



# The Internationalisation of Psychology in Brazil: an Analysis of Scientific Outputs, Collaboration Networks and Their Impacts

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## Abstract

This article aims to analyse the process of internationalisation of scientific output in Brazilian psychology and its subfields and compare them with other countries from 2011 to 2020. Two other objectives were taken into consideration: to describe the collaboration networks formed by national psychology researchers and their influence on the impact of scientific output while analysing the relationships in the North–South and South–South axes and to reflect on the advance of the quality of the scientific output over time, considering the indicators of its scientific impact. We used SciVal, based on the Scopus database. The main result is that cooperation on the South–North axis was dominant compared to cooperation on the South–South and South–East axes. The paper also discusses the importance of public funding agencies and the growth of graduate programs in Brazil, enabling the increase in output and the internationalisation of national psychology. The final part addresses the limitations of the Scopus database and some guidelines for the future of the internationalisation of Brazilian psychology.

**Keywords** Internationalisation of psychology · Psychology in Brazil · SciVal · Internationalisation · Globalisation of higher education · Internationalisation of higher education · Academic governance

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According to Merton, (1942), four sets of institutional imperatives are ideal for the practice of modern science. The first, universalism, assumes that scientists from all fields can potentially contribute to knowledge production. The second, communalism, embraces the principle of science as a public good as opposed to a private one. Disinterestedness is the third, based on the belief that scientific findings should be evidence-based and subjected to collective interests rather than the individual. Lastly, organised scepticism defends that knowledge production should be subjected to continuous critical scrutiny from peers and the general public.

The assumption that science is a public good (communalism) and that all fields of knowledge can contribute in a complementary way to the advancement of knowledge (universalism) opens windows to different forms of integration and cooperation among scientists from diverse backgrounds and regional contexts. The bases of this integration and collaboration include the need to meet local demands, respecting contextual, cultural differences; regional, which serve the interests of a larger, geographically demarcated collective; and global, that respond more to transversal interests, despite individual and contextual differences. The advancement of scientific knowledge, therefore, strongly depends on the ability of scientists to walk a continuous line that oscillates, at one pole, with the emphasis on particularisms that serve local interests, and at the other pole, with a universalism that meets collective interests that go beyond territorial borders. The internalisation of knowledge is a topic of great importance in a globalised world. Collaboration networks with researchers from different countries, sensitive to different contexts, increase the chances of moving between the two poles more easily and promote internationalisation in any field of knowledge (Henrich et al., 2010).

Since its origin as an independent science, becoming an international community has been a goal for psychology. This goal aligns with Merton's institutional norms, in tension with counter-norms within the scientific field. Creating international scientific entities and amplifying communication channels associated with knowledge exchange (e.g. cooperation projects, congresses and scientific events) are crucial pillars to promote and develop the psychology field (David & Buchanan, 2003). The International Association of Applied Psychology (IAAP), founded in 1920, is the oldest international scientific institution in this field. The International Council of Psychologists (ICP), created in 1941, and the International Union of Psychological Science (IUPsyS), created in 1951, also played a decisive role in the search for the research and curricula of psychology internationalisation worldwide (Rosenzweig et al., 2000).

For psychology, this goal has been addressed both by international organisations, such as those mentioned above by international conferences held worldwide, and by explicit national and regional initiatives to promote international exchange and engagement. Currently, psychology is present in most countries (Benjamin & Baker, 2012). Yet, debates about the process of internationalising psychology are still current in twenty-first-century discussions in the literature, focusing on a variety of topics: the concept of internationalisation (e.g. Begeny, 2018); the history of internationalisation, from the growth of international entities and world scientific conferences (e.g. Benjamin & Baker, 2012); the scope of internationalisation and its effects on the development of psychological science (e.g. Bullock, 2015); the internationalisation process in the USA, the centre

of scientific output in psychology (e.g. David & Buchanan, 2003; Hurley et al., 2013); and the state of the art of internationalisation and methods to promote global, inclusive and multicultural psychology (van de Vijver, 2013).

There is large country variance in the production of science and technology. Countries that lead in science and technology production often define the dominant models, phenomena that are investigated and theoretical and methodological frameworks used (David & Buchanan, 2003). In psychology, as in many other sciences, the USA has been the top central country in scientific output. More peripheral countries, such as Brazil, often take a supporting role in knowledge production, and the pressure for internationalisation can lead to subordination to the scientific lines of research from central countries, moving the local research agenda to a secondary place.

However, processes of globalisation, advances in rapid communication and a focus on a *knowledge society* are changing these dynamics. Essentially, ICTs and the internet have simplified the access to worldwide collaborators, enabling international research partnerships. The scientific output process is no longer the researcher's lonely and isolated work and becomes the product of various collaboration networks between researchers, research groups and institutions. The co-production of knowledge and establishing international research partnerships tend to impact the quality of the knowledge produced.

Globalisation has further promoted the discussion about internationalisation in psychology (Lo Bianco et al., 2010; Tudge & Freitas, 2012), mainly through enhancing interactions and promoting faculty and student mobility (Jones & Coelen, 2016). Simultaneously, there has been an expressive growth of internationalisation at home (Ramos, 2018; Silla et al., 2021), favouring better local alignment with international practices and expanding intercultural interfaces (Beelen & Jones, 2015).

As the scientific enterprise has become more active and global, competition is expressed through rankings of countries, institutions and scientists. These rankings become a driving force for the development of internationalisation, an initiative in peripheral countries' research groups that aim to expand their presence worldwide and discuss the multiple ways to measure scientific output and global networks. These aspects make us recognise that internationalisation is complex and is presented differently in each country and discipline, including psychology.

In this paper, we explore one such ranking system, the one used in Brazil, and compare it with other countries from 2011 to 2020. In summary, we will (1) describe the internationalisation processes in Brazil and (2) ask whether these processes affect the quantity and quality of scientific output.

## **Scientific Output of Brazilian Psychology Internationally: the Importance of the Emergence of Public Funding Agencies and the Growth of Graduate Programs**

In this section, we will cover the processes of Brazilian psychology internationalisation. This process broadens the interaction between Brazilian research groups and their foreign peers. It has been highlighted as the main road to promote the qualitative progress of graduate programs in Brazil (Tourinho & Bastos, 2010).

According to van de Vijver, (2013), one of the three most promising ways to promote advanced internationalisation in psychology is investing in international collaboration development. As in several other scientific fields, the development of psychology in Brazil has been characterised by researchers receiving a complete education abroad, although a qualified faculty inside the country could have trained them (Tourinho & Bastos, 2010). Moreover, many researchers came to Brazil and contributed to the development of psychology, and such mobility enabled the creation of partnerships with international entities, with effects on collaborative scientific output.

In Brazil, scientific development has been closely tied to increasing and strengthening the graduate program system. From the establishment of the first master's program in 1966<sup>1</sup> at the Pontifical Catholic University of Rio de Janeiro (PUC-Rio) (Gomes & Hutz, 2010), scientific research was institutionalised in universities rather than in laboratories/agencies.

However, despite an emphasis on graduate programs, for developing the scientific workforce, much of the psychology graduate training remained outside the country. The Brazilian scenario was changed because of substantial investment in graduate programs in the country supported financially by the Coordination for the Improvement of Higher Education Personnel (CAPES) and the National Council for Scientific and Technological Development (CNPq) and, moreover, through the continued growth and diversity of themes researched in psychology.

