

METODOLOGÍA

A productivity map of cognitive pretest methods for improving survey questions

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Interest in cognitive pretest methods for evaluating survey questionnaires has been increasing for the last three decades. However, analysing the features of the scientific output in the field can be difficult due to its prevalence in public and private institutes whose main mission is not scientific research. The aim of this research is to characterize the current state of scientific output in the field by means of two bibliometric studies for the period from 1980 to 2007. Study 1 analysed documents obtained from the more commonly used bibliographic databases. Study 2 supplemented the body of documents from Study 1 with documents from non-indexed journals, conference papers, etc. Results show a constant growth in the number of publications. The wide dispersion of publication sources, together with the highlighted role of the public and private institutions as centres of production, can also be identified as relevant characteristics of the scientific output in this field.

Mapa de productividad de los métodos cognitivos de pretest para optimizar las preguntas de las encuestas. Durante las últimas tres décadas se ha producido un creciente interés por los métodos cognitivos de pretest. Sin embargo, analizar las características de la productividad científica en el campo puede resultar difícil dada su prevalencia en institutos públicos y privados. El objetivo de esta investigación es caracterizar el estado actual de la producción científica en el campo en el período desde 1980 a 2007 por medio de dos estudios bibliométricos. El Estudio 1 analizó los documentos obtenidos de las bases bibliográficas más comúnmente utilizadas. El Estudio 2 completó la base de documentos del Estudio 1 a partir de revistas no-indexadas, comunicaciones en congresos, etc. Los resultados muestran un crecimiento constante en el número de publicaciones. La amplia dispersión de las fuentes de publicación, junto con el destacable papel de instituciones públicas y privadas como centros de producción, pueden también señalarse como características relevantes de la producción científica en este campo.

A broad consensus exists among the professionals involved in survey research that considers the use of cognitive pretest methods as one of the most outstanding developments in survey methodology in the last three decades (Beatty, 2003). Tourangeau's (1984) analytical model has become the most cited theoretical foundation to describe how interviewees respond to questionnaire questions. The procedures that are usually grouped under the term «cognitive methods of evaluating questionnaires» (Woolley, Bowen, & Bowen, 2006) are, among others, cognitive interviews, behaviour

coding, response latency, vignette analysis and formal respondent debriefings (Presser, Rothgeb, Couper, Lessler, Martin, Martin, & Singer, 2004). Nowadays, the field of pre-survey evaluation has grown to embrace cognitive methods as an important partner of methods such as expert review and usability tests (Cosenza, 2002).

Cognitive pretest methods began to be used in the 1980s with the Cognitive Aspect of Survey Methodology (CASM) conference (Jabine, Straf, Tanur, & Tourangeau, 1984), under a line of work that proposed the application of different cognitive methodologies for reducing habitual error sources in surveys. The CASM conference triggered an interdisciplinary collaboration between professionals that characterizes the new approach to the evaluation of survey questionnaires.

The use of cognitive pretest methods, oriented towards the identification of the causes of errors in surveys more than their effects, provides information about how people decide to take part in

surveys, how they elaborate their answers to the questions, how the interviewers affect the willingness of the interviewee to take part, etc. (Tourangeau, 1984). From this perspective, the need to study aspects related with the so-called «question-answer process» is proposed to optimize the quality of the information gathered by surveys.

In recent years, there has been a growing interest in the subject, which has been reflected in the appearance and growth of specific conferences, recommendations and guidelines developed by public and private organisations, specialised books, etc. In addition, there are books and papers available oriented to extend the use of cognitive pretest methods (e. g., Beatty & Willis, 2007; Willis, 2005; Presser et al. 2004).

Generally speaking, the development of cognitive pretest methods seems to be concentrated in organisations whose main mission is not the investigation and circulation of knowledge, but the use of these methods in applied projects. This circumstance, together with the short period of time that has passed since the systematic application of these procedures, makes it difficult to describe the state of scientific output in the field of design and development of questionnaires using cognitive pretest methods.

