Chapter III

The Aggregated Collections: 1987-1995

It has been shown through the tracking of costs and expenditures of serial and monographic resources how various factors in the economic and technological environment affected academic library collections in the 1980s. The fiscal crisis occasioned a number of studies, conferences, symposia, and cooperative ventures beginning in the 1990s. While the overall decreases in buying power and in acquisitions volume are well known, the deeper effects on the composition of library collections by subject and language have not been well documented. In order to study the contents of academic library collections in more detail, the OCLC/AMIGOS CACD has been utilized for a number of studies which were reviewed in chapter II. This chapter examines a set of nine years of data, 1987-1995, extracted from the 1997 OCLC/AMIGOS CACD. The nine years form a block of time sufficient for the study of the composition of the aggregated collections by subject and languages as percentages or proportions of the whole. In this chapter, the aggregated collections of academic libraries are analyzed by three peer size groupings standard to the OCLC/AMIGOS CACD. A fourth grouping (peer group 14) is made up of all of the libraries in the 1997 CACD and includes the three peer groups of academic libraries plus the holdings of all of the other libraries in the CACD database. The total number of bibliographic records in the nine-year dataset for each peer group are shown in Table III-1 along with the number of libraries in each group.

Peer Group 1 is composed of 95 research libraries, the members of the Association of Research Libraries. The next size grouping of libraries, Peer Group 4, is made up of libraries from institutions that are doctoral granting universities, but not members of the ARL. Peer Group 7 is composed of academic libraries from four-year institutions that grant primarily masters and undergraduate degrees and are smaller in size than those academic libraries in Peer Group 4.

Many of the libraries in peer groups 4 and 7 are included in the *ACRL Statistics* series. In addition to the academic libraries comprising peer groups 1, 4, and 7, there are peer groups of smaller academic institutions in the CACD, including community colleges, which are not separately analyzed in this study.

Table III-1
Composition of Peer Groups, 1997 CACD

Peer Group	No. of libraries	No. of titles 1987-1995
Peer Group 1 (ARL)	95	1,669,186
Peer Group 4 (Large)	123	839,472
Peer Group 7 (Medium)	227	712,849
Peer Group 14 (The database)	2,646	2,050,478

To begin the analysis of the nine-year dataset extracted from the 1997 OCLC/AMIGOS CACD, the total number of titles by peer group by imprint year are displayed in Table III-2. In all tables, the year is the publication or imprint year. The total number of titles in an imprint year do not represent all acquisitions for that year, but only the acquisitions for the number of titles published in that year owned by the combined libraries in each peer group. Figure III-1 illustrates the relative sizes of the aggregated collections by peer group and shows the increase/decrease in total number of titles over the time span for each of the peer groups.

In 1997, at the time the CACD was produced, the number of titles for 1987 in each peer group is the lowest in an eight year span from 1987-1994. The fact that the total number of titles for the 1987 publication year are still the lowest total ten years later when the 1997 CACD was produced, shows the severity of the decrease in monographic acquisitions at that time, and that there had not subsequently been a "catch-up" effect. It would appear that many of the titles which were missed in the latter 1980s have not ever been purchased.

Table III-2
Total Titles for Peer Groups by Year

	Peer Group 01	Peer Group 04	Peer Group 07	Peer Group 14
1987	174,929	88,581	74,691	212,597
1988	179,182	90,021	75,950	217,540
1989	183,312	93,347	78,719	222,774
1990	191,950	96,700	81,653	236,697
1991	193,462	95,310	81,159	237,744
1992	197,724	96,405	82,639	243,267
1993	196,924	96,216	82,264	243,177
1994	187,941	94,520	80,786	231,698
1995	163,762	88,372	74,902	204,984

With only slight variances, for each year subsequent to 1987, there is an increase in the number of titles in each peer group up until 1994, in which the numbers show a decrease. As 1995 is close to the year of the release of the 1997 CACD, it can be assumed that not all holdings had yet been added by the libraries and this figure would adjust upward with time. Indeed, libraries continually add titles, such that the data for the total holdings change constantly. The data in the study are not frozen in time and would differ for the same imprint years if the data were extracted again at a later time. As the data closest to the production year of the CACD product are subject to acquisitions and cataloging lag no conclusions can be drawn from them. For this reason, the dataset does not analyze all of the imprint years included in the 1997 CACD.

Figure III-1

Total Titles for Peer Groups by Year

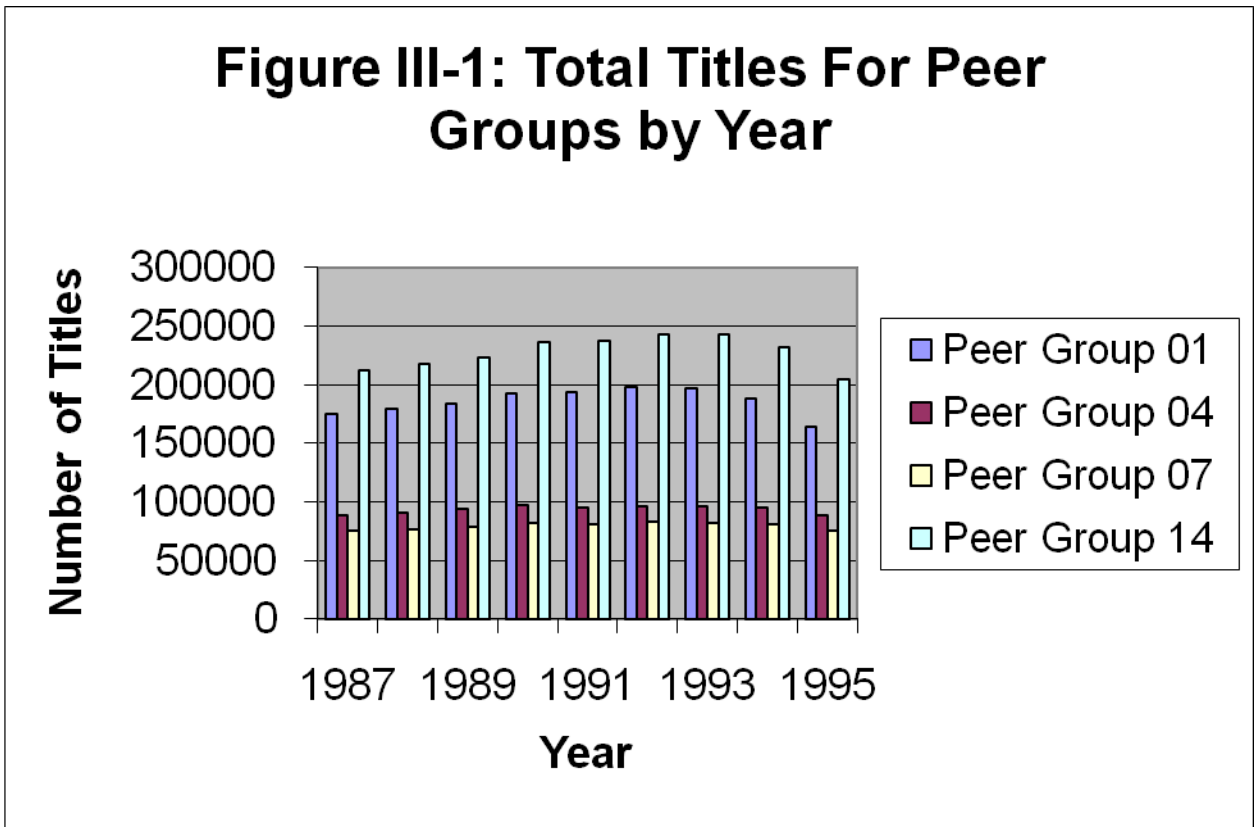
Figure III-1: Total Titles For Peer Groups by Year
Number of Titles
300000
250000
200000
150000
100000
50000
0
1987
1989
1991
1993
1995
Year
Peer Group 01
Peer Group 04
Peer Group 07
Peer Group 14

It is immediately apparent that the entire database in the CACD (PG14) and the total titles for the ARL library group (PG1) have a similar pattern over the nine-year period. It can be readily seen that the largest research libraries which make up Peer Group 1 have an aggregated total of 1,669,186 titles, or 81% of all the titles in the dataset of titles and holdings for the years 1987-1995. Thus, 95 libraries combined own 81% of the titles in the CACD database even though the total number of libraries contributing holdings is 2,646. Or phrased another way, only 19% of the titles in the dataset are not owned by at least one ARL library. The ARL (PG1) owns a large proportion of the total number of titles in PG14, the database. In fact, it can be said that the ARL library holdings "drive" the database.

Peer Group 7 has the largest number of libraries of the three peer groups of academic libraries, but the total number of titles in PG7 is the lowest of the three academic library peer groups. The size of the collections in PG4 and PG7 reflect the comparatively smaller size of the institutions in those peer groups from the ARL research institutions.

The academic library collections with a few exceptions show an increase in the total number of titles each year up through 1992. The totals then decrease each year from 1993-1995. In both peer groups 4 and 7, the range in the number of titles per year is approximately 8,000 titles from the lowest to the highest, a difference of 9 percentage points. In both of these groups, the total number of titles for 1987 and 1995, the first and last imprint years in the study, are very nearly the same.

The range for PG 1 is much larger – over 22,000 titles difference between the lowest and the highest totals, a difference of 17.7 percentage points. For PG 14, the range is even wider, about 39,000 titles or a difference of 18 percentage points.