Throughout the last three decades and consistent with the country's general trend, the psychology graduate program system has not stopped growing and diversifying itself in terms of lines of research and fields of focus in different national regions. Such growth has also reduced regional asymmetries in funding resources, graduate programs and researchers, historically concentrated in Southeast Brazil, although the iniquity remains high. In 2019, there were 164 graduate programs in psychology in Brazil, divided into 86 academic programs and 14 professional ones (Tomanari et al., 2019). This number is relevant, considering that the first master's program dates from 1966 and the first doctorate program from 1974.

The plans and strategies for action set by Brazilian graduate programs are integrated with Brazil's public policies. Therefore, creating the CAPES and the CNPq in the 1950s, when many federal universities were being founded, was an essential step to include science and researcher education in state policies. In addition to the strengthening of universities, especially public ones—some religious—and the expansion of graduate programs, a scientific community began to rise, increasingly broad and diverse. Graduate programs and research thus became inseparable since most of the research in Brazil is conducted within public graduate programs (Bastos et al., 2017).

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<sup>1</sup> The first two psychology doctorate programs in Brazil were established at the University of São Paulo (USP), in 1974, within the fields of School Psychology, Human Development and Experimental Psychology (Biaggio & Grinder, 1992; Costa & Yamamoto, 2016).

We should also mention the role played by the *Planos Nacionais de Pós-Graduação* (PNPGs),<sup>2</sup> a national agenda that outlined guiding elements for public policies aimed at the growth of graduate programs in Brazil. This agenda guided several agencies—e.g. CAPES; CNPq; Foundation for the Public Funding for Science, Technology and Innovation (FINEP); and research foundations (FAPs)—to act in a convergent way for the individual support of researchers and for the consolidation of research groups. These agencies also support the maintenance and expansion of graduate programs and scientific output. Consequently, the institutionalisation of science is complemented by the advent of scientific societies and other associations to make their specific fields more dynamic.

According to Gomes & Hutz, (2010), in the 1970s, CAPES had already become the principal agency responsible for implementing the first PNPG (I PNPG). In 1978, CAPES initiated an evaluation system, seeking to monitor the growth and development of the graduate program system, as an input to decision-making regarding funding distribution (aids and scholarships). In 1982, CAPES became the II PNPG administrator. Despite some interruptions in constructing PNPGs (for instance, in the 1990s, the IV PNPG was not approved), CAPES has successfully outlined a funding and evaluation model for graduate programs in Brazil (Barreto & Domingues, 2012; Bastos et al., 2017; CAPES, 2012). What is worrying is that the VII PNPG (2020) was not prepared, aggravated by the lack of prospects of having it in the coming years. The commission for building the PNPG for the 2020–2030 decade was only appointed in 2022, with a significant delay for the country's scientific policies. Hope for the resumption and approval of the 2021–2030 PNPG is renewed with a new government more committed to scientific development and Brazilian education.

In the late 1980s, the National Association of Research and Graduate Studies in Psychology (ANPEPP) was created. This association and CAPES were responsible for outlining research and graduate programs in this specialised field. Through its coordination of the psychology area, CAPES defines guidelines and models for evaluating and ranking courses, while ANPEPP has become a vital forum for discussing this whole process. This context is where scientific output, expansion, qualitative growth and internationalisation become major debates and reflections.

CAPES and ANPEPP, therefore, are the main institutional actors in the internationalisation of psychology in Brazil. Employing its Psychology Area Coordination, CAPES has been developing and improving internationalisation indicators of the area. ANPEPP has been working predominantly in the Internationalisation Forum. The debate advances mainly through several publications on the theme, comparing graduate programs with solid internationalisation aspects (evaluations 6 and 7 by CAPES, in a 1 to 7 scale) and addressing the implications of internationalisation for the national psychology curricula (Feitosa, 2007).

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<sup>2</sup> The National Postgraduate Plan (PNPG) is the government policy that directs the activities of higher education institutions that make up the national postgraduate system (SNPG). The PNPG is part of the National Education Plan (PNE) of the Ministry of Education (MEC). The CAPES is responsible for producing this document through a national commission formed by academic community members. Over 50 years (1950–2020) since its creation, six plans were created that helped to pave the way for the institutionalisation of the existing graduate system in the country.

There are three further issues to discuss: (1) variability of psychology programs across subfields and variability in scientific output (Lo Bianco et al., 2010), (2) challenges to increasing collaborative networks to improve the production and dissemination of new knowledge in psychology (Tourinho & Bastos, 2010) and (3) the effects of broad world trends on Brazil, such as the development of South-South collaborations or increasing access to scientific output outside traditional centres (Sato & Nardi, 2021).

## **Actions to Promote Internationalisation**

### **Internationalisation Forum by ANPEPP**

Faculty and researchers of affiliated graduate programs participated in the Internationalisation Forum (FI) coordinated by a committee of professors invited by ANPEPP's board. During the entity's biennial events, the forum's activities focused on discussing what internationalisation should be, mapped the initiatives concerning the graduate programs' actions to advance internationalisation and created a dialogue with national and foreign specialists with experience in internationalisation. The forum also invested in elaborating key documents to promote critical reflection on the internationalisation actions of public agencies and graduate programs, considering the North-South or South-South axis (ANPEPP, 2021).

### **Considering the Specificities of Brazilian Psychology, Overcoming the Three Challenges of Better-Integrating Quality and Quantity in Scientific Output and Internationalisation**

The first challenge refers to the balance between quality and quantity in scientific output. Since the early 2000s, evaluation processes have emphasised scientific output and quality as critical to courses' performance beyond quantity. Some resources were created to support the quality of the CAPES evaluation process, for instance *Qualis Periódicos* (journals), *Qualis Livros* (books) and *Qualis Produtos Técnicos* (technical products) (Bastos et al., 2017). *Qualis* is a national assessment methodology that aims to create parameters for comparative judgement concerning scientific production, subdivided into scientific articles, books and technical-technological products.

The articles published in well-ranked journals (coincidentally, those foreign journals indexed in international bases such as Web of Science and Scopus) became the main performance predictor of graduate programs. Additionally, the highest tiers for course evaluation became restricted to courses with performance similar to international ones, diversifying the criteria to classify a graduate program as international, not limiting it to the scientific output. There is a close relation between output demands and the system's general output increase, which includes psychology as documented by reports of the CAPES area committee (Bastos et al., 2016).

As peers carry out the evaluation, we emphasise that *Qualis* valued the output from journals organised by scientific societies in their rankings and not necessarily by impact factor with supporting professional publishers. This criterion deeply differentiated *Qualis* from other international rankings, which use the citation index as a quality indicator. A key aspect is that the notion of internationalisation of a graduate program should still be discussed, impacting how it is measured in Brazil and other countries.

The second challenge concerns the association between quality and internationalisation. Professional programs, as distinct from academic programs, have broken the relationship between quality and internationalisation; in particular, they are expected to socially impact the local and regional contexts in which they take part. However, such relation remains untouchable for most of the academic programs, including psychology. Due to the challenge of balancing the value of internationalisation and the impact on local society, CAPES chose to assign different weights in evaluating graduate programs. Thus, postgraduate programs with a more significant impact on the local community gain more points for this item. In contrast, programs with a greater vocation for a global impact received more weight in evaluating their internationalisation.