Science as such would not exist if scientific results were not reported (van Raan, 1999). Hence, one useful way to analyse the level of knowledge in a field of study is to analyse the characteristics of its scientific output. Nowadays, researchers can use a tool capable of gathering information about scientific output in the field of cognitive pretest methods, known as «Bibliometry».

Currently, Bibliometry is present in a large number of very diverse scientific disciplines and is considered of enormous usefulness in the world of research and science in general, since it is considered to be an efficient tool that properly utilises research resources (Moreno & Sánchez, 1998; Zulueta & Bordons, 1999). Despite the errors that can be committed when evaluating publication and citation patterns (Skoie, 1999) the main goal of Bibliometry is the storage and retrieval of information (Guilera, Gómez, & Hidalgo, 2006). Interest in the bibliometric process has given rise to a body of scientific literature that is sufficiently voluminous to merit analysis (Pulgarín & Gil-Leiva, 2004).

The aim of the research was to characterise the scientific output in the field of cognitive pretest methods using two bibliometric studies. The first study analysed documents obtained by means of an indexed search. The second study supplemented the body of documents from Study 1 with documents found using a focused search. Both studies aim to orientate researchers who want to identify the evolution of the scientific output, the types of documents, and publication sources, such as the centres, countries and type of collaboration between the authors involved in the field of cognitive pretest methods.

STUDY 1: INDEXED SEARCH

The aim of Study 1 was to analyse the scientific output in the field of cognitive pretest methods by analysing the documents indexed by the most commonly used bibliographic databases.

Method

The publications included in this study were identified via the Web of Science (WoS) database of the Institute for Scientific Information (ISI-Thomson Scientific, Philadelphia, PA, USA), specifically via the Expanded Science Citation Index (SCI-

EXPANDED), Arts and Humanities Citation Index (A&HCI) and the Social Sciences Citation Index (SSCI). Indexed documents were also located through the bibliographic databases PsycINFO, Medline, Sociological Abstract and Cinahl.

The bibliographic search was limited to a time period from 1980 to 2007. It was decided to start the search from 1980, as the pivotal development leading to a role for cognitive methods in pretesting did not come until the CASM conferences at the beginning of the 1980s (Jabine et al., 1984).

Given the wide variety of labels that cognitive methods are given and after various attempts at searching using key words such as «cognitive pretest», «cognitive method», «survey pretest», «pretest», «questionnaire pretest», etc., it was decided that the most suitable key word for incorporating the greatest number of publications about cognitive pretests was «pretesting». Thus, the key word «pretesting» was included as a search criterion in the bibliographic databases in the titles as well as in the abstracts and key words in order to locate journal articles, books, book chapters, conference presentations, doctoral theses, etc.

Document coding and analysis

The use of a key word as general as «pretesting» demanded a careful and meticulous document selection process. Two independent coders, in two rounds, purged the initial search by reading the document titles and abstracts. They were instructed to select only those works that referred explicitly to the use of cognitive pretest methods. The coders selected only documents in which the usual cognitive pretest methods (behaviour coding, cognitive interviews or focus groups), were used during the design or evaluation of questionnaires. The use of any of these methods had to have been previous to carrying out traditional pilot or field studies to collect information about «work load» of the interviewers, response reasons, rate of omissions, etc. For example, documents that included pretests in the context of experimental design (design, pretest, post-test), pretests not relating to surveys and pretests referring to the psychometric analysis of items were excluded.

The two coders worked independently. The final selection of documents was performed in two rounds. In the second round, each coder revised the documents selected by the other and they revised again those where they disagreed about their inclusion in the group of documents analysed.

The data was tabulated using SPSS v. 14.0 (2007), and the following variables were coded: publication date, number of contributing authors, names of authors, institution and country the authors belong to, type of publication and journals in which the article was published. The analyses carried out in the present study are fundamentally descriptive. Analyses of frequencies and percentages of publication were performed.

It must be noted that during the purge of the database searches, articles that had already been identified in previous searches were not selected, in other words, an effort was made to avoid repetition of documents included in more than one database.