Both PG1 and PG14 have a considerably fewer number of titles in the last two years than in 1987. The number of titles increases until 1993. In PG1 the number of titles decreases from

187,941 in 1994 to 163,762 in 1995. Likewise, in PG14, the total goes from 231,698 in 1994 to 204,984 in 1995. From these data it would appear that the libraries in peer groups 4 and 7 have much less of a cataloging lag than those in 1 and 14. It is also possible that the holdings in PG4 and PG7 are for mainstream titles which are cataloged quickly and often have pre-publication bibliographic records available in WorldCat.

Table III-3

Percentage Change in Total Titles by Peer Group by Year

	Peer Group 01	Peer Group 04	Peer Group 07	Peer Group 14
1988	2.43%	1.63%	1.69%	2.33%
1989	2.30%	3.69%	3.65%	2.41%
1990	4.71%	3.59%	3.73%	6.25%
1991	0.79%	-1.44%	-0.60%	0.44%
1992	2.20%	1.15%	1.82%	2.32%
1993	-0.40%	-0.20%	-0.45%	-0.04%
1994	-4.56%	-1.76%	-1.80%	-4.72%
1995	-12.87%	-6.50%	-7.28%	-11.53%

The annual percentage change is shown in Table III-3. The similarity in collecting patterns between the ARL libraries (PG1) and the CACD database holdings (PG14) can again be seen. The widest divergence between these two peer groups occurs in 1990 and 1995. There is a 1.54 percentage point difference in 1990 and a 1.34 percentage point difference in 1995. Other than those two years, the increase/decreases are virtually the same for both peer groups.

The two non-ARL academic library peer groups also have the same pattern with virtually identical rates of increase and decline. Although the patterns are the same, there is less fluctuation in the rate of increase/decline in the two non-ARL peer groups.

From the patterns in Tables III--2,3 and Figure III-1, several interpretations are possible.

The academic library collections, with few exceptions, appear to have had increases in the total number of titles added each year from 1987-1992. This could be a consequence of the realization at the end of the 1980s of the decrease in monographic acquisitions, with a subsequent increase or diversion of funding into monographs. Or it is possible that many academic libraries began to concentrate monographic purchasing on current materials to a greater extent than on retrospective materials, thus making it appear that there was an increase in acquisitions when actually the total number of acquisitions had decreased as compared with earlier years not shown in this study.

According to the *ARL Statistics* for those libraries reporting the number of monographs purchased, in the years 1987-88 the number purchased decreased, rose slightly from 1989 to 1991 and began to decline again in 1992. (See Table I-3) The ACRL libraries group medians also decline in 1993 for both serials and monographs purchased from the reported figures for 1991 and 1988. For the time span 1988 to 1995, there is little fluctuation in the reported number of monographs purchased in the ACRL libraries (Table I-4).

There is not an exact correspondence between the number of monographs purchased and the pattern of increase and decrease in the total number of titles in the CACD dataset by imprint year, but it must be borne in mind that in the two academic library statistics series, the reported monographs are for the number of titles purchased in a given year, but not that those purchased are all for that same imprint year. One year of purchasing usually covers a number of imprint years. If there is a bad budget year, the purchasing over the next several years can catch up or fill in for a previous year. If there is a sustained period of low funding for monographs, the effect will be seen in lower numbers of titles over several imprint years. And the acquisitions will be concentrated into a shorter time span of imprint years as the funding does not stretch very far.

Another factor may be the “access not ownership” paradigm which was becoming the dominant collection philosophy in the 1990s. That philosophy would seem to shift acquisitions

more toward the current imprint years. To assess the prevalence of a concentration in current buying, the researcher conducted an informal survey with a non-probability sample over the Colldv-L list in 1998. The question was asked, "In expending monograph funds for one budget year, what do you estimate the percentage breakdown would be for purchases by imprint year?"

Current year (defined as the present and the previous calendar year)
last 3-4 years
last 5-7 years
retrospective – older than 8 years

Twenty persons responded, mostly from academic libraries spanning all sizes and types. From this small non-scientific sample, the indications are that the researcher's assumptions about the spread of imprints for one acquisitions year do match actual practice in the field. Respondents gave the average for current year acquisitions at about 70 percent. When the next category of last 3-4 years was added to current year acquisitions, the average became over 90%. Thus it appears that acquisitions are primarily in the 3-4 years closest to publication date rather than for a wider range of imprint years including retrospective buying.

The research by Sweetland and Christensen on the development of language and literature collections found that selectors' definition of "current" was "within the last couple of years." [i] This at least partially explains the pattern of an increase in the number of titles for imprint years in the early 1990s over the numbers for the latter 1980s. By 1997, when the bibliographic records were extracted from WorldCAT, the numbers for the 1980s are still lower than later, more current, imprint years because acquisitions were concentrated in a smaller span of imprint years in the 1990s, thus increasing the absolute numbers for those current year imprints even though there had not been an overall increase in purchasing.

To look below the surface of the total number of titles by peer group by year, several analyses can be performed. The remainder of this chapter provides detailed analyses of the 1987-

1995 dataset extracted from the 1997 CACD according to

- percentage share of total
- percentage share of total by broad subject divisions
- percentage share of total by field or discipline
- unique titles as a percent of total
- unique titles by broad subject groupings
- mean number of holding libraries
- mean number of holding libraries per title by broad subject groupings
- titles held by 1-5 libraries

A number of analyses by discipline or fields are interspersed within the major categories outlined above. The first analysis is the number of titles and proportions of titles by subject groupings.

Insert Tables III–4-7

Tables 4-7

Number of Titles Per Year by Subject

Percentage Share of Total

The percentage share of total can be used to track shifts in the number of imprints by subject area. If shifts have taken place over a period of time, that can be an indication of changes in collecting emphasis by subject. The complete data analysis for percentage share of total is contained in the Master Tables Series One on the ACRL website. Tables III, 4-7 contain the first table from each peer group from the complete data series. Tables III, 4-7 contain two different analyses for percentage of total. The first percentage column is read horizontally and contains the percentage share that each year comprises of the nine-year time period. The second column contains the percentage each subject comprises of the total within a single imprint year and is read vertically. The next section looks at the percentage share of total within each imprint year

for four broad subject groupings

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Broad Subject Groupings by Peer Groups by Year

Four broad divisions of General and Reference, Humanities and Arts, Social Sciences, and Sciences and Technology were defined through assignment of 35 LC subject categories (Appendix B). The general and reference division is composed of the "A" and the bibliography sections of the "Z" classifications, but would not reflect actual reference collections in libraries since those would include materials from all call number ranges. The history classifications were grouped with the social sciences. The four broad knowledge divisions are analyzed by peer group.

Table III-8 displays the total number of titles in the nine-year dataset divided into four broad subject divisions for the four peer groups. Each of the four divisions is shown as a percentage of the total titles by imprint year, e.g., in PG14 for 1987 the arts and humanities comprised 36.58% of all titles for that year. Likewise, the social sciences comprised 42.57% of total and the sciences 19.16%. The differences in percentage share from one imprint year to the next are very small mathematically. Standard deviations were computed and utilized to describe magnitude of difference.

Looking first at PG14, all of the libraries in the CACD database, in the last few years of the 1980's, the arts and humanities appear to be in a downturn in percentage of total with the social sciences showing a very slight gain. Beginning in 1990, the arts and humanities begin to increase percentage share with the sciences showing a slight decrease. All of the fluctuations appear to be slight, although there are increases and decreases of more than one standard deviation. For the humanities and arts, there is a decrease of one standard deviation from 1987 to 1989. For the nine years, there is an increase in the humanities of more than one standard deviation between 1987 and 1995. The differences are mainly due to the low number of titles overall for the 1987 imprint year. The social sciences increase more than one standard deviation from 1987 to 1988. There are slight increases yearly until 1993, when the percent of total for the imprint year begins to decline in the social sciences. The highest percentage of total for the sciences is in the first year, 1987. Beginning in 1992 the sciences decline to a lower percentage share in 1995 than in 1987. The decline is slight, less than one standard deviation.

In PG1, the humanities and arts have the greatest amount of fluctuation as percentage of total by imprint year. The lowest percentage of total for the humanities occurs in 1989. This is counterbalanced by the sciences which have the highest percentage of total in 1989. Earlier research in the composition of ARL collections in the latter 1980s showed a decrease in the humanities for percentage share of total.[ii] The data from the previous research and the 1997 CACD dataset being analyzed in this study are not directly comparable. There were only 72 ARL libraries in the previous studies, not 95 libraries as in the present study. While the ARL study for imprint years 1985 and 1989 is not directly comparable, it is interesting that the same shifts had occurred -- the humanities had decreased while the sciences had increased in 1989.

Curiously, the humanities which have the highest percentage of foreign language materials, those most subject to cataloging lag, show an increased percentage share in the last

two years of the nine-year dataset. The *ARL Statistics* show that by the mid-1990s the ARL libraries had libraries had made adjustments and alternative arrangements to compensate for the high serials prices and were devoting a larger share of funds to monographic purchases. The humanities were benefitting as the high sums consumed by the serials in the sciences were counter-balanced by providing funding for monographic purchases in the humanities and social sciences. The mentality seemed to be one of fairness in that the sciences were consuming large amounts of funding for serials and an effort would be made to devote more funding to monographs for the humanities.