Regardless of this attempt to respect the vocation of each graduate program, the ranking model promotes competition, leading the programs to meet the requirements for the quality of evaluation, thus receiving more resources and support. The evaluation (Queiroz et al., 2020) and the model (e.g. Mattedi & Spiess, 2017) have been criticised over the years, and new approaches have been arising to overcome this limited perspective of evaluation (e.g. *Tabela de Melhor Produção*, a table for output improvement that has guided the evaluation of the output in psychology since the early 2000s, and *Tabela de Produção Técnica*, a table to account for the variety of technical outputs to value knowledge application). Nevertheless, the evaluation model became a core factor for increasing output and the purpose of internationalisation.

The third challenge refers to the specificity of psychology as a scientific field, closely interfacing with several other fields, which, in many graduate programs, are related to an interdisciplinary identity. Such interfaces with biology, neuroscience, health sciences, education, organisations, human sciences, applied social sciences and others pose a challenge in addressing internationalisation in a diversified field and between the subfields. In this sense, there is a challenge not only in comparing the internationalisation of psychology with other areas—since each one adopts its models—but also within psychology, which has subareas with very different characteristics and degrees of internationalisation. In summary, the integration of scientific production with several other scientific areas has a consequence on the imprecision of the concrete level of internationalisation of Brazilian psychology, as it ends up being dispersed and composing indicators of other related knowledge fields.

This situation leads to the question of whether it is possible to conceive a single internationalisation model for a field that moves so explicitly between biological/health, human and applied social sciences. Moreover, the partnerships with some countries become relevant, considering objectives and priorities of such different segments, which single-handedly would make the process of internationalisation widespread and plural.

## The Resurgence of International Collaboration Networks and Its Challenges

The collaborative network is a key to the internationalisation process. But, what are the bases for its understanding and operationalisation? What are the determinant factors? In Brazil, there is a persisting discussion about North–South asymmetries in internationalisation policies (Sato & Nardi, 2021), with criticism towards how exchanges with French, North American, Dutch and Spanish universities are more praised (Lo Bianco et al., 2010). This debate is also present in international literature. That Western countries are often the dominant side may be damaging, since the development of current international psychology depends on intellectual input from all sides (van de Vijver, 2013). Usually, these countries have advantages in language, accumulated experience and available resources (Adair et al., 2010; Horta, 2009).

Although it is recognised that the differences in how the process of internationalisation in Brazilian psychology is computed and evaluated by CAPES and the SCOPUS database, the general framework offered by SciVal may shed light on the growth, quality and nature of collaborations, leading to reflections on the future paths that the internationalisation process should follow.

### Method

#### Platform SciVal

For data analysis, we consulted the platform SciVal, which uses the Scopus database. It also searches for data based on Elsevier's approach to research metrics, which is a part of the Research Intelligence portfolio.<sup>3</sup> This tool uses advanced computer technology to process a significant volume of data on scientific output worldwide, with evidence of robustness, including comparison with other national indicators of evaluation used in other countries.

SciVal allows the visualisation of research performance in a given area; here, we focus on psychology and the benchmark between institutions and researchers. Finally, SciVal also analyses the development of partnerships between institutions and countries and allows the analysis of research trends. In summary, our option was to use SciVal data classified as belonging to the area of psychology instead of considering only CAPES data since such data refer exclusively to the productions from professors and students of Brazilian graduate programs in psychology.

### Sampling

Scopus considers psychology an area/field of knowledge instead of a subfield of social sciences and arts and humanities, areas that gather many of the fields of expertise of the CAPES Humanities College, or CNPq. Moreover, Scopus operates with

<sup>3</sup> [https://www.elsevier.com/\\_\\_data/assets/pdf\\_file/0020/53327/ELSV-13013-Elsevier-Research-Metrics-Book-r12-WEB.pdf](https://www.elsevier.com/__data/assets/pdf_file/0020/53327/ELSV-13013-Elsevier-Research-Metrics-Book-r12-WEB.pdf)



a set of seven psychology subfields and CAPES with eleven.<sup>4</sup> There are differences between the Scopus/SciVal database and the CAPES knowledge tree; for example, whereas the SciVal database has a subfield of clinical psychology, in CAPES, it is subdivided into psychoanalysis and clinical psychology. Likewise, what is called developmental and educational psychology in SciVal, in CAPES, it is split into developmental psychology and school and educational psychology. But perhaps, the main distinction lies in the fact that SciVal has a subfield called applied psychology, which does not exist in Brazilian classification, but CAPES includes subfields such as psychology and health and organisational and work psychology.

The SciVal database comprises the total production published in Scopus journals classified as belonging to the field of psychology; in numbers, it represents 1302 (3.0%) of the 43,016 journals in the Scopus database (Scopus source list, June 2022, <https://www.scopus.com>). Another differentiating aspect between CAPES and SciVal is found in the internationalisation analysis. CAPES counts the publications of authors (professors, students) linked to the graduate programs in psychology. Therefore, part of the scientific output is allocated to journals in related areas (social sciences, administration, education, etc.). SciVal only considers journals from the Scopus base classified as psychology. This distinction explains why, although a few psychology researchers study Alzheimer's, this is the most frequent topic in psychology at SciVal. But given its relevance, CAPES' psychology assessment area uses data from publications and citations from the SciVal database to assess the internationalisation of graduate programs in Brazil.

## Procedures

We selected data set systematically on overall research performance, using a year range between 2011 and 2020, all types of publication in psychology and its seven subfields (applied, clinical, developmental and education, general, neuropsychology and psychophysiology, social, experimental and cognitive). We collected information on the following indicators and rankings, considering the 40 most productive countries<sup>5</sup>: international collaboration, academic-corporate collaboration, scholarly output, citations per publication and field-weighted citation impact. Then, we compared these Brazilian indicators among psychology subfields according to the Scopus classification. In addition, we collected data to characterise the production of Brazilian psychology between 2011 and 2020, considering its subfields and other social and human sciences. Finally, we selected the clusters that SciVal makes available to identify the prevalent study themes in psychology.

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<sup>4</sup> Behavior analysis, psychological assessment, history and fundamentals of psychology, basic psychological processes/neurosciences, psychoanalysis, clinical psychology, development psychology, psychology and health, school and educational psychology, organizational and work psychology and social psychology.

<sup>5</sup> To illustrate, we cite 12 of the most productive countries: Australia, Canada, China, France, Germany, India, Japan, Italy, the Netherlands, Spain, the UK and the USA.