Results

The bibliographic searches in different databases generated a total of 1119 publications, of which the coders selected only 75 (6.7%). The 93.3% of the remaining documents at best made reference to pretests in the context of experimental studies, pretests

not applied to surveys or to pretests referring to psychometric analysis of items. Below the main results of the analyses performed are presented.

Evolution of scientific output and number of authors

The evolution of scientific output was analysed by calculating the frequency of the number of works published in the period 1980 to 2007. We divided the total period, 28 years, into seven intervals of four year each one. Figure 1 shows the evolution of the number of publications over time.

During the time period analysed, only one interval, 2000-2003 was lower than the before one, however, on average there has been a constant growth in the number of publications. This increase has been most notable from the second half of the 1990s. In contrast, during the 1980s, the number of studies that used cognitive pretest methods was very small.

The 75 documents included in the database were written by 194 different authors. The number of authors who contribute to each publication varies between 1 and 10 ($M= 3.07$; $SD= 2.18$). In addition, the majority of articles have been produced by 1 or 2 authors, 26.7% and 24% respectively. Next, 21.3% of the documents were written by 3 authors. After 3 authors, the number of publications decreases considerably, with only 27.9% of publications written by 4 or more authors.

Types of documents and sources of publication

The analysis of the type of scientific bibliography referred to different types of documents that appear in the databases. The types of documents found were journal articles, chapters in books, books and conference papers. Table 1 shows the frequencies and percentages for each type of document.

The group of 75 documents analysed was mostly composed of articles published in journals. The rest of the documents make up only a small proportion, only 20% are book chapters, books and conference papers.

With respect to the source of publication, the results show a wide dispersal of sources as they include three different types of source: namely editorials, survey research journals and health journals. The

75 documents have been published by 57 different sources. Among the most productive sources, the following journals together with the number of document in brackets can be identified: Public Opinion Quarterly (4), Bulletin de Methodologie Sociologique (3), Medical Care (3), Research in Nursing and Health (3), and Quality of Life Research (3).

Centres of production

The analysis shows that the authors belonged to a wide variety of organisations. The 194 authors worked in 76 different organisations. Table 2 presents the most productive organisations in the field of cognitive pretest method.

Table 1
Distribution of document type

| Type of document | Frequency | Percentage |
|------------------|-----------|------------|
| Article | 60 | 80.0 |
| Book chapter | 6 | 8.0 |
| Book | 5 | 6.7 |
| Conference paper | 4 | 5.3 |
| Total | 75 | 100.0 |

Table 2
Most productive institutions

| Institutions | Frequency | Percentage |
|--------------------------------|-----------|------------|
| US Census Bureau | 10 | 13.2 |
| University of Massachusetts | 9 | 11.8 |
| University of Michigan | 8 | 10.6 |
| National Cancer Institute | 6 | 7.9 |
| McMaster University | 4 | 5.3 |
| Gte Laboratories Incorporation | 3 | 3.9 |
| University of North Carolina | 3 | 3.9 |
| University of Maryland | 3 | 3.9 |
| Others | 30 | 39.5 |

