THE CLOTHING AND TEXTILE RESEARCH BASE: AN AUTHOR COCITATION STUDY

A thesis presented to the Faculty of the Graduate School at the University of Missouri, Columbia

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In partial fulfillment for the degree of Master's of Science

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DECEMBER , 2006

ACKNOWLEDGEMENT

I would like to thank my thesis committee for their time and effort in this project. I suspect that committee membership is often a thankless endeavor for professors. Being on this committee has probably taken up more time than they foresaw, and I want to convey my true appreciation for their individual contributions. Hopefully, my committee members will be satisfied at a later time to have helped such a promising and humble student.

I would also like to thank a few other instructors who have provided that rare, sustaining vision of a life dedicated to learning and to knowledge creation. Dr Ibitola Pearce, through a vigilant review of social meaning, helped me see the world anew. The experience was like putting on colored glasses for the first time, and it alone justified getting a bachelor's degree. Dr Hyunjoo Oh provided the kind of mentoring in research that I hear professor's reminisce of. That is to say, I owe to her my introduction to academic life in terms of knowledge creation. I'd also like acknowledge my instructor Dr Bryan Narendorf. Disparate though our professional paths may be, Dr Narendorf reminded me that a reading life offers its richness without consideration for our desire to make cash profit on it.

Not to forget where I came from, let me thank my brother Seth McIntire, my sister Hannah McIntire, and my first and most important instructor: Marsha McIntire. There are many places this path could have gone, but very few without them.

Cette recherche et mon seul coeur: ceux-ci sont dédié à Geraldine MEIER

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The Clothing and Textile Research Base: an Author Cocitation Study

1.0 Introduction

This proposal outlines a study of the clothing and textile field's research base. There are several products of the proposed study: summary statistics about the research base, statistical analyses results, data for use in bibliometric theory building, and a visual representation of the research base using bibliometric techniques. By analyzing the cocitation frequencies of top cited authors in clothing and textile research, an intellectual structure emerges. That structure is the research base: knowledge that is considered necessary for current advancements to be produced. Representations of this research base are important for several research agendas and for research managers. In order for the research base representation to be widely applicable, an interface is proposed. Through the interface end users can sort, extract, and summarize information into relevant dimensions and aggregates.

1.1 Statement of Problems:

1.1.1 Need to manage research

Expansion of a knowledge base requires resources: human efforts, properly equipped labs, access to computing, office support staff, examination of primary documents in remote locations, socialization and communication with peer researchers, and access to the field's knowledge base. Even in relatively well funded areas such as weapons development, corporate law, and intellectual property studies; there remains the basic need to manage resources in the face of almost limitless directions of study. For the

clothing and textile research field, a growing importance has been placed on academicians to produce publications and other knowledge in order to gain full professor rank and tenure. This pressure to produce coincides with a pressure on all academic units to reduce resource usage in terms of space, staff, and costs. These problems have been documented for the clothing and textile field by Laughlin & Kean (1996), Feather (1996), and Lennon & Burns (2000).

In addition to pressures on lead researchers, department chairs, and dean's of schools there is also a significant need for research metrics for academic administrators, policy makers, and grant review committees who may not know the roots, agenda, or missions of the clothing and textile research field. Again, International Textile and Apparel Association (ITAA) committees have reported that clothing and textile department chairs are increasingly asked to submit data speaking to the productivity and competitive position of their faculty (Laughlin & Kean, 1996). Even when such data are available, it is unlikely that it would be informative to all parties involved without user-specific transformations. Faculty, research managers, administrators, and policy makers may all want to know "what is happening" but will probably expect the answer in diverging ways. Creating scalable metrics that contain the same information but meet the format needs of different end users is an ongoing problem that this paper proposes to address.

1.1.2 Need to document research practices

Knowledge creation is a fundamental activity of academicians. Research, publication, and peer critique are accepted as the method by which new knowledge is created. In the last century a growing interest to academicians across disciplines has been the process of knowledge creation. Although this research area is vast, part of the agenda is to document knowledge creation practices, their dynamics, and how these contrast with each other. Previous work by Shim, O'Neal, & Rabolt (1998) has identified some aspects of the clothing and textile research domain as unique or divergent from other academic areas. Aside from issues of research management, the practice of knowledge creation in the clothing and textile field should be studied and documented for the sake of internal awareness and external comparisons.

There are many aspects of research activity that merit examination. One such area is the use of research bases. As the front of a research field changes or matures, how do its researchers define the base knowledge necessary to understand current work, or even to advance the front? This is a research base; a collection of knowledge that is held together only for as long as the current research front believes it is foundational. Charting current thought about past research is an important undertaking in that it helps us to understand the intellectual structure of the field at a given time. This study seeks to represent the intellectual structure in the clothing and textile research domain as it has been and as it has changed with time.

1.2 Research Objectives

This study creates an interactive website that outlines the clothing and textile research base from 1990-2006, and treats the intellectual exchange of the research domain as its primary structure to be revealed. Specifically the paper culminates in these products:

1.2.1 A custom database

Author citation and cocitation data from the Clothing and Textile Research Journal, years 1990-2006, will be collected in a custom database. Specifically, the database will include all the author citations, the citations sorted by article, and the top cited author's cocitation frequencies. The database will be made available through a public webpage.

1.2.2 Bibliometric Analysis

A bibliometric analysis of the author cocitation data will be created using principle component analysis. The results will represent the research base of the clothing and textile domain or its subfields at one of various time period: 1990-1995, 1996-2000, 2001-2006, 1990-2006.

1.2.3 Website

The proposal, methodology, and results of this study will be made public through a website. The final bibliometric results will be made available and rendered interactive using web development technology. Following from the suggestions of Noyons (1999), the interactive website should produce higher usage rates and be of greater utility to end users such as clothing and textile researchers, department administrators, and researchers studying knowledge creation.

1.3 Contributions

The study described here will provide contributions to a number of research agendas within and outside the clothing and textile field. These contributions are outlined below accordingly.

1.3.1 Studies of Textile and Apparel Faculty

This study extends work performed by Laughlin & Kean (1996) to assess clothing and textile faculty by tracking the contributors to this field's research. For example, it allows end users to assess the clothing and textile research base by its authors. Implicitly, this opens the possibility of tracking faculties, departments, and other locations or aggregates of the authors.

1.3.2 Studies of the Textile and Apparel Research Behavior

Previous work has shown that researcher behavior in the clothing and textile field is affected by their educational background (Shim, O'Neal, & Rabolt, 1998). Productivity, publication strategy, and attitude toward research have all been addressed for clothing and textile researchers. This study expands the assessment of researcher behavior to include how clothing and textile researchers draw upon previous knowledge. If, for example, a significant number of sources are from outside clothing and textile academic faculty, are researchers systematically drawing on other disciplines and in what ways? Alternatively, have researchers' demographic homogeneity influenced agendas, as suggested by Lennon & Burns (2000), and does it also effect what research base they employ? Linkages between the adoption of a research base and researcher behavior in other areas is a rich source of understanding for how clothing and textile knowledge is created and used.

1.3.3 Managing Textile and Apparel Research

Research within the clothing and textile field is diverse in subject and location of authorship. As noted in the literature review clothing and textile is an interdisciplinary field of study. It involves industrial design, sociology, psychology, business management, marketing, economics, political science, history, agricultural economics, and chemistry (among others). Researchers in clothing and textile may be located in their own departments, in disciplinary departments, among specialized faculty, or sharing broad teaching loads with only one or two other professors.

For individual researchers, lead researchers, or collaborative teams who want to manage research resources; there is a need to know and reference what has occurred and is occurring in the clothing and textile field. Part of that understanding comes from knowing how the base of current research has changed over time for the subfield or specialty of a given project. For example, researchers in textile recycling can use the interactive website produced in this study to understand where their contributions have been used among clothing and textile research conducted up till now.

For departmental chairs, deans of schools, and administrators of grants or academic institutions; the interactive website produced by this study will help them understand the possible impact and importance of current research and researchers. It aids, in short, their ability to make decisions by enabling them to

retrieve relevant information about the field, a time period, or specialties within clothing and textile research. For participants in this field interested in faculty location, this study helps set the groundwork for asking about knowledge sharing between divergent faculty positions. For example, are faculty of clothing and textile programs more used likely to be included in the research base than those whose position is in a disciplinary department such as marketing. Are there authors in the research base who have no direct involvement with clothing and textile departments? These questions are of importance to administrators of clothing and textile programs as they assess the effects of formal connections between these departments and others. For upper administrators, contributions of this work center on the ability to quantify, and track, interdisciplinary partnerships in knowledge generation and application.

1.3.4 For Bibliometricians

The creation of this database, the interactive website, and the interpretation of it provide bibliometricians with new and important material to continue developing both empirical knowledge and theoretical models of publishing behavior. For example, the database provides cost-free data to researchers interested in assessing size, date, and subject effects on empirically derived laws of bibliometrics such as Lotka's law, Bradford's law, or Zipf's law. The interactive website provides for testing and refining of Noyons (1999)

suggestion that interaction increases usage and utility. Finally, the format of the website and its ongoing validation demonstrate one of almost countless methods to validate bibliometric results.

1.3.5 Journal Indexing and Knowledge Access

An interesting facet of the clothing and textile research field is that its leading journal, *Clothing and Textiles Research Journal*, has not pursued contracts with the largest indexing services. Their best indexing was probably through AGRICOLA. Unfortunately, AGRICOLA does not record citations and is not connected to larger information tools such as popular web browsers or Thomson Scientific (ISI). Starting in mid-2006, the journal has begun to progressively turn over publication and management to a third party. Part of the new journal strategy is to aggressively move toward an ISI listing. As of this writing, CTRJ articles had already started to appear in web browser searches with full citation records, but are not listed in ISI.

This journal management strategy has had tremendous impacts on clothing and textile faculty who have been, or are publishing in the premier journal but whose work is relatively undetected by other fields. It is expected that full indexing will increase the citation and usage of clothing and textile research, increase the chances for external partnerships, and facilitate evaluation of faculty impact. This study will also reveal changes in clothing and textile knowledge

usage and production. By establishing the research behavior in the journal from 1990-2006, interested persons can measure future changes that take place after indexing. This may be, among other things, an importance reference for other professional societies whose in-house journals are considered for external indexing. With time, a better understanding of indexing's effect on knowledge transfer could emerge.

The Clothing and Textile Research Base: an Author Cocitation Study

2.0 Relevant Literature, Theory, and Methods

2.1 Research Domain Development

When apples are ripe, they fall readily (Sir Francis Galton).

This paper concerns the development of scientific knowledge within research domains. Specifically, it attempts to track development of knowledge through the written record of its development. Publication, for reasons later discussed, is taken at the moment at which knowledge is integrated into a field or discipline. In the accepted style of academic publications, knowledge is transferred using certain protocols. For example, juried academic journals expect the names of sources, dates of their publication, and keywords related to the articles content. So, a published work is not simply knowledge but also a record of current thought on that knowledge.

Research domains are dynamic entities. Their contributions swell, wane, diverge on topics, develop subfields and specialties, draw from traditional and novel sources, merge with other fields, and become obsolete. To the extent that the published record contains signs of these events, they can be quantitatively discovered. For the purpose of this paper, two important concepts about the development of a research domain will be needed: the research front and the research base.

2.1.1 Research Front

A research front represents the agenda of one or more active researchers in a given domain. For example, textile recycling is a research front because a number of researchers are currently publishing (creating knowledge) in this area. One attribute of a research domain at time period T is the number and description of its research fronts. Some research fronts are long enduring problems to the field. For example, in physics there are long standing questions about universal expansion. Other research fronts may be closer to subfields or specialized applications research. Water-resistant treatments for textiles may be a sub-field of textile treatments generally, and nano-carbon treatment a specialization.

Research fronts are composed of questions or problems receiving current attention (Noyons, 1999). Because of unique aspects of the U.S. academic system, researchers tend to be associated with only a few research fronts across their career. Specifically, grants and projects tend to follow the researcher rather than the institution. A change in university will not radically alter the research agenda of a given professor. On the contrary, the research specialization of a professor is encouraged and universities tend to reward specialized research such that there is an incentive to reduce the scope of research fronts being pursued. Finally, many of the problems now being considered require considerable interdisciplinary expertise. In research groups there is greater need for depth of specialization than for broad interests. Both the structure of university departments (supply side) and the managers of research teams (demand side) tend to expect tightly

focused research agendas. For these reasons, researchers can often be closely identified with their research front, and vise versa.

2.1.2 Research Base

All research fronts have a research base, and a research domain has a large research base composed from all its research fronts. Research bases are the knowledge that is needed to understand and further a research front (Noyons, 1999). For example, in order for colorfastness in non-woven textiles to be researched further, a base knowledge of agreed upon testing protocols must be developed. Research bases can be thought of as all of the knowledge that would be necessary to understand an incremental step forward in a research front. Continuing with the above example, the research base might not really include all information about colorfastness but only that which is directly relevant to ongoing research. Research bases are not cumulative, but only deal with what is necessary to create new knowledge. This definition makes the research base dynamic. Over time, the base of ongoing research will shift, broaden, or remove works no longer deemed relevant. Research bases do not define what the research front is, but rather what researchers in the front draw from to answer current questions. This is a form of communication between researchers. Of course, it is not synonymous with phone calls between researchers. Examinations of a research base bring forward routes of communication, an alternative social structure relating only to who is drawing from whom and in what way. This has been called a social or intellectual structure of the

research front and when examined at a larger scope, the intellectual structure of the research domain. At the level of an entire research domain the research base represents all knowledge that is part of ongoing work. Rather than being a vision of the past, the research base is a vision of how the field conceives of itself at present.

2.2 Bibliometrics Measures

For the researcher interested in tracking the development of a research domain through its published works there is a relatively well established body of data that does not require tainting of the sample through interviews or questionnaires. Bibliometrics is the application of mathematics and statistics to written communications (O'Connor & Voos, 1981). Bibliometrics are accepted measures derived from bibliographic records. Bibliographic records are compilations of data about published literature. There exist a plethora of bibliographic elements that are usable for bibliometrics, these include: author, title, source, date, address of author, abstract, citations, publisher information, keywords, index terms (Noyons, 1999). In a given document, these bibliographic elements can be analyzed using accepted statistical methods to derive frequencies, rates, distributions, and probabilities. Given a span of documents across time, bibliometrics can be analyzed for changes that would be both expected and unexpected. There are many reasons why bibliometrics might be useful. One area interested in bibliometrics is the "science of science": those looking to form a theoretical base about how new knowledge is created, published, and used. Other uses of bibliometrics are more practical, such as the

benchmarking of researcher performance for awarding grants. Noyons (1999) considers applied bibliometrics to exist in largely four areas: performance analysis, mapping science, information retrieval, and library management. These will be discussed after a brief review of bibliometric history.

2.2.1 The History of Bibliometrics

The use of bibliographic information has been a basic tool for libraries to hold, identify, store, search, and retrieve within their collection. Bibliometrics, on the other hand, can be traced to 1917 when Cole and Eales published an analysis of the history of comparative anatomy. It was the first to use quantitative analysis to picture a research field (Okubo, 1997). E. Wyndham Hulme first coined the term *statistical bibliography* in 1922 (Raisig, 1962). The name was later changed to bibliometrics to avoid confusing it with bibliographies of statistics (Eom, 2003; Devarajan, 1997). Suggested terms for this practice have included "statistical bibliography", "Librametrics", "Scientometrics", "informetrics", and "bibliometrics" (Devarajan, 1997). Pritchard's term "bibliometrics" won out, and has achieved good adoption in the U.S. (Devarajan, 1997).

Lotka (1926) linked counting to performance; he also discovered consistent distributions in publishing frequency. Specifically he noted that a small number of researchers formed the bulk of publications (Okubo, 1997). In 1932 George K. Zipf found that a good approximation of frequency of a word in a document was inversely proportional to its rank in frequency. Zipf's distribution has been found to hold for many

corpus of words including internet keyword searches, names in the population, and great literary works such as Hamlet. Finally, in 1934 Samuel C. Bradford described a naturally occurring distribution of publications across authorship, journals, and library holdings. Together these three natural laws have become bedrocks for later theoretical bibliometrics. Despite the importance of these three findings, between 1923 and 1962 only five references in English were made to bibliometrics (Okubo, 1997). However, Russian researchers in the 1930s had developed methodologies for measuring science and research. These later became the basis of applied bibliometrics (Okubo, 1997).

In 1963 Garfield founded the Science Citation Index, discovering unique distributions of journal usage along the way. The creation of the SCI spurred interest and applicability of bibliometrics (Okubo, 1997). In the 1970s new researchers emerged who were specialized and employed in bibliometrics. This was the birth of a new discipline known at the time as the "science of science" (Price, 1965). Also in the early seventies, Henry Small developed cocitation mapping techniques at the Institute of Scientific Information (Noyons, 1999).

Interest in cocitation of words, documents, institutions, journals, and authors emerged in the 1970s and 1980s. Work performed at the College of Information Studies at Drexel University helped establish a widespread interest in author cocitation analysis particularly (Eom, 2003). In the 1990s strong critiques emerged about the assumptions regarding citation behavior. This criticism dampened the quantity of research, but did not stop researchers from increasing the quality of cocitation analysis. For example,

researchers in France and Holland began earnest efforts to develop science policy tools and metrics based on cocitation. This work developed into usable metrics of performance, dynamics, and cooperation.

Bibliometrics continues to develop through its twin prodigy: theoretical development and empirical measures (O'Connor & Voos, 1981). In empiricism, bibliometrics addresses a wide range of needs that range from library holding management (usage prediction, indexing validity) to research management (researcher productivity assessment, impact assessment for published work). Empirical studies answer questions like "what is the core of a library's holdings" and "to what degree have researchers in physics been impacted by *journal X*".

Theoretical development in bibliometrics has expanded from empirically derived natural laws. The regularity of distributions within published material has allowed researchers to derive natural laws that provide very good predictions. For example, Lotka's law describes a distribution that can accurately estimate the number of authors publishing *n* papers based on the number publishing one paper. Why this occurs- the theoretical question- is yet to be fully articulated. The second mission of bibliometric research is to develop a theoretical base that illuminates the underlying process causing the written record of sciences to be uniformly produced, distributed, and used.

2.2.2 Applied Bibliometrics

Bibliometrics encompasses several areas of distinct methodology, data, or purpose (Noyons, 1999). There are at least four application areas for bibliometrics: performance analysis, mapping science, information retrieval, library management. The author would add research policy management to the previous list, since many of the bibliometric applications in Europe and Japan have focused on managing their nationalized research institutions. The paper will now describe each application (including research policy management) in more detail.

2.2.2.1 Performance Analysis

Performance analysis uses bibliometric techniques to evaluate productive units. Units of analysis can range from individuals (or career segments within the life of an individual), to entire countries. Data for performance analysis comes from publication records in journals, conferences, textbooks, or other locations for the dispersal of research products in a given domain. Performance has three primary components: activity, productivity, and impact (Noyons, 1999). Activity refers to the volume of output (publications, publication pages, etc). Productivity is a ratio value that compares activity to some type of input such as budget, salary, number of scientists, etc. Impact refers to what degree the output has been used by other productive units in the research field. Performance analysis is concerned, in aggregate, with matters of productivity. Although comparisons may be made between units, the units are considered as productive units that

convert inputs into outputs. Both the act of creating knowledge and the relationship between units are invisible to these methods.

2.2.2.2 Science Mapping

Science mapping examines a domain of research through bibliometrics in order to find the domains structure. Mapping generally seeks to uncover: the principle components of a domain; the relative importance of the components; the relatedness of components; and how these three attributes of the domain have changed over time. Mapping can produce varied cartographies depending upon the bibliographic information being analyzed. For example, mapping publication dates produces cartographies of the research domain as it interacts with time. These maps identify formative periods, interruptions or unions of the home discipline, changing views toward expected productivity or when in history it was expected to publish and when it was less so. Alternatively, a map of author cocitations tends to show the social structure of the productive units (authors, presumably) by visualizing the clustering of authors whose work tends to be used together again and again toward a research agenda. Mapping is a visualization of the research domain meant to both summarize and illuminate the work of all productive units as they relate to the collective. Therefore mapping is a study of the whole which uses bibliographic data about its contributors.

2.2.2.3 Information Retrieval

Information retrieval requires bibliographies. But in addition, it is enhanced by bibliometrics. For example, if a researcher searches for “genetics” they may also be interested in “gene therapy” (Noyons, 1999). A qualitative method of designing the relationship between bodies of literature is to solicit and examine expert opinion. The quantitative method is to use bibliometrics. Bibliometrics produces meta-data (information about information) to more precisely speak for the final documents. Using this meta-data, documents can be grouped and linked without requiring qualitative input that may overlook or minimize certain aspects of linkages.

2.2.2.4 Library Management

Library management involves many steps that rely on accurate meta-data. One of those steps is the selection of material to purchase and to curate. Bibliometrics allow a library to assess the impact and placement of a piece of research in order to decide if it matches with the libraries usage patterns and if the work is likely to be used to create new knowledge (or has done so in the past, and so is part of a historic stream).

2.2.2.5 Research Policy Management

Research policy management, like library management, uses bibliometrics to create agendas and manage their resources. Performance analysis, for example, provides benchmarks for productivity management. Academic institutions may use bibliometrics

to decide where start-up funds are placed, or may use a tenure system that is tied to productivity as measured by bibliometrics. In addition to these methods which focus upon the productive units (departments, professors), research management can also use mapping to understand where their staff or specialization is in terms of the total research domain. The mapped location of a sub-discipline or department staff also provides relevant management tools. Alternatively, a university may use science mapping to find linkages or avenues of exchange with other institutions before attempting to strengthen external research collaborations. Unlike performance analysis, mapping tells management where in the social structure their work is embedded (center, periphery), who it is closest to, and how this has changed over time.

2.2.3 Bibliometric Theory Building

As stated before, bibliometrics have both applied and theoretical areas. Although this paper is not concerned with theory building, it here includes a brief overview of the most important theoretical base. The principle agenda in theoretical bibliometrics is to understand what underlying process causes the written record of sciences to be so uniformly produced, distributed, and used. The base of this agenda is three natural laws: Lotka's law, Zipf's Law, and Bradford's distribution.

Lotka's law states that the number of authors publishing *n* papers is about $1/n^2$ of the number publishing one paper. Also, Lotka stated that about sixty percent of authors publish once. These propsitions were not actively discussed before Lotka's death in 1949.

Only later was it picked up as an important natural law of human publications. Many later researchers referenced Lotka's work without testing its application themselves. Potter (1981) concluded that Lotka's law had not been systematically tested in most previous studies. Even so, it appears that with samples larger than ten years and when the author size is quite large (above five thousand), that Lotka's distribution should approximate the empirical data (Potter, 1981). Potter concludes that there is a nearly universal author productivity pattern, and that the closer a sample of authors is to the universal population, the closer its distribution will be to Lotka's law (Potter, 1981). This is partially validated by research into what factors universally affect author productivity. Vlachy identified two variables that alter the distribution of author productivity: (1) the time period under review, and (2) the community of authors involved (Potter, 1981).

Zipf's law is stated as $rf = c$ where r is the rank of the word by its frequency in a document or aggregate of documents, f is the frequency count of the word and c is a constant computed from the number of all words being analyzed. Zipf's law is a better approximation of work rank and frequency in middle tier words than those used most or least. The law has important applications in anthropology, library management, linguistics, and bibliometrics (Potter, 1981). Zipf made broad claims that the law demonstrated an innate drive in humans to reduce their effort while communicating. Unfortunately, he never formed a clear hypothesis or tested this assumption (Potter, 1981). Later work by Mandelbrot showed that the distribution, when accounted for phonetically, does show a uniform effort to reduce vowels. Linguists and anthropologists

have thus seen Zipf's law as a study of human behavior. Bibliometricians see Zipf's law as a study in research behavior. Their attention is devoted to theory construction— why does this occur— and in empirical documenting of the distribution and any variances between distinct document sets. Finally, in terms of statisticians, Zipf's law is important because its distribution is generally applicable to many other classes of ranked objects: cities by population, biological genera by number of species, incomes by size, etc (Wyllys, 1981). The assumption is that there is an underlying probability function which is occurring in various contexts, the results of which follow Zipf's distribution. To this end several theories have been developed.

Bradford's law states that the total articles contributed by *n* journals is given as: $R(n) = k \log(n/s)$ Where: $R(n)$ is the cumulative count of articles contributed by n journals; k is a constant related to the subject, discipline, or field; s is a constant whose effect diminishes as the number of journals included increases. In its present form, Bradford's law does not hold for the most important journals in a given subject, discipline, or field (Potter, 1981). Theorists accept the poor predictions of Bradford's law understanding that its current form is a good approximation and is easily relatable to other distributions such as Poisson, Zipf's law, etc (Potter, 1981).

Lotka, Zipf, and Bradford's laws are all empirically derived natural laws. While important, this is not the same as a theoretical base. "The occurrence of dissimilar events at constant rates may allow for predictions of event frequency, but it does not explain their causes. There is no reason to assume that accurate predictions will lead to accurate

theoretical explanation" (O'Connor & Voos, 1981). Culminations of empirically derived natural laws are of little matter to bibliometricians in search of a theoretical underpinning to the phenomena. In short, a causal model has yet to be agreed upon (O'Connor & Voos, 1981).

2.2.4 Assumptions

Bibliometric analysis uses a range of parameters: scientific articles, authorship, patents, publication dates, citations, keywords. These parameters are indirect measures of the scientific community, its constitution, and output (Okubo, 1997). As regards bibliometric results such as the one being proposed in this paper, Noyons (1999) has outlined principle assumptions:

1. Bibliometric Results should represent scientific output, a proxy of scientific knowledge.
2. Bibliometric results are constructed on the basis of publication data.
3. Provided that the research output of a field is well covered in a bibliometric database, this field can be represented by this database.
4. Co-occurrence of bibliographic data (such as authorship) can reveal the structure of a database.
5. The structure of a database, per co-occurrence of bibliographic data, can represent the structure of the actual field assuming principle 3 holds.