## Results and Discussion

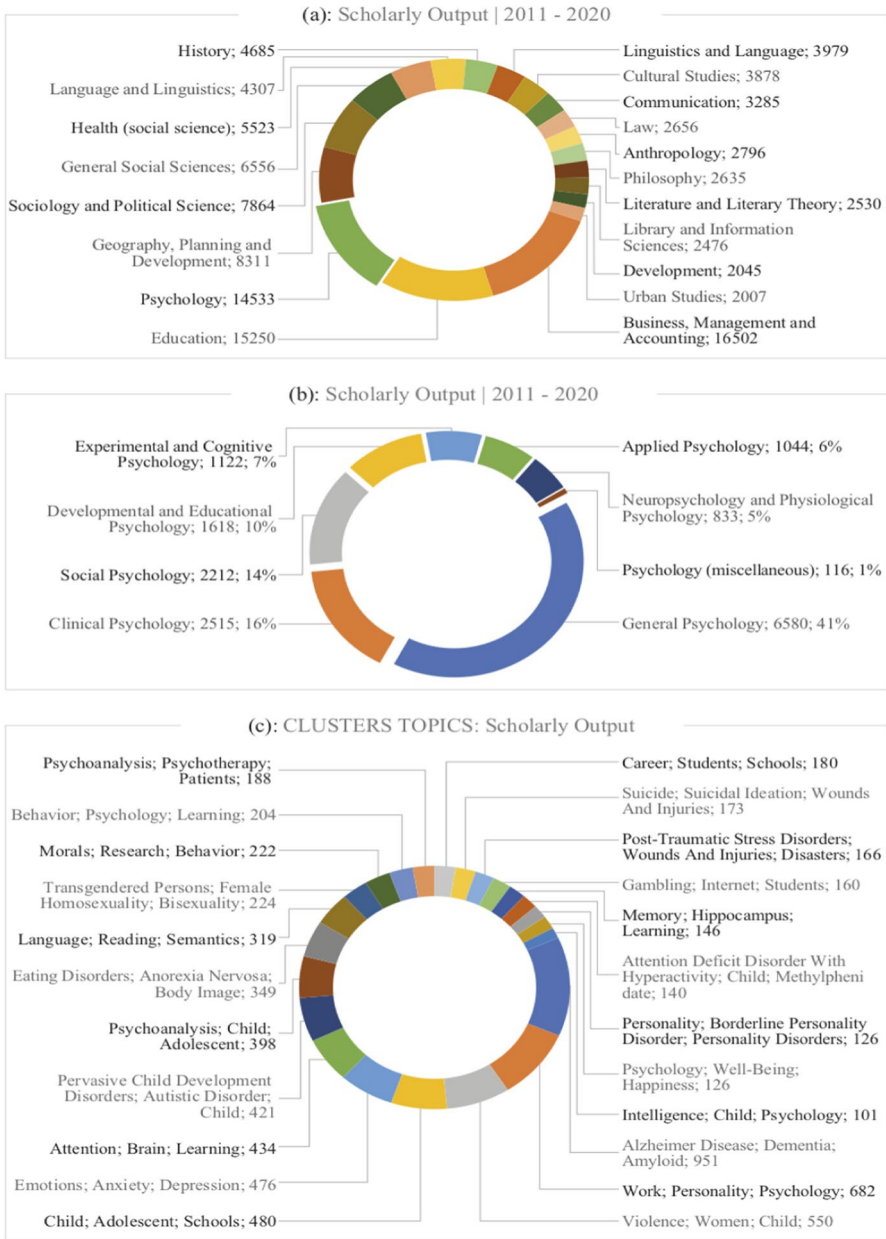
The data extracted from SciVal, concerning the period between 2011 and 2020, were organised in three main axes: (1) a brief characterisation of the Brazilian psychology output following the subdivided areas in Scopus and its status in comparison with other countries worldwide; (2) the evolution of such output over the last decade, considering quantitative indicators (number of items) and qualitative (citations and impact); and (3) the profile of the collaborations between entities, measured by co-authorships in publication, including information about the countries where the publication was more intensively accessed and with more impact in terms of citations.

### Axis 1: the Output in Brazilian Psychology Indexed in Scopus

In the indexed output, psychology takes 22nd place among the several knowledge areas of Scopus, being responsible for only 1% of contribution (a similar percentage of the multidisciplinary area and business, management and accounting). The six areas that contribute the most are medicine (15%), agriculture and biological sciences (12%), engineering (8%), biochemistry, genetics and molecular biology (7%), computer sciences (6%) and physics and mathematics (6%). However, in comparison with other areas of humanities (human sciences and applied social sciences), which is the field of psychology in the two national agencies (CAPES and CNPq), its position (Fig. 1a) is very different. Psychology is in third position, with 14,533 items.

The distribution of items indexed according to subfields is illustrated in Fig. 1b. General psychology (41%) and applied psychology (6%) are responsible for almost half of the items indexed in the period. Clinical psychology (16%), social psychology (14%) and developmental and educational psychology (10%) are responsible for 40%. Experimental cognitive psychology (7%) and neuropsychology and psychophysiology are less expressive (5%). These numbers do not converge with the reality of graduate programs in Brazil. According to Bastos et al. (2017), social psychology predominates in national graduate programs, followed by health psychology. Social psychology brings together a diversified volume of outputs (theoretically and methodologically) engaged in Brazilian social problems that interest the natives; thus, the publications are made in Portuguese and in national or Latin American journals. In the case of health psychology, SciVal does not include specific subfields that could help in the comparison. The production in that field may have been included in general psychology, applied psychology and neuropsychology and psychophysiology.

We complete the overview of the psychology output by examining the most frequent topic clusters (Fig. 1c). Each published and indexed item belongs to a topic and a cluster. The analysis enables a detailed view of research themes in the country and a better vision of what defines each subfield for the Scopus base. The examination of the most frequent clusters in Fig. 1c reveals an overview of the dominant research interests in the country (mental disorders, personality, work, violence, women and children, adolescents and school, emotions, anxiety and depression, attention, the brain, learning and developmental disorders, among others). However, an expressive portion of the output of areas of interface between psychology



**Fig. 1** **a** Participation of psychology in the production indexed in Scopus compared to other areas of social sciences and humanities (2011–2020). **b** Distribution of Brazilian psychology production by sub-fields in the period 2011–2020. **c** Clusters of research themes in psychology indexed in Scopus

**Table 1** Psychology production by subfields compared to the 40 most productive countries (2011–2020)

	Scholarly Output		Citations per publication		Field-weighted citation impact	
	Indicator	Rank	Indicator	Rank	Indicator	Rank
Overall Brazil (all areas)	742,841	14th	9.7	35th	.89	36th
Psychology Brazil (overall)	14,501	11th	6.2	38th	.60	40th
Subfields of psychology						
Applied	1047	20th	9.9	33th	1.12	32th
Clinical	2511	14th	9.0	31th	.78	33th
Developmental & educational	1617	19th	7.0	35th	.86	33th
General	6579	9th	3.2	39th	.36	40th
Neuropsychology & psychophysiology	833	14th	14.2	24th	.73	32th
Social	2184	11th	4.3	40th	.55	40th
Experimental & cognitive	1122	16th	11.8	28th	1.07	31th

SciVal (2021)

and other sciences, in the Scopus base, is indexed in other fields and subfields. For instance, part of the output in organisational and occupational psychology is indexed in business, part of educational psychology is indexed in education, part of health psychology is indexed in public health or health professions and part of social psychology is in social sciences. A revision of the subfields of psychology in Scopus is necessary to better represent psychology in the data with its interdisciplinary and multidisciplinary nature.

## Axis 2: Output Evolution Over the Last decade

Table 1 provides information for analysing the status of the psychology scientific output in Brazil through four main indicators, comparing the field with the general output in Brazil and its subfields. We considered only the 40 most productive countries in the world.<sup>6</sup> The Brazilian output in psychology is 11th in the world, dropping to 22nd in relation to the number of citations and to 38th in terms of the number of citations per published item. Although Brazilian science is in 14th position, the drop regarding citation indexes is smaller than the psychology set.