Evolution of the Number of Publications

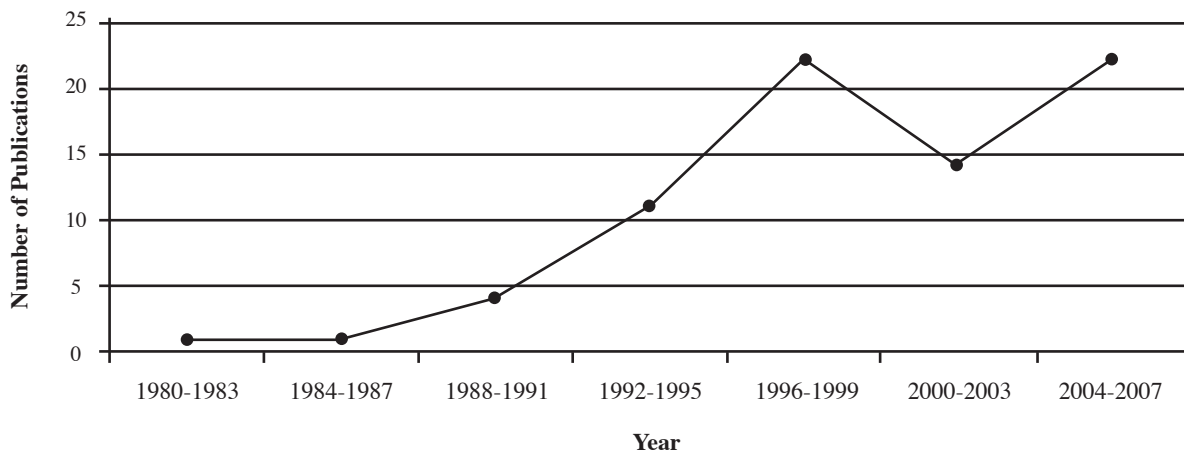


Figure 1. Evolution of the number of publications

Among the most productive organizations are found three main types of institution: universities such as Massachusetts or Michigan, public bodies such as the US Census Bureau and health research centres, such as the National Cancer Institute.

With respect to the analysis of productivity by the authors' countries of origin, the results show that scientific output is distributed among 18 countries. Nevertheless, it must be noted that authors from different countries have been able to contribute to the same article. Table 3 shows the results of the analysis.

As can be seen in Table 3, there is a concentration of work produced in the US where more than half (64.7%) of the scientific output in the field of cognitive pretests has been generated. 35.3% of the production is distributed between the 17 remaining countries among which the UK is notable for 6 documents.

Table 3
Most productive countries

| Country | Frequency | Percentage |
|-------------|-----------|------------|
| USA | 55 | 64.7 |
| UK | 6 | 7.1 |
| Canada | 4 | 4.7 |
| Italy | 3 | 3.5 |
| Germany | 2 | 2.4 |
| Netherlands | 2 | 2.4 |
| Others | 13 | 15.3 |

Discussion

In Study 1, an analysis of scientific output on the subject of cognitive pretesting methods has been carried out with regard to the number of publications. After weighing up the pros and cons, it was decided to use the word «pretesting» as the search criterion, so that the largest possible number of document about the use of cognitive pretest methods could be included in the set of documents to be analysed. To minimize the number of «false positive» documents, that's to say, documents indexed by the keyword «pretesting» but not related to the cognitive pretest methods, a careful selection process was carried out by two coders working independently through two rounds of selection.

Using the five most common data bases, only 75 indexed documents from a period of 28 years were analysed, most of which are articles (80%) published in journals. The small number of indexed documents could indicate that a large part of the studies applying cognitive pretest methods have not been circulated via journals. Thus, using only indexed documents as indicators of the scientific output can produce a very partial representation of the scientific output in the field of cognitive pretest method.

To avoid working with such a partial database, a «focused searched» was performed to complete the set of document obtained by the indexed search. The focused search was carried out to include other means of disseminating scientific work such as conference papers in the field, research reports, communication networks between professionals in the field, non-indexed journals, etc.

STUDY 2: INDEXED SEARCH PLUS FOCUSED SEARCH

The aim of Study 2 was to characterise the scientific output in the field of cognitive pretest methods by widening the bank of documents analysed in Study 1.

Method

The following search strategies were performed to complete the set of documents analysed in Study 1: a) papers presented in the Quest Workshops conferences in 2005 and 2007; b) a search in the Web of Science database focused on the most productive authors identified in Study 1; and c) an oriented search in the most productive journals in the field such as *Public Opinion Quarterly*, *Bulletin de Methodologie Sociologique*, *Quality of Life Research*, *Quality and Quantity*, *Field Methods*, *Research in Nursing and Health*, *Medical Care*, and *Journal of Official Statistics*.

Document coding and analysis

The focused search was limited to a time period from 1980 to 2007. A very similar procedure to that used in Study 1 was followed while carrying out the oriented search. Two independent coders selected the documents provided by the three search strategies by reading the document titles and abstracts. They were instructed again to select only those works that referred explicitly to the use of cognitive pretest methods. The coders, once more, selected only documents in which the usual cognitive pretest methods (behaviour coding, cognitive interviews or focus groups), were used during the design or evaluation of questionnaires.