6. The changing structure of a database over time can represent the changing structure of the field, per principle 5.

Indicators need perspective: they rely on comparative approaches. Absolute values in bibliometrics are not indicative per se (Okubo, 1997). The results of a bibliometric analysis require interpretation from bibliometricians, field experts, and end users. Counting citations is not difficult: drawing knowledge from them is more complex. The counts do not speak for themselves; they must be interpreted with an account of the real and artificial bias in the database and analysis methods (Okubo, 1997). For example, motivations to cite span from true scholarly impact to plugging the journal editor's work (Smith, 1981). Self citation and circular citations within research groups may bias samples. Examinations of self citation behavior found that they are usually much more recent than other citations (Smith, 1981). This will effect time studies (such as half life's of citations) if self citation is included in the dataset. There may also be great discrepancies between industrial and academic formal communication. In industrial labs and research there is a tendency to abridge the formal publication of the research to conceal purposes and methods that are not protected as intellectual property (Okubo, 1997). Military industries are even more reserved in their publications. In the same vein, the publication strategy of researchers should not be overlooked in assessing the structure of a field. Particularly, the different emphasis placed on subfields within the field (Noyons, 1999). Researchers may intend to present more conference papers rather than

academic journal publications, if their work is sponsored by professional societies or private groups, for example (Noyons, 1999). The suggestion is that some fields may have different "worlds" of work in which pure science is published in one way and application oriented science is published another.

Bibliometrics based on the bibliographic element *keywords* is an important area of research. Keywords are not included in this study for several reasons. The first is that keywords are an abstraction rather than a concrete connection. The nature of keywords obscures several parameters that make citation frequency analysis relevant. For example, the addition of keywords may come from one or all of the original authors, the jury readers, the journal editors, field experts, or an indexing service. Without a means of separating these sources, we would be unsure who has thematically linked frequently used keywords. Keywords are also plainly subjective: they apply field expertise to make a judgment about the applicability of a paper. Citations, in contrast, are exciting in that a paper (such as one by R.A Fisher) can be written about corn farming and be later used as the bedrock of modern statistics. This example segues into the last reason keywords are not used in the present study. Keywords are static, whereas citation behavior is dynamic. The dynamics of citation behavior provide living view of current usage of knowledge in research. A loss of dynamics would involve a loss of insight and of application for the final product.

This study involves the following bibliographic information: citations, journal of publication, date of publication. These three units of information compose the database

from which the analysis will be performed. This section will discuss each unit in turn, beginning with the journal of publication.

2.2.4.1 The Publication

Products of science are ideas, methods of communication, and responses to other ideas (Okubo, 1997). Examination of bibliographic data is meant to proxy the examination of products of science, particularly the formation of those products. Whatever scientists may say, knowledge is not considered part of a science until it is published. The expected outcome of research and scholarship is the timely communication of insights with a larger community of peers (Ayala, 1990). Knowledge that is peer assessed, and accessible to peers for further usage, is then considered part of a field or discipline (Noyons, 1999). But even upon publication, the article itself is not only knowledge but also an expression of the state of a group of scholars at the time (Price, 1963). Therefore, academic journal publications are important documents of science since they simultaneously create science and capture the process of creation.

Bibliometrics, being based on the published record, is limited by the extent to which scientists use non-written forms of communication (Okubo, 1997). Informal communication is not captured by bibliometrics. Fortunately, there are multiple incentives to record, even at later dates, the insights shared *inter alia*. As stated previously, there is the fact that only recorded and accessible information will be part of a

discipline's knowledge base. For the researcher, linking access to validity is paradoxical considering that many scientists publish to "lay claim" to knowledge they created (Okubo, 1997).

The publication source is a unit of analysis in bibliometrics. Often times, its selection (along with words, authors, or dates) is meant to define a field, discipline, or subject (O'Connor & Voos, 1981). Once an acceptable control has been achieved, this unit of analysis is implicitly available to the researcher.

2.2.4.2 Database

All bibliographic information that is used in a bibliometric measure must come from and be placed into a database. Often, the originating database is a commercial indexing service, while the database being created is custom and temporary. Before asking "what does the metric show" we must consider "what does our database cover?" (Noyons, 1999). The analysis never shows more than the database speaks to. Many assumptions and limitations within bibliometrics originate in the database. This section discusses what the database is, what it is assumed to provide, and biases that can occur because of it.

The constructed database defines all possible results, so the database should be carefully cultivated and its characteristics made known (Okubo, 1997). The source of the data will lie in one or more sets of bibliographic records. Bibliographic records are derived from original sources, indexing services, library holdings, or organizational

resources. In all cases, bibliographic records were not created primarily for bibliometrics. They require special processing and impose certain limits on the results (Okubo, 1997). Since this study uses citation data, we focus for the moment on database problems concerning citations. Most citation databases have the following distortions: negative citations are unidentified; citations are missing; self citations; predominance of one language (Okubo, 1997). These distortions alter what the database can proxy in terms of actual knowledge exchange, creation, and distribution.

Indexing service databases pose significant problems in bibliometrics. One of those problems is that the database may change dynamically over time. This happens when journals split, close, merge, or are created. It is often important to hold constant the journals being analyzed in order to have an appropriate base from which to measure changes in numbers. For example, if the number of journals in a dataset increases dramatically over time, it would be impossible to tell if an increase in citations is actual productivity changes or a change in the publishing environment (Okubo, 1997). The solution to this problem is not always clear. The 'freezing' of a journal set for analysis creates a conservative and skewed database. Some branches of science emerge with new discoveries (superconductors, ecommerce) and these research areas create their own journals. A database with fixed journal titles will miss the emergence of new sub-fields and disciplines. This is even more apparent in fast moving fields in first world countries where the research agenda changes quickly (Okubo, 1997).

The Clothing and Textile Research Base: an Author Cocitation Study

Bibliometricians face critical choices of who, when, and what to include in their analysis. Some of the database building questions concern breadth: what subject are we covering, how far back should we look for its roots, and will we follow its offshoots? In other cases, the questions concern depth of data: what percentage of the published record should be included? Drott (1981) proposes that lesser contributing sources (authors) merit inclusion in a bibliographic database. The line of reasoning is that of N authors contributing one article a fraction will go on to produce two or more articles. Therefore exclusion of some authors based on low frequency in a given time period may preclude a view of their rise into more prolific researchers. Drott (1981) also suggests that these authors provide important information regarding the distribution of research productivity: an issue of concern in both empirical and theoretical bibliometric research. In terms of bibliometric theory, Derek de Solla Price's cumulative advantage model predicts that research producers who publish are then more likely to publish again, where as failure to publish is seen as a non-event (Drott, 1981). In this view, there is a strong social structure that is perceived as hyper-productivity among top researchers, but may in fact be hyper-accessibility to research and publication tools. Poor control by bibliometricians may exasperate this confusion.

McCain (1990) outlined a methodology for a subjective or top-down approach to source selection. This involved the creation of a list of authors, journals, or time periods based upon interviews, personal knowledge, surveys, organizational membership, awards of merit, or other qualitative measures. The subjective judgment of experts, for example,

is believed to identify the leading authors in a given field. The researcher uses this pre-selected author as the inclusion criteria for bibliographic record collecting. It should be noted that most previous work in author cocitation analysis used this method because it is (a) less expensive and (b) works closely with the organization of commercial indexing services (Eom, 2003).

Alternatively, a researcher can use an objective or bottom-up approach in selecting sources. This method requires custom-built databases of all authors in a given research domain (Eom, 2003). All authors involved in textile draping, for example, would be contained in a database which included their citation counts. All authors who are cited above an arbitrarily high benchmark are then included in the conversion to a cocitation matrix and analysis. This method is more expensive, since it requires a massive database from which only the top five percent or less are actually needed. But the objectivity of the method makes it preferable for making judgments, particularly when the research field in question may be large enough that no small group of experts can fully describe its principle contributors over time. Finally, the objective method may require an approximation of all authors in a given research domain. For example, where is the definitive list of all authors contributing over time to our understanding of textile and apparel? Obviously, such a list is not available. To approximate such a list, this paper has chosen to document all citation activity within the *Clothing and Textile Research Journal* for the years 1990-2006. As the premier journal for research in the clothing and textile

field, this database of citations is assumed to reflect the best approximation of authors whose work contributes to the research domain.

All cocitation databases require construction, as even commercial indexes such as ISI are not organized for immediate use in this way. Eom (2003) outlined steps needed to produce a custom database for author cocitation analysis. In the process, Eom discussed the construction of a database of 1,616 articles which documented 25,339 citations. Per Eom (2003), the steps for creating a cocitation database are:

1. Selection of sources (authors, journals, years)
2. Data entry: collection of citation frequencies
3. Conversion from citation counts to cocitation counts

Once the data is in the cocitation format, it can be analyzed. Analysis involves the following steps:

4. Preparation of the SAS input file
5. Multivariate statistical analysis of the correlation matrix
6. Analysis output preparation
7. Results formatting, validation, and interpretation.

2.2.4.3 Citation and Cocitation

Cocitation occurs when two authors are cited in the same document. Cocitation analysis involves finding the frequency of any two articles being cited in the same document (Okubo, 1997). Author cocitation analysis is similar to document cocitation

analysis (Eom, 2003). In both cases the act of simultaneous usage constitutes the initial data by which inferences are made (through comparisons, time measures, etc). The output of this process can be displayed as a map of the research area (Okubo, 1997). This section reviews basic assumptions regarding citing, and then discusses the theoretical base of analyses using cocitation frequencies.

Knowledge creation is the product of a process involving circulation of ideas, methods, and critique within "invisible colleges" (Eom, 2003). Henry Small suggests that citations act as concept symbols and that frequently cocitation implies an interest or activity on subjects that need or are clarified by these concept symbols (Smith, 1981). Small also suggests a method to remove field expert's input in interpreting cocitation maps by capturing data about the context surrounding the citation and deriving shared concept symbols from this context information (Smith, 1981). This is particularly evident when examining sub-fields and specialties. Within a research specialty a core group of scientists can be found that account for a disproportionate amount of peer contacts, citations, and productivity (Bolourchi, 1981).

Reference and citation render the researchers' interactions partially visible. Author cocitation generally assumes that "bibliographic citations are an acceptable surrogate for the influence of various information sources" (McCain, 1986). This view has been criticized as simplistic and for aggregating unique usages of citations. For example, in terms of knowledge, an article is a conglomeration of smaller units (Smith, 1981). A citation implies a relationship between a part or whole of previous work and a

part or a whole of the current work (Smith, 1981). Unfortunately, scientific work may be cited for different parts by future authors. For example, an article that pioneers new apparatus usage on testing textile absorption of pesticides may be cited for its methodology, its use of a novel apparatus, or for its findings concerning pesticide absorption. Our current method of citing documents does not usually make the citation motivation clear (Smith, 1981). Because we only document the macro level citation (from titles to other titles), a serious error may occur when two authors are associated by cocitation.

Other critiques of citation-based analysis focus on the motive for the citation. Garfield described fifteen divergent motives for citing a given work (See figure 1), all of which are aggregated in citation counts. There are other equally fundamental problems with current methods of citation. These can include errors of omission and commission, whereby the referencing paper cites works that have not been used, and does not cite works being relied upon. There are also problems with quality: how are citations demonstrating their different levels of impact? Authors have been shown to avoid citing foundation works once that knowledge is considered universally accepted or known. There are also questions of how citations counts should address self citation and citations to authors who work closely within groups.

Figure 1

Fifteen reasons authors may cite (per Garfield):

1. Paying homage to pioneers
2. giving credit to related works
3. Identifying methods, equipment, protocols, etc
4. Indication of background reading
5. Correcting ones own work
6. Correcting other's work
7. Analyzing previous work
8. Substantiating claims
9. Alerting readers to forthcoming work
10. Providing leads to materials with poor availability
11. Authenticating data or classes of fact
12. Identifying original publications that open discussions, terms, etc
13. Identifying the origins of eponymic concepts or terms
14. Disclaiming work or ideas of others
15. Disputing prior claims of others

Despite these strong criticisms, citations are an important documentation of the state of research at a given time. For the interested researcher, citations are plentiful and do not require interaction from the subjects of the study. They may falter or fail in certain ways, but they are almost universally present in research papers and provide a partial

view as to what is thought of as necessary to understand or create the knowledge being delivered in that publication. Accepting this limited, but still usable, definition allows us to begin theorizing what is readable from citation activity. And, for this paper, what it means to be cocited with other authors.

Researchers tend to cluster informally into groups that address similar problems and in similar ways (Eom, 2003). Peer researchers working on the same problems will often cite similar sources. Cocitation of authors tends to display the social structure of a research domain (Noyons, 1999). But this social network is not the same as the actual interactions of researchers. For example, cocitation does not reveal "what was", but what is now considered the foundation. Cocitation is a dynamic measure in that the relationship appears, evolves, convolutes, and passes away with the continued development of the field and the changing citation behavior of its contributors (Devarajan, 1997). Obviously the real social network is not as transitory: researchers who worked together in the 1950s should always be seen as socially linked, which would not be clear with cocitation analysis.

Smith (1981) argues that cocitation analysis does not provide themes of research. This is because two authors may be cited together frequently without having similar content. Instead, cocited documents help define what is currently thought of as the knowledge base necessary within a research front. Cocitation couples previous work together as important contributors to current research fronts. The coupling of two authors through simultaneous citation is extrinsic to their original work. As an example, work

done in the 1960s on mammal brains may be cited along with work done in the 1980s on pattern-matching software. The original works had no intrinsic connection, but both are needed for work on the current artificial neural networks research front: they are extrinsically coupled. Smith (1981) points out that those intrinsic linkages are static; they will always appear when a reader goes to that document. Extrinsic connections are dynamic; they appear only for as long as new research chooses to draw on them. As a dynamic representation of communication within a field, cocitation maps can also be used to examine areas of deficit communication such as linguistic barriers, isolated researchers, or interdisciplinary interaction (Smith, 1981).

As a final note concerning the individual authors being studied, the fundamental assumption of author cocitation analysis is that higher relative frequency of cocitation indicates the authors are related by research content (Eom, 2003). As an important derivation, this paper does not conclude such a statement fully defines the concept "related by research content". This paper assumes that cocitation indicates that the research being conducted in the referencing paper is advanced by an analysis of some portion of the cited documents. Therefore, cocited authors are not arbitrarily "related by research content", but are considered to be part of the base knowledge needed at a given time to advance a research front.

Author cocitation can imply a variety of interactions. Authors often cited together can be considered part of the base knowledge needed to understand a problem actively being researched. Authors that often reference the same documents might be considered

part of the same research front (Noyons, 1999). For research managers, cocitation analysis results can help them understand the network of influence and contribution of authors in a given field. Cocitation analysis as a policy making tool has been in development since the seventies (Noyons, 1999). Most actively, research labs in the Netherlands and in France sought to discover the limitations and applications of such tools. Some of their conclusions involved strong critiques of citation behavior among researchers (Noyons, 1999). Even so, author cocitation analysis is the principle tool to establish relationships among researchers and to identify sub-fields and their proximity to each other (Eom, 2003). In short, cocitation analyses reveal the intellectual structure of a research domain. This intellectual structure is of great importance to research managers. As opposed to actual social histories, research management is improved by viewing the dynamic interactions of cocitation relationships.

2.2.4.4 Date of Publication

This paper describes a bibliometric analysis of cocitations in a given journal. For this to occur, a limiting start and end date must be chosen since articles are published at a specific time. The cocitation analysis then ends with an interactive website. This website represents the structure of the bibliographic database from time period *T*. The database includes work published during period *T*, but not worked performed during this period. Because of the unknown lag between research conduct and final publication, we are focusing here upon the creation of the field's knowledge (Noyons, 1999). Specifically,

we follow the assumption of Ziman (1984) in saying that knowledge is not created within a field until it is published and distributed.

Cocitation studies face criticism in fast moving fields because they may say very little about the research front itself, preferring a retrospective analysis of the founding literature as presently conceived (Noyons, 1999). This brings to attention the need to specify what is being studied. If we accept the date of publication as the date a unit knowledge is created, then we can view cocitation analysis as a method of approximating the knowledge base necessary to have produced a given unit of knowledge in some research front. This definition leaves the defining of the research front to interpretation of a third party, usually field experts. Bibliometrics have been seen as the history of sciences. If that is so, cocitation studies are a visualization of the current need of past knowledge.

2.2.5 Best Known Bibliometrics

Best known bibliometric indicators per Okubo (1997)

The number of papers: Provides a simple and cheap approximation of the productivity of a research unit. Limitations of this method grow as the paper count decreases. Co-authorship presents unique problems in this bibliometric. In general, authors can each be assigned full credit, or partial credit. The partial credit can be a division of one full article

evenly among authors or some other division which attributes more credit to the primary author (Okubo, 1997).

The number of citations: an approximation of the impact of a research unit or product. Timeliness and utility are thought of as attributes that are found in highly cited papers. Limitations include tendencies of authors to cite for reasons other than true influence. These tendencies clearly create bias in the dataset. Garfield considered number of citations from a given journal as a major indicator as to its role in the research area (Okubo, 1997). Impact measures, such as one developed by Garfield, examine references to a journal divided by the journal's number of articles or pages. Other factors have been considered, such as the use of self citation, self reference, and the proportion of references to citations (O'Connor & Voos, 1981).

Half life rates: a systemic measure of obsolescence of citations, have been examined across disciplines as a domain-level measure (O'Connor & Voos, 1981). These half life rates define to how many years back one must go to count half of the citations for certain aggregate of documents (in one key journal, for example).

The number of co-signers: used to examine trends in formal cooperation among researchers in a given field. It is often used to measure macro-level cooperation such as between regional blocks or countries. Limitations include difficulties assigning locality to

authors, since many authors take visiting positions at research institutions. In these cases cooperation is clear, but the locality of an author is not.

The number of patents: patent rates approximate changes in technology and industrial research over time. Patent format usually provides bibliographies, and so make good areas to analyze. Limitations include the differing patent seeking behavior of industries and countries, making cross-cultural or cross-industrial analysis meaningless.

The number of patent citations: an indicator of the impact of technology advances. The first page of a patent usually includes a list of references to similar patents. This list of references links the new edge of technology with previous technology developments, and so can show what impact certain patented technology had.

The affinity index: a measure of scientific exchange between two macro units (such as countries). It compares the rates of scientific exchange between two entities with the scientific exchange between these entities and all others. Limitations include the need for the two units to be approximately the same size in order for the results to be a realistic indicator of cooperation.

The correlation between scientific papers and patents: measures the correlation of journal productivity with the rate of patent application for a given field. The measures for

this can include length of time between journal publication and patent application, and the citation behavior between journal articles and patent applications. Limitations include the relatively unsubstantiated theoretical base for this approach.

Number of cocitations: measures the number of times two units are cited in the same document. This indicator approximates the scientific community's reaction to research being made public. Limitations include the tendency for certain research fields (such as technology) to rely less on formal communication.

The co-occurrence of words: identifies the frequency of certain terms to be included with other key words. This method is used to outline relationships between research agendas by identifying the rate at which topics are addressed together. Limitations include the relatively subjective nature of the database, since keywords are often assigned conservatively and may not accurately represent the actual document.

2.2.6 Who Performs Bibliometrics

Bibliometrics are produced in a variety of locations. Bibliometric analysis is its own discipline. It has, in addition, sub disciplines that center themselves on both methodology (cocitation vs. co-word occurrence) and upon application (research policy management vs. information retrieval). Outside of the disciplinary cadre sits a mass of

researchers who conduct occasional bibliometrics either on their own work or in examination of their research domain.

The question of who conducts bibliometric analysis is related to what is being analyzed. For the core researchers, expanding bibliometrics as a science is the goal. Hence, subjects are chosen for their ability to demonstrate utility, shortcomings, or the application of special processes. For researchers situated in other disciplines or fields, bibliometrics is a method that they learn and apply in the interest of their own research agenda. The resulting analysis is used to better understand or judge the topic, not bibliometric methodology.

2.3 Research Management

Since WWII, science and technology development have come to be seen as a major part of human development and of the United States' economy. Scientific endeavors are more and more considered to be a main interest of the society. They receive only slightly less funding per capita over the last several decades, but are reviewed more actively for aspects such as performance, impact, and social relevance (Noyons, 1999). In short, scientific research has been brought under the patronage and review of the society in ways that would have been seen as alien one century ago. "Knowledge sectors", for example, are touted as the U.S.'s chief means to compete in a global economy with a small scale manufacturing base. And as scientific knowledge

becomes more tied to the prosperity of the society, its management is of greater concern to institutions, corporations, and for societal governance.

All first world countries have found it necessary to assign administrative units over research and technology. For many, this involves active research on research (Okubo, 1997). Bibliometrics allows for the observation of the state of science and technology through the accompanying growth in scientific literature. The Netherlands and the United Kingdom were the first to publish bibliometrics for managing research policy. Since then Japan and France have also become major adopters (Okubo, 1997). There is, however, resistance among scientists to being evaluated with bibliometrics. They perceive it as mere paper counting and prefer peer review as the only appropriate measure (Okubo, 1997). This resistance has halted some bibliometric usage in policy management, particularly in the U.S. where researchers have relatively large amounts of power through the grant system (Ourisson, 1991).

Bibliometricians in France and the Netherlands were among the first to assess cocitation results in terms of their utility to research managers and policy makers (Noyons, 1999). These researchers found that cocitation results needed to be validated by the end user prior to completion. The validation process involved providing a structured method for end users to assess the usability of the results and to give feedback for alternative versions that would be more supportive of actual decision making. In addition, these studies found that usage was increased when the results were rendered interactive using internet-hosted displays rather than multiple printed pages. Although both versions

contained identical information, the interactive versions tended to have higher validity and utility to the end users (Noyons, 1999).

Research managers use bibliometrics for neutral assessments of "what's going on", performance metrics on research producing units, and for integrating complimentary researchers or agendas into labs, groups, or academic departments. For government officials controlling research funding, higher levels of aggregation, such as identifying themes rather than authors, tend to be more useful (Noyons, 1999). At the same time, drilling into the impact or placement of certain authors is also supporting research managers who may be concerned with only a hand full of current or possible researchers. This reinforces the suggestion that results need to be scaled or otherwise adjusted to the needs of users in order to be generally valid.

The advancement of knowledge through research is a fundamental goal of many universities and colleges. Identifying factors that may influence research productivity and impact has been a major concern for academic administrators.

2.4 Cocitation Analysis Methods

In order for cocitation results to be generated, a series of transformations and analyses must be performed. This section outlines the methodology for these steps and describes their assumptions and importance. The first step in a cocitation analysis is to generate the citation count from the database. As discussed above, a citation count database ought to have been created to represent the research domain. This citation count

must be transformed into a matrix of cocitations. A cocitation occurs when one author has been cited in the same document as another author. If both authors have been cited twice in the same document, their cocitation count will be two. However, if the first author has been cited three times and the other only once they have only one cocitation. In other words, a cocitation reflects how many times both authors have been cited together, and does not take into consideration the "extra" citations above this commonality. Since the author set for this study is quite large, an arbitrary limit was chosen to segregate the most important authors from the mass. Only the cocitations of these authors were then transformed into a cocitation matrix. The cocitation matrix is needed to perform the factor analysis.

2.3.1 Factor Analysis

Factor analysis refers to an analytical technique meant to reduce the number of variables or to reveal underlying structure between variables. There are also two types of analysis strategies commonly used with factor analysis (Garison, 2006 A). Exploratory factor analysis is meant to reveal underlying structure of the dataset without prior assumptions. There is no theoretical base to test; instead the researcher is guided by factor loadings to find intuitive structures for further examination or theoretical consideration (Garison, 2006 A). This method may use principal component analysis, principal factor analysis, or hierarchical factor analysis. The second strategy is to use factor analysis to confirm expected number of factors and their factor loading per some

theoretical framework. This strategy can use principal component analysis, Structural Equation Modeling (SEM), or other techniques to critically test previous assumptions (Garison, 2006 A). For this study, the cocitation study does not begin with a previous theoretical structure of the clothing and textile research domain, and so we will follow the strategy of exploratory factor analysis. Specifically, this study used principal component analysis of the cocitation matrix.

Principal component analysis for data reduction can be thought of as a stepwise progression of creating new variables whose data represent the least squares point of two or more existing variables, thereby reducing multiple existing variables into newly created factors. This process continues, with each new variable reducing the total dataset's variance. Because of the process iteration and factors addressing only variance not captured within the preceding factor, each factor is uncorrelated or orthogonal.

Factor analysis requires the data to be in the form of a correlation matrix. The cocitation matrix is a unique occurrence of a correlation matrix, whereby the variance of all variables is equal to 1. As a result, the total variance is equal to the number of variables. On analysis, a series of factors are created until all variance has been accounted for. These factors each account for less and less of the variance in the original data. Two popular methods exist for choosing how many factors to keep: the Kaiser criterion and the scree test. The Kaiser criterion selects only factors that account for more variance than an original variable in the correlation matrix, identified by eigenvalues greater than 1. The scree test plots the factors against variance in the dataset. The plot will show a

shallow reduction in variance to the right side of some factor. This is identified as an appropriate place to stop including factors. Using generated data, statisticians have shown the first method may include too few factors and the second method may include too many. Final acceptance of a number of factors is usually determined by interpretability.