In terms of volume, published documents of psychology subfields swing between the 9th place (general psychology) and 19th place (development and education psychology). The output from neuropsychology and psychophysiology and experimental cognitive psychology are the ones that drop less considering the citation indexes. Applied psychology and experimental cognitive psychology are the only subfields whose citation impact exceeds the world average, reaching 1.12 and 1.07, respectively (i.e. 12 to 7% above the world average). For the others, the impact indicator

<sup>6</sup> Ranking of countries is a resource offered by Scopus. The database treats data from 14,000 research institutions and 230 nations worldwide.

shows that we are below the world average of the field. In summary, Table 1 allows us to conclude that although production from Brazil is in the upper half for all psychology subfields, the impact of this production is relatively low in terms of citations. In other words, Brazil has increased scientific output, although it still has a low global impact.

Table 2 provides a general overview of trends in the psychology output and its subfields during the last 10 years (2011–2020), considering scholarly output, field-weighted citation impact and publications in top (10%) journal percentiles.

We can see, in general, an increase of twice as much in psychology (the exception was developmental and educational psychology) regarding the following indicators: international collaboration, output, citation impact and publications in the top 10% of journals. The growth was significant in all psychology subfields. Therefore, the scientific community has been expanding and increasingly seeking to publish their work in indexed and better-qualified journals, considering that the number of articles published in the top 10% of most-cited journals has increased. This indicator increased from 7.4% in 2011 to 12.9% in 2020. That leads to significant advances in the impact indicator, compared to the world average (from 0.65 in 2011 to 0.97 in 2020). In addition, publications involving international collaboration have also expanded, moving from 18.5% in 2011 to 36.1% in 2020.

As for the psychology subfields, in terms of the number of published items, we first see growth related to developmental and educational psychology (470.8%), despite some reduction of international collaboration, followed by applied psychology (343.5%). Clinical psychology and general psychology are the two areas with the lowest growth in the period, with percentages less than 100%, which is the average growth for the field. In general, the trend points an improvement in the quality indicators of the output in all the subfields. Even those from lower levels of international collaboration (general psychology and social psychology) advanced and doubled this indicator in 2020. In this same year (2020), applied and experimental and cognitive psychology reached half of the output resulting from international collaboration. The field-weighted citation impact also reveals an intensification between the beginning and the end of the period observed. In four of the six subfields, the average score of 1.0 was exceeded in 2020, with emphasis on experimental and cognitive psychology, which presented a 2.13 score. Even in general psychology, which presented the lowest impact factor in 2020 (0.5), this value represents more than double the impact compared to 2011. Finally, the percentage of publications in the top 10% journals varies over the years in several subfields, showing no clear growth pattern.

Another relevant indicator of the qualitative advance of the output refers to the quality of the journals that receive psychology publications, ordered according to the quartiles of CiteScore. By comparing the publication profile in journals in 2011 and 2020, we observe (Table 3) that in quartile 1 (top 25%), there was an increase from 17.8 to 26.2%; in quartile 2 (top 26–30%), from 7.8 to 17.7%; and in quartile 3 (top 51–75%), from 5.8 to 11.7%. In contrast, quartile 4 dropped from 68.6 to 44.4%. Such data become even more significant concerning the increased output volume between the 2 years selected for comparison.

**Table 2** Indicators of the evolution of scientific output in Brazilian psychology between 2011 and 2020

	Overall	2011	2013	2015	2017	2019	2020
<b>Experimental and cognitive psychology</b>							
International collaboration (%)	45.1	40.7	41.3	36.8	43.1	49.6	50.0
Scholarly output	1122	59	75	133	144	133	150
Field-weighted citation impact	1.07	.83	.75	.82	.91	.82	2.13
Publications in top journal percentiles (10% by CiteScore percentile)	9.5	3.4	22.7	1.6	14.7	5.3	7.4
<b>Applied psychology</b>							
International collaboration (%)	40.5	23.9	29.5	42	38.2	36.9	51.5
Scholarly output	1047	46	61	69	131	179	204
Field-weighted citation impact	1.12	1.13	.81	.96	.76	1.3	1.24
Publications in top journal percentiles (top 10% by CiteScore percentile)	17.4	20.7	19.7	16.2	12.7	13.4	20.2
<b>Clinical psychology</b>							
International collaboration (%)	34.1	24.6	26	28.6	41.1	39.3	45.2
Scholarly output	2511	203	231	234	253	267	334
Field-weighted citation impact	.78	.67	.54	.67	.96	.79	.88
Publications in top journal percentiles (top 10% by CiteScore percentile)	24.2	19.7	19.2	28.1	24.7	24.1	27.7
<b>Developmental and educational psychology</b>							
International collaboration (%)	32.3	41.7	30.5	35.9	30.4	33.9	38.0
Scholarly output	1617	48	105	131	194	189	274
Field-weighted citation impact	.86	1.01	.69	1.05	.52	.62	1.76
Publications in top journal percentiles (top 10% by CiteScore percentile)	11.3	14.6	11.5	7.7	13.0	13.4	15.4
<b>General psychology</b>							
International collaboration (%)	19.4	11.1	15.1	17.3	20.2	24.5	27.4
Scholarly output	6579	443	537	711	738	779	704
Field-weighted citation impact	.36	.23	.25	.38	.37	.42	.50
Publications in top journal percentiles (top 10% by CiteScore percentile)	2.8	1.0	1.1	3.0	5.5	2.8	3.4

Table 2 (continued)

	Overall	2011	2013	2015	2017	2019	2020
<b>Social psychology</b>							
International collaboration (%)	23.8	19.5	16.8	22.9	22.4	29.1	34.8
Scholarly output	2184	118	184	201	192	196	325
Field-weighted citation impact	.55	.29	.42	.36	.56	.5	1.17
Publications in top journal percentiles (top 10% by CiteScore percentile)	6.7	5.2	2.7	8.4	7.7	8.1	8.5
<b>Psychology</b>							
International collaboration (%)	27.3	18.5	21.9	24.5	29.8	32	36.1
Scholarly output	14,501	930	1200	1422	1556	1653	1863
Field-weighted citation impact	.6	.43	.44	.55	.6	.64	.97
Publications in top journal percentiles (top 10% by CiteScore percentile)	10.5	7.4	9.6	9.7	13.7	10.3	12.9

SciVal (2021). We used only international collaboration that indicates the extent to which an entity's publications have international co-authorship and single authorship

**Table 3** CiteScore quartile between 2011 and 2020

CiteScore quartile	Overall (2011– 2020)	2011		2020	
		<i>N</i>	%	<i>N</i>	%
Q1 (top 25%)	2993	156	17.8	480	26.2
Q2 (top 26–50%)	1557	68	7.8	324	17.7
Q3 (top 51–75%)	1419	51	5.8	214	11.7
Q4 (top 76–100%)	7536	602	68.6	813	44.4
Total	13,505	877	100.0	1831	100.0

SciVal (2021)

Therefore, there is an advancement if we compare these data with previous studies. Rogel-Salazar & Rogel-Salazar, (2014) analysed scientific publication in journals in four major areas: medicine, education, administration and finance and psychology. Their analysis is based on the Redalyc database (created by the *Universidad Autónoma del Estado de México*, initiated in 2002) between 2005 and 2007. Using the bibliometric technique Bradfordizing, the authors concluded that, although the number of journals in Ibero-America has grown, their impact is still very limited in the general scientific output. According to them, there is a difference between lack of quality in scientific output and lack of visibility, which seems to be the case in Ibero-America. Only three journals stood out in the psychology field: two from Colombia and one from Mexico: *Revista Colombiana de Psiquiatría* (Colombia), *Enseñanza e Investigación en Psicología* (Mexico) and *Universitas Psychologica* (Colombia). At the time of their investigation, no Brazilian psychology journal appeared in this ranking.