Table III-8

Titles by Subject Grouping as a Percentage of Annual Total

In the ARL, the social sciences increased percentage share throughout the 1990s, with a decline in 1995. The sciences remained relatively steady until 1992 in which there was a decline of over one standard deviation from 1990 to 1994. Percentage share for the sciences then increased in the last year, 1995. The science/technology fields have fewer titles and are subject less to cataloging lag because of the emphasis on currency of research. Thus it is possible that a decline here can be real, rather than a result of cataloging lag.

Looking at the percentage shares of the four knowledge groupings for PG1 and PG14 together, it can be seen that they are very similar. The ARL libraries have a larger share in the humanities and arts than PG14. Fiction collections in the public libraries do not seem to have influenced the percentage share of total for the humanities in PG14. The sciences have a slightly larger share in PG14 as do the social sciences. The humanities have an increase in the last imprint years in the study in both PG1 and PG14.

Peer groups 4 and 7 are very similar in the percentage of totals for the four knowledge

divisions and do not follow the same pattern as the ARL and PG14 groupings. For peer groups 4 and 7, the percentage of totals are close together with the sciences having a much higher percentage of total than in the ARL and the PG14 groupings.

The arts and humanities have the highest percentage of total in the ARL grouping and the lowest in PG7. The arts and humanities grouping averages 38.49% in the ARL and 34.07% in PG7 as percentages of total. The percentage share for the humanities in PG4 are in a range midway between PG1 and PG7. There is an increase of over one standard deviation in 1989 with further increases up to 1994 in PG4.

The social sciences average 42-43% in both the ARL and PG14, while averaging nearly 38% of total for peer groups 4 and 7. The sciences have a high of 26.56% in PG7 and a low of 18% of total in the ARL libraries. PG4 is also higher than PG1 with an average of a 24.32 percentage share in the sciences. The social sciences have the most stable pattern in all four peer groups. There is more fluctuation in percentage share of total in the sciences and the arts and humanities.

The lower percentage shares in the sciences in ARL libraries may be accounted for by the fact that in the large and medium- size institutions the collections are represented by one main library symbol, whereas in the research institutions, there may be science or health sciences libraries separate from the central library system which have their own library symbol. Thus, the science collections may be under-represented or not totally represented by the main library collection in the research libraries.

The largest research libraries do have a higher percentage of monographs in the humanities and social sciences as those institutions still emphasize the humanities curricula to a greater extent than medium-sized institutions which are oriented more toward professional and career curricula such as business and the allied health fields. There is also a much larger universe

of monographic titles produced in the humanities and social sciences than in the scientific and technical fields. Thus, all academic libraries could be acquiring the same core of science titles, while there could be greater variety in the arts and humanities titles because of a larger universe from which to select.

It is interesting to note that the general and reference category evidences a definite downtrend in percentage share of total throughout the nine-year period in all four peer groups. In all four peer groups there is a difference of more than two standard deviations between the first imprint year and the last in the general and reference category. Although these data are for monographic bibliographic records, it is possible that the growing universe of electronic resources was beginning to have an effect. The downtrend in the general/reference category over the nine years is probably an accurate reflection of the shift to electronic materials. The productivity of printed bibliographies began to decline as electronic indexing became a better means of producing current customized bibliographies. Foreign language purchasing could have decreased and foreign language titles may have been cataloged more slowly. These two factors could also have affected these subject classes.

In summary, for the nine years there do not appear to be significant shifts in the percentage of total among the knowledge divisions of the arts and humanities, social sciences, and sciences. Although in some areas the increases or decreases in percentage share are more than one standard deviation, practically speaking, the percentage shifts are very slight. The most pronounced decrease is in the general and reference category which declines in all four peer groupings moving forward. Of the four peer groups, the highest percentage of total for the arts and humanities is in the ARL libraries. The humanities and social sciences are close to the same percentage share in PG4, the large-sized institutions. The social sciences have the highest percentage share of total in all four peer groups. And the sciences have the lowest percentage

share in all four peer groups by dint of the tighter universe of publication in those fields.

The next section examines percentage share of total for specific fields or disciplines by two different measures.

Percentage Share of Total by Field or Discipline

The analysis by individual fields first looks at the percentage share each year comprises of the total number of imprints over the nine-year time span. Beginning with PG14, following the data in Table III -4, column 1 across the grid, it can be seen that the pattern for percentage share of total is not one of consistency within the individual fields or disciplines. The percentage shares by year do change for individual fields. For example, in PG14 for English literature, 8.86% of all titles for the nine years are 1987 imprints. The percentage increases moving forward in time so that by 1991 it is 11% of the nine-year total, increasing to 13.7% in 1993, and declining slightly to 12.71% in 1995. This is another indication of the lower number of imprints in the latter 1980s. For English literature, by ten years later when the data were extracted, the share of the whole for the nine-year dataset made up by each imprint year has increased moving toward the present. The percentage share of total within English literature is governed by the increases and decreases in absolute numbers over the nine years. As acquisitions of monographs were concentrating into current year imprints, the percentage share of total for each year in the nine-year dataset increases.

The patterns of percentage share by imprint year within specific subject areas are similar in all four peer groups. The percentage shares tend to increase each year with some leveling off toward the last two years in the study. The exception to this is the general and reference categories. As observed earlier, there is a decline in percentage share of total within the general reference and bibliography lines. In all four peer groups in 1987, the general and bibliography

lines start out within an 11-16 % range of percentage share. By 1995, these percentages are down in the 6-8% range of percentage share. The number of acquisitions in these subject areas began decreasing in the 1980s and the decline continued throughout the 1990s.

Another field which exhibits a downturn in the percentage share by imprint year going toward the present is library and information science with the most marked decline in PG1, the ARL libraries. The absolute numbers for library and information science are close to those in PG14, but the field does not decline in PG14 until 1994. Computer science exhibits an opposite pattern with the lower percentage shares in the older imprint years, increasing percentage share moving toward the present. With the pressure for current materials in computer science this is an appropriate pattern as there are more titles in current years.

The second percentage column in Tables III, 4-7 shows the percentage of total that each field or discipline comprises of the total number of titles within each imprint year and is read vertically. The percentage share of total for the four broad divisions is also shown. Looking at PG14, it can be seen that the "P's" -- languages and literature classifications -- excluding English and American literature, make up 16% of the total number of titles for 1987. The next largest subject area of business, finance, & economics comprises 10% of total. Surprisingly, English literature averages less than 2% of total collections in most of the nine years. American literature hovers in the 3% range, although it increases to 4% of total in 1995. Cataloging lag appears to affect other areas with American literature receiving more prompt attention. Less surprising is that the religions make a strong showing with over 5% of total collections. The health sciences comprise 4% of the total.

The percentage shares are somewhat determined by the establishment of subject areas according to Library of Congress classification divisions. The subject areas follow academic disciplinary fields. Thus English and American literature, history of the Americas, etc., are

separated because of their prominence in the curriculum. Other fields are in larger groupings such as business and finance, the languages and literatures other than English, and history other than the Americas. These larger groupings would naturally have the largest number of titles and thus larger percentage shares of the whole. The relevance in the analysis by percentage share of total is in the overall composition of the collections compared by peer group.

The most interesting aspect of the analysis for percentage of total collections by year is the remarkable consistency of the percentages. While the absolute numbers of titles by field or disciplines vary from one year to the next, the percentage shares remain virtually the same. The indication is that acquisitions remain consistently the same percentage for each field while the actual numbers increase or decrease dependent upon funding.

Thus, there do not appear to be significant shifts in acquisitions between subject areas and fields or disciplines in the nine-year dataset. The remarkable consistency in both measures of percentage of total almost form a lockstep pattern. It is as if there is a model in existence in which percentage shares are dictated and every library follows that model. Is this a function of percentage allocations by subject remaining constant from one year to the next? Or is the universe of publication influencing acquisitions such that the proportions by subject are a function of the available number of publications? These are, to be sure, aggregated data and thus averages for peer groups of libraries. But in the measures of percentage of share within imprint year and within subject fields over the nine years, the patterns for acquisitions as measured by percentage share of total for all peer groups are remarkably similar. This obtains for PG14 with 2,646 libraries and for the academic library peer groups with much smaller numbers of libraries. Although funding and acquisitions may vary widely over the nine years by individual library, the variations are not inconsistent enough to affect the aggregated data.

These findings of the constancy of the acquisitions of the current collective resources

within the four peer groups in the study can be further examined through the next variable to be studied, that of unique titles.

Insert Tables 9-12

Unique Titles

For purposes of this study, unique titles have been defined using the OCLC/AMIGOS CACD definition.[iii] A title is unique within a peer group if only one library within the group owns that title. A title may be unique in more than one peer group, that is, one library in each peer group could own the same title, but it would be unique in each peer group because only one library in each group owned the title. If a title is unique in PG14, it means that there is only one library holding location for that bibliographic record in the CACD database. There can be a variant record or a different edition, but a record is deemed "unique" if it has only one library holding symbol.[iv] The assumption for the data is that bibliographic records with only one library holding symbol indicate a unique title to the peer group.

The complete data for unique titles are contained in Tables III, 11-14. These tables show both the number and percentage of unique titles and also the number and percentage of titles held by five or fewer libraries. Table III-13 displays the number of unique titles within the three peer groups of academic libraries compared with the number of unique titles in the aggregated database of the 1997 OCLC/AMIGOS CACD. Table III-14 displays the annual rate of increase/decrease in the number of unique titles.

