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# COMPUTERIZED SEARCHES ON ARTICLES

## REPORTING READING RESEARCH: A CLOSER LOOK

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Like other scholars, college professors of reading education rely on the journal literature to report their research and to incorporate other research results into their own teaching and research. Reports on computerized databases have been appearing in reading journals. Thus, specialists in reading have become familiar with the computerized retrieval counterparts of the traditional print services which abstract the relevant journal literature. They take advantage of search services in their area of interest, such as the following (print format in parenthesis): ERIC/CIJE[1] (Current Index to Journals in Education), LLBa/Online[2] (Language and Language Behavior Abstracts), and PsycINFO[3] (Psychological Abstracts).

When establishing the originality of a proposed research project, reading researchers may believe that the thoroughness of their literature search has resulted in retrieval of the articles relevant to their interest. This article, which draws on examples supplied by previous studies involving fifty articles in the psycholinguistic literature[4], [5], [6], explores how the choice of terminology used in database records and in searches may actually impede retrieval, and it suggests compensatory measures.

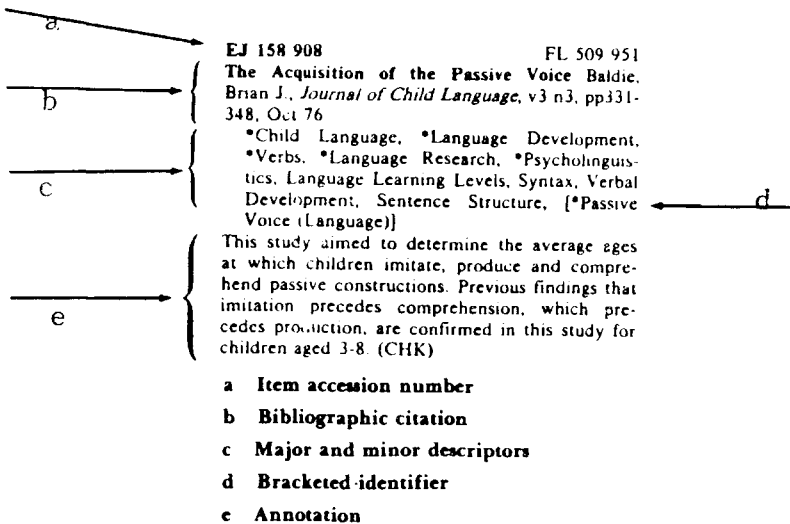
### Field Structure of Bibliographic Records

Before discussing database records and the search process, it will be helpful to review the field structure of the records. Bibliographic records that act as surrogates for articles in computerized abstracting services are composed of an accession number, abstracts, bibliographic citations, and terms signifying a study's subject content and design. These manually-composed records in the machine-readable

databases of the abstracting services are organized by fields which vary from one database to another. A designated field, several fields, or the entire bibliographic record may be accessed in a search, depending on the desired comprehensiveness of the retrieval output.

The bibliographic record in Figure 1 shows the location of the index fields included in the ERIC/CIJE database: (a) item accession number, (b) bibliographic citation including author(s), title, journal, volume, issue, pages, and date, (c) major descriptors (distinguished by an asterisk) and minor descriptors (access by computer only), with both sets taken from an identical thesaurus of terms, (d) bracketed identifiers, which is another type of descriptor reserved for proper names and concepts not yet represented by approved descriptors, and (e) annotation, or abstract, supplied either by the author of the article or contributed by the database service ("abstract" will be used in this article).

Figure 1  
Location of the index fields  
included in the ERIC/CIJE



LLBA/Online and PsychINFO also include a broad content classification, or "section heading," such as "psycholinguistics," at the bottom of the record. In addition, the indexers provide a phrase field describing the research. The phrase field is located below the descriptor field and consists of phrases or word strings that indicate major independent and dependent variables, as well as sample population, study sites, and type of research. For example, the following phrases, separated by a semicolon, appear as shown in LLBA/Online for an article on the acquisition of deictic verbs: Index Phrase: acquisition of deictic verbs of movement, location; 15-33 month olds.

Following are the phrases for the same item as shown in PsychINFO, separated by commas and introduced by "Identifiers."

Identifiers: movement & location contexts, spontaneous use of verbs "come" & "go," 2 year olds.

There is no corresponding phrase field in ERIC/CIJE. However, the descriptor field in this database does incorporate some study design features, such as education level of a study's subjects. Excepted are proper names which appear in the identifier field. These ERIC/CIJE identifier terms are not to be confused with PsycINFO's "Identifiers," a word used to introduce its phrase field, as shown above.