Once the researcher has determined the appropriate number of factors, the analysis is recreated with only these factors. As a result, a table is created by the SAS program which measures the loadings of each original variable onto the factors. Loading values are the measure of the variance within a variable that is explained by the factor. These loading values can be treated as points within a multidimensional space. The loadings are fixed relative to each other, but given an arbitrary axis within the space they can be rotated onto new absolute values. For example, two factors may have a variable loading of .25 and .25 respectively. But these values can be rotated to .5 and 0 without altering their relationship relative to one another. Doing so gives the researcher a clearer indication of which factor a given variable should load onto. There are many strategies for rotation of factor loadings, and rotation is almost always necessary in order to make the factors identifiable. Two classes of rotation exist; orthogonal and oblique. Orthogonal rotations do not allow for correlation between factors, whereas oblique rotations do. Oblique rotations also provide a factor loading value representing the amount of correlation between factors. For this study, an oblique rotation was used.

2.4.1.1 Assumptions and limitations of factor analysis

Factor analysis has several important limitations and assumptions that should be mentioned. These will be addressed below, along with their relevancy to the study being proposed.

Factor analysis assumes that all relevant variables and no irrelevant variables have been included in the correlation matrix. Breaking this assumption can seriously distort the results. In this study, the cocitation matrix is constructed from the most cited authors in the dataset. They represent the most relevant variables to test, and so meet this basic assumption of factor analysis.

Outliers have detrimental impacts on factor analysis, and so must be adjusted or removed (Garison, 2006 A). This study will determine if there are outliers by using Mahalanobis distance. Outliers will be removed from the factoring analysis and noted in the discussion of results. Also, linearity is assumed for factoring analysis. Testing for linearity will be done by examining the residual distributions and noting any nonlinearity in the results.

Factor analysis is meant to reduce variables or identify variable structure based on the assumption that there is an unobserved structure to the data. If this is not true, factoring will only produce nonsensical results. For this study an underlying structure is known to exist, and factoring is used to identify it and its changes in time.

2.5 Cocitation Studies

Cocitation studies require the following steps (Eom, 2003):

1. Selection of sources (authors, journals, years)
2. Data entry: collection of citation frequencies
3. Conversion from citation counts to cocitation counts

Once the data is in the cocitation format, it can be analyzed. Analysis involves the following steps:

4. Preparation of the SAS input file
5. Multivariate statistical analysis of the correlation matrix
6. Analysis output preparation
7. Results formatting, validation, and interpretation.

This section discusses step number seven: validation and interpretation.

2.5.1 Validation

Validation generally refers to a series of steps, undertaken by different stake holders, to assure the quality and usability of the cocitation study results. A validation triangle exists in which bibliometricians, researchers, and research managers all must provide input for the study results to be unbiased, representative, and useful (Noyons,

1999). Bibliometricians, for their part, validate the data sources, author selection criteria, methodology, and the representation of the results. Experts in the field under study work with the bibliometricians to convert the result factors to terms that reflect the constitution of the field as seen by researchers. Research managers, such as science policy makers, must also validate the map as a usable representation of the field for their decision making needs. Utility, as a validation criterion, is absolutely vital to the completion of a successful cocitation study (Noyons, 1999).

Enthusiastic research in bibliometric studies peaked in the seventies and eighties, dropping off in the nineties (Noyons, 1999). In part this was the result of perceived threat to field experts and inaccessibility of the results for users: problems directly related to validation. According to Noyons (1999), the objections to the cocitation result validity follow the method's structure:

1. Evaluated scientists (as objects of study): perceived as inferior to peer assessment
2. Bibliometricians (as producers): the costs and data integrity
3. Policy makers (as users): the accessibility and utility of final results

Below, each of these three types of criticisms are discussed.

2.5.3.1 Evaluated Scientists

Experts have critiqued the validity of cocitation results. These critiques generally assume that the evaluation of the field should be left to field experts: the academic preference for peer review. Although not opposed to the study of cocitations per se, this

critique says that proper data and methods create nothing more than a point distribution over the virtual bibliographic space. Field experts have claimed that non-experts (i.e. research managers and bibliometricians) lack the ability to convert point distributions in the cocitation results to complete representations of the field in question. Scientists under review as objects of the cocitation study prefer for this point distribution to be provided meaning and recognition by field experts. Such a process involves validation of data and methods by the bibliometricians and recognition and elucidation by field experts: the result is then a representation of the field's structure.

While this method is appealing, since it does allow for expert input and would provide new insights, there is also a danger of exposing the study to new biases. Healey, Rothman, and Hoch (1986) proposed a paradox in which unconventional structure estimates from cocitation results will be rejected by experts in the field since they are counter-intuitive. Alternatively, intuitive structures will be validated easily by experts, but not valued by them because they tend to show "nothing new". Likewise, experts may not see, or may prefer to not focus upon, the significant amount of research that has failed to develop or has otherwise resulted in less-than total adoption by the field. These areas may be exactly what is important to end users of cocitation studies, but are often overlooked by experts immersed in a field's front line. For example, cocitation results face criticism in fast moving fields because they may say very little about the research front itself, preferring a retrospective analysis of the founding literature as presently conceived (Noyons, 1999). Purely quantitative methods give no preference to research

that is later considered revolutionary (or misleading); exposing only reactions that were recorded in the citation record at the time. Studies have shown that proper introduction, emphasis on proper usage, and higher levels of interactivity will ease field expert's criticisms (Noyons, 1999).

2.5.3.2 Research Managers and End Users

Research policy makers and research managers are often the final user of cocitation studies. In such a case the bibliometric process has been commissioned in order to provide succinct and appropriate information to decision makers regarding the field of research. End users play an important role in validating cocitation studies. Specifically, they must provide a final acceptance or rejection of the results as a usable tool to make better decisions. Studies of end usage, however, reveal systemic difficulties in using the study results (Noyons, 1999). These problems are characterized by: (1) the inability of the user to control the scope of the results and (2) an inability to recognize the availability of important information in the results (Noyons, 1999). Regarding the first problem, Noyons (1999) documents improvements using hyper textual formats posted to the internet. Such formats allow the user to drill into, or pull back from a given level of aggregation. Therefore the user can move between a field-wide view, to a sub-field view at will. This arrangement increased the ability of users to select the desired information. The second issue raised by Noyons was the phenomenon of users overlooking important information in the results. Specifically, users tended to only look for division within the

field, rather than using the relationships between divisions, which is an important indicator of proportional relationships between units.

2.5.3.3 Bibliometricians

Cocitation studies require data sets retrieved from bibliographic records. As stated elsewhere in this paper, bibliographic records are not created for bibliometrics. The original bibliographic records have their own biases, omissions, and structure. Many of the validation concerns of bibliometricians concern the problems of relying on commercial indexing services and other bibliographic databases. For example, there are concerns that commercial databases index only the first author; a limitation carried over to any usage of that data base. Some such limitations can be overcome with additional time and costs. As such, cost is also a validation concern of bibliometricians. Custom databases are often a cost tradeoff in a bibliometric study. A custom database may take funds that require a reduction in the scope of the study, or in its quality of the analysis. Validation concerns such as these require careful attention of the bibliometricians and communication to the end users.

2.6 The Textile and Apparel Research Domain

2.6.1 The Foundation of Home Economics Research

Home economics was an integral part of co-educational land grant schools in the U.S. at the turn of the 20th century (Solomon, 1986). Their work was multidisciplinary by definition and intended to integrate scientific knowledge with human environments such as the home, family, and community. The research areas in home economics are largely defined by common human activities and their environment: what we eat, how we dress, how we educate and disperse resources, how children are socialized, and the effects of space around us. The role of early home economics research was to bridge basic sciences to applicable sciences (Stage, 1997). Home economics scholars drew from bacteriology and biology to do groundbreaking work in human nutrition. They applied political science, philosophy, and economics to develop social work as we now conceive it. From backgrounds in psychology, history, and architecture they created interior design. And from industrial management, fiber sciences, agriculture, and history they developed clothing and textile sciences.

2.6.2 Early Textile and Apparel Research

2.6.2.1 Textiles

For much of the U.S. at the turn of the century, textile production was a chief economic sector (Stage, 1997). Land grant institutions in the south-east of the U.S. often included mandates to perform industry supporting research into textile production. This research base spanned agricultural management and inputs, fiber grading and tests,

industrial apparatus to produce textiles, and textile economics. Again, a major tenet of textile research within home economics was applicability of the knowledge base.

2.6.2.2 History

Early home economics researchers included historians. Some were pursuing research agendas related to anthropology: what are the universal tenets of human adornment? Some researchers were interested in industrial history; the rise and dissemination of textile machinery. Others pursued questions of social organization around clothing, fashion cycles, or political histories such as the rise of the Ladies Garment Workers' Union. This branch grew steadily and maintained strong interdisciplinary ties with sociologists, psychologists, anthropologists, and historians.

2.6.2.3 Clothing Design and Construction

One of the expectations of home economics extension work was that it would increase the abilities and productivity of clothing producers (Solomon, 1986). Since a primary need of human society is apparel, and earlier American society devoted so much of their energies to its creation, it is no wonder that home economists became synonymous with clothing producers (Solomon, 1986). Early research efforts in this area included pattern making and grading, cloth hand, cloth selection, stitching patterns and qualities, production techniques, and care or repair of apparel. Later, as home production became less desirable, home economics researchers turned to production and

consumption of mass apparel. Research in this area included pattern making and grading, production techniques, business management, consumption cycles and models, soft goods logistics, and marketing of apparel.

2.6.3 Current Textile and Apparel Academic Institutions

As explained in the above history, home economics had been a part of land grant schools from the beginning. Changes in the perceived place of the home in social life have fueled a revision in the name and perhaps the activities of many home economics programs (Feather, 1996). In the 1960s and 1970s the expertise and application of home economics research moved from the home to the commercial community. Graduates of these programs started: personal finance counseling, daycares and daycare policy support, social work centers, designing and merchandising apparel or textiles. Changing program focuses also brought on changing department names. What was once home economics may now be called human ecology, human environmental science, or human science. Today there are hundreds of clothing and textile programs at the undergraduate level nested in former home economics departments, and a lesser number offering masters and doctorate level degrees. The majority of these programs are also quite small. Approximately half of these units had less than 75 undergraduates in 1990 (Laughlin and Kean, 1996). The small faculty size has made specialized research difficult at most schools.

The decreased access to funding has effected clothing and textile departments just as it affects others. Many programs face merger within their institution. Art, business, and chemistry are among the departments that have absorbed smaller clothing and textile faculties. This pressure has had an impact in the research activity of the field. Whereas extension had been the founding mission of many home economics departments, strong career preparation has emerged as today's clothing and textile department's mission (Laughlin and Kean, 1996). Unlike other home economics sub-units such as nutrition sciences or social work, clothing and textile departments were able to raise their enrollments significantly using their career-oriented programs as a selling point (Laughlin and Kean, 1996). This emphasis on a professoriate interested in the business-side of the field has also effected who is receiving the best research institution positions, thereby affecting the knowledge being created within the field. Laughlin & Kean (1996) state that clothing and textile department administrators are coming under pressure to produce quantitative assessments of their program in terms of quality, centrality of mission, and competitiveness. This pressure is compounded by a difficulty in communicating a common mission or perspective of the department (Feather, 1996). As a field, clothing and textile has suffered problems similar to their divergent academic department constituents who differ along mission, disciplinary backgrounds, and title (Feather, 1996). There is also a great deal of flux in current departments, as many are adding or deleting substantial classes, majors, or emphasis areas (Feather, 1996).

2.6.4 Textile and Apparel Faculty

The characteristics of clothing and textile faculty are also of interest. For example, clothing and textile has less tenured and full professor rank per degree earned than when compared to other disciplines. Slightly over half of clothing and textile faculty hold tenure, whereas most areas have 80% of their faculty tenured. This has significant importance to the field since it limits the role clothing and textile faculty can play in academic affairs, it makes clothing and textile positions less desirable, and it signals lower pay and less security for researchers in this field. Since the majority of faculty in clothing and textile are women, suggestions have been made that lower tenure rates for women may have greater presence in this field (Shim, O'Neal, & Rabolt, 1998). This is also thought to affect the research performed in the field, since there are divergent productivity patterns for men and women in academic research (Shim et al, 1998).

Clothing and textile faculty not only teach and conduct research in a multidisciplinary field, they also come from diverse educational background. Only 72% of faculty earned their terminal degree in clothing and textiles or home economics (Laughlin & Kean, 1996).

2.6.5 Uniqueness of the Textile and Apparel Research

As clothing and textiles moves away from its extension-oriented past, administrators are increasingly looking for high quality research from their faculty (Goldsmith, Thoresen, & Goldsmith, 1988). The fact that research was less important in

the near past may have significant impacts on today's clothing and textile faculty. For example, studies have shown that exposure to research-styles of the faculty for graduate students have a major impact on later research productivity and style (Shim, O'Neal, & Rabolt, 1998).

As noted above, the diverse educational background of clothing and textile researchers also effects the development of the field's knowledge. Educational background is not the only effect on expertise, methodology, and interests. Social networks are created or disrupted by educational background. Scientists working actively in a specialty for longer periods of time tend to have commonalities such as educational background (Bolourchi, 1981). Also, during abrupt changes in, or the advent of new research specialties, the educational background is a major factor in how a researcher will approach the changed research agenda (Bolourchi, 1981).

As opposed to their diverse educational background, clothing and textile faculty tend to share significant similarities in their demographic backgrounds. For example, the great majority of clothing and textile faculty are from the middle class, white, and women (Lennon & Burns, 2000). This similarity may be enhanced by the relatively small number of academic departments that have large faculties in textile and apparel. Sharing a similar demographic niche, and often employed at similar land grant schools, clothing and textile researchers run risks of homogeneity. Lennon & Burns (2000) suggest that many critical inputs in the research agenda formulation and research conduct are affected by the social similarities of the researchers themselves. For example, research agendas have often

followed upper-middle class economic interests partially because the authors of the agenda had little exposure to problems specific to other classes (Lennon & Burns, 2000).

Research in clothing and textile is published in a large set of research journals. Some journals, such as *Textile Chemist and Colorist* have specialized for a sub-field of textile and apparel. Others journals are discipline focused and print contributions from clothing and textile faculty but are not intrinsically concerned with the area being studied. For example, the *Art Therapy* journal may publish studies by clothing and textile researchers concerning quilting practices, but treat the topic of quilting as a field of application or observation rather that a core area of interest to the journal.

Because of high rates of faculty who are not full professor rank or tenured, Laughlin and Kean (1996) have termed clothing and textile academicians as "in maturation". This implies that we might see noticeable differences in the research field related to the state of the researchers. They may be producing more work, in an effort to reach higher recognition and rank. Alternatively, Laughlin and Kean (1996) have suggested many are consciously tied to a position because they lack the terminal degree, resources, or skills to advance. Researchers have been shown to make significantly less effort in research when they are in such situations.

A line of research presented by Lennon and Burns (2000) outlines the research methodology tendencies in the clothing and textile field. Some points are summarized here, but the interested reader is referred to the original article for a more complete discussion. Many of the tendencies are relative to the sub-field being studied.

2.6.5.1 Strategies of Data Gathering

Research on cultural aspects of dress tend to gather data using fieldwork. Social-psychological studies of dress tend to use experimentation as do textile chemists. Consumer behavior research tends to draw from non reactive or survey data. Finally, historical research in clothing and textile tends to use non reactive gathering strategies.

2.6.5.2 Time Frames of Research

Textile, apparel, and human behavior research tend to use cross sectional designs. Longitudinal studies are rare and limited to research on cultural aspects or history. Sequential and cohort designs have been subject to limited use.

2.6.5.3 Origin of Data

Individual data dominates research on textile and apparel, particularly in human behavior. Interindividual data has seldom been collected. Media analysis and cultural research has elicited societal or cultural data.

2.6.5.4 Technique of Data Collection

Studies of consumer aspects of textiles and dress, along with social psychological aspects of dress, often use direct eliciting of data. Fabric hand research also directly

elicits data, as does research on cultural aspects of dress. Consumption and history of textile or apparel is often researched using indirectly elicited data.

The Clothing and Textile Research Base: an Author Cocitation Study

3.0 Methodology

3.1 Study Design

The proposed study follows established methodology for a bibliometric analysis of author cocitation frequencies from a custom database. The following is an outline of the study, with a more detailed discussion following.

A research domain was chosen for further analysis. For this study, the clothing and textile research domain was selected. A body of published literature was chosen to proxy the knowledge within that domain. This published literature was designated as the *Clothing and Textile Research Journal*, with a time period from 1990-2006. As discussed in the literature review, the published literature contains both knowledge (such as empirical results), current thought about that knowledge (such as references to work that are believed to be fundamental), and bibliographic records (such as author's name or date of publication). A custom database was created, using information from the *Clothing and Textile Research Journal*. Specifically, the database contains the names of all cited authors, the frequency of citations for each author, and the date and article of each citation. This custom database was then examined, with the top cited authors being selected for further analyses.

The top cited authors had their citation frequencies transformed into cocitation frequencies. The cocitation matrix is adjusted by changing the diagonal cell values. The diagonal cell values are replaced with the maximum cocitation count for the author. This matrix of cocitation is then analyzed using principal component analysis. The results are

validated in terms of statistical significance. Validation by end users and researchers occurs when the results are made available in interactive cocitation results on the internet. Creation of the map is done using the animation and interactive application development software Flash ®. At the same time, the website makes original data, assumptions, and methods available for critique or further research. Through solicited and unsolicited input from field experts and end users, the shortcomings of the original site design were identified and corrected.

3.2 Data Collection

All articles published in the *Clothing and Textile Research Journal* during the years 1990-2006 were subject to data collection. This time period was chosen because it is (1) sufficiently large to draw inferences that may include generational effects (2) provides a series of results through which developments in the field can be viewed.

A custom database was created containing the names of all cited authors from 1990-2006, along with when and where they were cited. In addition, some information about the citing work was recorded, such as date of publication. This dataset includes thousands of authors who have been cited only once within the time period under review and many more whose citation counts are only marginally higher. As an arbitrary measure of significance, only authors who were cited five or more times during one of the three time periods will be included in the final analyses.

Once the authors have been sorted for analysis, their citation counts were converted into a cocitation matrix. Such a matrix shows the cocitation frequency: how often author *X* has been cited in the same document as author *Y*. Using the cocitation matrix, two new transformations were made to render the data ready for analysis. The first was to create an adjusted cocitation matrix for principle component analysis.

3.2.1 Data Transformation Algorithm

The raw citation counts, once collected, had to be systematically transformed into cocitation counts. A manual method of computing cocitation counts would have resulted in a high error rate, since it is laborious and the number of computations is quite large. A database with n authors would have n^2 cocitation counts. Because a cocitation of author A with author B is tantamount to a cocitation of author B with author A, half of the n^2 cocitation counts are redundant. Thus, the true number of cocitation values to be calculated is: $(n^2)/2$. For a database of 400 authors, this amounts to 80,000 cocitation values.

For this study, the author wrote an excel program in visual basic that computes the cocitation counts for all author pairs from a citation count spreadsheet. A basic form of an algorithm for cocitation counting is presented in Figure 2. Note that the basic algorithm in Figure 2 scales exponentially in its processor requirements given changes in author set or journal set size. In other words, with the basic algorithm in Figure 2, a change from 10 to 20 authors would require four times more processing power. The

algorithm developed by the author differs significantly from the basic algorithm presented in Figure 2. The author's proposed algorithm is presented here in Figure 3.

There are two important, and interacting, advantages of the proposed algorithm over the basic algorithm. The first advantage derives from ordering authors by their total citation counts. In the proposed algorithm, the re-ordering of author's based on total citation counts alters the scaling of computational power needs as x , the number of authors examined, approaches n , the total number of authors in some database. Earlier theoretical models in bibliometrics, such as Lotka's and Bradford's laws, suggest that a Poisson distribution underlies certain events such as article publication counts. Figure 4 and Figure 5 illustrate the Poisson distribution with parameters selected from a preliminary data base. Preliminary analysis, as shown in Figure 6, suggests that about 90% of the authors in a large dataset will have 3 or fewer citations. For the proposed algorithm, the probability of executing a complete cocitation computation on a given article is presented in graphical format in Figure 7.

The second advantage of the proposed algorithm is that it scales linearly for changes in the author size, even given constant citation counts. A change from 10 to 20 authors who are equally cited requires approximately twice the computational power. The reduced computational demand occurs because one dimension of pair wise comparisons is conducted "at once" rather than iteratively. An array is generated for each article that compares a selected author to all other authors. In this way, an addition of w authors to the author set size requires w more arrays to be generated, but not w^2 more direct pair

wise comparisons. There is, of course, computational power needed to generate the array, but this is not identical to the computational power needed to compute all pair wise comparisons individually. The difference between computational power requirements for pair wise comparisons, and generating the array containing comparisons, occurs because of a difference in programming methods. The pair wise comparison is generated using visual basic, a high level, object-oriented language. The array is generated using Excel's underlying code, a low level language. High level languages are not generally as efficient in terms of processor usage as low level languages.

These two advantages (author set ordering and array generation) of the proposed algorithm interact. If a large sample is chosen that follows a Poisson distribution, as suggested by other bibliographic theoretical models, the unordered author list computations would scale approximately linearly, while the ordered author list computations would scale much better. Because of these attributes, larger databases can be used with less computational costs, and changes between author set sizes can be made with a less consideration regarding processor demands.

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Figure 2
Logic steps in a basic cocitation count algorithm

Step 1: The program selects author ***k*** and author ***m*** from a list of ***n*** authors. The initial values are defined as: ***k*** = 1 and ***m*** = ***k*** + 1.

Step 2: The program examines article ***j,*** out of a list of ***g*** articles. The initial value of ***j*** is set to 0.

Step 3: The program redefines the article to examine as ***j*** = ***j*** + 1 and proceeds to **step 4**.

Step 4: If either author ***k*** or ***m*** has not been cited in the article ***j***, the program jumps ahead to **step 7**, otherwise it proceeds to **step 5**.

Step 5: If both authors ***k*** and ***m*** have been cited at least once in the article ***j***, the program records the lesser of the two citation values as the cocitation count for authors ***k*** and ***m*** for article ***j***.

Step 6: The cocitation count for article ***j*** is added to the total database cocitation count of authors ***k*** and ***m***.

Step 7: If the Boolean value ***j*** = ***g*** evaluates FALSE, then the program returns to and runs from **step 3**, otherwise the program proceeds to **step 8**.

Step 8: If the Boolean value ***j*** = ***g*** evaluates TRUE, then the program proceeds to **step 9**.

Step 9: If the Boolean value ***m*** = ***n*** evaluates FALSE, then the program proceeds to **step 10**. Otherwise, the program proceeds to **step 11**.

Step 10: The program redefines the authors to be examined as ***k*** = ***k***, ***m*** = ***m*** + 1. The program then returns to and runs from **step 3.**

Step 11: If the Boolean value ***k*** = ***n - 1*** evaluates FALSE, then the program proceeds to step 12. Otherwise, the program proceeds to **step 13**.

Step 12: The program redefines the authors to be examined as ***k*** = ***k*** + 1, ***m*** = ***k*** + 1. The program then returns to and runs from **step 3.**

Step 13: The program opens a spreadsheet populated with the total database cocitation count of authors ***n***, and ends the algorithm.

Figure 3
Logic steps in the proposed cocitation count algorithm

Step1: All authors in a list of ***n*** are sorted into descending order of total citations, so that for all authors ***k***, the citations of ***k*** are greater than author ***k*** +1.

Step 2: The program selects author ***k*** and creates an array of authors ***m*** from a list of ***n*** authors. The initial values are defined as: ***k*** = 1 and ***m*** = all authors **>** ***k***.

Step 3: The program examines article ***j,*** out of a list of ***g*** articles. The initial value of ***j*** is set to 0.

Step 4: The program redefines the article to examine as ***j*** = ***j*** + 1 and proceeds to **step 5**.

Step 5: If the Boolean value "citations count for author **k** in article **j**" **> 0** evaluates FALSE, the program jumps ahead to **step 8.** Otherwise it proceeds to **step 6**.

Step 6: A new array is created. For each item in array ***m***, the program records in the new array the lesser of the two citation values for author ***k*** and the authors in array ***m***. This new array represents the cocitation count for authors ***k*** and all authors in array ***m*** for article ***j***.

Step 7: The new array, representing the cocitation count for article ***j*** , is added to the total database cocitation count of authors ***k*** and authors in the array ***m***.

Step 8: If the Boolean value ***j*** < ***g*** evaluates TRUE, then the program returns to and runs from **step 4**, otherwise the program proceeds to **step 9**.

Step 9: If the Boolean value ***j*** = ***g*** evaluates TRUE, then the program proceeds to **step 10**.

Step 10: If the Boolean value ***k*** = ***n - 1*** evaluates FALSE, then the program proceeds to **step 11**. Otherwise, the program proceeds to **step 12**.

Step 11: The program redefines the authors to be examined as ***k*** = ***k*** + 1, ***m*** = all authors **>** ***k***. The program then returns to and runs from **step 4.**

Step 12: The program opens a spreadsheet populated with the total database cocitation count of authors ***n***, and ends the algorithm.

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Figure 4
Poisson Distribution Function

The Poisson Distribution Function takes the form:

$$f(k;\lambda) = \frac{e^{-\lambda}\lambda^{k}}{k!},$$

Where;

e is the base of the natural logarithm
λ is the expected count of an event during a period of time
k the number of actual events
k! is the factorial of ***k***

Calculations using the Preliminary Dataset

The parameters of the preliminary dataset that used to compute its Probability Distribution are:

λ = Expected citation count per author = average citation count per author = 1.734971

k = The actual citation count for each author

Figure 5
Key Citation Count Probabilities

Citations Count	Cumulative Prob.
1	48.246%
2	74.796%
3	90.151%
4	96.811%

The table above demonstrates the proportion of authors who are expected to lie at or below a given citation count based on preliminary data and an underlying Poisson distribution. This is important since the proposed algorithm requires substantially less processing power for author's with few citations.