Table III-13

Total Number of Unique Titles by Peer Group by Year

Table III-14

Annual Percent Change in Unique Titles

1995					TOTAL				
No. of titles	Unique	% Unique	1-5 Holders	% 1-5	No. of titles	Unique	% Unique	1-5 Holders	% 1-5
655	197	30.08%	390	59.54%	8,234	2448	29.73%	4970	60.36%
1,280	297	23.20%	647	50.55%	18,002	3255	18.08%	7736	42.97%
1,935	**494**	**25.53%**	**1,037**	**53.59%**	**26,236**	**5,703**	**21.74%**	**12,706**	**48.43%**
2,614	415	15.88%	1122	42.92%	27,014	4493	16.63%	11739	43.46%
11,307	2622	23.19%	6021	53.25%	112,986	27384	24.24%	62281	55.12%
2,658	468	17.61%	1104	41.53%	25,189	4682	18.59%	10850	43.07%
7,691	1898	24.68%	4182	54.38%	78,618	19745	25.12%	43868	55.80%
1,822	445	24.42%	1031	56.59%	17,922	4228	23.59%	9741	54.35%
339	86	25.37%	190	56.05%	3,316	749	22.59%	1688	50.90%
32,359	7249	22.40%	18093	55.91%	332,256	64164	19.31%	171455	51.60%
5,091	1246	24.47%	2494	48.99%	49,800	12900	25.90%	25514	51.23%
4,718	534	11.32%	1399	29.65%	37,116	4339	11.69%	10579	28.50%
8,394	1285	15.31%	2694	32.09%	68,932	10891	15.80%	23093	33.50%
76,993	**16,248**	**21.10%**	**38,330**	**49.78%**	**753,149**	**153,575**	**20.39%**	**370,808**	**49.23%**
1,880	338	17.98%	701	37.29%	18,251	3751	20.55%	7896	43.26%
20,042	4471	22.31%	11556	57.66%	197,386	41510	21.03%	108668	55.05%
8,237	1409	17.11%	3445	41.82%	83,670	14854	17.75%	35549	42.49%
1,885	503	26.68%	1063	56.39%	18,984	5877	30.96%	11803	62.17%
1,793	392	21.86%	950	52.98%	17,466	3398	19.45%	8825	50.53%
2,555	653	25.56%	1113	43.56%	21,833	6024	27.59%	10073	46.14%
556	248	44.60%	386	69.42%	6,219	2413	38.80%	4146	66.67%
18,841	5543	29.42%	10636	56.45%	203,174	60573	29.81%	118915	58.53%
5,694	1222	21.46%	2669	46.87%	55,257	12214	22.10%	27224	49.27%
2,958	743	25.12%	1427	48.24%	29,591	7572	25.59%	15075	50.94%
4,210	855	20.31%	2138	50.78%	43,182	8508	19.70%	21390	49.53%
12,305	4564	37.09%	8216	66.77%	122,353	42015	34.34%	81283	66.43%
5,296	1665	31.44%	2845	53.72%	57,427	19200	33.43%	33290	57.97%
892	256	28.70%	471	52.80%	10,805	2953	27.33%	5837	54.02%
87,144	**22,862**	**26.23%**	**47,616**	**54.64%**	**885,598**	**230,862**	**26.07%**	**489,974**	**55.33%**
3,111	560	18.00%	930	29.89%	30,125	6765	22.46%	11785	39.12%
763	153	20.05%	353	46.26%	7,636	1699	22.25%	3681	48.21%
2,073	341	16.45%	726	35.02%	19,945	3605	18.07%	7201	36.10%
3,587	729	20.32%	1353	37.72%	37,978	9012	23.73%	16830	44.32%
3,168	655	20.68%	1310	41.35%	31,152	7149	22.95%	14107	45.28%
9,171	1325	14.45%	2859	31.17%	88,956	15919	17.90%	30942	34.78%
3,093	788	25.48%	1519	49.11%	31,892	9430	29.57%	17635	55.30%
8,521	2080	24.41%	3904	45.82%	85,239	22636	26.56%	42424	49.77%
5,425	1279	23.58%	2120	39.08%	52,572	14200	27.01%	24431	46.47%
38,912	**7,910**	**20.33%**	**15,074**	**38.74%**	**385,495**	**90,415**	**23.45%**	**169,036**	**43.85%**
204,984	**47,514**	**23.18%**	**102,057**	**49.79%**	**2,050,478**	**480,555**	**23.44%**	**1,042,524**	**50.84%**

From Table III-13 we can see that the number of unique titles in the ARL peer group corresponds closely to the number of unique titles in the CACD database (PG 14). All three academic library peer groups are contained within the database, PG14. Thus, the total number of unique titles for the database would combine all of the three peer groups. If the number of unique titles for the smaller library peer groups, PG4 and PG7, are added together, that total exceeds the total for PG14 by around 5,000 titles. The ARL group titles are about 5,000 less than the total for PG14. Thus, it can be seen that there are titles unique to each group, which when the three peer group aggregated collections are combined, the totals for PG14 are higher than just the ARL holdings, but lower than the two smaller peer groups combined. Since the number of unique titles in the two smaller peer groups are considerably less than those of the ARL group, it can be assumed that many of the titles which are unique in the smaller groups are also present in the ARL collective holdings. And the results are seen in the closeness between the totals of unique titles for peer groups 1 and 14. There are unique titles in the database not owned by any ARL library, but that number is not more than 10% of the total number of unique titles. So we can see that the majority of the unique titles can be accounted for by the ARL group. In other words, because of the size of the ARL collections, the number of unique titles is the largest of the peer groups and there is overlap between the holdings of the large research libraries and the other two academic library peer groups.

The rate of change in the number of unique titles to total is shown in Table III-14. As in the increase/decrease in total number of titles by peer group, the number of unique titles show less fluctuation in the non-ARL peer groups, 4 and 7, than the ARL and the CACD peer group 14. PG7 has the least fluctuation in titles, but it also has the lowest level of acquisitions. While the magnitude of fluctuation is less in the two non-ARL peer groups, they do not both have an identical pattern and percentages of change as with the total number of titles per year. In fact, the

patterns for all four peer groups are not the same. The change in total in unique titles increases in PG1 and PG7 until 1993. Both PG4 and PG14 decrease in 1991, increase in 1992 and then decrease from 1993 forward. The largest increases for all four peer groups are in 1990, the year in which total acquisitions begin to increase. It is clear from the annual percentage change in the total number of unique titles that, as the number of total titles decreases, so does the number of unique titles. The non-ARL peer groups may have lesser rates of change because they have a lower total number of titles.

Table III-15

Unique Titles by Year and as Percent of Total Titles for All Peer Groups

	1987		1988		1989		1990	
	No. of Titles	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**
Peer Group 14	50,069	23.55%	50,918	23.31%	51,262	23.01%	57,282	24.20%
Peer Group 01	44,379	25.40%	45,343	25.30%	46,329	25.30%	50,353	26.23%
Peer Group 04	29,522	33.30%	29,600	32.90%	30,105	32.31%	31,779	32.91%
Peer Group 07	23,587	31.60%	23,977	31.60%	25,410	32.30%	26,435	32.43%

	1991		1992		1993		1994		1995	
	No. of Titles	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**
Peer Group 14	55,441	23.32%	57,666	23.70%	57,304	23.56%	53,096	22.92%	47,514	23.18%
Peer Group 01	50,962	26.33%	53,141	26.83%	53,062	26.94%	50,322	26.79%	44,856	27.38%

	1991		1992		1993		1994		1995	
Peer Group 04	30,989	32.54%	31,388	32.56%	31,361	32.58%	29,956	31.74%	26,578	30.09%
Peer Group 07	26,525	33.74%	26,600	32.22%	26,201	31.84%	25,276	31.32%	23,246	31.03%

Table III-15 shows the number of unique titles by year and the percentage share those unique titles comprise of the total number of titles. The percentage share of total in unique titles is lowest in PG14, but this is to be expected, in that a title has to have only one location among the 2,646 libraries in the database to be considered unique. In PG14, less than one in four, but more than one in five titles is unique. In the ARL group, PG1, the ratio increases from right at one in five to more than one in five titles being unique. In PG7, the ratio hovers right at one third with one in three titles being unique. In PG 4 the ratio is less than one in three but very close to that in some years. The interest is in the differences between peer groups with the ARL aggregated collection showing a much lesser degree of diversity of resources than the smaller academic libraries peer groups in which one in three titles is unique. In these data, the fluctuations in percentage share of unique titles by year do not vary much at all from one year to the next.

If we look at percentages of total for unique titles, the percentage shares in PG1 and PG 4 are much closer together than the absolute numbers. The same can be said for PG4 and PG7. In fact, in some years, both peer groups 4 and 7 have almost exactly the same percentage shares in unique titles. The rate of change in percentage shares over the nine year period are less than one percentage point with only three exceptions. In both PG1 and PG14 there is an increase of over one percentage point from 1989 to 1990. The other change is a decrease of over one percentage point in PG4 between 1994 and 1995. Although the year to year change is only in 10ths of a

point, the rate of change over the nine years is larger. There is a two percentage point increase in unique titles in PG1 from 1987 to 1995. There is a decrease of three percentage points in PG4. In both PG7 and PG14 the percentage shares of total in unique titles are nearly identical in 1987 and 1995. Although it would seem that unique titles would decrease in the last years due to cataloging lag, the opposite obtains in PG1 with the percentage share of unique titles increasing each year beginning in 1990. PG14 has the most consistent pattern of percentage share of unique titles hovering at 23% in all but 1990. Thus, the aggregated holdings of all 2,646 libraries have a remarkable consistency of percentage share of unique titles across the nine years. However, within the aggregation there are real differences among the academic peer groups.