### Axis 3: Profile of the Collaboration in Brazilian Psychology Output

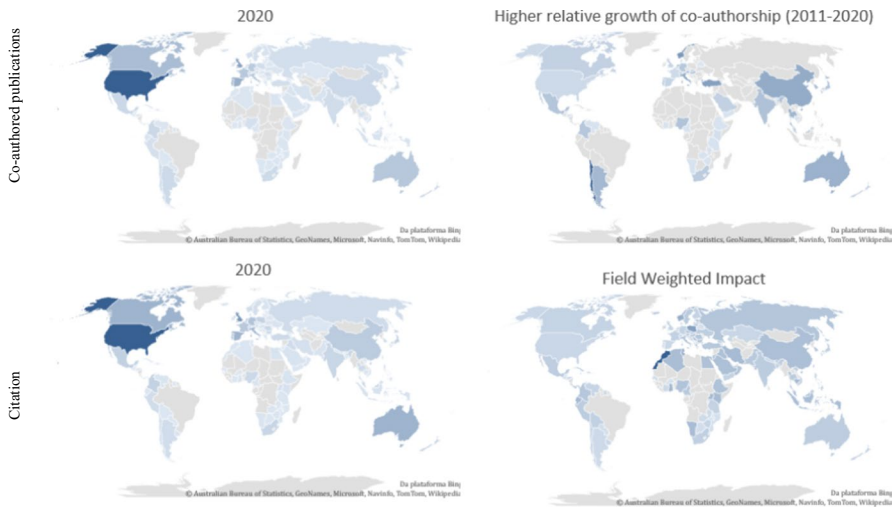
One of the most critical aspects of internationalisation refers to the cooperation with foreign researchers to develop research, with effects on the publications. In Table 4, a comparison of the international (with other countries), Brazilian (between regions of the country) and institutional (within the same institution) collaboration presents some indicators that reveal the differential impact of the output derived from collaboration. Table 3 shows that 27.3% of Brazilian output in psychology came from international collaborations, compared with more than 60% that were based on national or institutional collaboration. According to SciVal data, scientific output derived from international collaboration presents higher indexes of citations per publication (12.3). In addition, the field-weighted citation impact of Brazilian publications in psychology resulting from international collaboration is 1.32, which is 32% above the world average.

Three subfields stand out with percentages of international collaboration higher than 40% (experimental and cognitive, 45.1%; neuropsychology and psychophysiology, 41.1%; and applied psychology with 40.5%). These subfields also have greater citation impact: Applied psychology stands out for presenting the highest level of impact of its output in collaboration with foreign researchers



**Table 4** Collaboration profile involved in psychology and its sub-areas in the period 2011–2020

Psychology	Percent	Scholarly output	Citations per publication	Field-weighted citation impact
<b>Psychology</b>				
International collaboration	27.3	3.962	12.3	1.32
Only national collaboration	30.4	4.413	4.9	.39
Only institutional collaboration	30.1	4.366	3.8	.31
Single authorship (no collaboration)	12.1	1.760	1.7	.23
<b>Social psychology</b>				
International collaboration	23.8	520	11.6	1.57
Only national collaboration	28.3	618	2.1	.23
Only institutional collaboration	29.8	650	1.9	.18
Single authorship (no collaboration)	18.1	396	1.7	.28
<b>Neuropsychology &amp; psychophysiology</b>				
International collaboration	41.1	342	20.9	1.10
Only national collaboration	32.7	272	8.6	.46
Only institutional collaboration	22.8	190	11.4	.50
Single authorship (no collaboration)	3.5	29	5.4	.32
<b>Experimental &amp; cognitive psychology</b>				
International collaboration	45.1	506	14.4	1.49
Only national collaboration	28.5	320	11.4	.80
Only institutional collaboration	23.5	264	8.2	.66
Single authorship (no collaboration)	2.8	32	5.4	.31
<b>Developmental &amp; educational</b>				
International collaboration	32.3	523	11.6	1.72
Only national collaboration	29.6	478	7.1	.56
Only institutional collaboration	28.3	457	3.4	.39
Single authorship (no collaboration)	9.8	159	2.3	.33
<b>Clinical psychology</b>				
International collaboration	34.1	856	15.7	1.47
Only national collaboration	27.0	677	7.7	.56
Only institutional collaboration	23.7	596	6.2	.48
Single authorship (no collaboration)	15.2	382	1.0	.11
<b>Applied psychology</b>				
International collaboration	40.5	424	17.0	1.93
Only national collaboration	25.4	266	5.1	.55
Only institutional collaboration	27.8	291	5.4	.57
Single authorship (no collaboration)	6.3	66	4.3	.66
<b>General psychology</b>				
International collaboration	19.4	1274	6.7	.90
Only national collaboration	33.3	2191	2.8	.25
Only institutional collaboration	34.8	2291	2.3	.20
Single authorship (no collaboration)	12.5	823	1.5	.22



**Fig. 2** Countries with the highest number of collaborations with Brazil in the period 2011–2020

(1.93). In contrast, the subfield of general psychology, which presents the lowest contingent of international collaboration, also has a field-weighted citation impact lower than 1 (0.90), although this number is higher than the index without international collaboration. Some subfields, perhaps with less epistemological convergence (theoretical and methodological), need only strategic partners to have citation impacts (Fradkin, 2017). As we discussed earlier, Brazilian scientific production in psychology is highly dependent on actions and policies instituted by CAPES, CNPq and ANPEPP, in which some research groups are older and historically consolidated. This may have repercussions on the solidification of the international partnerships of these groups in relation to more recent research groups, with more contemporary approaches.

We find some evidence of this considering the developmental and educational psychology presented in Table 2: Despite less international collaboration, the scientific impact increased between 2011 and 2020.

Figure 2 shows quality indicators of joint output, considering the 20 countries that worked more in collaboration with Brazil in 2011 and 2020.

North American, South American and European countries stand out with frequent interactions. The USA was the most frequent partner, followed by the UK, Spain and Portugal. Although these are the countries with the highest frequency of co-authorship partnerships, the analysis of publications that occurred between 2011 and 2020 signals changes. The countries that maintained higher relative growth of co-authorship in publications in psychology in this period were Chile, Turkey, China, Italy, Norway, Australia, Thailand and Argentina. Notwithstanding, the co-authorship with the highest citation indexes were with China, the Netherlands, Belgium and Australia, and the highest impact with Morocco, Poland and China. The partnerships among Portuguese and Spanish language

countries (e.g. Spain, Portugal, Argentina and Chile) showed the lowest citation and impact indicator. The data suggest that there seems to be no direct effect relationship between co-authored output, the number of citations per publication and the impact in the Scopus base.

Contribution using co-authorship is indeed a challenge (e.g. Sato & Nardi, 2021; Tourinho & Bastos, 2010). The various formats of evaluation can be an obstacle. In the Europe-USA axis, evaluation not only includes top journals but penalises authors if there are a great number of co-authorship and they are not first authors. In Brazil, the evaluation does not follow such criteria; interestingly, having people from other countries/institutions is welcomed, and the author's order is not relevant for program evaluation; those practices reduce competitiveness and promote cooperation.