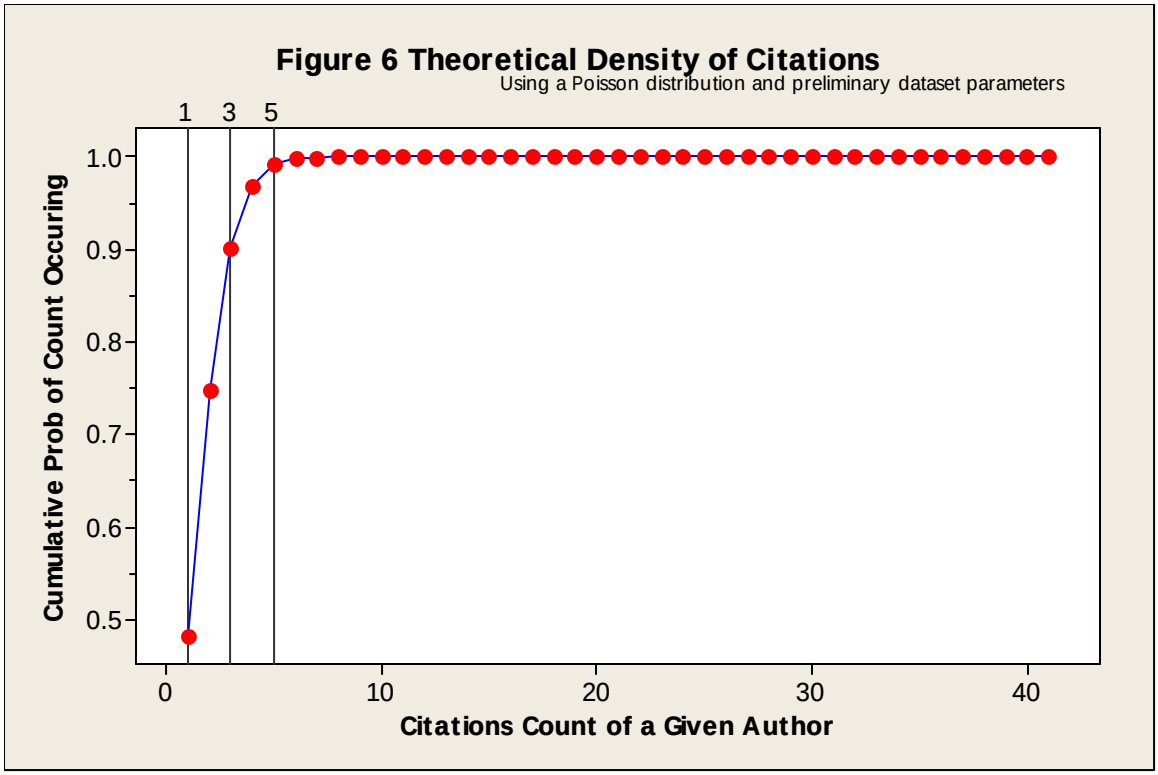


Figure 6 Theoretical Density of Citations
Using a Poisson distribution and preliminary dataset parameters
1 3 5
1.0
0.9
0.8
0.7
0.6
0.5
Cumulative Prob of Count Occuring
0
10
20
30
40
Citations Count of a Given Author

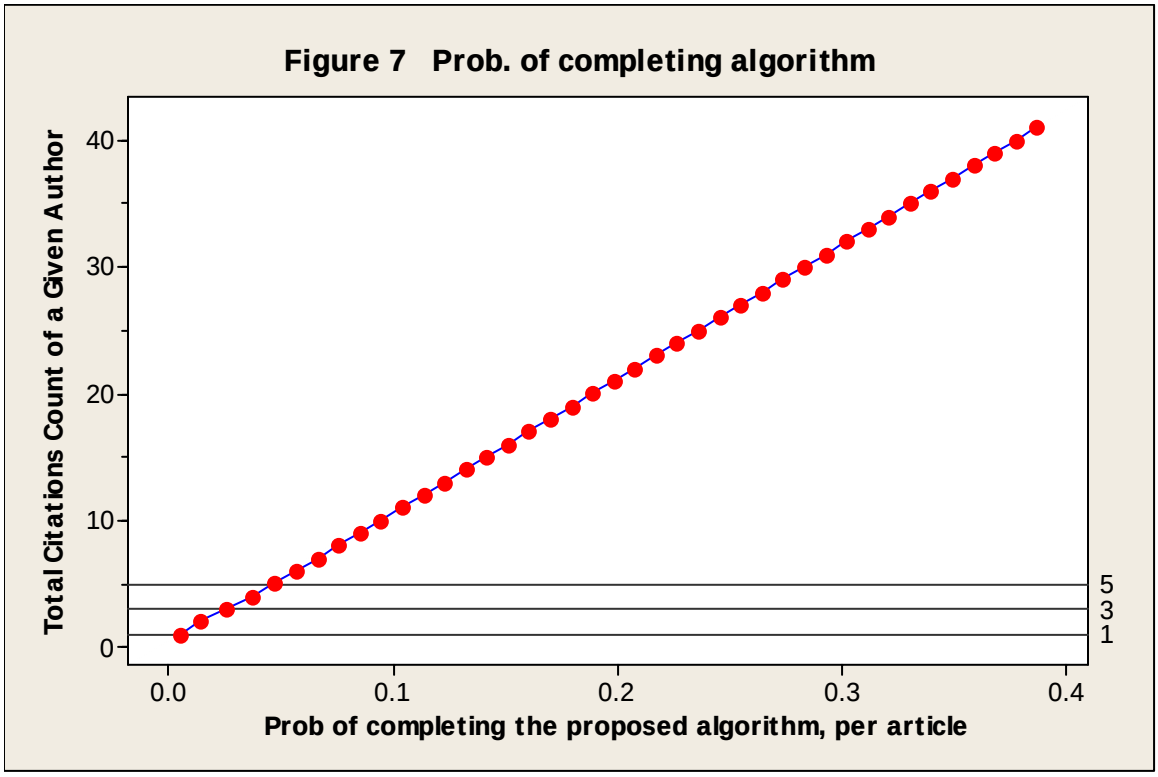


Figure 7 Prob. of completing algorithm
Total Citations Count of a Given Author
40
30
20
10
0
0.0
0.1
0.2
0.3
0.4
Prob of completing the proposed algorithm, per article
5
3
1

3.3 Data Analysis

After the cocitation matrix has been created, it must then be transformed for use. A typical cocitation matrix might take a triangle form shown in the example in Figure 8. This is because there is no need for the other half of the matrix, as it would be repetitive.

Figure 8 Example of cocitation matrix

Author	P. Harris	S. Shim	J. Kean	M. Wilson	G. Raull
P. Harris					
S. Shim	6				
J. Kean	2	8			
M. Wilson	4	3	1		
G. Raull	9	2	0	7	

Unfortunately, SAS and other statistical programs will not always process such a data matrix. SAS requires two changes to this format: (a) the completion of the matrix (b) the adjustment of the diagonal cell values. Transposing the data to fill in the matrix is not difficult or unusual. There are several methods to adjust the diagonal cell values. McCain (1990) discusses three of these methods, which she found to not have significant differences. Parity of results from the three methods was also observed by Eom (2003). For this study, the adjusted diagonal cell values will contain the highest cocitation count for that author. In other words, for a given row the diagonal cell value will be replaced by that row's greatest cell value.

After creating the adjusted cocitation matrix, the data analysis will use the SAS procedure Factor in order to perform a principal component analysis. See the flow chart in Figure 9 for a visualization of the procedure.

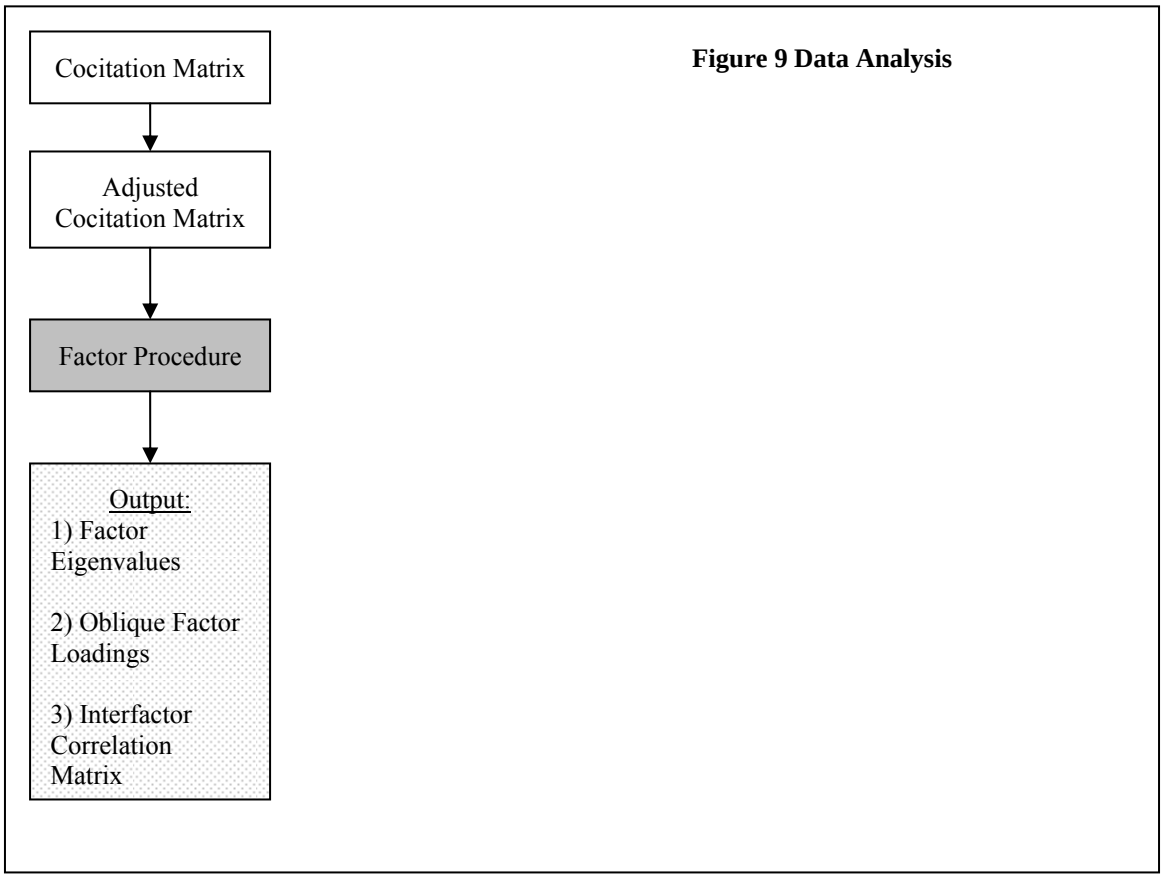


Figure 9 Data Analysis

3.3.1 The Factor Analysis

For this study, factor analysis is used to identify unobserved components that can account for variance in the cocitation frequencies. In short, the factor analysis explains cocitation behavior by creating new variables onto which authors load. Rotation procedures were then used to identify possible correlation between components and to

make loading of authors onto components more readable. The resulting components, undefined, are a method of explaining the structure of the cocitation behavior. Their interpretation is shared by the study, end users, and the authors as subjects.

The adjusted cocitation matrix, created in Excel, was converted to a SAS file and saved for later use. This file formed the input portion of the factor analysis. The analysis procedure began from here. The FACTOR procedure in SAS used several explicit parameters. These are the extraction strategy, criteria for ending iterations of factor creation, rotation method, and dataset to use. This study used principle component analysis as its variance extracting strategy. We also set factors with less than 1 eigenvalue as insubstantial, so iteration of factor creation ended when eigenvalues fell below 1. Finally, the oblique rotation Promax was used in this study. This forms the procedure step of the factor analysis. Next we examine the output of the factor procedure.

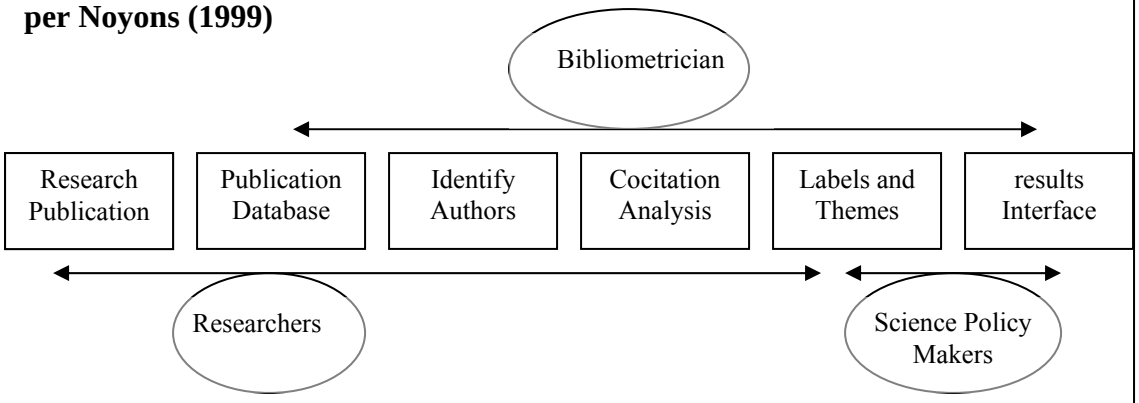
Output from the factor procedure included three items. The first is the factor eigenvalues; a measure of how much variance is accounted for by each factor. For this study, eigenvalues that are less than 1 indicate a factor accounting for less variance than an original variable (an author). This was undesirable for our analysis, and so factors were only be kept if their eigenvalues are above 1. The second output of the factor procedure was the oblique rotation of factor loadings. Oblique rotations assume that factors can be inter-correlated; a more realistic structure for explaining research base behavior. The third output of the factor procedure was the interfactor correlation matrix.

Together, the factor eigenvalues, oblique rotation, and orthogonal rotation formed the three outputs of the factor analysis.

3.4 Validation of Results

The results of the analyses were formed into an interactive website representing the clothing and textile research base at a given time. This process involved interpretation of the data analyses results and rendering information into a display format. Both the interpretation and the rendering were done initially by the researcher, but must be later validated by the end users and the subjects of the research. The tasks associated with performing a cocitation study involve differential validation across field experts, bibliometricians, and end users. This relationship is depicted below in Figure 10.

Figure 10 Schematic view of cocitation study activity per Noyons (1999)



Validation steps prior to the analysis were conducted in sequence during the publication selection, data collection, and data analysis. For example, validating the publication database involved selecting an appropriate body of published work from which to draw inferences of the research domain. As the schematic of cocitation study activity in Figure 10 demonstrates, a selection of representative publications is also validated by the research subjects or field experts. Here follows an outline of the objects or attributes which must be validated by the study, field experts, and end users.

3.4.1 Research Publication

Validating the research publication behavior and collection is a function of the subject researchers. Researchers being assessed through bibliometrics have to independently evaluate whether their collective publication behavior is a proper assessment of their field's knowledge. Researchers in fields that have a systematic bias interrupting publishing may not see the published knowledge in their field as valid for the entire field. Among the reasons a published body may not be found to represent a field's knowledge are: predominance of oral communication, systematic exclusion of researchers from journals for political reasons, or a published literature in one language when the field is multilingual. In these cases there is no valid body of written work that holds the knowledge of the field. Validating that the clothing and textile field does have such a body of knowledge is the work of its researchers or field experts.

3.4.2 Publication database

If a body of published work does represent the knowledge of textile and apparel, where and what is it? The defining this body of knowledge may not be necessary if a representative sample of the published work can be found. For example, this study has chosen the Clothing and Textile Research Journal as representing the published knowledge of the clothing and textile field. This journal was chosen because it is the field's premier journal, and almost all subfields will publish their most important work in it. Also, it would be part of any top clothing and textile researchers publication strategy.

From the point of view of the study, a series of validating questions must be asked: (a) is the publication set bias to certain subfields, specialties, languages, or researchers; (b) is the time period under study large enough to avoid sample size errors or undue influences from editorial preference; (c) does the publication set include journals that have undergone changes of mission, publication frequency, size, or format; (d) is the publication set representative of the whole at reasonable costs to convert to a database; (e) will this publication set yield a database that has potential for future studies. These aspects of the publication set must be validated by the study and the outcome conveyed in its results. The researchers subject to study will have other validation concerns.

For a field expert or a researcher subject to this study, validating the publication database involves defining the unobserved biases in the publication set. For example, clothing marketing researchers may consider the Clothing and Textile Research Journal as slightly less observant of their subfield's knowledge production during certain time periods. They may suggest alternative publications to include or may simply note that further review is merited. Validation of the publication set by field experts and subject researchers is an important step since it signals faith or merit in the results of analysis based on this information. Without validation of the publication set, the results follow the garbage-in garbage-out idiom.

3.4.3 Identify Authors to Analyze

An arbitrary method must be chosen to select a subset of all authors from which to generate the cocitation count. Both the cost of inclusion and the assumptions of factor analysis state that including erroneous authors into the dataset will lead to lower quality results. Therefore, the study must set an arbitrary rule of inclusion. As discussed in the literature review, several methods have been suggested. For this study, only authors who have averaged one citation per year will be included in the final analysis. Validation concerns for the study are: (a) yielding a set of significantly contributing authors; (b) yielding a large author set; (c) accounting for a large portion of the research being cited; (d) reducing the cost of analysis.

Field experts or subject researchers may have divergent validation concerns. For example, field experts may see frequency of citation to be unduly influenced by alternative citation motives, as outlined in the literature review. Also, researchers may oppose or support inclusion of self citations in the frequency counts, which could significantly alter the final author set.

3.4.4 Cocitation Analysis

During the transformation, analysis, and interpretation, there are several points where validity must be monitored. For the study, validation should include observing standard data analysis methods and reporting any important caveats or uncertainties. It also includes defining the cocitation count. For example, the study must define if

cocitation can occur multiple times in a given article. If two authors are cited multiple times, this study counts them as cited as many times as both can be joined: i.e. the lesser of the two frequencies. Field experts or subject researchers may have divergent concerns when examining the cocitation counts. For example, should third or fourth or fifth authors be counted as cocited with each other to the same degree that two primary authors are counted? And should multiple authors be counted as cited together, or should the primary author count alone? These validation concerns should be discussed openly by researchers in the field being evaluated.

3.4.5 Labels and Themes

The data analysis results must be rendered into an interactive website. Although such a rendering is a quantitatively accurate display of the dataset, it requires interpretation to represent the field in question. Naming the elements of the research base, much less the research front they may be used in requires subjective input from field experts and end users. For this study, validation of the map requires the subjective input of the author followed by solicited critique by field experts and end users, and then unsolicited critique by field researchers. Field experts and researchers will validate the map's ability to convey an understanding of the field in terms of its research base and that base's dynamics in time. End users, such as policy makers and department chairs, will validate the maps themes as applicable to management and decision making.

3.4.6 Website Interface

Validating the website interface means questioning its format and ability to convey decision supporting information to end users. Subjects of the study, the field researchers, are not directly involved with this stage of the study. Once the content of the results are validated, the website's ability to support decision making is only of interest to end users and the author.

For the author, the website interface should be validated as concerns: (a) its ability respond to user interaction; (b) its conveyance of assumptions and limitations; (c) the costs of construction and future revision; (d) ease of access. End users have similar but unique validation concerns. Some of these are: (a) ease of use; (b) applicability to decision making needs; (c) availability of the website interface and regular updating, i.e. dependability. End user input will be facilitated through the construction of simple feedback forms nested in the website.

2.5 Creation of a Website

The website that hosts the cocitation results also contains the citation frequency database and a written report on the study including how source publications were chosen, methodology of data analysis, and initial interpretation of the resulting map. The website provides feedback forms that users can fill out in order to critique, clarify, or request explication of the interface and the study as a whole.

There are many methods of creating dynamic content and interactivity on internet applications. JAVA applets, XML tables, and Flash ® Actionscript are just a few examples. The author of this study is more familiar with the Flash program, and so will use it to render the interactive and animated cocitation results. The wide use of Flash and its low bandwidth requirement make it an appropriate choice. There are, however, some limitations to this method of construction. The Flash production environment is proprietary, and so is less likely and more costly to be used by future researchers intending to update the results. Second, because Flash uses client-side computing, there are possibilities for future users to have difficulty accessing the original document due to backwards compatibility of browsers. Current browser and web design conventions have placed backward compatibility at a premium, and so this may not come to be a true barrier. Finally, Flash does not render from a database directly, and so revisions will require more time than if the original document was created using XML, for example. Even considering these limitations, the author feels that creating the website in Flash is the most affordable and reliable method currently at disposal.

4.0 Results of Analyses

4.1 Overview of Results

The results of the analyses can be listed as: Citation Counts, Cocitation Counts, Factoring Solutions, the website that hosts the results, and the author's preliminary interpretation. The citation and cocitation counts are important results because they: (a) allow for duplication of analyses by peer researchers, (b) provide a metric for research behavior in the clothing and textile field, (c) act as data for further studies on the clothing and textile field, and (d) act as empirical data for theory building on citation and cocitation behavior universally. The statistical results from the factoring procedure are important because they: (a) identify structures that account for most of the variance in the research base, (b) reduce the number of variables (usually authors or topics) needed to describe the breadth of the Textile and Apparel field, (c) provide metrics about the loading of authors onto the suggested structures, and (d) analytically identify linkages between authors as they are being used by the research front. Finally, the preliminary interpretation is important because it: (a) provides the field-expert end users with a starting point for their own interpretation and validation, and (b) allows for preliminary validation by searching for clear inconsistencies.

The results are presented below with references to attached appendices. The study results are hosted on the project's web page.

4.2 Results of Data Collection

Collection of citation counts for authors referenced to in the *Clothing and Textiles Research Journal* from 1990-2006 was completed. A total citation count was not taken, however, as some of the cited sources did not act as a research base or had authorship that was markedly different from academic authorship. For example, references to statistical program manuals were not recorded. This choice to not record a small subset of the citations may alter the "top cited" membership, but should not otherwise change the vision of the research base obtained from author cocitation analyses. A complete list of citations not included is given here:

Items Not Included In Citation Count:

- Statistical program manuals
- Reference Materials such as dictionaries
- Trade magazines such as Bobbin
- Newspapers
- Historical Artifacts such as museum collections, letters, or documents dating further back than 1940
- Consultant Reports such as Kurt Salmon & Associates

Special cases when non-authors were kept:

- U.S. Government Department Reports
- Textile and Apparel Industry Organizations such as "American Apparel Manufacturer's Association"

All other references, including self citations, were included in the final citation count. See Appendix A for the full citation counts. The data recorded citations by author and by article, with a result of about 7,792 authors, with 15,307 citations, across 310 articles.

4.3 Citation Data

The citations were grouped into three periods: 1990-1995, 1996-2000, 2001-2006. The dataset covering 2001-2006 includes the first journal of 2006 (Volume 24, Issues 1 & 2), as the journal was still being published without management by Sage. Figure 11 summarizes the citation counts from each time period.

Years	Total Citations	Total Authors	Average Citations Per Author	# with More than 5 Citations	Citations accounted for
1990-1995	4589	2647	1.734	134 or 5%	1248 or 27%
1996-2000	6144	3574	1.719	149 or 4%	1445 or 24%
2001-2006	4574	2828	1.618	113 or 4%	1067 or 23%

Figure 11 Citation Count Summary

The citation data were examined using proc univariate in SAS to identify an underlying distribution. Previous theoretical constructs of citation distribution suggest that citation counts approximate a Poisson distribution, given a large author set ($n >$ 10,000). Our data set contains citation information for about 4500 authors, but is still distributed as an approximate Poisson with $\lambda = 1.7$ for a given 5 year period. Of all

authors cited, those cited five or more times in each five year period under review accounted for only 4-5 percent of the authors but 23-27 percent of the citations. This portion of the authors represents the most influential and pervasive elements of the research base for current TAM research fronts. Authors with five or more citations in a five year period were used to compute cocitation counts.

4.4 Cocitation data

Authors with five or more citations in one of the three time periods (1990-1995, 1996-2000, 2001-2006) had their cocitation counts computed. The cocitation counts were stored in a square matrix, with the trace cells being replaced by the maximum cocitation count for each author. See appendix A for the full cocitation counts.

4.5 The Website

A website was created to host the study results. The website, written by the author, is used to present the results of the study in a more usable format. The written thesis is also available through the website, allowing users to review the study goals and methodology. Interested readers should take a moment to look over the website, hosted at www.missouri.edu/~jmwc7/CTRJ/index.html. Below is a brief description of the website and its tools.

The website has 5 areas: an introduction, the ACA mapping tools, Articles and papers, FAQs, and the raw databases from the study. The introduction to the site provides

an indexed outline to the study's results. It is meant to inform users as to what author cocitation analysis is and why it has been applied to the clothing and textile research field. The ACA mapping tools provides a user interface for sorting and displaying the statistical results. It also allows users to view the initial interpretation of the factor memberships. The ACA mapping tools provides the most important part of the website, in that it reduces the effort required for users to retrieve the desired information from the study results.

The website's "articles and papers" section contains links to this thesis as well as other published literature pertaining to the study. The FAQs section provides a list of common user questions and theirs answers. Finally, the databases section contains links to the citations, cocitations, and analyses results as excel files. These databases allow users to perform alternate studies and to replicate the current study's results. The database section is the second most important aspect of the website.