Unique Titles by Broad Subject Groupings

In comparing the number of unique titles by three broad subject groupings of humanities, social sciences, and sciences, according to the four peer groups, some interesting patterns emerge. In looking at Table III-16, for the percentage of unique titles by year within the broad subject groupings, there are marked differences among peer groups.

Looking at the percentages for all four knowledge groupings in PG14 for all imprint years, it can be seen that the highest percentage for any grouping in the nine years is 26.85% in the social sciences in 1993. Only the social sciences have a share above 25% in unique titles in PG14.

In PG1 the general and reference category has the lowest percentage unique titles across peer groups and years at 19.52% in 1987. The percentage unique for general and reference does increase each year in PG1 until 1994. PG4 has the highest percentage of unique titles of all four peer groups in general/reference. The percentage remains stable across the nine years in PG4. The largest amount of fluctuation for percentage of unique titles in general/reference occurs in

PG7. The percentage level is similar in both PG4 and PG7.

In the humanities and arts grouping, the lowest percentage in unique titles is in PG14 in which the percentage remains almost static over the nine years. The percentage of unique titles in the arts and humanities in PG1 is slightly higher than PG14, with slight increases moving forward in time. In PG4, the arts and humanities are at the same level as in peer groups 1 and 14 in 1987. However, the percentage of unique titles increases at a much higher rate in PG4 so that there is an increase of more than 10 percentage points from 1987 to 1993. In PG7, the arts and humanities start out in 1987 a full ten percentage points higher in 1987 than in the other three peer groups.

Table III-16

Number of Unique Titles by Broad Subject Groupings

Percentage of Unique Titles by Broad Subject Groupings

	1987		1988		1989		1990		1991	
Peer Group 14										
	No. of Titles	**Percent of Toatl**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**
General/ Reference	3,578	20.46%	3,455	20.20%	3,428	18.55%	3,223	20.97%	2,967	21.33%
Humanities	77,767	21.12%	79,182	20.39%	80,091	19.44%	86,118	20.68%	85,963	20.12%
Social Science	90,509	25.15%	93,612	25.44%	96,689	25.67%	102,190	26.81%	103,458	25.61%
Science	40,743	24.91%	41,291	24.86%	42,566	24.04%	45,166	25.24%	45,356	24.28%
Peer Group 1										
General/ Reference	3,125	19.52%	3,043	18.73%	2,994	17.60%	2,783	20.05%	2,553	20.21%
Humanities	67,201	23.42%	68,321	23.24%	69,149	22.63%	73,694	23.56%	73,934	23.52%
Social Science	72,290	26.67%	75,042	26.61%	77,053	27.14%	79,944	27.84%	81,689	27.79%
Science	32,313	27.09%	32,776	27.24%	34,116	27.10%	35,529	28.66%	35,286	29.36%
Peer Group 4										
General/ Reference	1,674	35.35%	1,659	35.00%	1,581	34.36%	1,542	35.24%	1,197	34.42%
Humanities	31,956	22.34%	32,274	22.60%	34,082	24.54%	35,409	25.68%	34,551	31.91%
Social Science	33,615	36.75%	34,201	36.03%	34,804	35.15%	36,194	35.66%	36,108	34.81%
Science	21,336	25.91%	21,887	25.62%	22,880	25.22%	23,555	25.47%	23,454	26.20%
Peer Group 7										

General/ Reference	1,486	27.39%	1,509	30.02%	1,420	27.11%	1,393	29.00%	1,031	33.75%
Humanities	25,556	33.47%	25,898	33.98%	26,560	34.15%	27,600	33.98%	27,270	34.49%
Social Science	27,992	33.69%	28,651	34.00%	29,757	35.17%	31,045	35.00%	31,287	34.17%
Science	19,657	26.44%	19,892	25.05%	20,982	26.16%	21,615	26.77%	21,571	28.18%

	1992		**1993**		**1994**		**1995**	
Peer Group 14								
	No. of Titles	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**	**No. of Titles**	**Percent of Total**
General/ Reference	2,757	24.05%	2,482	23.93%	2,411	23.93%	1,935	25.53%
Humanities	89,080	20.29%	90,515	20.33%	87,440	20.12%	76,993	21.10%
Social Science	106,081	26.70%	105,911	26.85%%	100,004	25.94%	87,144	26.23%
Science	45,349	24.47%	44,269	22.30%	41,843	21.46%	38,912	20.33%
Peer Group 1								
General/ Reference	2,327	23.25%	2,137	24.19%	2,091	22.51%	1,655	26.83%
Humanities	75,767	23.43%	76,470	23.54%	73,904	24.53%	63,948	26.35%
Social Science	84,299	27.63%	84,252	28.95%	79,566	28.51%	68,155	28.74%
Science	35,331	28.17%	34,065	27.56%	32,380	28.52%	30,004	26.56%
Peer Group 04								
General/ Reference	1,029	35.18%	939	35.04%	947	34.13%	772	32.68%
Humanities	35,169	29.93%	35,932	32.80%	35,100	33.26%	32,268	29.66%
Social Science	36,658	33.91%	36,035	33.77%	35,844	33.16%	33,798	31.19%

Science	23,549	26.67%	23,310	27.01%	22,629	25.56%	21,534	24.44%
Peer Group 07								
General/ Reference	957	36.57%	801	33.83%	782	33.76%	620	26.22%
Humanities	27,842	33.71%	28,470	33.93%	28,059	34.11%	25,591	34.65%
Social Science	31,779	33.26%	31,106	32.60%	30,722	31.76%	28,298	41.19%
Science	22,061	28.53%	21,887	28.00%	21,223	26.79%	20,479	28.53%

In PG14 the social sciences have the highest percentage of unique titles of the four knowledge groupings, slightly over one-fourth of titles in that grouping. In PG1, the social sciences and sci/tech fields have almost the same percentages of unique titles. The percentage of unique titles in the social sciences are much higher in peer groups 4 and 7 with similar levels and patterns of fluctuation. In both 4 and 7, the social sciences have over one-third of total in unique titles in most years. PG4 has slightly higher levels than PG7. These range from 5-10 percentage points higher than in peer groups 1 and 14. In PG14, the sciences have nearly one-fourth in unique titles in 1987, declining to one in five in 1995. The percentage of unique titles in the sciences is highest in the ARL group, in the 27-29% range in most years. PG4 has slightly lower percentages of unique titles and PG7 has the same percentage range as PG1.

From the data in Table III-16 for all peer groups, the arts and humanities have lower rates of unique titles than the social sciences and sciences. While the numbers of unique titles are lower for PG4 and 7, the percentage share of the broad knowledge groupings made up by unique titles in those peer groups is much higher than for peer groups 1 and 14. In PG14, the percentage shares of unique titles in all data cells are in the 20% range. In PG1, the percentages are in the 20% range, but reach higher levels than in PG14. In PG4 and PG7, the percentage in unique titles is in the upper 20% to mid 30% range. In PG7, the percentage of unique titles in the humanities and social sciences are all in the 30% range.

The data presented here show an increase in unique titles in the early 1990s. For the humanities in PG1, the ARL libraries, there is a low of 15,736 unique titles in 1987 with a high of 18,769 in 1993. In 1987 and 1988, the ARL libraries had fewer unique titles than the aggregated database, i.e., there were titles in the database that no ARL library owned. Beginning in 1991, the ARL libraries have more unique titles than the database. The small differences in the number of unique titles between the database and the ARL group could mean that the majority of

the unique titles are owned by ARL libraries. From the devastating years in the late 1980s, there seems to be some recovery in that the number of unique titles in PG1 does rise in the early 1990s, increasing slightly the diversity of resources on a collective basis. This contrasts with the findings of the earlier ARL study in which the number of unique titles had declined.[v] It is possible that the increase in the number of unique titles is due to an increase in the number of libraries in the peer group, rather than being a true increase in proportion over the previous study. Or is it possible that selection patterns had changed as a result of the economic environment for libraries? It is also possible that a larger universe of publication could have made a difference and caused more diversity in selection.

There may be a pattern of fewer unique titles in the sciences because of electronic information sources or publication patterns. These data can be interpreted as there being much more of an agreed upon core of materials in the sciences than the humanities and social sciences. In technology, monographic publication is largely textbooks and manuals. Publication and approval plan data show the universe of titles in the sciences to be much smaller than the universe of publication in the humanities, arts, and social sciences. Thus, in the sciences, it appears that academic libraries are buying the same titles. Since monographs in the sciences tend to summarize established research findings, a low number of unique titles in the sciences may be an appropriate collecting pattern. In fact, the number for the sciences may be a higher proportion of the publication universe being acquired than for other fields.

To summarize for unique titles, the ARL libraries hold the preponderance of unique titles in the arts and humanities, with the medium-sized and smaller academic libraries tending to have more unique titles in the social sciences than in the humanities. For all peer groups the number of unique titles in the sciences declines moving forward in time.

The next section examines unique titles by specific subject fields or disciplines.