#### Database Records and the Search Process

With the bibliographic field structure in mind, terminology problems that impede retrieval and which are inherent in the database records and in subject search statements will now be considered. The bibliographic record displays subject content on three levels, exemplified below, each providing greater specificity of approach than the previous: section headings, the descriptor field, and the phrase field. Subject search statements applied to the desired fields may use Boolean logical operators (and, or, not) to combine concepts, like the following four-set statement: COGNITIVE DEVELOPMENT (first set) and LANGUAGE ACQUISITION or READING PROCESSES (second set) and ELEMENTARY SCHOOL STUDENTS (third set) not ELEMENTARY SCHOOL CURRICULUM (fourth set).

"Section headings," assigned by LLBA/Online and PsycINFO, represent the broadest grouping of subject designa-

tions. The use of section headings focuses the scope of a search on one or more of the determined categories to the exclusion of other section headings. The technique may be combined with the use of more specific approaches. Each article in the databases that assign section headings is placed in at least one major category. Table 1 exemplifies the section headings assigned by LLBA/Online and PsycINFO to two articles on the acquisition of comparative adjectives.

Table 1  
Section Headings Assigned by LLBA/Online  
and PsycINFO to Two Articles

		Section Headings	
		<u>LLBA/Online</u>	<u>PsycINFO</u>
Art. 1	Child language acquisition		Developmental psychology
Art. 2	Child language acquisition		Cognitive and perceptual development

Problems arise, however, when the indexer and searcher do not think in similar fashion concerning the appropriate category for an article. With reference to the studies cited above, only twenty-seven articles, or 54%, of the fifty on the application of psycholinguistics to the teaching of reading and language arts were assigned to section headings in LLBA/Online that both the searcher and a reading specialist judged to be most appropriate to the content after studying the articles. In the case of the same fifty articles also present in the PsychINFO database, the result was twenty-three articles, or 46%. Reading specialists who desire to obtain articles in the area of a section heading should remember that not all relevant articles may have been assigned to that section heading. Additional searches under one or two other related section headings may be in order.

### Descriptor field

In contrast to the broad grouping provided by section headings, the descriptor field identifies the content of an article through vocabulary terms assigned from a thesaurus at the article's judged level of specificity. Table 2 shows the descriptors assigned by ERIC/CIJE, LLBA/Online, and PsycINFO to the two articles mentioned above on the acqui-

sition of comparative adjectives.

Table 2  
 Descriptors Assigned by ERIC/CIJE, LLBA/Online,  
 and PsycINFO to Two Articles

Article 1		
<u>ERIC/CIJE</u>	<u>LLBA/Online</u>	<u>PsycINFO</u>
PSYCHOLINGUISTICS	ADJECTIVE	PRESCHOOL AGE
LANGUAGE DEVELOPMENT CHILD LANGUAGE	CHILD LANGUAGE	CHILDREN
COMPREHENSION	COGNITIVE PROCESSES	SCHOOL AGE CHILDREN
LEARNING THEORIES	CONCEPT FORMATION AND	LANGUAGE DEVELOPMENT COGNITIVE DEVELOPMENT
EXPERIMENTS COGNITIVE DEVELOPMENT TABLES (DATA)	IDENTIFICATION	
Article 2		
CHILD LANGUAGE LANGUAGE DEVELOPMENT ADJECTIVES	PSYCHOLINGUISTICS CHILD LANGUAGE	ADJECTIVES PRESCHOOL AGE CHILDREN
LANGUAGE RESEARCH PSYCHOLINGUISTICS COMPREHENSION DEVELOPMENT VOCABULARY SKILLS SEMANTICS WORD RECOGNITION PRESCHOOL CHILDREN	ADJECTIVE AGE DIFFERENCES IN LANGUAGE	WORD MEANING LANGUAGE DEVELOPMENT

Problems arise, however, from terminology chosen when abstracts are prepared, insufficiency in number and kind of descriptors assigned by indexers, and the nature of psycholinguistics itself. With respect to the articles in Table 2, terms available in the thesaurus for each of the three

databases were not necessarily assigned. For example, the term "adjectives" is in the thesaurus of both ERIC/CIJE and PsycINFO. Failure on the part of these databases to assign this term as a descriptor may have resulted from the fact that the author of the first article used the word "adjectives" in the first sentence of the article but did not use it in the abstract. Indexers depend on abstracts for assistance in assigning descriptors. The abstract of the second article included the word "adjectives," and all three databases selected it as a descriptor. This example points out the problems of abstracts that miss key concepts. It illustrates how a searcher could have failed to retrieve the first article in the ERIC/CIJE AND PsycINFO databases if a search had been conducted on the term "adjectives" in the descriptor field.