4.6 Factor analyses:

4.6.1 1990-1995:

The 134 authors' cocitation counts were converted into a correlation matrix and factored. The factors were rotated using the Promax method, resulting in 24 oblique factors with eigenvalues above 1. The 24 factors accounted for 91% of the variance in the cocitation counts. Factor loadings were examined to determine factor membership for each author. A factor loading of .5 or greater was used as criteria for factor membership.

Four factors did not have more than one high loading author, and so was discarded. The remaining 20 factors accounted for 90% of the variance in the cocitation counts. See Figure 12 for a list of the factors, their eigenvalues, their members, and the cumulative variance explained. The number of members to a factor ranged from a maximum of 26 to a minimum of 1. The complete factor loading matrix is attached as appendix B. Interfactor correlations were examined but were not significant. The matrix of interfactor loadings is included as appendix C.

Figure 12: Factors, Members, and Eigenvalues for 1990-1995

Factor 1: Members
Schiffman__L_G
Hawkins__D_I_
Coney__K_A_
Best__R_J_
U_S__Bureau_of_the_Census
Lumpkin__J_R
Mills__M_K_
Howell__R_D
Engel__JF
Blackwell__R_D
Kotsiopulos__A_
Bellenger__D_N_
Darden__W_R
Miniard__P_W
Shim__S_
Reynolds__F_D
Gutman__J
Drake__M_F
Cassill__N_L_
Douglas__S_P_
Dickey__L_E_
Solomon__M_R_
Greenberg__B_A_
Olson__J_C_
Black__W_C_
Sproles G B

Factor 2: Members
Workman__J_E_
Taylor__S_E
Miller__F_G
Fiske__S_T
Buckley__H_M
Freeman__C_M
Kelly__E
DeLong__M_R_
Johnson__K_K_P_
Wingate__S_B
Lennon__S_J
Branson__D_H____
Davis__L_L_
Morganosky__M_A_
Peters__K_
Forsythe__S_M____
Creekmore__A_M_
Kaiser__S_B_

Factor 3: Members
Davis__F
Nagasawa__R_H_
Hutton__S_S_
Stone__G_P
Goffman__E
Nagasawa__R_B_
Kaiser__S_B_
Peters__K_

Factor 4: Members
Mayfield__R_J_
Gully__R_L_
Garnsworthy__R_K
Kenins__P_
Westerman__R_A_
Niwa__M_
Kawabata__S_
Hollies__N_R_S

Factor 5: Members
Canton_B
Wolins__L
Winakor__G_
Horne__L_
Minshall__B_C_
Paek__S_L__
Jacoby__J
Wagner__J
Ettenson__R

Factor 6: Members
Erekosima__T_V_
Alagoa__E_J
Michelman__S_O_
Eicher__J_B_
Daly__M_C_
Hamilton__J_W
Pannabecker__R_K_
Roach_Higgins__M_E_

Figure 12 Continued: Factors, Members, and Eignevalues for 1990-1995

Factor 7: Members	**Factor 8: Members**	**Factor 9: Members**
Finley__E_L_	Markee__N_L_	Swan__J_E_
Leonas__K_K_	Barker__R_L_	Oliver__R_L
American_Association_	Wilson__D_R_	Ward__S_
of_Textile_	Hatch__K_L___	Zeitmal__V_A
Gold__R_E_	Maibach__H_I_	Francis__S_K_
DeJonge__J_O	Hollies__N_R_S	Hirschman__E_C_
Laughlin__J_M_		
Easley__C_B_		
American_Society_for_		
Testing_and		

Factor 10: Members	**Factor 11: Members**	**Factor 12: Members**
Kahle__L_R_	Davis__B_	Cox__C_A_
Goldsmith__R_E___	Sternquist__B_J_	Cox__C_E_
Stith__M_T_	Reynolds__T	Cash__T_F
Allport__G_W_	Sproles__G_B	Forsythe__S_M____
Morganosky__M_A_	Dickerson__K_G_	Johnson__K_K_P_
Sontag__M_S__	Behling__D_U_	

Factor 13: Members	**Factor 14: Members**	**Factor 15: Members**
Cusick__G_E_	AAMA	Horn__M_J_
Hearle__J_W_S_	Jacobs__B_A	Ryan__M_S_
Collier__B_J_	Toyne__B_	Gurel__L_M_
American_Society_for_	U_S__Dept_of_	
Testing_and	Commerce	
Kawabata__S_	Dickerson__K_G_	

Factor 16: Members	**Factor 17: Members**	**Factor 18: Members**
Ettenson__R	Oakes__J_	Lapitsky__M_
Wagner__J	Hamilton__J_W	Sontag__M_S__
Dillman__D_A_	Hamilton__J_A_	Kelley__E_A
Kotler__P_	Pannabecker__R_K_	

Figure 12 Continued: Factors, Members, and Eignevalues for 1990-1996

Factor 19: Members	**Factor 20: Members**
Lusch__R_	Sibley__L_R_
Black__W_C_	Jakes__K_A_

Factor Eignevalues:

Factors	**Variance Explained**
1	**18.8%**
2	**16.7%**
3	**6.6%**
4	**6.2%**
5	**5.6%**
6	**5.0%**
7	**3.9%**
8	**3.5%**
9	**3.2%**
10	**2.8%**
11	**2.4%**
12	**2.2%**
13	**2.0%**
14	**1.9%**
15	**1.7%**
16	**1.5%**
17	**1.5%**
18	**1.3%**
19	**1.2%**
20	**1.1%**

Total Variance Explained 0.911

4.6.2 1996-2000:

The 149 authors' cocitation counts were converted into a correlation matrix and factored. The factors were rotated using the Promax method, resulting in 27 oblique factors with eigenvalues above 1. The 27 factors accounted for 91% of the variance in the cocitation counts. Factor loadings were examined to determine factor membership for each author. A factor loading of .5 or greater was used as criteria for factor membership. Five factors did not have more than one high loading author, and so were discarded. The remaining 22 factors accounted for 90% of the variance in the cocitation counts. See Figure 13 for a list of the factors, their eigenvalues, their members, and the cumulative variance explained. The number of members to a factor ranged from a maximum of 30 to a minimum of 1. The complete factor loading matrix is attached in appendix B. Interfactor correlations were examined, with no correlation being significant. The matrix of interfactor loadings is included in appendix C.

Figure 13: Factors, Members, and Eignevalues for 1996-2000

Factor 1: Members	**Factor 2: Members**	**Factor 3: Members**
Berlyne__D_E_	Freitas__A_J_	Kim__M_S_
Wolins__L_	Hammidi__T_N_	Goldsmith__R_E___
Canton__B_	Hall__C_A	Greenberg__B_A_
Winakor__G_	Kim__J_W_	Bellenger__D_N_
Holbrook__M_B_	Chandler__J_L_	Forsythe__S_M____
Swinney__J_L_	Foucault__M_	Lumpkin__J_R_
Hirschman__E_C_	Hooks__B	Butler__S_
Creekmore__A_M_	Michelman__S_O_	King__C_W
Minshall__B_C_	O_Neal__G_S_	Chowdhary__U_
Hillestad__R_	Wilson__E	Reynolds__F_D_
Farrell_Beck__J_	Kaiser__S_B_	Forney__J_C__
Kadolph__S_J____	Davis__F_D	Darden__W_R
Eckman__M_	Roach_Higgins__M_E_	
DeLong__M_R_	Musa__K_E_	
Kwon__Y_H_	Gurel__L_M_	
Freeman__C_M		
Watkins__S_M_		
Damhorst__M_L_		
Fiore__A_M_		
Laughlin__J_M_		
Fairhurst__A_E_		
Davis__L_L_		
Solomon__M_R_		
Littrell__M_A_		
Morganosky__M_A_		
Salusso_Deonier__C		
Sproles__G_B		
Sheth__J_N		
LaBat__K_L		
Paek__S_L__		

Figure 13 Continued: Factors, Members, and Eigenvalues for 1996-2000

Factor 4: Members
Abraham_Murali__L__
U_S__Dept_of_Labor
Ajzen__I_
Francis__S_K_
Fishbein__M
Bitner__M_J
Dickson__M_A_C_
Dillman__D_A_
Littrell__M_A_
U_S__Bureau_of_
Census
Shim__S_
Butler__S_
Deshpande__R
Eckman__M_

Factor 5: Members
Silberstein__L
Striegel_Moore__R
Cash__T_F
Rodin__J
Thompson__J_K
Freedman__R_J
Winstead__B_M_
Rudd__N_A_
Banner__L_W

Factor 6: Members
Abbey__A_
Edmonds__E_
Cahoon__D_
Johnson__K_K_P_
Workman__J_E_
Lennon__S_J

Factor 7: Members
Glock__R_E
Kunz__G_I_
Jarnow__J_
Brown__P_M_
Dickerson__K_G_
Kincade__D_H_

Factor 8: Members
Tatham__R_L_
Hair__J_F_
Black__W_C____
Moschis__G_P_
Churchill__G_A__Jr_

Factor 9: Members
Helvenston__S_I
Steele__V_
Hamilton__J_
Lowe__J_W_G_
Craik__J
Nagasawa__R_H_
Hutton__S_S_
Blumer__H_

Factor 10: Members
Morgado__M_A_
Oliver__B_A_
Kimle__P_A_
Kean__R_C_

Factor 11: Members
Erekosima__T_V_
Eicher__J_B_
Welters__L_
Musa__K_E_
Roach_Higgins__M_E_

Factor 12: Members
Wind__Y
Ettenson__R_
Wagner__J_
Sheth__J_N

Figure 13 Continued: Factors, Members, and Eigenvalues for 1996-2000

Factor 13: Members
Beatty__S_E_
Liskey_Fitzwater__N_
Churchill__G_A__Jr_

Factor 14: Members
Goffman__E
Belk__R_W_
Stone__G_P
Miller__K_A_

Factor 15: Members
Pourdeyhimi__B_
Wood__E_J_
Hollies__N_R_S
ASTM_

Factor 16: Members
Dale__J_D_
Crown__E_M_
Rigakis__K_B_
ASTM

Factor 17: Members
Covin__J_G
Slevin__D_P
Kincade__D_H_

Factor 18: Members
Warner__P_C_
Wilson__E
McCracken__G_
Evans__C
Davis__F_D

Factor 19: Members
Summers__T_A_

Factor 21: Members
Stein__P_J
Dwyer__F_R

Factor 22: Members
DeJonge__J_O
Jones__J_C_

Factor 24: Members
Lincoln__Y_S_
Deshpande__R

Figure 13 Continued: Factors, Members, and Eigenvalues for 1996-2000

Factor Eignevalues:

Factor	Variance Explained
1	20.0%
2	14.8%
3	7.8%
4	5.9%
5	4.6%
6	4.0%
7	3.3%
8	3.0%
9	2.8%
10	2.4%
11	2.2%
12	2.1%
13	2.0%
14	1.7%
15	1.7%
16	1.6%
17	1.4%
18	1.4%
20	1.2%
21	1.0%
23	0.9%
Total Variance Explained	0.90

4.6.3 2000-2006:

The 113 authors' cocitation counts were converted into a correlation matrix and factored. The factors were rotated using the Promax method, resulting in 21 oblique factors with eigenvalues above 1. The 21 factors accounted for 91% of the variance in the cocitation counts. Factor loadings were examined to determine factor membership for each author. A factor loading of .5 or greater was used as criteria for factor membership. Two factors did not have more than one high loading author, and so were discarded. The remaining 19 factors accounted for 90% of the variance in the cocitation counts. See Figure 14 for a list of the factors, their eigenvalues, their members, and the cumulative variance explained. The number of members to a factor ranged from a maximum of 27 to a minimum of 1. The complete factor loading matrix is attached in appendix B. Interfactor correlations were examined but were not significant. The matrix of interfactor loadings is included as appendix C.

Figure 14: Factors, Members, and Eignevalues for 2001-2006

Factor 1: Members	**Factor 2: Members**	**Factor 3: Members**
Fallon__A	Westbrook__R_A	Fishbein__M
Cash__T_F	Babin__B_J	Eastlick__M_A____
Moreno__J_M_	Ridgway__N_M	Ajzen__I_
Thompson__J_K	Bloch__P_H	Shim__S_
Hillestad__R_	Darden__W_R	Grewal__D
Kimle__P_A_	Kahn__B_E	Feinberg__R_A___
Freedman__R_J	Hirschman__E_C_	Paek__S_L__
Striegel_Moore__R	Holbrook__M_B_	Drake__M_F_
Rodin__J	Lee__M_Y	Lohse__G_L
Fiore__A_M_	Baker__J	Kwon__Y_H_
Rudd__N_A_	Cohen__J_B_	Miniard__P_W_
Salusso_Deonier__C	Kincade__D_H_	Engel__J_F_
Lennon__S_J	Miniard__P_W_	Blackwell__R_D_
Richins__M_L		Donthu__N
DeLong__M_R_		Jasper__C_R_
Feather__B_L_		Kang__J_K
Sparks__D_		
Roach_Higgins__M_E_		
Michelman__S_O_		
Markus__H_R		
Eicher__J_B_		
Damhorst__M_L_		
Hegland__J_E_		
Johnson__K_K_P_		
Davis__L_L_		
Morgado__M_A_		
Kaiser__S_B_		

Factor 4: Members	**Factor 5: Members**	**Factor 6: Members**
Hammidi__T_N_	Strauss__A_L_	Eckman__M_
Freitas__A_J_	Glaser__B_G_	Workman__J_E_
Chandler__J_L_	Corbin__J_	Cassill__N_L_
Hutton__S_S_	Lincoln__Y_S_	Kadolph__S_J____
Davis__F	Cerny__C_A_____	Johnson__K_K_P_
Nagasawa__R_H_	Miller__K_A_	Morganosky__M_A_
Farrell_Beck__J_	Sontag__M_S__	Dillman__D_A_
Kaiser__S_B_	Stone__G_P	Drake__M_F_
McCracken__G_		

Figure 14 Continued: Factors, Members, and Eigenvalues for 2001-2006

Factor 7: Members	**Factor 8: Members**	**Factor 9: Members**
Watkins__S_M_	Tung__R_L	Koh__A_
Kallal__M_J_	Sternquist__B_J_	Nelson__N_J_
LaBat__K_L	Dickerson__K_G_	McCracken__G_
Istook__C_L	Rabolt__N_J____	
	Morganosky__M_A_	
	Kincade__D_H_	

Factor 10: Members	**Factor 11: Members**	**Factor 12: Members**
Craig__J_S_	Dickson__M_A_	Kunz__G_I_
Brush__C_G	U_S__Bureau_of_Census	Pine__B_J
Horridge__P_E_	Donthu__N	Lee__S_
	Belk__R_W_	
	Littrell__M_A_	

Factor 13: Members	**Factor 14: Members**	**Factor 15: Members**
ASTM	Oliver__M	Vitell__S_J
Gamble__G	Feather__B_L_	Rawwas__M_Y_A
Price__J		Moschis__G_P_
Collier__B_J_		

Factor 16: Members	**Factor 17: Members**	**Factor 18: Members**
Kean__R_C_	Jasper__C_R_	Belleau__B_D____
Laughlin__J_	Paek__S_L__	Summers__T_A_
Dillman__D_A_		

Figure 14 Continued: Factors, Members, and Eigenvalues for 2001-2006

Factor 19: Members
Fundaburk__E_L
Morgado__M_A_

Factor Eignevalues:

Factor	Eigenvalues
1	22.0%
2	15.3%
3	8.5%
4	6.4%
5	4.9%
6	4.6%
7	3.8%
8	3.2%
9	2.7%
10	2.4%
11	2.4%
12	2.1%
13	2.0%
14	1.9%
15	1.8%
16	1.6%
17	1.5%
18	1.3%
19	1.1%

Total Variance Explained 0.90

4.7 Preliminary Interpretation

4.7.1 Factor Interpretation

Preliminary interpretation of factors was completed. Using keywords associated with the authors being examined, an estimated commonality was recorded. For example, in the 1990-1995 period, Factor 14 contained: American Apparel Manufacturer's Association, Jacobs, B.A., Toyne, B., U.S.Dept of Commerce, and Dickerson, K.G. After looking at keywords associated with the published research of these authors and groups, I interpreted this factor to represent the research base of international trade in the apparel industry. In some cases, it appears that multiple research bases are represented by a single factor. This could occur because the authors are producing research in multiple areas. If so, their loading in one factor may represent the best reduction of variance without indicating that the authors are being linked across all their works. In fact, the majority of the authors appear to have published in a variety of areas, but are only cited (in *CTRJ* from 1990-2006) for one or two of these areas. Alternatively, author's may have been cited because they appear as second author on work mostly performed by graduate students. This would alter what structure is appearing through citation behavior, though no discredit that structure. For this and other reasons, the method of preliminary interpretation should not be treated as a summary of behavior but an abstraction of that behavior. Experts in the subfields of clothing and textile research will, most likely, have much more nuanced interpretation as to why authors have loaded onto factors as they have during these time periods.

4.7.2 1990-1995

Figure 15 outlines the factors' membership and the author's preliminary interpretation of the factor's commonality.

Figure 15: Factor Interpretation and Members for 1990-1995

Factor 1: Members	**Factor 2: Members**	**Factor 3: Members**
Schiffman__L_G Hawkins__D_I_ Coney__K_A_ Best__R_J_ U_S__Bureau_of_ the_Census Lumpkin__J_R Mills__M_K_ Howell__R_D Engel__JF Blackwell__R_D Kotsiopulos__A_ Bellenger__D_N_ Darden__W_R Miniard__P_W Shim__S_ Reynolds__F_D Gutman__J Drake__M_F Cassill__N_L_ Douglas__S_P_ Dickey__L_E_ Solomon__M_R_ Greenberg__B_A_ Olson__J_C_ Black__W_C_ Sproles__G_B **Interpretation:** Marketing and business treatment of apparel decision making	Workman__J_E_ Taylor__S_E Miller__F_G Fiske__S_T Buckley__H_M Freeman__C_M Kelly__E DeLong__M_R_ Johnson__K_K_P_ Wingate__S_B Lennon__S_J Branson__D_H____ Davis__L_L_ Morganosky__M_A_ Peters__K_ Forsythe__S_M____ Creekmore__A_M_ Kaiser__S_B_ **Interpretation:** The visual: Fashion innovation, prototyping, spatial aptitude, visual analysis.	Davis__F Nagasawa__R_H_ Hutton__S_S_ Stone__G_P Goffman__E Nagasawa__R_B_ Kaiser__S_B_ Peters__K_ **Interpretation:** Symbolic Interactionist Theory

Figure 15: Factor Interpretation and Members for 1990-1995

Factor 4: Members
Mayfield__R_J_
Gully__R_L_
Garnsworthy__R_K
Kenins__P_
Westerman__R_A_
Niwa__M_
Kawabata__S_
Hollies__N_R_S

Interpretation:
Textile Mechanics and Testing

Factor 5: Members
Canton_B
Wolins__L
Winakor__G_
Horne__L_
Minshall__B_C_
Paek__S_L__
Jacoby__J
Wagner__J
Ettenson__R

Interpretation:
Satisfaction and Business management of Satisfaction

Factor 6: Members
Erekosima__T_V_
Alagoa__E_J
Michelman__S_O_
Eicher__J_B_
Daly__M_C_
Hamilton__J_W
Pannabecker__R_K_
Roach_Higgins__M_E_

Interpretation:
Ethnographic Research

Factor 7: Members
Finley__E_L_
Leonas__K_K_
AATM
Gold__R_E_
DeJonge__J_O
Laughlin__J_M_
Easley__C_B_
ASTM

Interpretation:
Textile and chemical resistance

Factor 8: Members
Markee__N_L_
Barker__R_L_
Wilson__D_R_
Hatch__K_L___
Maibach__H_I_
Hollies__N_R_S

Interpretation:
Textile comfort including thermal properties

Factor 9: Members
Swan__J_E_
Oliver__R_L
Ward__S_
Zeitmal__V_A
Francis__S_K_
Hirschman__E_C_

Interpretation:
Consumer satisfaction, trust, regret.

Continued Figure 15: Factor Interpretation and Members for 1990-1995

Factor 10: Members
Kahle__L_R_
Goldsmith__R_E___
Stith__M_T_
Allport__G_W_
Morganosky__M_A_
Sontag__M_S__

Interpretation:
Psychological and Social psychological treatment of Apparel Decision making

Factor 11: Members
Davis__B_
Sternquist__B_J_
Reynolds__T
Sproles__G_B
Dickerson__K_G_
Behling__D_U_

Interpretation:
Relationship between Apparel Industry and Larger Society

Factor 12: Members
Cox__C_A_
Cox__C_E_
Cash__T_F
Forsythe__S_M____
Johnson__K_K_P_

Interpretation:
Fashion and Individual Expression

Factor 13: Members
Cusick__G_E_
Hearle__J_W_S_
Collier__B_J_
ASTM
Kawabata__S_

Interpretation:
Textile chemistry and production methods

Factor 14: Members
AAMA
Jacobs__B_A
Toyne__B_
U_S__Dept_of_
Commerce
Dickerson__K_G_

Interpretation:
International Trade

Factor 15: Members
Horn__M_J_
Ryan__M_S_
Gurel__L_M_

Interpretation:
Clothing and the self

Factor 16: Members
Ettenson__R
Wagner__J
Dillman__D_A_
Kotler__P_

Interpretation:
Effects on Shopping Intention in a Retail Space

Factor 17: Members
Oakes__J_
Hamilton__J_W
Hamilton__J_A_
Pannabecker__R_K_

Interpretation:
Critique of Symbolic Interactionist theory

Factor 18: Members
Lapitsky__M_
Sontag__M_S__
Kelley__E_A

Interpretation:
Clothing and General Social Values

Continued Figure 15: Factor Interpretation and Members for 1990-1995

Factor 19: Members
Lusch__R_
Black__W_C_

Interpretation:
Services and relationship management

Factor 20: Members
Sibley__L_R_
Jakes__K_A_

Interpretation:
Textile Anthropology and Archeology

Factor 21: Members
Kunz__G_I_

Interpretation:
Merchandising Teaching and Business

Factor 22: Members
Sheth__J_N

Interpretation:
Macro-Economics and Global Business

Of the 22 factors retained, two factors had only one author who loaded strongly onto it. Factor 21 had only the member Kunz, G.I., and factor 22 had only one member, Sheth, J.N. Factors 1 and 2 were the most important and accounted for 19 and 17 percent reductions in variance, respectively. As stated before, none of the interfactor correlations were significant. This suggests that there are not inherent poles of opposition in the clothing and textile field. Even factors 3 and 17, which were interpreted as proponents and critics of Symbolic Interaction Theory, did not form a true axis within the cocitation data.

4.7.3 1996-2000

Of the 26 factors retained, five factors had only one author who loaded strongly onto it, and so were discarded. Figure 16 outlines the factors' membership and the author's preliminary interpretation of the factor's commonality.

Figure 16: Factor Interpretation and Members for 1996-2000

Factor 1: Members
Berlyne__D_E_
Wolins__L_
Canton__B_
Winakor__G_
Holbrook__M_B_
Swinney__J_L_
Hirschman__E_C_
Creekmore__A_M_
Minshall__B_C_
Hillestad__R_
Farrell_Beck__J_
Kadolph__S_J____
Eckman__M_
DeLong__M_R_
Kwon__Y_H_
Freeman__C_M
Watkins__S_M_
Damhorst__M_L_
Fiore__A_M_
Laughlin__J_M_
Fairhurst__A_E_
Davis__L_L_
Solomon__M_R_
Littrell__M_A_
Morganosky__M_A_
Salusso_Deonier__C
Sproles__G_B
Sheth__J_N
LaBat__K_L
Paek__S_L__

Interpretation:
The business side of TAM and how TAM departments operate in this space

Factor 2: Members
Freitas__A_J_
Hammidi__T_N_
Hall__C_A
Kim__J_W_
Chandler__J_L_
Foucault__M_
Hooks__B
Michelman__S_O_
O_Neal__G_S_
Wilson__E
Kaiser__S_B_
Davis__F_D
Roach_Higgins__M_E_
Musa__K_E_
Gurel__L_M_

Interpretation:
Appearance & Identity as it pertains to gender and sexuality

Factor 3: Members
Kim__M_S_
Goldsmith__R_E___
Greenberg__B_A_
Bellenger__D_N_
Forsythe__S_M____
Lumpkin__J_R_
Butler__S_
King__C_W
Chowdhary__U_
Reynolds__F_D_
Forney__J_C__
Darden__W_R

Interpretation:
Marketing and business treatment of apparel decision making

Figure 16: Factor Interpretation and Members for 1996-2000

Factor 4: Members
Abraham_Murali__L__
U_S__Dept_of_Labor
Ajzen__I_
Francis__S_K_
Fishbein__M
Bitner__M_J
Dickson__M_A_C_
Dillman__D_A_
Littrell__M_A_
U_S__Bureau_of_
Census
Shim__S_
Butler__S_
Deshpande__R
Eckman__M_

Interpretation:
Qualitative treatment of social environment and alternative-markets on employees and consumers

Factor 5: Members
Silberstein__L
Striegel_Moore__R
Cash__T_F
Rodin__J
Thompson__J_K
Freedman__R_J
Winstead__B_M_
Rudd__N_A_
Banner__L_W

Interpretation:
Body image, eating disorders, and gender

Factor 6: Members
Abbey__A_
Edmonds__E_
Cahoon__D_
Johnson__K_K_P_
Workman__J_E_
Lennon__S_J

Interpretation:
Theoretical constructs of Fashion innovation, leadership, dispersion, motivation, and behavior

Factor 7: Members
Glock__R_E
Kunz__G_I_
Jarnow__J_
Brown__P_M_
Dickerson__K_G_
Kincade__D_H_

Interpretation:
Textile and Apparel as an Academic Department: research, Department Administration, Field Coverage

Factor 8: Members
Tatham__R_L_
Hair__J_F_
Black__W_C____
Moschis__G_P_
Churchill__G_A__Jr_

Interpretation:
Applied multivariate statistics

Factor 9: Members
Helvenston__S_I
Steele__V_
Hamilton__J_
Lowe__J_W_G_
Craik__J
Nagasawa__R_H_
Hutton__S_S_
Blumer__H_

Interpretation:
Anthropology and Cultural Studies applied to Dress

Figure 16 Continued: Factor Interpretation and Members for 1996-2000

Factor 10: Members Morgado__M_A_ Oliver__B_A_ Kimle__P_A_ Kean__R_C_ **Interpretation:** Fashion Academic Research	**Factor 11: Members** Erekosima__T_V_ Eicher__J_B_ Welters__L_ Musa__K_E_ Roach_Higgins__M_E_ **Interpretation:** Dress and Identity: ethnographic Perspective	**Factor 12: Members** Wind__Y Ettenson__R_ Wagner__J_ Sheth__J_N **Interpretation:** Apparel Buyers and Global Apparel Industry
Factor 13: Members Beatty__S_E_ Liskey_Fitzwater__N_ Churchill__G_A__Jr_ **Interpretation:** Consumer Segementation: By Attitude, psychographics	**Factor 14: Members** Goffman__E Belk__R_W_ Stone__G_P Miller__K_A_ **Interpretation:** Consumption and identity	**Factor 15: Members** Pourdeyhimi__B_ Wood__E_J_ Hollies__N_R_S ASTM_ **Interpretation:** Textile mechanics: abrasion
Factor 16: Members Dale__J_D_ Crown__E_M_ Rigakis__K_B_ ASTM **Interpretation:** Heat and chemical protective apparel: design and testing	**Factor 17: Members** Covin__J_G Slevin__D_P Kincade__D_H_ **Interpretation:** Apparel Industry technology investment: Quick response, mass Customization, etc.	**Factor 18: Members** Warner__P_C_ Wilson__E McCracken__G_ Evans__C Davis__F_D **Interpretation:** Consumer Goods and cultural meaning

Figure 16 Continued: Factor Interpretation and Members for 1996-2000

Factor 19: Members Summers__T_A_ **Interpretation:** Leather Market	**Factor 21: Members** Stein__P_J Dwyer__F_R **Interpretation:** Unsure
Factor 22: Members DeJonge__J_O Jones__J_C_ **Interpretation:** Chemical residue in textiles	**Factor 24: Members** Lincoln__Y_S_ Deshpande__R **Interpretation:** Org Culture
Factor 24: Members Monson__T_	

4.7.4 2001-2006

Figure 17 outlines the factors' membership and the author's preliminary interpretation of the factor's commonality. Of the 20 factors retained, one had only a single author who loaded strongly onto it, and so was discarded. As stated before, none of the interfactor correlations were significant.