Unique Titles by Field or Discipline

The analysis by individual field or discipline is confined to specific examples which add to the profile developed by the broad knowledge analysis. The ranges for the four peer groups in percentage of unique titles by fields or disciplines from low to high are shown in Table III-10.

Tables III-17
Mean Ranges in Percentage of Unique Titles by Peer Groups

	Peer Group avg.	Lowest	Highest
Peer Group 14	23%	11.69% (Engl. Lit.)	38.80% (Genl. Soc. Sci.)
Peer Group 1	26%	15.44% (Engl. Lit.)	39.78% (Law)
Peer Group 4	32%	19.47% (Health Sci.)	41.94% (Geography)
Peer Group 7	32%	18.03% (Mathematics)	44.87% (Visual Arts)

The ranges by specific fields or disciplines averaged across the nine years for each peer group show an escalation in the percentage of unique titles. This corresponds to the finding in percentage share of total which showed increasing share of total moving forward in most subject fields; as number of titles increases, number of unique titles increased. PG14 with all of the libraries has the lowest level of unique titles at 23 percent. The differential is less between PG1 and PG4 at 5 percentage points than between PG 4 and PG7 at 0 percentage points. The pattern for the three academic library peer groups appears to be a function of size. The largest research libraries, the ARL (PG1), have the lowest percentages of unique titles across nearly all subject areas. The next academic libraries in size of collections, PG4, have slightly higher means for percentage of unique titles. The peer group with the smaller collections but the largest number of academic libraries, PG7, has the highest percentage level of unique titles across all subject areas.

More specific analyses for fields and disciplines serve to further elaborate upon the

findings for percentage of unique titles. Looking comparatively at both PG14 and PG1, in the first line for general reference, the percentage of unique titles is higher in PG14 at nearly 30% to 27% for PG1. The average percentage of total in unique titles in the bibliography line are almost identical in both peer groups at 18%. In the humanities and arts there are no subject fields in which the percentage of unique titles is higher in PG14 than in PG1. There is only one field in which the percentage of unique titles is higher in PG14 over PG1 and that is education. As observed earlier, the ARL libraries contribute the highest number of unique titles to the database. The ARL libraries have a higher percentage of collections in unique titles than the database of all libraries. There are titles which are owned by only one ARL library which are also owned by libraries in other peer groups, thus lessening the number of unique titles overall in PG14, the database.

In PG1, the humanities and arts, the two fields with the highest percentage of unique titles are the religion classifications and the area of general literature. The field with the lowest unique title percentage is English literature which hovers in the 13-15% range until 1992 when it increases to 16% for the three most current imprint years.

In contrast to English literature, American literature hovers in the 21- 23% range for unique titles, increasing to 26% after 1992. The mean for the nine years for percentage of unique titles in English literature is 15.44% and for American literature it is 24.37 percent. The percentage of unique titles in religion increases from a low of 28.63% in 1987 to a high of 28.99% in 1988 staying above 29% for the most current years.

For PG1, the percentage of unique titles by field is on the whole, much lower than those in both PG4 and PG7. While English literature has 13.15% unique in 1987 in PG1, it has 19.33% in PG4 and 18.75% in PG7. American literature for PG1 has 22.47% unique in 1987; in PG4 the percentage is 28.76% and in PG7 it is 26.85%. The area with the highest percentage of

unique titles in PG1 in 1987 is geography with 39.29%. Law is second highest with 36.37%. In PG4, the fields with the highest percentage of unique titles, over 40%, are architecture, both history lines, and agriculture. In PG7, geography and agriculture both have over 40% in unique titles.

In PG1, the average percentage of unique titles for the nine years is higher than the percentage in 1987 in all fields but general, religions, architecture, geography, general science, physical sciences, life sciences, and engineering. With the exception of these fields, the number of unique titles has risen over the nine-year period. While the absolute number of titles in the study increased overall in the 1990s, the percentage of unique titles was also increasing. It would appear, that while the sciences were remaining static with a more agreed upon core of titles, the humanities and social sciences were gaining in diversity of titles.

Research by Hardesty and Mak, using the OCLC/AMIGOS CACD and WORLDCAT, on core collections for college libraries found a high level of diversion and no commonly agreed upon core of materials in that group of libraries. Although performed on the collective resource base of 427 libraries in the size range of 100,00-299,999 titles, the next size down from PG7 in this study, their findings are in agreement with the indications in this study.[vi] While it might be expected that the percentages of unique titles would be higher in the ARL libraries because size would seem to mean that the largest collections would have the largest number of unique titles, this assumption holds true only when compared to the PG14 database. The other academic library peer groups do not fit this expectation. While one would expect the smaller size would mean a tighter more agreed upon core of materials, that assumption is not supported by the unique title data. It must be remembered that when analyzing unique titles by peer group, one title can be unique in all peer groups if only one library in each peer group holds the title. Thus it is understandable that PG14 has the lowest percentage of unique titles because in the entire

CACD database each title is only counted once, even if it is unique to the other three peer groups. The findings show that collecting emphases are not as easily identifiable for the two smaller academic library peer groups, although PG4 does more closely parallel the ARL pattern than does PG7.

If the pattern is one of increasing percentage of unique titles through 1993 and then decreases over the last two imprint years, this could indicate that in the last two years cataloging lag has affected the addition of unique titles or there could be a real decline in acquisitions. In all peer groups, 1987 has the lowest percentage of unique titles, but also the lowest absolute number of titles. The percentage of unique titles does seem to follow the volume of acquisitions. In the nine-year dataset, as the number of titles goes up per imprint year, the number of unique titles also goes up. If acquisitions decrease, then so does the percentage of unique titles in the nine years of this study.

Another measure by which to judge collecting intensity is the mean number of holding libraries which is an indication of collection concentration.

Insert Tables III–18-21 which are the all languages tables for each peer group from Master Tables series three mean number tables

Mean Number of Holding Libraries

The mean number of holding libraries is calculated by dividing the aggregate number of holding libraries in a given subject category by the total number of bibliographic records (titles). The resulting figure is an average of the number of owning libraries per title.

What does the mean number of holding libraries indicate about the diversity of resources

in the aggregated database? Both the number of unique titles and the mean number of holding libraries indicate the availability of resources in terms of resource sharing. The mean number of libraries operates conversely from the percentage of unique titles. If the percentage of unique titles is high, this is an indication of a greater amount of diversity in collections because a larger number of titles are held within the group. Conversely, if the mean number of libraries is high, this is an indication of less diversity and a commonality in collection philosophy among a group of library collections in that many libraries own the same titles. While the number of unique titles indicates the diversity of resources, the breadth or the range of different titles, the mean number of holding libraries indicates how commonly held a title is within the database, or indicates whether the resources by subject area are widely collected or narrowly collected within a group of libraries. If the mean number of holding libraries is relatively high, then it can be said that those resources are regarded as core, mainstream, or important for a large number of libraries, that there is an identifiable core of materials being purchased within the group of libraries. If the mean number of holding libraries is relatively small, then the indication is that only a few libraries are acquiring monographic resources in those subject areas. A low number of holding libraries may indicate a subject is being collected by a few libraries which have a special focus and collecting strengths in that subject area, or it may indicate the area is not collected extensively and the acquisitions are not due to a collecting pattern but are a few random selections. Because the data are aggregated, it is not possible to distinguish individual library collecting patterns. Complete data for the mean number analyses are contained in Master Table Series Three on the ACRL website.

It is interesting to note that the mean number of holding libraries does not seem to be affected by cataloging lag as greatly as the number of unique titles. This is understandable in that once a bibliographic record is entered into the database, the majority of libraries which have

purchased that title can add their holdings symbol relatively quickly. Thus, the data in the last years of the dataset have more validity for the mean number of holding libraries, which is a reflection of duplication or overlap, than for the number of unique titles which might require original cataloging.

There are differences in the profiles of the peer groups by mean number of holding libraries. The mean numbers for each peer group cannot be compared between peer groups except as a proportion of the number of libraries within the peer group. In other words, the mean number is affected by the number of libraries in the peer group. PG7 with the largest number of academic libraries would naturally have a higher mean number per title than peer groups 1 and 4 which do not have as many libraries in the group. The fact that the number of libraries in each peer group is very different affects the data to a much greater extent than in the analysis by unique titles, in which the number of titles is the ruling element.

Table III-22 displays the number of libraries, total number of titles and mean number of holding libraries by peer group. The last column shows the mean number of holding libraries as a percentage of all libraries within the peer group.

Table III-22

Mean Number of Holding Libraries as a Percentage of Total Libraries by Peer Group

Peer Group	No. of libraries	No. of titles 1987-1995	Mean No. of Holding Libr.	Percent of Peer Group
PG 1 (ARL)	95	1,669,186	11.99	12.6
PG 4 (Large)	123	839,372	11.74	9.5
PG 7 (Medium)	227	712,849	14.13	6.2
PG 14 (database)	2,646	2,050,478	40.12	1.5

The total number of titles in the nine-year dataset is 2,050,478. The average number of

libraries owning a title for this total is 40.12. That is, on the average each title in the dataset is owned by 40.12 libraries. The dataset is made up of the holdings of 2,646 libraries. The mean number of 40.12 as a proportion of the total number of libraries is 1.5% of all libraries in the database. Thus, on the average a title is owned by only 1.5% of the libraries in the database.

