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Ineffective Bibliographic Search Engines?

Ivan Valiela and Paulina Martinetto correctly point out the increasing volume of academic literature published yearly and the challenges involved in keeping up to date (*BioScience* 55: 688–692). It is, however, disturbing to learn only an average of 36 percent of known publications were retrieved from online bibliographic databases. As science librarians, we feel their strategy and findings warrant a response since our knowledge of database search and retrieval may explain their results.

First, ASFA and Biological Sciences provide good coverage of aquatic sciences; however, the choice of databases in the group column in table 1 is problematic since it was based upon what was available as opposed to their subject coverage. Better results may have been achieved if subject-relevant databases had been included such as BIOSIS Previews, Wildlife & Fisheries Worldwide, or Selected Water Resources Abstracts, instead of GeoRef, MEDLINE, PsycINFO, and TOXLINE.

Second, the variability within databases occurs for several reasons. Databases employ indexing practices which may involve core indexing (full content) or selective indexing (less than 50 percent of the content) of journals. Valiela and Martinetto did not state whether they had verified the level of indexing and coverage of journals by ASFA or Biological Sciences, or if they had verified whether journal titles of unfound publications were indexed *at all* by the databases. Moreover, the lack of availability of publications prior to 1970 would be expected, considering that ASFA and Biological Sciences were first published in 1971 and 1982, respectively. Given the extensive date range of publications used in the study, the authors could have made the study format independent (i.e., print or electronic) for the publications dating back to the 1940s. This could include the print indexes *Biological Abstracts* or *Zoological Record,* as their coverage began in 1926 and 1864, respectively.

Finally, commercial databases are not constructed in the same way as Internet search engines such as Google or Yahoo and should not be expected to perform in a similar manner. Although the digital platform allows for keyword searching, a certain level of skill is still required. It is for this reason that librarians continue to provide formal instruction on the use of bibliographic databases to teach the finer points of searching and how to manage differences in indexing practices.

As the importance of these databases continues to grow within academia, it becomes increasingly crucial for researchers and students to gain an understanding of the intricacies of commercial resources. The Internet has overwhelmed society and given the illusion that one can find anything, anytime, anywhere. However, in reality, this is not the case. Online searching is an evolving technology, and the practice of supplementing with traditional research methods, as suggested by Valiela and Martinetto, is recommended. For more than a century, librarians have developed their expertise in literature searching, and a partnership with these professionals should be an integral part of any scholar's research practice.

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Response from Martinetto and Valiela

Using search engines available in our library, we reported surprisingly inadequate recovery in test searches for lists of known references. Atkinson and Cunningham suggest that better results could have been obtained had we used BIOSIS Previews: perhaps, but BIOSIS Previews indexes more than 5000 serials, whereas CSA's Biological Sciences indexes more than 6000 serials. Regardless, the problem was not *missed journals but inadequate coverage of the contents of journals. Atkinson and Cunningham also recommend Wildlife & Fisheries Worldwide, an engine that we cannot find, even in their own library; perhaps the reference is to Fish and Fisheries Worldwide (which contains a subset of ASFA, one of the engines we used). A third suggested alternative, Selected Water Resources Abstracts, is a subset of CSA, which we used in our searches.*

We do not expect that use of the suggested alternatives would improve results; there was, in fact a very excellent match between the subject matter of the work in aquatic sciences in our list of known publications and the subjects covered by the search engines we used. Atkinson and Cunningham also point out that ASFA and Biological Sciences began work in 1971 and 1982; this does not explain why the inadequacy of the record was as prominent post-1970, nor why some papers published before 1970 appeared in our search. Atkinson and Cunningham also suggest that we should have added print indexes to our search, but our aim was not in a complete search, but rather on what normal working scientists would find in computer searches.

We reported a remarkable level of inconsistency, and below-par performance in tools that we all depend on every day. Atkinson and Cunningham try to explain the remarkable inconsistencies among databases as the result of different levels of full or selective indexing applied to different journals, and that commercial and other sorts of search engines differ in construction

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and serial selection. These may be the kinds of procedures that need review.

We have welcomed the attention that professional librarians have given to our article, as evident in many e-mails and in Atkinson and Cunningham's letter. We would like, however, that our results reach those who use citation indexes, searches, and related statistics to make decisions that matter to people's careers and lives. Such judgments need to be made, considering the current inadequacy of these ever more important tools.

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