Figure 17: Factor Interpretation and Members for 2001-2006

Factor 1: Members	**Factor 2: Members**	**Factor 3: Members**
Fallon__A Cash__T_F Moreno__J_M_ Thompson__J_K Hillestad__R_ Kimle__P_A_ Freedman__R_J Striegel_Moore__R Rodin__J Fiore__A_M_ Rudd__N_A_ Salusso_Deonier__C Lennon__S_J Richins__M_L DeLong__M_R_ Feather__B_L_ Sparks__D_ Roach_Higgins__M_E_ Michelman__S_O_ Markus__H_R Eicher__J_B_ Damhorst__M_L_ Hegland__J_E_ Johnson__K_K_P_ Davis__L_L_ Morgado__M_A_ Kaiser__S_B_	Westbrook__R_A Babin__B_J Ridgway__N_M Bloch__P_H Darden__W_R Kahn__B_E Hirschman__E_C_ Holbrook__M_B_ Lee__M_Y Baker__J Cohen__J_B_ Kincade__D_H_ Miniard__P_W_	Fishbein__M Eastlick__M_A____ Ajzen__I_ Shim__S_ Grewal__D Feinberg__R_A___ Paek__S_L__ Drake__M_F_ Lohse__G_L Kwon__Y_H_ Miniard__P_W_ Engel__J_F_ Blackwell__R_D_ Donthu__N Jasper__C_R_ Kang__J_K
Interpretation: The image of the body: gender, sexuality, aesthetics, attractiveness, satisfaction	**Interpretation:** Marketing: segementation, customer service, attitude, etc	**Interpretation:** Consumer psychology: behavior, attitude

Figure 17 Continued: Factor Interpretation and Members for 2001-2006

Factor 4: Members
Hammidi__T_N_
Freitas__A_J_
Chandler__J_L_
Hutton__S_S_
Davis__F
Nagasawa__R_H_
Farrell_Beck__J_
Kaiser__S_B_
McCracken__G_

Interpretation:
Social meaning of Appearance: Symbolic Interaction Perspective

Factor 5: Members
Strauss__A_L_
Glaser__B_G_
Corbin__J_
Lincoln__Y_S_
Cerny__C_A_____
Miller__K_A_
Sontag__M_S__
Stone__G_P

Interpretation:
Sociology using Qualitative methods: Human ecology, ethnographic research, grounded theory

Factor 6: Members
Eckman__M_
Workman__J_E_
Cassill__N_L_
Kadolph__S_J____
Johnson__K_K_P_
Morganosky__M_A_
Dillman__D_A_
Drake__M_F_

Interpretation:
Retailing and the apparel market

Factor 7: Members
Watkins__S_M_
Kallal__M_J_
LaBat__K_L
Istook__C_L

Interpretation:
Design and testing of functional or protective apparel

Factor 8: Members
Tung__R_L
Sternquist__B_J_
Dickerson__K_G_
Rabolt__N_J____
Morganosky__M_A_
Kincade__D_H_

Interpretation:
Global Trade and TAM: business and academics

Factor 9: Members
Koh__A_
Nelson__N_J_
McCracken__G_

Interpretation:
material culture analysis

Factor 10: Members
Craig__J_S_
Brush__C_G
Horridge__P_E_

Interpretation:
Women and entrepernurialship in the Apparel industry

Factor 11: Members
Dickson__M_A_
U_S__Bureau_of_Census
Donthu__N
Belk__R_W_
Littrell__M_A_

Interpretation:
Ethnicity, Identity, and Apparel Business

Factor 12: Members
Kunz__G_I_
Pine__B_J
Lee__S_

Interpretation:
Mass Customization

Figure 17 Continued: Factor Interpretation and Members for 2001-2006

Factor 13: Members	**Factor 14: Members**	**Factor 15: Members**
ASTM Gamble__G Price__J Collier__B_J_ **Interpretation:** Testing and Chemistry of Cotton	Oliver__M Feather__B_L_ **Interpretation:** TAM Program Management	Vitell__S_J Rawwas__M_Y_A Moschis__G_P_ **Interpretation:** Ethics in advertising, marketing

Factor 16: Members	**Factor 17: Members**	**Factor 18: Members**
Kean__R_C_ Laughlin__J_ Dillman__D_A_ **Interpretation:** TAM Faculty and Department Assessment	Jasper__C_R_ Paek__S_L__ **Interpretation:** Multichannel shopping	Belleau__B_D____ Summers__T_A_ **Interpretation:** Leather Market

Factor 19: Members	**Factor 20: Members**
Fundaburk__E_L Morgado__M_A_ **Interpretation:** Hawaiian apparel: industry and aesthetic	Kotsiopulos__A_ **Interpretation:** Unsure

4.7.5 Post-Hoc Analysis of the total 15 year period

In a post-hoc analysis, the three time periods were agglomerated and a new study was performed using the full 15 year time period. Because of the change in time period, a different inclusion criterion was necessary. For this new study, authors were included in analysis if their citation count was 15 or greater. Of 7,792 authors in the 15 year dataset, this criterion resulted in 88 authors whose cocitation behavior was analyzed. Because the analysis was the same for this new study as for the study proposed, the author will go directly to a presentation of the results rather than re-stating the methodology.

All of the 88 authors had a maximum cocitation count of 6 or greater. Only 55 authors had a maximum cocitation count of 10 or greater. These 88 authors contain .11% of the authors in the 15 year dataset, and about 17% of the citations.

The factor analysis extracted 17 factors, but two were discarded because of low factor loadings by the authors. Therefore, 15 factors were retained that explained 86% of the variance in the cocitation behavior. Factor interpretations are given in figure 18. The factors were rotated using an oblique rotation strategy, but no interfactor correlations were significant.

Figure 18: Factor membership for time period 1990-2006

Author Members	Factor #	Interpretation
Fiore__A_M_	1	Product Development
DeLong__M_R_		Aesthetics
Cash__T_F		Sizing

Kimle__P_A_		
Salusso_Deonier__C		
Feather__B_L_		
Rudd__N_A_		
LaBat__K_L		
Morgado__M_A_		
Lennon__S_J		
Damhorst__M_L_		
Watkins__S_M_		
Roach_Higgins__M_E_		
Eicher__J_B_		
Davis__L_L_		
Johnson__K_K_P_		
Kwon__Y_H_		

Hammidi__T_N_	2	Culture and Consumption
Chandler__J_L_		Symbolic Interaction Theory
Freitas__A_J_		
Wilson__E		
Davis__F		
Hutton__S_S_		
Goffman__E		
Nagasawa__R_H_		
Kaiser__S_B_		
Michelman__S_O_		
O_Neal__G_S_		
Stone__G_P		
Freeman__C_M		
McCracken__G_		

Forsythe__S_M____	3	Dress and Sexuality
Workman__J_E_		
Buckley__H_M		
Johnson__K_K_P_		
Davis__L_L_		
Lennon__S_J		

Engel__J_F_ Blackwell__R_D_ Miniard__P_W_ Moschis__G_P_ Bloch__P_H U_S__Bureau_of_Census	4	Consumer Behavior
---	---	---
Winakor__G_ Minshall__B_C_ Farrell_Beck__J_ Holbrook__M_B_ Kadolph__S_J____ Eckman__M_ Jacoby__J Hirschman__E_C_ Sproles__G_B	5	Branding
---	---	---
Lumpkin__J_R Reynolds__F_D Drake__M_F Gutman__J Darden__W_R Kotsiopulos__A_	6	Elderly as Consumers
---	---	---
Eastlick__M_A____ Sheth__J_N Fishbein__M Summers__T_A_ Shim__S_ Drake__M_F_ Kotsiopulos__A_	7	Predicting Social Behavior Attitude Theory
---	---	---
Kincade__D_H_ Dillman__D_A_ Horridge__P_E_ Dickerson__K_G_ Cassill__N_L_	8	Apparel Manufacturing

U_S__Dept_of_Commerce Kunz__G_I_		

Kean__R_C_ Laughlin__J_M_ Kunz__G_I_	9	Clothing and Textile Academics
	---	
Dickson__M_A_C_ Littrell__M_A_	10	Sustainable Development and Trade
	---	
Erekosima__T_V_ Eicher__J_B_ Roach_Higgins__M_E_	11	Ethnographic Research
	---	
Goldsmith__R_E___ Sternquist__B_J_ Morganosky__M_A_	12	International Innovation
	---	
Hatch__K_L___ Maibach__H_I_ Hollies__N_R_S	13	Textile Comfort
	---	
Sontag__M_S__ Creekmore__A_M_	14	Human Ecology and Apparel

Kawabata__S_ Hollies__N_R_S	15	Textile Testing

4.7.6 Other Interpretations

Overview

The factors clearly changed over the 15 year time period. Not only did their membership change, but the communality of the members appears to shift. This is an important aspect of the results in that it captures the evolving nature of the research base. For example, research bases in eating disorders, sexuality, and body image all appear as major components of the clothing and textile research base after 1995. Also notice the appearance of multivariate statistics, which joins the clothing and textile research base after 1995. Smaller shifts, such as the quieting of discussion surrounding symbolic interaction theory and metatheory, are equally important to clothing and textile field research managers. These shifts, large and small, identify the change in what knowledge is picked up and extended, or otherwise likely to impact present research efforts.

Gender Effects

Another salient point, which relates somewhat to work done by Laughlin & Kean (1996), is that there has been a clear tendency for clothing and textile research to target research bases that have women as subjects. Laughlin & Kean (1996) had described the clothing and textile research faculty as being largely comprised *of* women. There may or may not be a significant connection between the gender of the researchers and gendered selection of topics. The present study cannot make a conclusion on this matter. But, from an initial interpretation of factors and keywords of top-cited authors, it is clear that

women's ecology, psychology, and behavior are an underlying concern of researchers in the clothing and textile field. Research in women as subjects may be lacking or prejudiced in the contributing disciplines, causing high quality work on women to find publication in the Textile and Apparel field. Again, further research would be required to quantify to what extent the phenomena explains general research base selection and usage.

The Presence of Outside Researchers vs. Clothing and Textile Faculty

The results from all three time periods can be used to trace the use of external research within the clothing and textile research base. For example, a large number of the top cited authors are neither publishing in clothing and textile journals, not are they employed in clothing and textile departments. Regardless, their work is considered necessary to expanding clothing and textile research fronts. An interested field expert could use the statistical results to assess where, what, and how external knowledge is brought to bare on clothing and textile research. In the following paragraphs, the author poses a few interpretations along these lines.

External research did not appear to be less nested than internal research. That is to say, external research appears to have been treated essentially the same as internal research, at least among the top cited authors. This may have some bearing on whether the clothing and textile researcher should hold academic positions only within clothing

and textile departments. For the top cited authors, academic post does not seem to affect how the research front uses their work.

Outside researchers appear more likely when their research is of a "basic" nature: statistical methods, mechanical testing methods, aesthetics, human behavior, ethnographic research tools, etc. In general, outside research seemed to be used when it had reached a level of maturity such that it was considered generally accepted within the host field. For example, the first clothing and textile e-commerce research base appeared to have brought in human-machine research that was dating from a period before the internet despite the fact that concurrent publications in human-machine interfaces would have included preliminary explorations of the appearance of the internet. Further, the author suggests that this tendency to borrow only the mature research does not apply to the disciplines which represent the core of clothing and textiles research. It appears that changes in marketing, business, or applied psychology would have been used right away by clothing and textile scholars. Perhaps this occurs because clothing and textile scholars feel equipped to weigh-in on an ongoing debate and understand the complexity of new theoretical propositions in the major contributing disciplines.

The Mix of Disciplines.

The clothing and textile research agenda has always reflected the fact that it is a field, not a discipline. Our scholars come from diverse educational backgrounds, and work in disparate academic settings. In addition to their own expertise, clothing and

textile scholars have often partnered with various disciplinary scholars to advance the field's research agenda. What the results of this study begin to make clear is to what degree our research base uses the contributing disciplines. In the following paragraphs, the author outlines some important points that emerge from the study results.

The results from all three time periods, and from the post-hoc analysis, show that the following disciplines are vital contributors to clothing and textile research: marketing, clothing design, ethnography, business management, macroeconomics, sociology, psychology, engineering. To go one step further, we can identify the top four disciplines in terms of variance explained: Marketing, ethnography, psychology, sociology. For field experts, either of the previous lists pose an interesting view of the clothing and textile research base. For example, for an academic department that prides itself on high employment preparedness, does this not relate to the incredible shift toward a "knowledge economy"? It is the author's view that the identity of the major contributing disciplines is largely an indicator of the clothing and textile field being application oriented. This is discussed at greater length below.

Embracing Internet and E-Commerce

The results of the study show that the clothing and textile research front quickly incorporated e-commerce and the internet into its research base. At the very least, this shows the degree to which our field is sensitive to changes in general culture. The author proposes that the clothing and textile field is uniquely tied to larger society trends through

two particular mechanisms: the time horizon of our research agenda, and the subjects we tend to study. The first mechanism refers to the fact that the clothing and textile research agenda is not dominated by long standing problems for which researchers must be dedicated for extended periods. All research fronts have their agendas, and some of these agendas contain enormous projects that will remain central for decades at a time. The mapping of human DNA was one such research goal in biology. It dominated research efforts of top scholars for a long period. Now in biology, the cataloging of DNA variations is essentially the same type of project. Clothing and textile research goals tend to be smaller in scale and so are more sensitive to environmental changes.

The other mechanism which tends to tie clothing and textile research to general culture is the fact that our projects subjects are usually tied to human behavior. This may take the form of marketing segmentation, fashion theory, consumer attitude, etc. The human behaviors we tend to observe and experiment upon are very sensitive to cultural changes. Shopping behavior, gift giving, and patronage are all examples of individual behaviors that largely reflect our culture rather than a static aspect of humanity.

Application Oriented

The clothing and textile research base appears to show a definitive preference for applicable knowledge. This interpretation should also help end users understand why the study results found certain contributing disciplines. Clothing and textile academic departments tend to focus on producing high employment readiness among their

graduates. Although far from a trade school, clothing and textile degrees can be more application oriented than a bachelor's degree is business, for example. Twenty five years ago, this would have meant training apparel production and designer managers. As production factories in both textiles and apparel left the U.S., clothing and textile academics shifted to what sectors of the industry were flourishing. By 2006, marketing and other "knowledge" intensive sectors were the only segments of the apparel value chain that could compete as domestic industries. Marketing, branding, and to a lesser extent, apparel design together represent a very large proportion of the clothing and textile research base. It is no surprise they also represent a large portion of textile and apparel employment.

Comparison of the Three Smaller Segments with 15 Year Block

The post-hoc analysis of the combined 15 year database should be used as a reference point for the clothing and textile research base in general. That is to say, it is the highest-order abstraction available to describe actual research base usage within the clothing and textile field. No other published work documents as much of the research behavior to our field. External researchers, in particular, should review the 15 year period results first. For people who do not have a background in the field, it shows what disciplines and knowledge has been our backbone since around 1990. The three 5 year segments provide a finer instrument for measuring the field dynamics, rather than just summarizing its shape and interests.

For expert end users, the 3 five year results will show subtle shifts in the conduct of researchers and where the research base grounds itself. Although the clothing and textile research field does not change so quickly that we are looking at new configurations, it does develop in specific and identifiable ways. For a field expert, we expect the 5 year results to be more meaningful than the 15 year results.

Although not a field expert, the author has a few interpretations to note when comparing the 15 year results with the three 5 year block results. First, the 15 year study identifies fewer authors, fewer factors, and fewer contributing disciplines than the five year results. This suggests that there is a less dynamic core to the clothing and textile research base that is supplemented by a more dynamic periphery. The 15 year study rendered the core visible, as these disciplines and subjects endured as major contributors to the clothing and textile research front since 1990. The 5 year study results highlighted the periphery active during that period. This periphery was not, it seems, an indicator of the direction of the field. The author suggests that the direction of the field is tied to larger cultural changes, and we will not find the rising and domination of a contributing discipline or subject unless its also tied to cultural shifts. What does the periphery represent, then? Aside from saying that all fields must have a core agenda and a widely changing agenda, the author proposes that academic structure may be accounting for some research behavior.

There has been some upheaval in the academic structure of clothing and textile programs. Departments have: lost professors when tenure was not available, swelled or

waned in undergraduate enrollment, lost graduate programs, merged into disciplinary departments, etc. It is possible that the periphery in the clothing and textile research base appears because of the influence academic structuring has had over the contributing researchers. Other studies have shown that research behavior is greatly affected by researcher environment.

Author's who Bridge Time Periods

The time period 1990-2006 was divided into three five year segments. A concern was raised that some authors may meet the inclusion criterion of 5 citations in 5 years, but because they bridge the time period divisions, would not be counted. The issue is some what complex, and the author discusses the full effects below.

In an author cocitation analysis (ACA) it is necessary to delineate a time period during which citation behavior is studied. This is because the ACA is concerned with studying interaction rather than the performance of authors. During any time period, some authors will be better represented than others whose work is partially truncated by the time horizon. Special circumstances aside, this should not have a deleterious effect on the ACA results, since the authors are only lens for examining the research base. That said, it is still germane to identify how many authors could have met the criterion and if it is possible to include them.

A post-hoc analysis shows that 58 authors had 5 citations in 5 years, but were not included in the original study. It is not possible, however to include these authors in the

study without altering the time spans, and as the 58 authors have different 5 year spans necessary, it is ultimately intractable to aggregate these authors. The important information from this post-hoc analysis is to say that a total of 456 out of 7,792 authors had at least 5 citations in *CTRJ* in 5 years from 1990-2006.

Authors with Low "Maximum Cocitations"

At the presentation of results, Dr Eom had raised concerns about the presence of some authors in the study whose maximum cocitation count was low. For example, D. Sparks has a maximum cocitation count of 2. Dr Eom stated that these values were too low. A review of ACA literature has not revealed an investigation into the effect of including authors with low maximum author cocitations. It is likely that their inclusion will effect the variance explained by the factor procedure.

Dr Eom had suggested a post-hoc analysis whereby authors whose cocitation count is less than 10 are excluded. In the three 5 year time period this would not produce large enough samples to perform analyses. In the 15 year period, out of 7,792 authors only the top .07% would beet this criterion.

It is possible that this issue has resulted from miscommunication. Specifically, the term "maximum cocitation count" may have been confused with "total cocitation count". Many ACA studies have noted that the total cocitation count must not be too low. In the study conducted, none of the authors had a total cocitation count below 20. The author D.

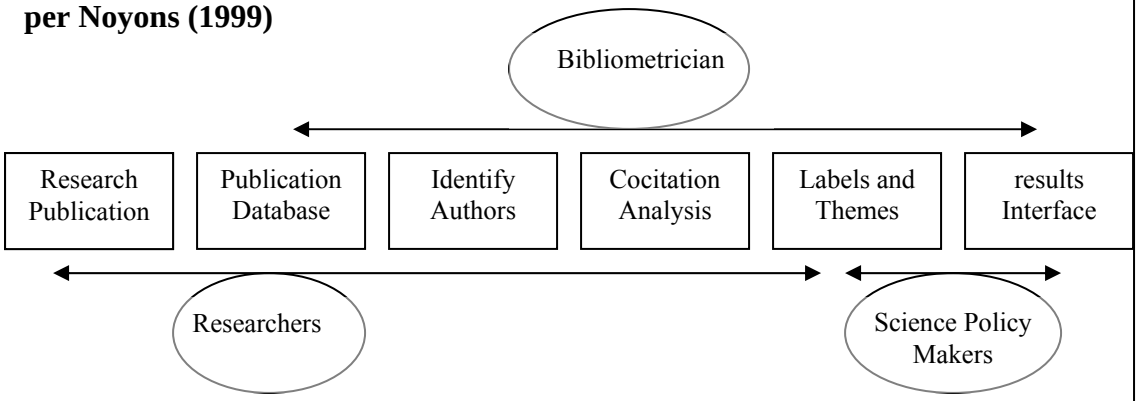
Sparks, discussed earlier, had a total cocitation count of 37 even though his maximum cocitation count was 2.

4.8 Suggestions for further Research

4.8.1 Validation

Bibliometric studies must be validated. As discussed earlier, a validation triangle exists in which bibliometricians, research subjects (field authors), and end-users must validate separate aspects of the cocitation analysis. The needs of these three groups are not the same; hence they validate different but overlapping portions of the study. Bibliometricians validate the data source, the scope of data collection, the statistical methodology, and conversion of raw result data to usable reports or formatted documents. Field authors validate the source data, its scope, and the interpretation of the results. End users validate the utility and application of the results to real world problems. Figure 19 is a diagram representing the various activities in an Author Cocitation Analysis along with their validating party.

Figure 19: Schematic view of cocitation study activity per Noyons (1999)



The next step for the study is validation by field authors. To do so, the website has been designed to elicit feedback and an email will be sent inviting most of the analyzed authors to view the study and its results. After greater input from field authors and experts, the interpretation of the study results will be more in line with what end users need for real world problems. Selected end users will also be invited to view the results and suggest alterations. Ideally, end users will incorporate the results into their decision making.

4.8.2 *Clothing and textiles Research Journal* Management

The management of *CTRJ* has already changed hands, to some extent, as Sage Publications is set to take over the journal in all aspects starting in the spring of 2007. In general, journal management is in a state of continuous accommodation to greater processing power, data storage capacity, and an increase in the need for information management. Current problems being researched often require inputs from divergent and distant authors, and journal publication strategies must render these connections possible. For journals who are listening to the larger changes, issues such as intellectual property rights, Open Access, and divergent indexing methodologies will all play out in the next four or five years. The study described in this paper documents a research base's structure as captured by one journal with a specific management style. Future extensions of this study hold promise for identifying the impact of alternate management styles. Specifically, an extension of the study into the year 2011 should identify key changes to the research base after the journal began open indexing. The quantifying of cause and effect relationships through indexing would be beneficial to *CTRJ* managers, as well as the larger journal management field.

4.8.3 Clothing and Textile Department Management

Textile and Apparel Management must define its space within an academic enviroment where funding is limited and must be tied to either enrollment, alumni value, or grants. For large research universities, research productivity and impact is a major

metric for evaluating the placement and benefit of departments. Evaluating research production also involves understanding critical linkages in research: who contributes and who benefits from TAM research endeavors? This study documents the usage of external (and internal) research bases in the TAM research front. Although not part of the current study, the database created allows for precise analyses of internal and external citation patterns. Because of the large time span of the data, it would be possible to identify trends that might be otherwise lost or over interpreted.