To thoroughly analyse the collaborations per subfield of psychology, we examined data from the 40 countries with more frequent partnerships in each subfield, based on the criterion of being equal to or above 80% of all items published in co-authorship. These countries were gathered in three categories: South-North (partnerships with core countries of North America and Europe), South-South (partnerships with Latin American and African countries) and East (partnerships with countries of the Middle East, Asia and Oceania). The comparative performance analyses considered only two quality indicators (citations per item and weighted impact). The results are displayed in Table 5.

Following the general pattern, we can notice a predominance of South-North collaboration in all subfields, with the prominence of the USA (constantly the first place in quantity of items), followed by the UK. Collaborations with Eastern countries always appear in second place, and Australia and China stand out, taking turns in first positions in the output. South-South interactions are always less frequent, especially with Latin American countries and even less with African countries. South-North collaborations proved to be more intense in the experimental and cognitive and neuropsychology and psychophysiology subfields, exceeding 80% of the collaborations. They are also the subfields that present lower percentages of South-South interaction. In this category, social psychology stands out as this type of partnership occurs more frequently, reaching 12.9% of the published items.

Examining the two quality indicators of collaborations in citation and impact reveals that South-North partnerships do not present the highest indicators. On the contrary, partnerships with the East systematically achieve the highest indexes in general and in almost every subfield. Developmental and educational psychology is the exception, with South-South partnerships causing the most impact in citations. In psychology as a whole, the average for South-North collaborations is 20.3 citations per item and 3.1 weighted impact, while those with the East reach 33.5 and 4.0, respectively. Overall, South-South relations present lower indicators, but are not that distant from the other collaborations. However, in some subfields (development and educational, clinical and applied psychology), South-South partnerships outperform the others in citation per item and others in weighted impact.

To illustrate the importance of international partnerships, the Iranian researchers Nikzad et al., (2011) compared the co-authorship networks of social science articles in the field of library and information science, psychology, management and

**Table 5** Type of collaboration and quality indicators in psychology and its subfields in the period 2011–2020

Region	Co-authored publications	Percent	Citations per publication	Field-weighted citation impact
Psychology				
South-North	5824	75.1	20.3	3.1
South-South	791	10.2	21.7	3.0
East	1140	14.7	33.5	4.0
Social psychology				
South-North	938	67.7	26.2	4.1
South-South	179	12.9	18.3	3.0
East	268	19.4	27.9	4.2
General psychology				
South-North	1686	75.8	14.7	2.8
South-South	203	9.1	9.4	2.7
East	336	15.1	18.6	3.9
Applied psychology				
South-North	838	73.7	29.9	2.9
South-South	88	7.7	46.0	2.8
East	211	18.6	44.0	3.3
Clinical psychology				
South-North	1422	72.7	26.6	2.9
South-South	173	8.8	27.6	3.0
East	362	18.5	32.0	3.4
Developmental & educational psychology				
South-North	763	79.2	14.7	3.9
South-South	94	9.8	16.3	5.4
East	106	11.0	14.3	2.7
Experimental & cognitive psychology				
South-North	705	81.0	24.8	3.9
South-South	64	7.4	25.1	2.9
East	101	11.6	36.2	5.0
Neuropsychology & psychophysiology				
South-North	435	81.9	17.9	1.4
South-South	33	6.2	21.9	1.7
East	63	11.9	48.9	1.9

SciVal (2021)

economics in the ISI Web of Knowledge database, during 2000–2009. They concluded that in psychology, the number of authors was increasing and was more significant than in other areas. They also pointed to evidence that for articles signed by more than one author, the probability of acceptance is higher than those signed by only one. Besides, more prestigious journals accept more articles of multiple authorship than the not-so-prestigious ones. In addition, co-authorship is a path for

publishing more articles and thus achieving productivity goals. This situation pressures faculty and education institutions, although we may find movements favouring other criteria for hiring, promoting and evaluating the quality of the faculty or researcher (Woolston, 2021).

As for the position of several South American countries, despite Brazil having more publications between 2011 and 2020, this fact does not affect the number of citations nor the impact over the field. There are more citations for Bolivia, Peru, Chile, Argentina, Venezuela and Colombia than Brazil. Brazil is in the last position among other South American countries. This number can also be explained by the evaluation criteria adopted by CAPES, which has chosen SciELO and PePSIC databases (less international reach), unlike the other countries, which have adopted European rankings, thus closer to international standards.

Data extracted from SciVal also point out that the collaboration between South American countries between 2011 and 2020 reveals that Chile and Argentina ( $N=199$  publications) cooperate more among themselves. Brazil establishes more cooperation networks for scientific output with Chile ( $N=149$ ) and Colombia ( $N=118$ ), followed not so closely by Peru ( $N=65$ ). Colombia is the South American country that most establishes cooperation networks for scientific output ( $N=149$ , increasing by 766% during the period observed) with the other countries, which does not mean that its publications present more impact (3.84). For instance, Ecuador, although with only seven international co-authorship publications, presents a higher impact (5.45).

The prominent role played by Colombia in South America can be explained by greater investment in the international collaboration network. Ordoñez-Matamoros et al., (2010) analysed international scientific collaboration in Colombia (between 2001 and 2002), measured by co-authorships in articles signed by national researchers with foreigners. They concluded that international collaboration increases the scientific output capacity of research teams by approximately 40% (between 3 and 5 products). Research collaboration also increases creativity, productivity in science and the consolidation of research agendas, without harming the production of knowledge related to national issues and problems.

These results demonstrate that partnerships can improve scientific knowledge by integrating international and national demands. We defend that the movement that pushes for more internationalisation of Brazilian psychology is associated with expanding partnership networks. In Brazil, there has been an incentive for the establishment of international cooperation agreements for research and teaching, such as the CAPES-Print program.<sup>7</sup> Furthermore, research with coordinators of Brazilian graduate programs considered internationalisation oriented towards academic mobility abroad, the formation of networks and the establishment of international collaborations in research. The presence of professors trained abroad and capable of mobilising their external networks to establish scientific exchanges and partnerships is considered a key condition for the internationalisation of graduate studies and research in Brazil (Ramos, 2018).

<sup>7</sup> <https://www.gov.br/capes/pt-br/acao-a-informacao/acoes-e-programas/bolsas/bolsas-e-auxilios-internacionais/informacoes-internacionais/programa-institucional-de-internacionalizacao-capes-print>

In a nutshell, the general data extracted from SciVal about the Brazilian status indicate situations that had already been pointed out in previous decades (Lunt & Poortinga, 1996). Psychology faces a strong ethnocentric bias as the USA remains the main actor (David & Buchanan, 2003), although there is some progress in the distribution of partnerships with the East—those that can potentially cause more citation impact.

One of the effects of such US prominence in science worldwide and especially in psychology is to pose several challenges about the importance of associating the increase in scientific output to the fact that it is read and cited by colleagues worldwide (Henrich et al., 2010). Brazilian scientific output does not seem to be followed by citations, despite the efforts of some internationalisation policies in the country (Ramos, 2018). However, it should be noted that most of the psychology output items indexed in Scopus are from national journals, available only in Portuguese, which hinders the calculation of impact, causing the reduction of such index.