Insufficiency in number and kind of descriptors assigned by indexers may explain the fact that identical terms assigned to an article by all three databases were few in number. A total of only eight descriptors was assigned in common to the same article by all three databases: READING MATERIALS, VERBAL LEARNING, SEMANTICS, SYNTAX, VOCABULARY, PHONETICS, COGNITIVE PROCESSES, and WRITTEN LANGUAGE. To compensate for descriptor assignments that may insufficiently represent articles, the searcher would be advised to use a variety of Boolean sets in a series of searches. Consequences of problems in matching search terms with assigned descriptors are more serious for the researcher who seeks as comprehensive an output as possible in order to establish the originality of a proposed research project.

Searchers should access the term PSYCHOLINGUISTICS with special caution. Authors of psycholinguistic research studies often fail to make explicit use of this word in their own articles. In regard to the fifty articles studied that dealt with psycholinguistics, ERIC/CIJE assigned the term PSYCHOLINGUISTICS to twenty articles, thirteen times as a major descriptor. Twelve times it was the only database of the three to assign the term. LLBA/Online assigned the term to eleven articles, three times uniquely. Interestingly, although the term appeared in its Thesaurus, PsycINFO did not assign the term PSYCHOLINGUISTICS to any of the fifty articles.

On the other hand, assigning the term PSYCHOLINGUISTICS to a large number of articles may burden the searcher with unmanageable output. The term would appropriately be applied to those articles that deal explicitly with psycholinguistic theory and research findings. However, it did not appear at all in the bibliographic record of two articles in which the authors did make the psycholinguistic nature of the content explicit. The first author placed the article in the context of "a growing body of psycholinguistic research," but the term PSYCHOLINGUISTICS did not appear among the descriptors. Neither was it found in the abstracts of the three databases, nor within the phrase fields supplied by LLBA/Online and PsycINFO. The second author began with a statement that psycholinguistic research workers in the early 1960s reached a consensus that children's grammatical competence is mostly acquired before age five. The author placed the article in the context of that psycholinguistic research and the research that followed. However, the term PSYCHOLINGUISTICS was entirely absent from the bibliographic record as in the previous example.

Adverse effect on retrieval is obvious from these examples of practices by authors and indexers regarding use of the term PSYCHOLINGUISTICS. Searchers desiring articles on this subject should avoid the use of PSYCHOLINGUISTICS as a required component of Boolean search statements. The reason is that they may avoid missing a number of articles that rightly fall under the term but which have not been assigned the term.

#### Phrase field

In contrast to both the section headings and the descriptor field, the phrase field permits retrieval, as noted above, on a study's independent and dependent variables and design features through the use of word strings on a more specific level. It is a valuable field that tends to be overlooked in the search process. Along with the title and abstract fields, the phrase field may be accessed in what is called a free text search using natural language provided by the searcher. Table 3 displays the phrase fields supplied by LLBA/Online and PsycINFO for the two articles mentioned above on the acquisition of comparative adjectives. (see next page)

Problems arise, however, when searchers approach a phrase field at what they consider to be an appropriately



specific level, whereas the indexer has provided instead a still more specific level. For example, the first article,

Table 3  
 Phrase Fields Supplied by LLBA/Online and  
PsycINFO for Two Articles

<u>LLBA/Online</u>	<u>PsycINFO</u>
Article 1	
language comprehension; understanding of more, less; three to seven year olds; replication	comprehension of "more" & "less," 3-7 yr olds
Article 2	
children's difficulty with "marked" comparative adjectives; children ages 2.6-4 years	interpretation of marked comparative adjectives, 2-4 yr olds

which treats the adjectives "more" and "less" throughout, explicitly refers to them as "comparative adjectives," but the broader term "comparative adjectives" does not appear in the phrase field. It is also lacking in all other fields of the bibliographic record provided by LLBA/Online and Psych-INFO for that article. Thus, a search on the adjacent words "comparative adjectives" would retrieve only the second article. This would occur only through a "phrase field" search that would reveal the presence of "comparative adjectives" imbedded in the specific term "marked comparative adjectives."

On the other hand, the level of specificity expected in the phrase field may not be found in the phrases that have been assigned by the abstracting service. With respect to the earlier example of a phrase field concerning an article that treats the verbs "come" and "go," a search on these specific verbs in the LLBA/Online phrase field would not have retrieved the article. Searchers would be advised to approach their subjects at various levels of specificity to compensate for possible inadequacy of indexing at any one

level.

### Conclusion

Although the items retrieved from the computerized services located on various campuses may appear to be very adequate, a simplistic conception of what is adequate does not further the purposes of scholarship. Further exploration is needed concerning whether researchers would assign different section headings, descriptors, and phrase fields to their articles than do the indexers of computerized database services. Although terminology problems may never be fully resolved, results would undoubtedly influence indexing practices and database retrieval.

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