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Appendix A:
Citation and Cocitation Counts for Included Authors, all three time period

1990-1995	Citations	Max Cocitations
ATCCA	5	4
American Textile Manufacturers Institute	5	2
Barker, R.L.	5	5
Best, R.J.	5	5
Canton B	5	5
Coney, K.A.	5	5
Cox, C.E.	5	5
Cusick, G.E.	5	4
Douglas, S.P.	5	5
Finley, E.L.	5	4
Fiske, S.T	5	5
Garnsworthy, R.K	5	5
Gully, R.L.	5	5
Hawkins, D.I.	5	5
Hearle, J.W.S.	5	4
Horne, L.	5	5
Kelly, E	5	4
Kenins, P.	5	5
Kotler, P.	5	3
Lusch, R.	5	2
Markee, N.L.	5	5
Mayfield, R.J.	5	5
Michelman, S.O.	5	5
Mills, M.K.	5	5
Minshall, B.C.	5	3
Paek, S.L.	5	3
Stith, M.T.	5	5
Toyne, B.	5	2
Wagner, J	5	5
Ward, S.	5	3
Westerman, R.A.	5	5
Wilson, D.R.	5	5
Wingate, S.B	5	5
Wolins, L	5	5
AAMA	6	3
Alagoa, E.J	6	6
Allport, G.W.	6	4
Behling, D.U.	6	3
Black, W.C.	6	4
Collier, B.J.	6	4

Cox, C.A.	6	5
Ettenson, R	6	5
Freeman, C.M	6	6
Goffman, E	6	5
Greenberg, B.A.	6	5
Horn, M.J.	6	4
Jacobs, B.A	6	3
Lapitsky, M.	6	3
Nagasawa, R.B.	6	5
Oliver, R.L	6	5
Peters, K.	6	6
Ryan, M.S.	6	4
Schiffman, L.G	6	5
Sibley, L.R.	6	6
Sweat, S.J.	6	4
Taylor, S.E	6	5
Bellenger, D.N.	7	5
Cash, T.F	7	4
Davis, B.	7	7
Easley, C.B.	7	7
Goldsmith, R.E.,	7	5
Kelley, E.A	7	5
Miniard, P.W	7	7
Musa, K.E.	7	7
Olson, J.C.	7	4
Pannabecker, R.K.	7	3
Reynolds, T	7	6
Rosencranz, M.L.	7	6
Sheth, J.N	7	4
Sternquist, B.J.	7	7
Zeitmal, V.A	7	4
American Society for Testing and Materials	8	4
Branson, D.H. &	8	4
Daly, M.C.	8	7
DeJonge, J.O	8	6
Dickey, L.E.	8	5
Dillman, D.A.	8	3
Hirschman, E.C.	8	4
Howell, R.D	8	8
Jakes, K.A.	8	6
Johnson, K.K.P.	8	6
Leonas, K.K.	8	6
Miller, F.G	8	6
Niwa, M.	8	8

Swan, J.E.	8	5
Wall, M.W.	8	3
Davis, F	9	9
Hamilton, J.W	9	8
Hollies, N.R.S	9	4
Hutton, S.S.	9	8
Kahle, L.R.	9	5
Buckley, H.M	10	6
Dickerson, K.G.	10	3
Engel, JF	10	10
Francis, S.K.	10	6
Kotsiopulos, A.	10	6
Kunz, G.I.	10	2
Oakes, J.	10	3
Sontag, M.S.	10	3
Stone, G.P	10	6
Forsythe, S.M. &	11	8
Kawabata, S.	11	8
Nagasawa, R.H.	11	9
Blackwell, R.D	12	10
Gutman, J	12	6
Solomon, M.R.	12	6
Sproles, G.B	12	4
U.S. Bureau of the Census	12	5
U.S. Dept of Commerce	12	3
Cassill, N.L.	13	8
Gurel, L.M.	13	6
Hamilton, J.A.	13	8
Jacoby, J	13	5
Creekmore, A.M.	14	6
Gold, R.E.	14	13
Hatch, K.L.,	14	13
Morganosky, M.A.	14	7
Lumpkin, J.R	15	9
Maibach, H.I.	15	13
Reynolds, F.D	15	12
Damhorst, M.L.	16	12
DeLong, M.R.	17	6
Shim, S.	17	13
Erekosima, T.V.	18	18
Laughlin, J.M.	19	13
Winakor, G.	20	5
Darden, W.R	23	12
Drake, M.F	25	13

Lennon, S.J	25	15
Roach-Higgins, M.E.	30	15
Davis, L.L.	34	15
Eicher, J.B.	39	18
Kaiser, S.B.	41	11

1996-2000	**Citations**	**Max CoCitations**
Campos, A.	5	1
Garfield, E.	5	1
Brown, P.M.	5	2
DeJonge, J.O	5	2
Lowe, J.W.G.	5	2
Beatty, S.E.	5	3
Bellenger, D.N.	5	3
Chowdhary, U.	5	3
Deshpande, R	5	3
Greenberg, B.A.	5	3
Horridge, P.E.	5	3
Jarnow, J.	5	3
LaBat, K.L	5	3
Lincoln, Y.S.	5	3
Miller, K.A.	5	3
Oliver, B.A.	5	3
Wind, Y	5	3
Banner, L.W	5	4
Blumer, H.	5	4
Craik, J	5	4
Dale, J.D.	5	4
Dwyer, F.R	5	4
Freeman, C.M	5	4
Helvenston, S.I	5	4
Jones, J.C.	5	4
Kim, M.S.	5	4
Paek, S.L.	5	4
Rigakis, K.B.	5	4
Salusso-Deonier, C	5	4
Wood, E.J.	5	4
Abbey, A.	5	5
Ajzen, I.	5	5
Berlyne, D.E.	5	5
Cahoon, D.	5	5
Canton, B.	5	5
Edmonds, E.	5	5
Evans, C	5	5

Musa, K.E.	5	5
Tatham, R.L.	5	5
ASTM	6	2
Bitner, M.J	6	2
Creekmore, A.M.	6	2
U.S. Dept of Commerce	6	2
Butler, S.	6	3
Forney, J.C.,	6	3
Francis, S.K.	6	3
Hamilton, J.	6	3
King, C.W	6	3
Lumpkin, J.R.	6	3
Crown, E.M.	6	4
Hillestad, R.	6	4
Stein, P.J	6	4
Summers, T.A.	6	4
Swinney, J.L.	6	4
Thompson, J.K	6	4
Hair, J.F.	6	5
Hall, C.A	6	5
Kim, J.W.	6	5
U.S. Dept of Labor	6	5
Foucault, M.	6	6
Hooks, B	6	6
Silberstein, L	6	6
Winstead, B.M.	6	6
Wolins, L.	6	6
Forsythe, S.M. &	7	3
Kincade, D.H.	7	3
Liskey-Fitzwater, N., &	7	3
Paoletti, J.B	7	3
Goffman, E	7	4
Pourdeyhimi, B.	7	4
Black, W.C. &	7	5
Ettenson, R.	7	5
Fishbein, M	7	5
Morgado, M.A.	7	5
Reynolds, F.D.	7	5
Steele, V.	7	5
Wagner, J.	7	5
Abraham-Murali, L.	7	7
Slevin, D.P	7	7
Striegel-Moore, R	7	7
Churchill, G.A. Jr.	8	3

Fairhurst, A.E.	8	3
Cassill, N.L.	8	4
Goldsmith, R.E.,	8	4
Hollies, N.R.S	8	4
Stone, G.P	8	4
Farrell-Beck, J.	8	5
U.S. Bureau of Census	8	6
Erekosima, T.V.	8	8
Belk, R.W.	9	3
Kwon, Y.H.	9	4
Sheth, J.N	9	4
McCracken, G.	9	5
Minshall, B.C.	9	5
Freedman, R.J	9	6
Gurel, L.M.	9	6
Sproles, G.B	9	6
Covin, J.G	9	7
Kimle, P.A.	9	8
Monson, T.	9	8
Miniard, P.W.	9	9
Rodin, J	9	9
Welters, L.	10	2
Watkins, S.M.	10	4
Feather, B.L.	10	5
Drake, M.F.	10	6
Laughlin, J.M.	10	7
Chandler, J.L.	10	10
Freitas, A.J.	10	10
Moschis, G.P.	11	3
Dillman, D.A.	11	4
Darden, W.R	11	5
Kean, R.C.	11	7
Rudd, N.A.	11	7
Warner, P.C.	12	3
Winakor, G.	12	8
Engel, J.F.	12	11
Glock, R.E	12	11
Hamilton, J.A.	13	6
Fiore, A.M.	13	9
O'Neal, G.S.	13	10
Blackwell, R.D.	13	11
Davis, F.D	13	12
Eckman, M.	13	13
Hirschman, E.C.	14	8

Holbrook, M.B.	14	8
Johnson, K.K.P.	14	10
Solomon, M.R.	14	12
Wilson, E	14	13
Hammidi, T.N.	14	14
Workman, J.E.	15	10
Davis, L.L.	16	10
Kunz, G.I.	17	11
Cash, T.F	18	9
Kadolph, S.J. &	18	13
Morganosky, M.A.	19	8
Lennon, S.J	19	11
Roach-Higgins, M.E.	19	13
Nagasawa, R.H.	19	19
Shim, S.	20	7
Michelman, S.O.	20	15
Dickerson, K.G.	21	7
DeLong, M.R.	22	10
Hutton, S.S.	22	19
Eicher, J.B.	32	13
Dickson, M.A.C.	33	21
Littrell, M.A.	35	21
Damhorst, M.L.	37	17
Kaiser, S.B.	63	19

2001-2006	**Citations**	**Max Cocitations**
Arthur, L.B.	5	4
Belleau, B.D.,	5	4
Collier, B.J.	5	1
Craig, J.S.	5	5
Donthu, N	5	3
Fallon, A	5	5
Farrell-Beck, J.	5	4
Feather, B.L.	5	5
Freedman, R.J	5	5
Freitas, A.J.	5	5
Gamble, G	5	2
Glaser, B.G.	5	4
Hammidi, T.N.	5	5
Istook, C.L	5	3
Jasper, C.R.	5	4
Lee, S.	5	3
Lohse, G.L	5	2
Paek, S.L.	5	5

Pine, B.J	5	5
Price, J	5	4
Rawwas, M.Y.A	5	5
Richins, M.L	5	4
Rodin, J	5	5
Striegel-Moore, R	5	5
Westbrook, R.A	5	5
ASTM	6	3
Baker, J	6	4
Cassill, N.L.	6	4
Cerny, C.A., &	6	5
Cohen, J.B.	6	3
Corbin, J.	6	6
Darden, W.R	6	5
Davis, F	6	5
Fundaburk, E.L	6	3
Grewal, D	6	4
Hegland, J.E.	6	4
Kahn, B.E	6	4
Kallal, M.J.	6	3
Kang, J.K	6	4
Koh, A.	6	4
Laughlin, J.	6	6
Lincoln, Y.S.	6	4
Moschis, G.P.	6	3
Nelson, N.J.	6	4
Oliver, M	6	5
Salusso-Deonier, C	6	5
Stone, G.P	6	4
Summers, T.A.	6	4
Watkins, S.M.	6	4
Belk, R.W.	7	3
Brush, C.G	7	4
Chandler, J.L.	7	7
Dillman, D.A.	7	3
Eckman, M.	7	6
Feinberg, R.A.,	7	5
Fishbein, M	7	7
Hillestad, R.	7	6
Kincade, D.H.	7	3
Lee, M.Y	7	4
Miller, K.A.	7	5
Rabolt, N.J. &	7	3
Ridgway, N.M	7	6

Sontag, M.S.	7	5
Thompson, J.K	7	7
Vitell, S,J	7	5
Babin, B.J	8	7
Drake, M.F.	8	5
Kadolph, S.J. &	8	5
Kunz, G.I.	8	5
Markus, H.R	8	7
McCracken, G.	8	4
Moreno, J.M.	8	8
Morgado, M.A.	8	5
Morganosky, M.A.	8	5
Sparks, D.	8	2
Sternquist, B.J.	8	3
Strauss, A.L.	8	6
Tung, R.L	8	3
Ajzen, I.	9	7
Hirschman, E.C.	9	6
Horridge, P.E.	9	5
Hutton, S.S.	9	9
Kean, R.C.	9	6
Kotsiopulos, A.	9	7
Bloch, P.H	10	7
Nagasawa, R.H.	10	9
Dickson, M.A.	11	7
Holbrook, M.B.	11	5
Kwon, Y.H.	11	7
Michelman, S.O.	11	8
Miniard, P.W.	11	10
Blackwell, R.D.	12	12
Dickerson, K.G.	12	3
Engel, J.F.	12	12
Kimle, P.A.	12	11
U.S. Bureau of Census	12	5
Eastlick, M.A. &	13	9
Workman, J.E.	13	7
Cash, T.F	14	10
LaBat, K.L	16	9
Rudd, N.A.	16	16
Johnson, K.K.P.	18	9
Fiore, A.M.	19	13
Roach-Higgins, M.E.	19	16
Davis, L.L.	20	13
U.S. Dept of Commerce	22	5

Eicher, J.B.	24	15
Shim, S.	27	9
Littrell, M.A.	30	8
Damhorst, M.L.	32	16
DeLong, M.R.	34	15
Kaiser, S.B.	38	16
Lennon, S.J	39	16

Appendix B:
Complete factor Loadings Matrix for All Three Time Periods

Oblique Factor Rotation Loadings for 1990-1995

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
Mayfield__R_J_	-12%	-6%	-5%	97%	-5%	-5%	-4%	15%	-5%	-3%	-3%	-2%	0%
Gully__R_L_	-12%	-6%	-5%	97%	-5%	-5%	-4%	15%	-5%	-3%	-3%	-2%	0%
Garnsworthy__R_K	-12%	-6%	-5%	97%	-5%	-5%	-4%	15%	-5%	-3%	-3%	-2%	0%
Kenins__P_	-12%	-6%	-5%	97%	-5%	-5%	-4%	15%	-5%	-3%	-3%	-2%	0%
Westerman__R_A_	-12%	-6%	-5%	97%	-5%	-5%	-4%	15%	-5%	-3%	-3%	-2%	0%
Niwa__M_	-13%	-10%	-6%	85%	-5%	-5%	-4%	-4%	-5%	-5%	-4%	-3%	42%
Kawabata__S_	-14%	-11%	-6%	79%	-5%	-6%	-5%	-4%	-6%	-5%	-4%	-3%	55%
Hollies__N_R_S	-16%	0%	-2%	67%	-6%	2%	-2%	67%	-5%	-3%	-4%	-5%	6%
Paek__S_L__	4%	36%	19%	26%	60%	-6%	-11%	-8%	-5%	-6%	-2%	18%	0%
Wilson__D_R_	-11%	-4%	-5%	18%	-6%	-5%	-4%	95%	-5%	-3%	-3%	-2%	-6%
Barker__R_L_	-11%	-4%	-5%	18%	-6%	-5%	-4%	95%	-5%	-3%	-3%	-2%	-6%
Markee__N_L_	-11%	-4%	-5%	18%	-6%	-5%	-4%	95%	-5%	-3%	-3%	-2%	-6%
Collier__B_J_	-11%	-9%	-5%	14%	-5%	-5%	-3%	-6%	-5%	-4%	-3%	-1%	95%
Cusick__G_E_	-11%	-9%	-5%	13%	-5%	-5%	-4%	-6%	-5%	-4%	-3%	-1%	96%
Branson__D_H___	-15%	70%	6%	12%	-6%	-5%	25%	40%	-3%	25%	-1%	12%	-7%
Hearle__J_W_S_	-11%	-9%	-5%	11%	-5%	-5%	-3%	-6%	-6%	-4%	-3%	-1%	96%
Hatch__K_L___	-9%	-4%	-4%	7%	-4%	-4%	-3%	94%	5%	-3%	1%	1%	-3%
Maibach__H_I_	-10%	-7%	-4%	6%	-5%	-4%	6%	94%	-3%	-4%	-3%	-1%	-4%
American_Society_	-15%	-7%	-6%	6%	-7%	-6%	56%	-7%	-5%	-5%	-6%	-4%	65%
American_Textile_M	21%	-17%	-11%	0%	-4%	-6%	-7%	-10%	-6%	-9%	-10%	1%	44%
Cash__T_F	2%	29%	6%	-1%	3%	17%	-2%	1%	-2%	0%	4%	74%	1%
Wingate__S_B	-10%	73%	19%	-1%	0%	9%	7%	1%	-5%	12%	-1%	-19%	-4%
Gurel__L_M_	-6%	8%	25%	-1%	29%	-2%	-7%	-7%	-10%	-2%	4%	22%	36%
Freeman__C_M	-11%	84%	16%	-2%	3%	7%	3%	-1%	-4%	12%	-2%	-16%	-4%
Reynolds__T	13%	2%	0%	-2%	-5%	-3%	-4%	-2%	4%	6%	77%	4%	-3%
Sontag__M_S__	0%	27%	5%	-2%	-1%	20%	-1%	1%	13%	58%	7%	-2%	0%
Goffman__E	-8%	27%	72%	-3%	0%	48%	-2%	-2%	-1%	2%	-1%	6%	-1%
Davis__F	-6%	13%	91%	-3%	-2%	17%	-3%	-2%	-2%	2%	1%	-5%	-1%
Davis__L_L_	13%	70%	35%	-3%	6%	8%	-7%	3%	12%	20%	25%	32%	-7%
Howell__R_D	94%	-5%	-6%	-3%	11%	-3%	1%	-2%	-1%	-10%	0%	-4%	-1%
Toyne__B_	-7%	3%	9%	-4%	-5%	-3%	5%	-2%	0%	0%	2%	-1%	-3%
Damhorst__M_L_	-4%	45%	41%	-4%	13%	16%	-1%	3%	28%	21%	29%	25%	-2%
Erekosima__T_V_	-10%	3%	19%	-4%	-4%	93%	-3%	-3%	-2%	-2%	-2%	-1%	-3%
DeLong__M_R_	-7%	80%	22%	-4%	3%	5%	-5%	-3%	-1%	-2%	-4%	7%	1%
Hamilton__J_W	-11%	6%	24%	-4%	-8%	59%	-3%	-3%	-4%	-2%	-5%	-4%	-5%
Lumpkin__J_R	94%	-3%	-2%	-4%	14%	-3%	-3%	-3%	-2%	12%	-2%	-3%	-1%
Shim__S_	87%	-5%	-7%	-4%	8%	-4%	-1%	-3%	22%	-12%	6%	1%	-1%
Reynolds__F_D	86%	-6%	-4%	-4%	11%	-5%	-2%	-2%	0%	-5%	-2%	-5%	-1%
DeJonge__J_O	-16%	35%	5%	-4%	-6%	7%	82%	-2%	-6%	-1%	-5%	-7%	-3%
Gold__R_E_	-9%	-7%	-5%	-4%	-6%	-5%	84%	-2%	-6%	-4%	-3%	0%	-7%
Cox__C_A_	-3%	46%	16%	-4%	21%	1%	-5%	-3%	-1%	-6%	3%	81%	-2%
Schiffman__L_G	97%	-4%	1%	-4%	5%	-4%	-5%	-4%	-2%	11%	-1%	-4%	-3%
Sheth__J_N	39%	-10%	-11%	-4%	26%	-3%	2%	-3%	19%	-8%	24%	-6%	-1%
Easley__C_B_	-9%	-10%	-4%	-5%	-6%	-4%	73%	-1%	-7%	-5%	-2%	1%	-9%

Kunz__G_I_	23%	0%	8%	-5%	5%	0%	12%	-3%	0%	-2%	-8%	-2%	-1%
Johnson__K_K_P_	-6%	75%	5%	-5%	-1%	9%	-1%	-2%	-2%	-6%	1%	61%	-3%
Darden__W_R	88%	-7%	-7%	-5%	16%	-5%	-1%	-3%	8%	-4%	-1%	-6%	-2%
Kahle__L_R_	31%	13%	1%	-5%	-6%	-4%	-5%	-3%	2%	89%	3%	2%	-3%
Engel__JF	93%	-7%	-4%	-5%	13%	-3%	-2%	-4%	13%	4%	4%	-2%	-2%
Laughlin__J_M_	0%	-7%	-4%	-5%	-6%	-5%	82%	-3%	-5%	-5%	0%	0%	-7%
Alagoa__E_J	-10%	-4%	-7%	-5%	-6%	93%	-4%	-4%	-4%	-5%	-3%	-3%	-4%
Jakes__K_A_	-8%	-5%	-2%	-5%	-5%	-2%	-5%	-4%	-5%	-3%	-3%	1%	-4%
Sibley__L_R_	-8%	-5%	-2%	-5%	-5%	-2%	-5%	-4%	-5%	-3%	-3%	1%	-4%
Lennon__S_J	-8%	73%	34%	-5%	20%	14%	-5%	-3%	9%	11%	6%	36%	-3%
Kotsiopulos__A_	90%	-4%	0%	-5%	-5%	-4%	-2%	-4%	20%	-10%	0%	-1%	-3%
Leonas__K_K_	-11%	1%	-8%	-5%	-8%	-6%	92%	-4%	-6%	-2%	-4%	-3%	-2%
Daly__M_C_	-12%	8%	40%	-5%	-4%	81%	-5%	-4%	-4%	-1%	-2%	5%	-3%
Fiske__S_T	-10%	92%	5%	-5%	0%	0%	-3%	-4%	-2%	-3%	-1%	28%	-3%
Miller__F_G	-11%	94%	12%	-5%	1%	6%	-4%	-4%	-1%	2%	-2%	5%	-4%
Workman__J_E_	-11%	97%	6%	-5%	-1%	0%	-3%	-4%	-4%	-2%	-2%	9%	-4%
Cox__C_E_	-7%	46%	18%	-5%	23%	-1%	-6%	-4%	-1%	-5%	3%	76%	-3%
Douglas__S_P_	78%	7%	13%	-5%	21%	-4%	-5%	-5%	-4%	-13%	2%	36%	-3%
Taylor__S_E	-11%	97%	5%	-5%	-1%	-1%	-3%	-4%	-5%	-2%	-3%	9%	-4%
Zeitmal__V_A	18%	-1%	-4%	-5%	4%	-4%	-5%	-3%	71%	-8%	41%	7%	-4%
Ryan__M_S_	-3%	13%	14%	-5%	1%	25%	-5%	-3%	42%	5%	-1%	0%	-2%
Dickey__L_E_	76%	8%	-3%	-5%	-2%	-6%	-4%	-3%	23%	28%	27%	2%	-3%
Buckley__H_M	-9%	89%	6%	-5%	-1%	0%	10%	-4%	-1%	12%	-1%	25%	-5%
Nagasawa__R_H_	-9%	33%	85%	-6%	13%	15%	-5%	-4%	-3%	0%	2%	17%	-3%
Mills__M_K_	94%	-3%	2%	-6%	-9%	-5%	-6%	-5%	8%	16%	0%	-6%	-4%
Sternquist__B_J_	9%	-3%	-5%	-6%	-4%	-5%	-6%	-4%	9%	6%	88%	2%	-4%
Davis__B_	9%	-3%	-5%	-6%	-4%	-5%	-6%	-4%	9%	6%	88%	2%	-4%
Rosencranz__M_L_	15%	48%	43%	-6%	0%	28%	-9%	-6%	7%	27%	-4%	1%	-4%
Hutton__S_S_	7%	34%	85%	-6%	-6%	25%	-3%	-4%	-5%	18%	-1%	-2%	-4%
Forsythe__S_M___	-2%	54%	12%	-6%	26%	-5%	-7%	-1%	19%	-5%	15%	64%	-2%
Jacobs__B_A	-12%	-9%	-4%	-6%	-5%	-3%	-6%	-5%	1%	1%	5%	-1%	-5%
Coney__K_A_	95%	-5%	2%	-6%	-4%	-4%	-6%	-5%	-5%	12%	-2%	-3%	-3%
Hawkins__D_I_	95%	-5%	2%	-6%	-4%	-4%	-6%	-5%	-5%	12%	-2%	-3%	-3%
Best__R_J_	95%	-5%	2%	-6%	-4%	-4%	-6%	-5%	-5%	12%	-2%	-3%	-3%
Eicher__J_B_	-13%	25%	30%	-6%	-2%	84%	-3%	-4%	1%	-1%	-3%	6%	-5%
U_S__Bureau_of_t	95%	-5%	1%	-6%	-9%	-5%	-6%	-5%	2%	10%	-1%	-2%	-3%
Blackwell__R_D	92%	-8%	-6%	-6%	14%	-4%	-3%	-5%	11%	10%	2%	-3%	-2%
Cassill__N_L_	81%	6%	-1%	-6%	5%	-7%	0%	-4%	2%	24%	25%	5%	-4%
Michelman__S_O_	-12%	2%	22%	-6%	-4%	92%	-5%	-5%	-5%	-4%	-2%	4%	-4%
Bellenger__D_N_	88%	-9%	5%	-6%	-3%	-7%	-6%	-5%	-2%	21%	-3%	-1%	-5%
Goldsmith__R_E__	34%	11%	1%	-6%	-5%	-7%	-4%	-3%	1%	88%	3%	-2%	-5%
Pannabecker__R_I	-13%	6%	40%	-6%	-5%	58%	-7%	-5%	-5%	-3%	-4%	9%	-5%
Black__W_C_	59%	-10%	9%	-6%	20%	-6%	-7%	-6%	-1%	28%	-8%	-6%	-6%
Olson__J_C_	70%	3%	-2%	-6%	2%	-5%	-6%	1%	39%	-6%	39%	5%	-3%
Finley__E_L_	-12%	-7%	-5%	-6%	-6%	-5%	95%	1%	-4%	-4%	-4%	-3%	1%
Horne__L_	-12%	-3%	-4%	-6%	78%	-2%	-5%	-4%	2%	2%	-1%	-9%	-4%
Swan__J_E_	10%	0%	-3%	-6%	-3%	-7%	-6%	0%	95%	1%	9%	5%	-4%
Stith__M_T_	38%	2%	3%	-6%	-7%	-7%	-5%	-4%	-3%	78%	1%	-5%	-5%
Gutman__J	84%	-1%	0%	-6%	-9%	-6%	-7%	-6%	8%	24%	32%	-3%	-5%
Oliver__R_L	13%	-1%	0%	-6%	-7%	-1%	-7%	-7%	92%	3%	-2%	-1%	-6%
Musa__K_E_	-9%	15%	44%	-7%	19%	45%	-6%	-5%	-6%	-6%	1%	37%	-4%
Lusch__R_	25%	-12%	0%	-7%	1%	-6%	-6%	-5%	-2%	-7%	-4%	-4%	-2%