For PG1, there are 95 libraries, 1,669,186 titles with a mean number of 11.99 holding libraries. PG1 has the largest proportion of libraries on the average owning each title, 12.6 percent. PG4 with 123 libraries has an overall mean number of holding libraries of 11.74 on 839,372 titles. The proportion here is lower with 9.5% or almost 10% of the total number of libraries in the peer group on the average owning each title. In PG7 the proportion is 6.2% of the libraries in the peer group owning each title. Viewed this way, the mean number of holding libraries per title could be considered very low in comparison to the total number of libraries in each peer group. From these data it appears that the smaller the number of libraries in the group, the higher the proportion of holding libraries per title as a percentage of the total number of libraries in the peer group.

These data are in agreement with the data for percentage of unique titles analyzed in the previous section. In PG7 it was found that there was a higher level of unique titles than in the other two academic library peer groups which are comprised of research libraries. The mean number data for PG7 show that it has the lowest proportion of libraries per title of the three academic library peer groups. This is in agreement with the findings of Hardesty and Mak[vii] in that the data indicate that the smaller academic libraries in collection size do not appear to have an agreed upon core of materials. There is a high level of unique titles and a low mean number of holding libraries per title in PG7.

Table III-23

Mean Number of Holding Libraries by Peer Group by Year

	Peer Group 01	Peer Group 04	Peer Group 07	Peer Group 14
1987	12.36	12.96	15.81	41.28
1988	12.42	12.93	15.60	41.68
1989	12.43	12.74	14.80	41.32
1990	11.96	12.25	14.30	39.74
1991	11.58	11.84	13.51	39.02
1992	11.43	11.57	13.19	38.29
1993	11.62	11.88	13.35	38.76
1994	11.92	12.10	13.48	40.16
1995	12.33	12.30	13.33	41.41

Table III-24

Percent Change in Mean Number of Holding Libraries by Year

	Peer Group 01	Peer Group 04	Peer Group 07	Peer Group 14
1988	0.49%	-0.23%	-1.33%	0.97%
1989	0.08%	-1.47%	-5.13%	-0.86%
1990	-3.78%	-3.85%	-3.38%	-3.82%
1991	-3.18%	-3.35%	-5.52%	-1.81%
1992	-1.30%	-2.28%	-2.37%	-1.87%
1993	1.66%	2.68%	1.21%	1.23%
1994	2.58%	1.85%	0.97%	3.61%
1995	3.44%	1.65%	-1.11%	3.11%

The mean number of holding libraries for each peer group over the nine years in the study are shown in Table III-23. The percent change by year is shown in the next Table III-24. The pattern of change in the mean number of holding libraries is similar in all four peer groups. PG1 and PG 4 have almost identical mean numbers for the time span despite the difference in the

number of libraries in each peer group. This indicates a much greater degree of diversity of resources among the large academic libraries in PG4 than the research libraries in PG1. The three largest peer groups, 1, 4, and 14 all have a decline in mean numbers in the early 1990s with an increase beginning in 1993. There is a steady decline in the mean numbers for PG7 from 1987 to 1995. The mean number of holding libraries in PG7 decreases by two libraries per title or 1.6% from 1987 to 1995. The other three peer groups have the same mean number of holding libraries in 1995 as in 1987, the fluctuations occurring in the years in between.

While the mean number of holding libraries does not differ substantially by year, there are differences by broad knowledge area. A fuller understanding of the collecting patterns can be gained by looking at the average number of libraries per title by broad knowledge groupings.

Table III-25

Mean Number of Holding Libraries by Broad Subject Grouping

Mean Number of Holding Libraries by Broad Subject Grouping

There are differences in the mean number of holding libraries in the profiles of the three academic library peer groups among the broad subject groupings. Table III-25 summarizes the mean number of holding library data for each peer group by the three major knowledge divisions: humanities, social sciences, and sciences.

In PG1, the mean number of holding libraries is almost identical for the humanities and the social sciences. The sciences have higher mean numbers of holding libraries than both the humanities and the social sciences across the nine year time span. The mean number of holding libraries decreases in the humanities, but increases in the social sciences. In 1987 they both have slightly less than 12 holding libraries; in 1995 the humanities are still at slightly less than 12, but the social sciences have slightly over 12 holding libraries per title. The mean number for the humanities and arts is the same as the overall means for the peer group. Changes in the absolute number of titles throughout the time span seem to have very little effect on the mean number of holding libraries in PG1. The preponderance of titles in the humanities and social sciences combined are determining the overall mean number of holding libraries in PG1. The collecting patterns in the aggregated collection of the ARL libraries remain consistent across the nine years by the variable of mean number of holding libraries.

In PG 4, the large academic libraries, the social sciences maintain the highest mean number of holding libraries. The sciences are next with the humanities having the lowest mean number of holding libraries per title. The differential between the three knowledge divisions is approximately one library less in the sciences than the social sciences and two libraries less in the humanities than the social sciences. In 1995, the difference has widened between the social sciences and the sciences with the sciences having two holding libraries less than the social sciences. The humanities have three libraries less than the social sciences in 1995. The mean

numbers decline in all divisions in 1989 and do not begin to increase until 1993. In PG4, both the humanities and social sciences have almost identical mean numbers in 1995 as in 1987. But the sciences decline by two holding libraries from 13.11 in 1987 to 10.98 in 1995. Although PG1 and PG 4 have almost identical means by year, the means in PG4 for the humanities and social sciences are not as close as those in PG1.

For PG7, the mean numbers decline moving forward in time in all three knowledge groupings. The difference in the arts and humanities is nearly three fewer libraries per title in 1993-1995 from 1987. A decline in the mean number of holding libraries can occur either because the number of titles increases or the number of holding libraries decreases. In PG7, the decline occurs because there is a decreasing number of holding libraries each year rather than an increase in the number of titles. In PG7, the social sciences have the highest mean number of holding libraries and maintain the strongest position throughout the time span. The humanities have the next highest mean numbers with the sciences and technology considerably lower. In 1987, there are almost three libraries more for each social science title than for each humanities title. The sciences have almost three fewer holding libraries per title than the social sciences and two libraries fewer than the humanities. By 1995 the differentials between the three knowledge divisions have widened. The sciences have over six titles fewer than the social sciences and the humanities have nearly four fewer titles. The social sciences have clearly been sustained to a greater extent than either the humanities or the sciences in PG7.

Although the number of libraries in the two peer groups 4 and 7 are different, with PG7 having 104 more libraries than PG4, the absolute numbers of holding libraries in each peer group are remarkably similar for the three knowledge groupings. There is more stability in the mean number of holding libraries in the humanities and social sciences in PG4 than in the sciences. The mean number of holding libraries decreases in PG7 whereas it holds steady in PG4 except in

the sciences. In both peer groups the number of titles increase in the middle years 1990-1993. The mean numbers for the sciences are nearly the same in both peer groups; indeed the number of titles in the sciences and the absolute number of holding libraries are very close in spite of the difference in the number of libraries in the peer groups.

In PG14, the sciences maintain the highest mean number of holding libraries. These data reflect the inclusion in the database of separate health science libraries which are not included in the three academic library peer groups. While the sciences have the highest mean number of holding libraries there is a decrease in the mean number of slightly less than three libraries from 1987 to 1995 in PG14. This is the same pattern as found in the three academic library peer groups. But unlike the three academic library peer groups in which the social sciences had higher mean numbers than the humanities, in PG14 the humanities maintain a lead over the social sciences. The lead does diminish very slightly from three libraries more in 1987 to less than three in 1995. Both the humanities and the social sciences decline slightly in the mean number of holding libraries until 1993. By 1995, they both gain slightly over one library per title compared to 1987.

The collections of the smaller liberal arts colleges and public libraries included in the CACD database may be influencing the higher mean number of holding libraries in the humanities in PG14. Those buying both literary classics and popular fiction could raise the mean number of holding libraries in the humanities, although they do not seem to contribute to the number of unique titles. While there are still similarities in collecting patterns between the ARL group and PG14 in the mean number of holding libraries, there is not as close a pattern as in the other measures of percentage share by subject and unique titles.

The pattern in all four peer groups is that of a decrease in the mean number of holding libraries in the years in which the number of titles increases. These data complement the unique

title data and show that the amount of funding does directly affect the spread of unique resources within the aggregated collections. Reduced funding definitely reduces diversity of resources. No library wants to forego acquiring current mainstream titles. Therefore, acquisitions concentrate on current mainstream or core materials, and the mean number of holding libraries rises when the total number of titles decreases. Direct curriculum support does not suffer to the extent that the acquisition of research materials suffers.

One additional analysis is a variation of the measures of unique titles and mean number of holding libraries. The number of titles with 1-5 libraries can be another indication of the intensity of collecting.

Number of Titles with 1-5 Holding Libraries

The percentage of titles by subject field with 1-5 holding libraries is also an interesting measure and another way of looking at concentrations of collecting by subject. The measure of 1-5 libraries can be used as a reverse measurement of the percentage of a subject area which is heavily collected. That is, using the percentage of a subject area in which titles are owned by 5 or fewer libraries, the remaining percentage of that subject area is the proportion for which the titles are owned by more than 5 libraries. It is a different indication of the proportion of less heavily collected titles than unique titles which measure diversity. Thus the proportion of titles with more than five libraries can be used as an indication of a proportion of more commonly collected materials, but the proportion which is below the mean number of holding libraries for all three academic peer groups. Complete data for this analysis are contained in the tables for unique titles, Tables III, 9-12.

