Chapter III
The Impact of the ISI Convention of Relying on only the Name of the First Author on ACA Results:
An Empirical Investigation

ABSTRACT

Virtually all ACA studies using Thomson's ISI citation indexes used only the first author to retrieve the cocitation counts. Therefore, this has been a methodological issue in ACA study. First, this chapter introduces two classifications of author cocitations (Rousseau & Zuccala, 2004; Zhao, 2006). Second, literature survey of three studies is conducted to review what has been done to deal with this issue. Third, we discuss the data and cocitation matrix generation system used in our study. Fourth, using our data produced by the cocitation matrix generation system, principal component analysis and non-metric multi-dimensional scaling (MDS) are applied to compare the differences in the process and outcomes of using different cocitation matrices. Finally, we discussed the results of comparative analyses of our study and three other studies in this area. In doing so, the treatment of the diagonal values in a cocitation matrix, the number of authors in all author ACA

and first author ACA are critical determinants of ACA outcomes such as number of factors, total percent of variance explained, goodness of fit, and so forth. In future research, it is imperative to use the same assumption in regard to the treatment of the diagonal values, the selection of authors using the same criterion, and so forth. If these are not uniformly standardized, the results are always incomparable and have less meaning. Three conclusions can be reached based on our study. First, all author-based ACA is better to capture all influential researchers in a field than first author-based ACA. It identifies more subspecialties. Finally, all author-based ACA and first author based ACA produce little differences in stress values.

INTRODUCTION

The majority of author cocitation analysis (ACA) have relied on the Institute for Scientific Information (ISI) citation databases. ISI convention allows only the retrieval of papers citing works of which the author is the first or sole author. As McCain states (1990, p. 435), "Authors who consistently publish as coauthors, in second or later position, will not be visible in the retrivals based on these contributions."

The purpose of this chapter is to empirically examine the impact of the ISI convention of relying on only the name of the first author in assembling the cocitation matrix on the investigation of the intellectual structure of academic disciplines. Virtually all ACA studies using Thomson's ISI citation indexes only used the first author to retrieve the cocitation frequency matrix. Therefore, this has been a methodological issue in ACA study. There are many full-text research articles and citation indexes that index all authors of cited works on the web (Zhao, 2006). Further, it is possible to use popular software such as Microsoft Excel to develop co-citation generation system (McIntire, 2007).

First, we introduce two classifications of author cocitations (Rousseau & Zuccala, 2004; Zhao, 2006). Second, literature survey of three studies is conducted to review what has been done to deal with this issue. Third, we discuss the data and cocitation matrix generation system used in our study. Our system is based on Foxbase database management systems and computes author co-citation frequencies between any pair of all (primary and non-primary) authors under study(Sean B. Eom, 2003; Sean B. Eom, 2006). Fourth, using our data produced by the cocitation matrix generation system, principal component analysis and non-metric multi-dimensional scaling (MDS) are applied to compare the differences in the process and outcomes of using different cocitation matrices. Finally, we discussed the results of comparative analyses of our study and three other studies in this area. In doing so, we found that the treatment of the diagonal values in a cocitation matrix, and the number of authors in all author ACA and first author ACA are critical determinants

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