The two coders worked independently. Again, a meeting was held to revise documents about whose inclusion the coders disagreed, and to set up the group of documents to be analysed.

The data was tabulated using SPSS v. 14.0 (2007), and the following variables were coded: publication date, number of contributing authors, names of authors, institution and country the authors belong to, type of publication and journals in which the article was published.

Results

Evolution of scientific output and number of authors

Study 2 generated a total of 205 publications. The evolution of the scientific output was analysed by calculating the frequency of the number of works published in the period 1980 to 2007 and we divided the total period, 28 years, into seven intervals of four year each one, as in Study 1. Figure 2 shows the evolution of the number of publications over time.

Figure 2 shows a progressive increase in the number of documents over the analysed time period. The increase is especially relevant from the second half of the 1990s.

The 205 documents analyzed in Study 2 were written by 356 different authors. The number of authors who contribute to each publication varies between 1 and 10 ($M= 2.64$; $SD= 1.87$), the majority of them having been written by 1 or 2 authors (59.5%).

Types of documents and sources of publication

The types of documents found in Study 2, as in Study 1 were journal articles, chapters in books, books and conference papers. In addition this new seven type of documents were found: dissertations, unpublished papers, proceedings, memorandums, reports, doctoral dissertations and conference books. Table 4 presents the frequencies and percentages for each type of document that represents more than 5% of the analysed documents.

Evolution of the Number of Publications

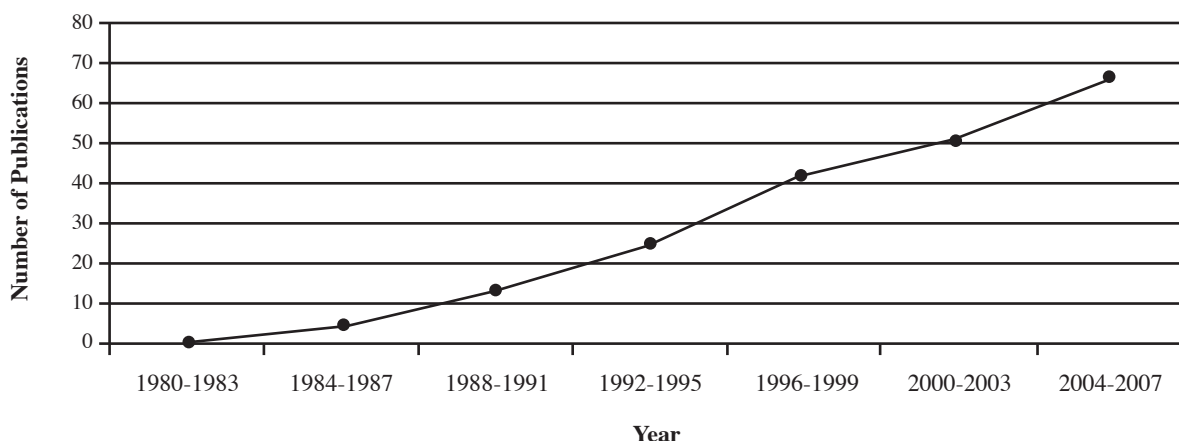


Figure 2. Evolution of the number of publications

As it is shown in Table 4, the percentage of articles published in journals decreases by almost 35% due to the increase of the percentages of documents published as books, conference papers and dissertations. The significant percentage of dissertations (12.2%) carried out during the time period analysed in this study is noteworthy.

Regarding the sources of publication, the results reflect the wide dispersal in the field, the 205 documents analysed have been published by 115 different sources. Most of the sources of publication are related to health and survey research fields. Nevertheless, new sources of publication were identified in Study 2 such as non-indexed journals (e. g., Journal of Official Statistics), and public bodies (e. g., US Census Bureau).

Centres of production and geographic patterns of collaboration

The analysis shows that the 356 authors belonged to 94 different organizations. The most productive organizations in the field of cognitive pretest methods are shown in Table 5.

The most remarkable finding is the increase in the number of public bodies such as the National Cancer Institute, the National Centre for Health Statistics, and Statistics Norway, etc., among the centres of scientific production together with universities.

