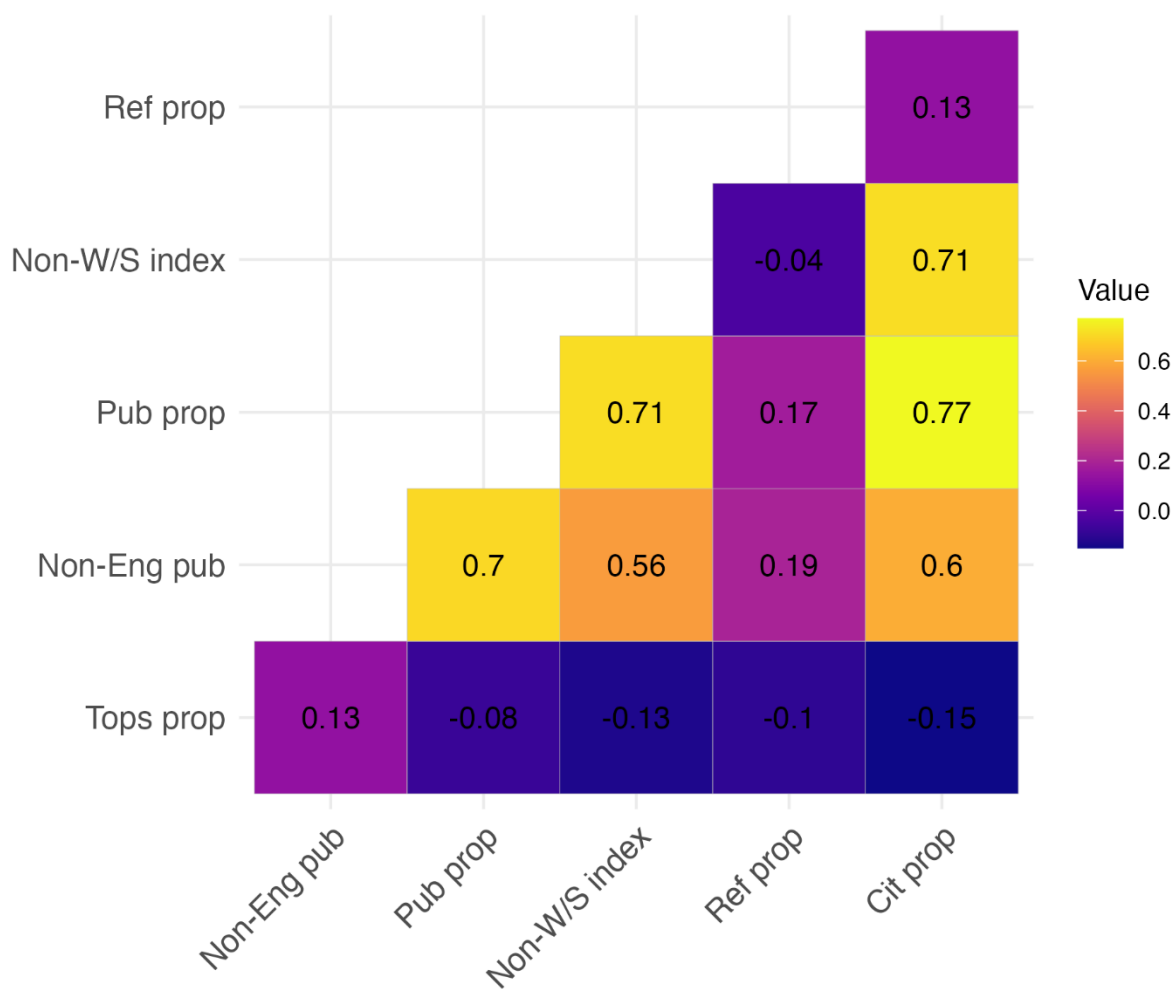


Figure A1. Country level correlations of variables from all operational approaches.