Table III-26

Mean Ranges in Percentage of Titles Owned by 1-5 Libraries

	Avg. for Peer Group	Lowest	Highest
Peer Group 14	51%	28.51% (Engl. Lit.)	66.67% (Genl. Soc. Sci.)
Peer Group 1	58%	37.61% (Engl. Lit.)	72.77% (Law)
Peer Group 4	61%	39% (Mathematics)	70% (History, not America)
Peer Group 7	60%	43% (Mathematics)	77% (Agriculture)

It can easily be seen in Table III-25 that the percentage of titles owned by 1-5 libraries is the majority of titles in all four peer groups. The average of titles with 1-5 library holding symbols for all three academic library peer groups are almost identical. The average is that 58-60% of titles are owned by 5 or fewer libraries. This means that overall, only 40% of titles have more than 5 holding libraries. The percentage of total titles left after the 1-5 titles have been subtracted ranges from a low of 39% in PG 4 and PG7 to a high of 49% in PG14.

The greatest concentration in the three academic library peer groups is in the number and percent of titles held by from 1-5 libraries. While the percentage of unique titles is highest in the two non-ARL peer groups, the percentage of titles having five or fewer holding libraries is also highest in those peer groups. This is understandable in that the 1-5 holding libraries includes one holding library, in other words, unique titles. This can be explained by there being a larger number of libraries in the two non-ARL peer groups then the ARL. Thus, there are more libraries to raise the number of titles with over five holding libraries. That the percentage of titles with 1-5 holding libraries in the ARL is only two percentage points lower than the two non-ARL groups with a larger number of libraries shows a greater concentration of collecting in the ARL than in the other two peer groups. Or phrased in the opposite, the collecting is more scattered or dispersed in the two non-ARL peer groups.

The database, PG14, has the lowest percentage of the four peer groups in titles with only 1-5 owners. This would seem appropriate in that the much larger number of libraries of all types

in PG14 have a larger agreed upon number of titles with more than five holding libraries. But further analysis points out the low collecting levels. In PG14, the number of titles with 1-5 holding libraries is only approximately 10% more than the same measurement in the ARL libraries. While there are 2,646 libraries with holdings in the 1997 CACD, only 50% of the titles are owned by more than five libraries. The ARL has a higher percentage of 1-5 libraries than the database, but there are only 95 libraries in the ARL peer group.

While the percentages of unique titles by subject field in PG14 range from a low of 11.69% in English literature to a high of 38.80% in the general science category, it would seem the percentages for titles owned by 1-5 libraries would be much higher. In PG14, English literature still has the lowest percentage with only 28.51% of titles being owned by 1-5 libraries. This measure indicates a high level of agreement in acquisitions in English literature in that 71.5% of the titles are owned by more than 5 libraries in PG14. It also indicates low diversity of titles. Conversely, the subject areas with the largest percentage of titles owned by 1-5 libraries are the general social sciences at 66.67% and law with 66.43%. This is a lower level of agreement in collecting in that less than 34% of titles in these two subject areas are owned by more than 5 libraries

In PG14 the ratio of titles with 5 or fewer holding libraries to titles with more than 5 holding libraries is near 50/50. For all titles in PG14, 51% are only owned by 1-5 libraries, indicating that almost 50% have more than 5 holding libraries. With 2,646 libraries it would not seem that the number with only 1-5 holding libraries would be such a large proportion.

In PG1, the overall percentage of titles owned by from 1-5 libraries is 58% for the group. This is a low level of agreement in collecting in that only 42% of titles have more than 5 holding libraries. English literature again has the highest percentage of more than 5 library holding symbols, in that it has the lowest percentage of 1-5 owners, 37.61 percent. This means a high

level of agreement in collecting in English literature in that over 60% of titles are owned by more than 5 libraries.

As with unique titles in PG1, law has the highest percentage of 1-5 holders; 72.77% of all titles in law have from 1-5 holding libraries, or less than 30% of titles are owned by more than five libraries. This is not a very high level of agreement in collecting in the aggregated collections of the ARL libraries. Regional interests may be an influence in that collecting in law is regionally or state oriented. As with the health sciences, the ARL research institutions have separate law libraries and what is reflected in the CACD database is general library collections which would closely correspond with collections of smaller institutions.

In PG4, the math has the lowest percentage of titles owned by 1-5 libraries at 39%. This again, shows the high level of agreement of collecting in the sciences. History, not America is the subject with the highest percentage in 1-5 holding libraries at 70 percent. These would be areas in which there are high numbers of unique titles. Agriculture is not emphasized in universities which are not land grant institutions so there would be fewer libraries collecting those materials. Foreign language materials also have lower levels of collecting intensity. The range in the percentages for PG1 and PG4 are almost identical, from 42/43% to 72 percent.

In PG4, the percentage of 1-5 holding libraries remains in the 60-62% range until it decreases to 58% in 1995. In PG7, the percentage of 1-5 holding libraries increases until 1991 and then decreases back to the 1987 level in 1995 in an almost perfect bell curve. The decreases at the end of the time period could be a function of cataloging lag with locations being added slowly. In PG7 the lowest percentage of 1-5 holding libraries by subject area is 43% in mathematics and the highest is 77% in agriculture. Since the group does not contain many land grant universites, very few are collecting in agriculture. The libraries in PG7 have the lowest percentage of titles with more than 5 holding libraries of the four peer groups. That is, 41% of

titles have more than 5 while 59% have 5 or fewer holding libraries. The 227 libraries in PG7 have the highest percentages in unique titles and the lowest percentages in titles with more than 5 owners. The number of libraries could affect the proportion of titles with 1-5 holding libraries. By these measures, a larger number of libraries appears to lead to more diversity and less concentration on the same titles.

The medium-sized libraries in PG7 are the smallest libraries in the study and have the highest percentages of titles with 1-5 holding libraries, even though this peer group has the largest number of libraries. The percentage of titles with 1-5 libraries is much higher in PG4 and PG7 than in the larger peer groups, leaving lower percentages of titles with more than 5 holding libraries.

Viewed from another perspective, in the majority of the subject fields, titles owned by 1-5 libraries make up the largest percentage of titles within the subject area. The humanities and social sciences have smaller percentages of unique titles and titles with 1-5 holding libraries in PG1 and PG14. The sciences have more titles with over five holding libraries, again showing greater concentration in the sciences.

Chapter Summary

The analyses by subject fields and imprint years contained in this chapter reveal a number of interesting findings about the aggregated collections of the three peer groups of academic libraries and the collection of 2,646 libraries contained in PG14, the 1997 CACD database.

- the ARL libraries set the profile of the 2,646 library database by virtue of their overwhelming size
- the acquisitions patterns of the non-ARL academic libraries do not exhibit as much

fluctuation as the aggregated resources of the ARL libraries

- it would appear that increased funding leads to increased variety of resources; the higher the volume of acquisitions the higher the number of unique titles
- conversely, decreased funding compresses acquisitions to a core of mainstream titles
- By percentage share of total the percentage shifts are slight.
- The most pronounced decrease in percentage share of total is in the general and reference category which declines in all four peer groupings moving forward.
- The social sciences have the highest percentage share of total in all four peer groups.
- The sciences have the lowest percentage share in all four peer groups.
- The highest percentage share of total for the arts and humanities are in the ARL libraries.
- For unique titles, the ARL libraries hold the preponderance of unique titles in the arts and humanities
- the medium-sized academic libraries have more unique titles in the social sciences than in the humanities
- For all peer groups, the number of unique titles in the sciences declines moving toward the present.
- The medium-sized academic libraries in PG7 have the highest percentages of titles with 1-5 holding libraries, meaning the lowest number of titles owned by more than 5 libraries of all the peer groups
- The pattern in all four groups is that of a decrease in the mean number of holding libraries in the years in which the total number of titles increases.

In summary, the findings are that the as the total number of titles increases, the number of unique titles increase, but the mean number of holding libraries declines. The two measures of percentage of unique titles and the mean number of holding libraries have been found to operate

conversely. When funding is adequate, more unique titles are purchased decreasing overlap. When funding decreases, the number of unique titles decrease and the mean number of holding libraries per title increases, resulting in a greater concentration on the same titles.

The total number of titles per year by four peer groups were analyzed in this chapter. These findings are for English language imprints and non-English language imprints combined. In Chapter IV, foreign language groupings are analyzed by the same variables of percentage share of total titles, unique titles, and mean number of holding libraries.

Notes for Chapter III

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i. James H. Sweetland and Peter G. Christensen, "Developing Language and Literature Collections in Academic Libraries: A Survey," *Journal of Academic Librarianship* 23, no.2 (March 1997): 122-123.

2. Anna H. Perrault, "The Shrinking National Collection: a Study of the Effects of the Diversion of Funds from Monographs to Serials on the Monograph Collections of Academic Libraries," *Library Acquisitions Practice & Theory* 18 no.1 (1994): 3-22.

iii. OCLC/AMIGOS Collection Analysis CD User Guide, rev. ed. (Dublin, Ohio: OCLC Online Computer Library Center, Inc., 1989), 1:3.

iv. OCLC gives incentives for contributing libraries to assist with database "clean-up." Eliminating duplicative bibliographic records is also accomplished through periodic database scans.

v. Perrault.

4 Larry Hardesty and Collette Mak. "Searching for the Holy Grail: A Core Collection for Undergraduate Libraries." *Journal of Academic Librarianship* 19, no. 6 (1993):366.

vii. Ibid.