Regarding the authors' countries of origin, the scientific output is distributed among 19 countries, one more than in Study 1. Table 6 shows the results of the analysis.

Although the scientific output is distributed among 19 countries, researchers working in centres of scientific production located in the USA generated more than half (62%) of the scientific output in the field of cognitive pretest methods. Finally, in order to analyse the pattern of collaborations, a specific analysis was carried out. The total productivity of the 6 most productive countries was divided in to single author documents, intranational collaboration, and international collaboration, so that geographical patterns of collaboration could be identified. Figure 3 presents the distribution of the types of collaboration.

| Type of document | Frequency | Percentage |
|-------------------|-----------|------------|
| Article | 94 | 45.9 |
| Book | 25 | 12.2 |
| Dissertation | 25 | 12.2 |
| Conference paper | 21 | 10.2 |
| Book chapter | 14 | 6.8 |
| Unpublished paper | 11 | 5.4 |
| Others | 15 | 7.3 |

| Institutions | Frequency | Percentage |
|---------------------------------------|-----------|------------|
| US Census Bureau | 44 | 14.5 |
| Statistics Canada | 23 | 7.6 |
| University of Michigan | 22 | 7.2 |
| University of Massachusetts | 17 | 5.6 |
| National Cancer Institute | 13 | 4.3 |
| National Centre for Health Statistics | 11 | 3.6 |
| Statistics Norway | 10 | 3.3 |
| Others | 163 | 53.8 |

| Country | Frequency | Percentage |
|-------------|-----------|------------|
| USA | 126 | 62.0 |
| Canada | 23 | 11.3 |
| Netherlands | 13 | 6.4 |
| UK | 8 | 3.9 |
| Germany | 6 | 2.9 |
| Norway | 6 | 2.9 |
| Others | 21 | 10.3 |

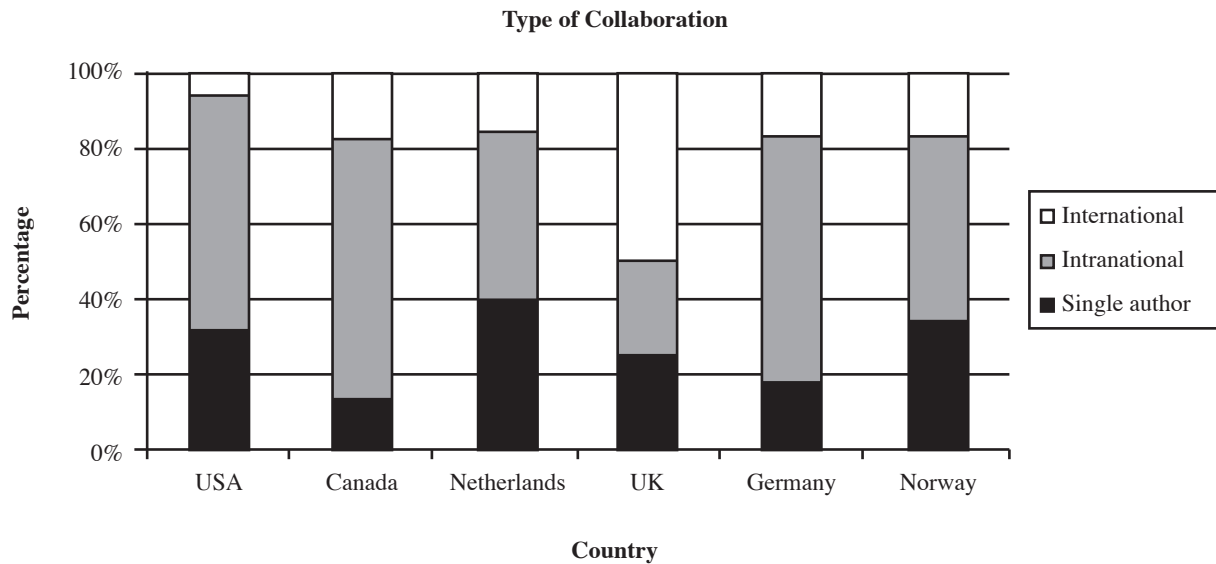


Figure 3. Type of collaboration

Figure 3 shows that the majority of documents are the fruit of intranational collaborations in all the countries except the UK, where there is a higher percentage of international collaborations. The highest percentages of intranational collaboration were found in the USA, Canada and Germany.