Lastly, the data available on SciVal also suggests that there is a greater effort for the unification of science through more exchange between researchers of different countries and economic blocs, intensifying the capacity to meet global and local needs, and their scientific fields. One of the challenges is to find a middle ground between an effort for standardisation aiming at a global project of science, and the respect for the diverse features of the countries, with their specific needs. Such challenge also involves a more balanced solution between the normative and counter-normative principles of modern science described by Merton, (1942), as a result of the tensions between universal/particular science, communality/isolation in scientific output, disinterest/interest (regarding the evidence found) and scepticism/dogmatism, preserving the scrutiny of the knowledge produced by society and the scientific community.

## Summary

The overview of the scientific output of Brazilian psychology and its subfields can be summarised in three points. First, Brazil ranks 11th among the top 40 countries in terms of output, increasing from 15th 10 years ago to 19th 20 years ago. There is a clear growth in volume, which occurs across all subfields of psychology. We should emphasise that such growth also reveals the larger number of Brazilian journals that have been indexed on Scopus as a result of their consolidation and strengthening. Currently, 21 Brazilian psychology journals are found in the Scopus database, representing around 1.6% of the total journals in this field (Scopus source list, June 2022, <https://www.scopus.com>). However, the list of journals in the Scopus database is growing rapidly. In 2022, there were 1302 psychology journals active in the Scopus database, and in 2011, this number was only 390 (cf., Bastos et al., 2012).

Second, there is also a growth in quality and quantity over the years, as shown by the average impact factor, although Brazil is still well below the world average (0.60). Presumably, such impact results from the inclusion in the database of many

items published in Portuguese in indexed national journals. The increase of items published in journals in the first quartiles is another indicator of qualitative growth.

Third, most international collaborations occur with northern countries, especially the USA, the UK, Portugal and Spain. Collaborations with the East have also increased, particularly with Australia, China and Japan. We also highlight that the output of these international collaborations presents much higher levels of impact than those that are the result of national collaboration or isolated output of a researcher. With internal variations, this movement is also seen in the various subfields of psychology. It is also relevant that the South-North collaborations do not generate an output of greater impact; instead, the collaborations with the East do. Those within the South-South do not differ significantly in terms of the impact of their output.

Such information, so far unavailable to the Brazilian scientific community, points to the potential effects resulting from the evaluation model used by CAPES and the previously addressed general pressure on the scientific output of Brazilian psychology. Graduate programs, which are the main source of scientific output in Brazil, are increasingly investing in international partnerships or publishing in high-ranked foreign journals. At the same time, CAPES' evaluation model is concerned about balancing internationalisation and attention to local needs. In this sense, the evaluation of graduate programs in terms of impact on society may give greater weight to internationalisation or local, regional and national insertion, depending on the characteristics of each program (Tomanari et al., 2020). This is an important aspect because, despite the importance of internationalisation, there are phenomena with local, regional and national scope that deserve the scientific community's attention.

Despite having advanced, Brazil's internationalisation process is still a major challenge. According to Cunha-Melo, (2015), achieving international scientific standards requires major changes involving researchers' and students' attitudes and educational and institutional research systems, followed by government scientific public policies supporting such advances. As such, there is not only one pathway to internationalisation, and Brazil has certainly learned from other countries' more advanced models, adapting them to the local Brazilian reality. Cunha-Melo, (2015) also points out that the idealised condition of internationalisation implies the support of multiple factors in terms of efficiency (technical mastery), loyalty (to the ideal of science), justice (recognising the limits and possibilities), equity (in the distribution of opportunities and resources) and productivity (new knowledge in terms of quality and quantity).

Brazilian psychology can potentially contribute to global challenges related to phenomena within its study field. On the one hand, the contextualised perspective of the development of international production on psychology in Brazil in the period 2011–2020 can be explained by the emergence of public funding agencies and the growth of graduate programs (Barreto et al., 2012; Bastos et al., 2017; Costa & Yamamoto, 2016). On the other hand, the drop in funding for scientific research, especially since 2017, leads us to question to what extent this upward trend will continue.

But beyond the issues of funding for scientific output, the rise of the internationalisation of Brazilian publications in psychology also needs to be discussed considering its role in the global context. Its particularities as a Latin American country can possibly explain the expansion in the last decade of publishing partnerships with Chile (3800% growth) and Argentina (1200%), Mexico (825%) and Colombia (767%). A review of the literature on international and indigenous psychology would be helpful to understand better the relationship between the universality of scientific knowledge (global) and the specificities (local) of the psychological phenomena. This literature review would need to consider the subfields of psychology, since some focus on more universal phenomena, such as neuropsychology and psychophysiology, while other subareas investigate phenomena that are more influenced by contextual aspects, such as some in the subarea of social psychology.

In addition to the differences inherent to the phenomena studied in the subareas of psychology, there are many obstacles to overcome, including becoming more visible when contributing to new knowledge. The SciVal data presented in this article point out the relevance of expanding strategic partnerships to make Brazilian output more visible, in addition to well-established journals capable of meeting Scopus criteria.

The process of internationalisation in Brazilian psychology could and should go even further. The dream, possibly utopic, encompasses investments in a global internationalisation project of psychology, capable of encouraging the worldwide integration and dissemination of several domains—technical, scientific and ethical—of producing science involved in and committed to a better society. We could reduce inequalities and asymmetries worldwide and make science more democratic, emic and plural.

Finally, we would like to reflect on the limitations of the material presented and discussed in this article. The main limitation is that we have restricted the search to the Scopus database, which leaves out a volume of scientific output, including international data, which we cannot measure. Scopus is the largest psychology index base, but it does not cover all the national and international journals in which the national researchers publish their work. Therefore, a portion of our output is not included here. We would still not overcome such limitations if we chose another base, such as Web of Science (WoS), which is even more limited in human and social sciences.

The second limitation refers to the definition of psychology itself, as an area of knowledge, by Scopus. We have evidence from SciVal that researchers and outputs of several psychology subdomains are, according to Scopus, incorporated in other fields or subfields. As we have previously stated, areas linked to management, medicine, health and education absorb part of the output in psychology, and we cannot estimate the amount that comes from psychology graduate programs. On the other hand, for some themes, researchers of such related fields can be indexed as belonging to psychology by Scopus, which causes distortions. For instance, with the analyses of research and topics of the psychology graduate programs in Brazil, we observe that mental disorders, particularly Alzheimer's, are not shown as prevalent, although they are in a leading position in the Scopus database.



Finally, the third limitation relates to the model that splits psychology into subfields with distinct specificities. In the future, Scopus will need to improve the division of the field, following international standards, to give more visibility to important subfields of research not yet covered by the database. This explains why general and applied psychology encompasses almost 50% of all indexed items, which camouflages a good deal of internal diversity.

Despite such limitations, SciVal indicators showed robustness in providing a comprehensive picture of the internationalisation of psychology in Brazil, although different from results from national graduate programs. Sadly, the authors of this paper fear the interruption of a spiral of growth that put Brazil in a prominent position in terms of world science, considering the striking discontinuation during the last 4 years of the country's science and technology policies. The profound changes in the Ministry of Science, Technology and Innovation regarding its independence, plus the brutal decrease of public investments in science, may seriously damage Brazilian science's historical path of success, especially in the humanities areas, with psychology as a case in point.

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**Data Availability (Data Transparency)** The datasets generated during the current study are available in the Scopus repository (link: [www.scival.com](http://www.scival.com)).

**Code Availability** Not applicable.

## Declarations

**Consent to Participate** Not applicable.

**Conflict of Interest** The authors declare no competing interests.

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