Discussion

A «focused search» was performed in Study 2 to augment and complete the set of documents obtained by the indexed search conducted in Study 1. The focused search was carried out to include other means of disseminating scientific work such as conference papers in the field, research reports, communication networks between professionals in the field, non-indexed journals, etc. It was decided to include the QUEST conferences held in 2005 and 2007 in order to include a large part of the professionals most active in the field of cognitive pretest methods. On the other hand, journals such as the Journal of Official Statistics are mediums of renowned prestige among the professionals involved in survey methodology.

The number of documents analysed in Study 2 increases by 273.3 % from the 75 documents analysed in Study 1 to 205. This increase is even more notable from the second half of the 1990s. The distribution of the number of authors is quite similar in Study 1 and 2; the majority of documents have been produced by 1 or 2 authors in both Study 1 (50.7%) and Study 2 (59.5%). In addition, new types of documents were analysed in Study 2: dissertations, unpublished papers, proceedings, reports, memorandums, doctoral dissertations and conference books, etc., and as a result, decreasing the percentage of publications in journals from 80% (Study 1) to 45.9% (Study 2). With regards to the centres of production, results show that public bodies such as the National Cancer Institute, the National Centre for Health Statistics, etc., play a remarkable role in the field. Referring to the most productive countries, USA is the most productive country followed by Canada and the Netherlands. Lastly, intranational collaborations are more frequent in all the countries analysed, except the UK, where international collaborations are in the majority.

Conclusions

The aim of this research was to characterise the scientific output in the field of cognitive pretest methods using bibliometric evidence. This characterisation is useful for analysing the current situation of research as well as for anticipating its evolution. The bibliometric evidence was analysed in two studies. Study 1 obtained documents from the more commonly used bibliographic databases. Study 2 supplemented the group of analysed documents with a directed search. The separation of the two studies gave two benefits: (1) it partly overcame the limitations of the bibliographic databases (indexing criteria, time delay, etc.); and (2) it compared the results obtained by a traditional search (bibliographic databases) with those of an 'expert' search (directed search). It should be noted that the directed search did not aim to be exhaustive but to improve the scope of the group of documents analysed. The pattern of the results obtained in the two studies is very similar, which reinforces the appropriateness of the document search carried out in Study 2.

Both studies reveal a constant increase in the application of cognitive pretest methods in the period from 1980 to 2007, the increase being especially notable from the second half of the 1990s. Although the percentage decreases to 45.9% in Study 2 because of the inclusion of other types of documents, such as conference presentations, dissertations, etc. the most numerous type of documents are articles published in peer reviewed periodical journals, with 2 or 3 authors.

Another of the notable characteristics of the scientific output in the field of cognitive pretest methods is the great diversity of publication sources. Together with journals specialised in methodology, there is a significant number of documents published by journals in the fields of Health or Social Sciences. The role of public organisations focused on research by means of surveys is also significant, redeeming themselves as centres of production. This role of the public organisations may explain the fact that the majority of the scientific output is disseminated via reports, conference presentations, memos, etc. instead of by scientific journals, which are the main medium of scientific communication.

With respect to the most productive countries, the majority of the documents produced during the analysed time period are from authors linked with organisations located in the United States. In turn, the analysed documents are principally the fruit of intranational collaboration in the most productive countries, with the exception of the UK.

The results obtained in both studies allow us to predict that the increase in documents about cognitive pretest methods will continue in the coming years. This increase will bring the scientific

output up to levels similar to those of other methodological subjects. Additionally, the consolidation of research groups and university departments and European public bodies in recent years will increase the scientific output. Lastly, the role of universities and a greater desire to publish the work carried out by public organisations in scientific journals could increase the visibility of the scientific output in the field of cognitive pretest methods via the usual mediums for disseminating scientific knowledge.

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