Allport__G_W_	31%	16%	5%	-7%	-9%	-7%	-6%	-5%	4%	74%	16%	-6%	-3%
AAMA	-5%	-10%	-6%	-7%	-12%	-4%	-6%	-6%	-8%	-3%	-1%	-2%	-4%
Greenberg__B_A_	71%	-4%	5%	-7%	3%	-5%	-7%	-6%	-9%	44%	-7%	-9%	-5%
Kelly__E	36%	82%	9%	-7%	0%	1%	-2%	-5%	-9%	-4%	0%	-11%	-4%
Miniard__P_W	88%	-7%	-3%	-7%	-2%	-3%	-4%	-5%	17%	9%	5%	-6%	-2%
Hamilton__J_A_	-14%	26%	39%	-7%	-8%	46%	-2%	-5%	-1%	-2%	-6%	-6%	-6%
Wolins__L	17%	-1%	7%	-7%	94%	-4%	-6%	-6%	1%	-6%	-2%	10%	-4%
Canton_B	17%	-1%	7%	-7%	94%	-4%	-6%	-6%	1%	-6%	-2%	10%	-4%
Nagasawa__R_B_	-10%	45%	71%	-7%	20%	6%	-1%	-6%	-9%	-7%	-3%	13%	-5%
Wagner__J	-3%	-2%	-4%	-7%	54%	-6%	-6%	-5%	11%	-2%	19%	-1%	-5%
Ettenson__R	-3%	-2%	-4%	-7%	54%	-6%	-6%	-5%	11%	-2%	19%	-1%	-5%
Oakes__J_	-12%	-7%	7%	-7%	-8%	30%	-7%	-6%	-8%	-5%	-6%	2%	-3%
Sproles__G_B	51%	9%	10%	-7%	27%	8%	-3%	2%	28%	5%	54%	4%	-1%
Roach_Higgins__M	-13%	49%	31%	-7%	7%	57%	-5%	-6%	-6%	-7%	-3%	29%	-5%
U_S__Dept_of_Co	18%	-3%	-6%	-7%	27%	-5%	-6%	-5%	-4%	-10%	1%	-6%	2%
Francis__S_K_	21%	8%	-5%	-7%	1%	1%	-6%	0%	64%	19%	22%	3%	-5%
American_Associat	-11%	-8%	-5%	-7%	-6%	-4%	84%	3%	-3%	-3%	-5%	-2%	12%
Morganosky__M_A	14%	68%	13%	-7%	-2%	0%	-6%	-6%	11%	58%	4%	-6%	-5%
Creekmore__A_M_	26%	51%	15%	-7%	2%	11%	-9%	-6%	26%	28%	10%	-10%	-4%
Dillman__D_A_	11%	0%	-8%	-7%	-5%	-8%	2%	-6%	25%	-9%	19%	12%	-4%
Kelley__E_A	-9%	46%	21%	-7%	41%	9%	-9%	-7%	13%	20%	0%	14%	-7%
Hirschman__E_C_	31%	-9%	-8%	-7%	2%	-6%	-6%	2%	61%	3%	20%	3%	-2%
Horn__M_J_	-7%	5%	3%	-7%	-3%	4%	12%	-5%	-8%	4%	1%	3%	3%
Kotler__P_	24%	-11%	-3%	-8%	-6%	-8%	-7%	-7%	32%	-8%	12%	10%	-3%
Solomon__M_R_	73%	4%	14%	-8%	27%	0%	-8%	-6%	-3%	-11%	-1%	33%	-2%
Lapitsky__M_	0%	23%	22%	-8%	39%	-3%	-8%	-7%	1%	21%	17%	24%	-1%
Peters__K_	-14%	57%	57%	-8%	17%	25%	-4%	-6%	-6%	-2%	0%	27%	-5%
Stone__G_P	26%	9%	83%	-8%	14%	16%	-9%	-7%	0%	-3%	-7%	12%	-7%
Minshall__B_C_	7%	35%	11%	-8%	77%	-2%	-9%	-9%	-3%	-8%	-9%	17%	-5%
Winakor__G_	28%	-3%	5%	-9%	87%	-5%	-8%	-7%	-3%	-3%	-5%	9%	-3%
Jacoby__J	36%	-10%	-4%	-9%	57%	-6%	-9%	-1%	35%	-7%	5%	1%	-5%
Dickerson__K_G_	0%	-8%	-8%	-9%	-11%	-7%	-9%	-8%	7%	5%	53%	-3%	-6%
Drake__M_F	82%	12%	1%	-9%	20%	-6%	-6%	-7%	17%	3%	15%	22%	-5%
Behling__D_U_	-1%	16%	24%	-9%	32%	0%	-9%	-9%	3%	0%	51%	33%	-5%
Ward__S_	16%	-13%	-10%	-9%	20%	-9%	-9%	-9%	80%	4%	-8%	-11%	-6%
Wall__M_W_	39%	-6%	-1%	-10%	-13%	-10%	-10%	-9%	44%	45%	41%	-6%	-8%
Kaiser__S_B_	8%	51%	64%	-10%	5%	29%	-7%	-7%	-6%	11%	0%	3%	-5%
Sweat__S_J_	27%	42%	47%	-10%	46%	16%	-5%	-7%	-8%	-8%	5%	22%	-4%

Continued Oblique Factor Rotation Loadings for 1990-1995

Factor	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
Mayfield__R_J_	-4%	-3%	-2%	-3%	-1%	-1%	-2%	-1%	-1%	0%
Gully__R_L_	-4%	-3%	-2%	-3%	-1%	-1%	-2%	-1%	-1%	0%
Garnsworthy__R_K	-4%	-3%	-2%	-3%	-1%	-1%	-2%	-1%	-1%	0%
Kenins__P_	-4%	-3%	-2%	-3%	-1%	-1%	-2%	-1%	-1%	0%
Westerman__R_A_	-4%	-3%	-2%	-3%	-1%	-1%	-2%	-1%	-1%	0%
Niwa__M_	-4%	-1%	-3%	-2%	-1%	-1%	-2%	-1%	1%	0%
Kawabata__S_	-5%	0%	-4%	-2%	-1%	-1%	-2%	0%	1%	1%
Hollies__N_R_S	-3%	-1%	-5%	9%	-4%	-2%	-1%	1%	1%	-5%
Paek__S_L__	0%	28%	-18%	-6%	19%	7%	-1%	-4%	28%	-4%
Wilson__D_R_	-4%	-3%	-2%	-2%	-1%	-2%	-2%	-2%	0%	-1%
Barker__R_L_	-4%	-3%	-2%	-2%	-1%	-2%	-2%	-2%	0%	-1%

Markee__N_L_	-4%	-3%	-2%	-2%	-1%	-2%	-2%	-2%	0%	-1%
Collier__B_J_	-4%	4%	-3%	-2%	-1%	-1%	-2%	1%	0%	2%
Cusick__G_E_	-4%	3%	-3%	-2%	-1%	-1%	-2%	1%	0%	3%
Branson__D_H___	-7%	-13%	4%	5%	17%	-1%	-3%	-6%	-5%	-18%
Hearle__J_W_S_	-4%	4%	-3%	-2%	-1%	-1%	-2%	1%	0%	2%
Hatch__K_L___	-4%	-2%	-1%	-3%	-2%	1%	-1%	3%	-2%	2%
Maibach__H_I_	-3%	-2%	-3%	-4%	-1%	-1%	-2%	0%	1%	5%
American_Society_	-5%	-5%	-2%	-3%	-2%	-3%	-2%	-14%	-7%	-21%
American_Textile_M	34%	12%	28%	-19%	1%	20%	-5%	34%	4%	-35%
Cash__T_F	1%	21%	2%	8%	-23%	-8%	6%	-5%	-1%	2%
Wingate__S_B	0%	4%	-9%	27%	-18%	-5%	1%	6%	7%	-25%
Gurel__L_M_	0%	69%	-14%	11%	11%	-7%	-1%	2%	10%	-11%
Freeman__C_M	-1%	10%	-9%	19%	-13%	-4%	1%	3%	7%	-16%
Reynolds__T	1%	-3%	-7%	-3%	-9%	-7%	-2%	-1%	-26%	4%
Sontag__M_S__	2%	-1%	10%	20%	54%	-2%	2%	10%	-20%	10%
Goffman__E	-1%	13%	2%	-4%	-10%	-1%	4%	-3%	-5%	8%
Davis__F	0%	-2%	0%	9%	-2%	0%	-1%	7%	-3%	4%
Davis__L_L_	-3%	1%	13%	-2%	13%	-1%	-2%	11%	-18%	6%
Howell__R_D	3%	-4%	0%	4%	5%	14%	1%	-8%	2%	8%
Toyne__B_	86%	-2%	5%	9%	-3%	-3%	0%	28%	-7%	13%
Damhorst__M_L_	1%	-10%	15%	10%	23%	7%	1%	25%	-31%	10%
Erekosima__T_V_	-3%	1%	-1%	7%	3%	0%	-2%	0%	-2%	0%
DeLong__M_R_	8%	19%	-4%	-9%	-3%	1%	1%	-7%	5%	15%
Hamilton__J_W	3%	3%	-4%	69%	1%	-3%	-2%	13%	1%	-4%
Lumpkin__J_R	2%	-3%	-2%	1%	-1%	10%	0%	-5%	1%	1%
Shim__S_	8%	-3%	16%	2%	11%	15%	1%	-4%	16%	2%
Reynolds__F_D	1%	-6%	-6%	7%	1%	25%	0%	-19%	-8%	12%
DeJonge__J_O	-4%	-2%	-4%	17%	-7%	-4%	0%	-5%	-3%	-22%
Gold__R_E_	-2%	5%	-4%	-7%	0%	0%	-3%	20%	9%	36%
Cox__C_A_	-5%	-1%	2%	-4%	15%	0%	-1%	1%	0%	0%
Schiffman__L_G	-3%	-2%	-3%	-4%	-5%	1%	-2%	2%	1%	0%
Sheth__J_N	-6%	-10%	39%	5%	-2%	8%	1%	1%	59%	10%
Easley__C_B_	-2%	6%	-6%	-9%	0%	0%	-3%	23%	11%	45%
Kunz__G_I_	12%	3%	2%	16%	-3%	-13%	-2%	79%	0%	5%
Johnson__K_K_P_	-4%	-5%	4%	4%	-7%	0%	1%	-2%	-2%	1%
Darden__W_R	0%	-6%	-4%	6%	3%	26%	0%	-18%	2%	13%
Kahle__L_R_	-4%	-2%	3%	-4%	14%	-3%	-1%	4%	-6%	2%
Engel__JF	-1%	-5%	4%	-2%	-1%	2%	0%	3%	23%	0%
Laughlin__J_M_	1%	9%	0%	-5%	0%	2%	-2%	27%	11%	40%
Alagoa__E_J	-4%	-4%	-4%	0%	4%	0%	-4%	0%	3%	-4%
Jakes__K_A_	-4%	0%	-3%	-2%	-1%	-2%	98%	-1%	0%	0%
Sibley__L_R_	-4%	0%	-3%	-2%	-1%	-2%	98%	-1%	0%	0%
Lennon__S_J	-5%	3%	8%	-6%	23%	-1%	-1%	5%	-12%	3%
Kotsiopulos__A_	3%	-3%	19%	8%	4%	-11%	0%	13%	7%	2%
Leonas__K_K_	-3%	1%	5%	0%	0%	1%	-2%	-6%	-7%	-13%
Daly__M_C_	-2%	3%	-1%	29%	0%	-2%	1%	3%	-4%	4%
Fiske__S_T	-4%	-7%	1%	-2%	3%	3%	-2%	0%	0%	5%
Miller__F_G	-3%	6%	-3%	-6%	10%	-2%	-2%	-3%	0%	5%
Workman__J_E_	-4%	-3%	-2%	-1%	-2%	0%	-2%	0%	2%	1%
Cox__C_E_	-5%	-3%	0%	-4%	17%	2%	-2%	1%	1%	1%
Douglas__S_P_	-2%	12%	-6%	-1%	20%	-15%	0%	-3%	2%	-10%
Taylor__S_E	-4%	-3%	-2%	-1%	-1%	1%	-2%	0%	1%	2%

Zeitmal__V_A	2%	0%	6%	-6%	-1%	21%	0%	26%	-16%	-13%
Ryan__M_S_	-4%	69%	8%	2%	16%	8%	0%	0%	-10%	0%
Dickey__L_E_	3%	1%	0%	2%	28%	-8%	0%	-8%	-16%	6%
Buckley__H_M	-3%	1%	9%	-2%	15%	3%	-1%	-1%	-4%	4%
Nagasawa__R_H_	-3%	1%	-3%	3%	18%	-1%	-3%	3%	1%	1%
Mills__M_K_	-3%	2%	-5%	-5%	-3%	-11%	-3%	-4%	-8%	2%
Sternquist__B_J_	9%	-1%	25%	-4%	8%	0%	-2%	-5%	22%	-1%
Davis__B_	9%	-1%	25%	-4%	8%	0%	-2%	-5%	22%	-1%
Rosencranz__M_L_	-3%	47%	1%	-8%	-3%	-4%	1%	-6%	0%	13%
Hutton__S_S_	-2%	-1%	0%	7%	-10%	0%	-2%	4%	-2%	-2%
Forsythe__S_M___	-4%	8%	15%	-7%	19%	8%	-2%	8%	-3%	-2%
Jacobs__B_A	86%	-9%	-13%	4%	-5%	-7%	-3%	-9%	0%	4%
Coney__K_A_	-3%	2%	-3%	-8%	-6%	-9%	-3%	14%	-5%	-6%
Hawkins__D_I_	-3%	2%	-3%	-8%	-6%	-9%	-3%	14%	-5%	-6%
Best__R_J_	-3%	2%	-3%	-8%	-6%	-9%	-3%	14%	-5%	-6%
Eicher__J_B_	-4%	20%	-3%	15%	1%	-4%	1%	-5%	1%	-1%
U_S__Bureau_of_t	4%	2%	9%	-7%	-4%	-3%	-2%	6%	-5%	-7%
Blackwell__R_D	-2%	-4%	2%	-4%	-3%	2%	-1%	9%	21%	-3%
Cassill__N_L_	13%	4%	25%	-4%	15%	7%	-1%	-2%	-12%	-2%
Michelman__S_O_	-6%	-2%	-2%	4%	2%	-1%	-2%	0%	-2%	1%
Bellenger__D_N_	-4%	-4%	-2%	-2%	-10%	26%	-3%	-8%	-6%	3%
Goldsmith__R_E__	-5%	-2%	-4%	0%	-2%	2%	-2%	-3%	2%	-3%
Pannabecker__R_I	-2%	10%	-1%	57%	-3%	-2%	1%	2%	-4%	5%
Black__W_C_	-7%	-2%	-6%	-5%	-17%	55%	-4%	-4%	10%	2%
Olson__J_C_	-1%	1%	0%	-3%	1%	8%	0%	20%	-26%	-3%
Finley__E_L_	-5%	-4%	-3%	-2%	-2%	-3%	-2%	-7%	-4%	-9%
Horne__L_	-5%	-9%	25%	-3%	-12%	-15%	-3%	7%	-25%	6%
Swan__J_E_	-2%	-1%	2%	-4%	0%	3%	-2%	6%	-7%	0%
Stith__M_T_	-6%	-3%	-12%	0%	-27%	3%	-3%	-3%	8%	-6%
Gutman__J	-2%	-1%	-6%	-5%	-5%	-9%	-3%	-1%	-14%	2%
Oliver__R_L	1%	10%	4%	-2%	9%	-1%	-4%	-7%	1%	1%
Musa__K_E_	-4%	43%	-10%	17%	-5%	-9%	17%	-7%	3%	-1%
Lusch__R_	30%	-2%	8%	-3%	-2%	77%	-3%	-15%	2%	0%
Allport__G_W_	4%	23%	4%	-7%	26%	-3%	-3%	-1%	4%	-1%
AAMA	90%	0%	17%	-4%	0%	5%	-3%	2%	-8%	-11%
Greenberg__B_A_	-6%	-3%	-9%	-6%	-24%	15%	-4%	2%	-2%	-1%
Kelly__E	-2%	4%	-8%	6%	-12%	-13%	-1%	4%	-4%	-9%
Miniard__P_W	-5%	-1%	5%	-7%	-7%	-7%	-1%	18%	25%	-5%
Hamilton__J_A_	12%	13%	-3%	65%	2%	-4%	-3%	7%	3%	-7%
Wolins__L	-1%	-1%	7%	-1%	7%	7%	-1%	-3%	6%	0%
Canton_B	-1%	-1%	7%	-1%	7%	7%	-1%	-3%	6%	0%
Nagasawa__R_B_	-2%	10%	-11%	14%	5%	-6%	-2%	-2%	10%	-15%
Wagner__J	-4%	-6%	75%	1%	-4%	-11%	-3%	-3%	-1%	8%
Ettenson__R	-4%	-6%	75%	1%	-4%	-11%	-3%	-3%	-1%	8%
Oakes__J_	0%	20%	-4%	82%	0%	-1%	-4%	6%	1%	2%
Sproles__G_B	1%	27%	-1%	6%	-2%	3%	5%	12%	-15%	8%
Roach_Higgins__M	-4%	32%	-7%	19%	-9%	-6%	7%	-7%	3%	-2%
U_S__Dept_of_Co	78%	8%	4%	-1%	5%	28%	-1%	-3%	13%	-3%
Francis__S_K_	-3%	10%	46%	1%	31%	-3%	-1%	-6%	22%	4%
American_Associat	-5%	-7%	-3%	-4%	-1%	-4%	-1%	-12%	-6%	-16%
Morganosky__M_A	-2%	13%	-4%	-3%	21%	-7%	-3%	-2%	-8%	3%
Creekmore__A_M_	3%	40%	-1%	-5%	38%	-12%	-1%	-13%	-3%	13%

Dillman__D_A_	39%	9%	69%	-9%	10%	23%	-3%	10%	0%	-12%
Kelley__E_A	-6%	28%	10%	-7%	51%	-9%	-3%	-10%	-1%	4%
Hirschman__E_C_	-7%	-11%	36%	5%	-6%	2%	0%	3%	39%	4%
Horn__M_J_	0%	85%	2%	18%	0%	0%	-1%	6%	-2%	3%
Kotler__P_	26%	6%	60%	-12%	6%	30%	-4%	8%	21%	-26%
Solomon__M_R_	-4%	30%	-6%	-4%	15%	-7%	-1%	9%	4%	-16%
Lapitsky__M_	5%	32%	-7%	-8%	61%	-7%	-3%	-8%	14%	-11%
Peters__K_	-7%	-1%	-5%	-4%	24%	-4%	-3%	-2%	0%	-5%
Stone__G_P	-4%	15%	-3%	9%	9%	16%	-3%	-5%	-1%	-1%
Minshall__B_C_	2%	18%	-4%	-6%	8%	3%	-1%	-11%	10%	3%
Winakor__G_	-3%	4%	4%	-4%	1%	5%	-3%	10%	3%	-7%
Jacoby__J	-5%	-5%	4%	-6%	-10%	43%	-2%	26%	-14%	-5%
Dickerson__K_G_	69%	0%	7%	-4%	13%	10%	-4%	-5%	5%	-6%
Drake__M_F	3%	0%	20%	-2%	19%	9%	-2%	-2%	14%	1%
Behling__D_U_	4%	29%	15%	-1%	38%	-5%	-4%	-9%	5%	-13%
Ward__S_	-3%	-6%	11%	-3%	-9%	-17%	-5%	-12%	10%	3%
Wall__M_W_	14%	2%	-13%	-6%	-3%	-3%	-5%	-19%	-6%	6%
Kaiser__S_B_	-3%	25%	-8%	14%	1%	-7%	-2%	4%	-3%	0%
Sweat__S_J_	-7%	15%	-2%	3%	17%	-18%	-1%	2%	-6%	-13%

Oblique Factor Rotation Loadings 1996-2000

Factor	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Feather__B_L_	44%	-2%	-6%	24%	0%	13%	24%	46%	-8%	13%	8%	-4%	15%	25%
Lowe__J_W_G_	-3%	-11%	14%	2%	-7%	-9%	-4%	31%	72%	-8%	-13%	5%	-3%	0%
King__C_W	14%	5%	73%	-3%	0%	5%	19%	-8%	28%	12%	-5%	-6%	-21%	-3%
Horridge__P_E_	-5%	1%	44%	14%	-4%	2%	21%	15%	23%	20%	-3%	1%	-25%	-9%
Paoletti__J_B	-11%	49%	5%	-4%	36%	11%	3%	-14%	2%	21%	29%	-11%	-11%	35%
Hooks__B	-4%	76%	0%	-4%	26%	4%	-1%	-9%	1%	12%	9%	-6%	-5%	1%
Blumer__H_	-5%	32%	18%	0%	-4%	12%	1%	-14%	58%	6%	6%	-10%	-6%	45%
Banner__L_W	2%	23%	-4%	-4%	68%	42%	-1%	-10%	8%	18%	28%	-5%	-5%	4%
Musa__K_E_	3%	51%	-8%	-3%	3%	14%	-3%	-3%	15%	-9%	67%	-5%	-2%	4%
Fishbein__M	10%	-6%	36%	74%	-8%	2%	5%	18%	-2%	-4%	-5%	14%	21%	-8%
Chowdhary__U_	27%	5%	72%	0%	1%	15%	4%	-1%	1%	4%	-2%	10%	1%	-6%
Michelman__S_O_	-1%	74%	1%	-3%	13%	23%	0%	-8%	7%	1%	45%	-6%	-2%	18%
Lennon__S_J	34%	19%	21%	4%	46%	66%	5%	-4%	8%	5%	9%	-3%	-5%	4%
Liskey_Fitzwater__	8%	-2%	3%	45%	1%	2%	-2%	-3%	-2%	6%	-2%	-17%	66%	9%
Kimle__P_A_	44%	29%	0%	2%	25%	31%	35%	-2%	6%	55%	10%	-1%	7%	4%
Miller__K_A_	-4%	18%	5%	-3%	1%	15%	0%	-9%	17%	24%	34%	-4%	0%	54%
Jones__J_C_	40%	-7%	1%	18%	-9%	2%	24%	-4%	-6%	-6%	-3%	-17%	45%	-8%
Fiore__A_M_	66%	20%	-1%	6%	19%	28%	32%	-4%	7%	44%	8%	-3%	6%	4%
Evans__C	2%	47%	6%	1%	4%	15%	6%	-9%	30%	17%	33%	-8%	-10%	7%
Roach_Higgins__M	0%	55%	-5%	-2%	16%	37%	-2%	-7%	13%	5%	65%	-4%	-1%	21%
Kadolph__S_J____	79%	2%	16%	35%	0%	8%	28%	5%	1%	18%	-3%	11%	6%	-1%
Eckman__M_	77%	3%	17%	50%	-3%	10%	8%	-1%	-1%	10%	-2%	6%	14%	-1%
Thompson__J_K	4%	0%	-10%	-3%	94%	1%	-2%	11%	-1%	4%	2%	-1%	-3%	-4%
Belk__R_W_	42%	11%	4%	14%	-3%	12%	-10%	-1%	-7%	-9%	17%	9%	0%	74%
Abraham_Murali__I	20%	-1%	5%	84%	-5%	8%	0%	2%	-4%	4%	-3%	-7%	38%	4%
Wilson__E	-3%	65%	4%	-5%	0%	19%	-2%	-8%	23%	7%	17%	-5%	-5%	19%
Damhorst__M_L_	66%	27%	15%	36%	8%	38%	15%	2%	6%	17%	6%	0%	11%	18%
Morgado__M_A_	47%	22%	2%	-4%	8%	8%	17%	-3%	15%	70%	0%	-2%	5%	5%

Jarnow__J_	4%	-5%	4%	19%	-7%	-5%	82%	7%	-1%	1%	-3%	30%	1%	-4%
Helvenston__S_I	-2%	21%	1%	2%	0%	14%	0%	-4%	86%	-3%	11%	-1%	6%	0%
Lincoln__Y_S_	16%	-8%	-12%	35%	-4%	4%	48%	-8%	-9%	-1%	-3%	8%	-10%	-3%
O_Neal__G_S_	28%	70%	-8%	2%	34%	27%	2%	-4%	4%	33%	21%	2%	3%	12%
Watkins__S_M_	67%	-11%	-5%	-1%	-9%	-2%	42%	-1%	-6%	-4%	-1%	-11%	8%	-5%
Davis__L_L_	58%	21%	17%	14%	23%	41%	18%	11%	4%	3%	7%	14%	15%	16%
Farrell_Beck__J_	80%	14%	0%	38%	-7%	2%	-2%	-4%	-3%	-17%	0%	-10%	24%	-1%
Ajzen__I_	7%	-6%	14%	80%	-8%	2%	5%	4%	-2%	-6%	-4%	15%	30%	-9%
Warner__P_C_	17%	20%	-8%	0%	16%	13%	3%	6%	23%	-13%	10%	-2%	15%	44%
Butler__S_	11%	-5%	74%	51%	-8%	8%	5%	2%	6%	-7%	-8%	13%	-7%	0%
U_S__Bureau_of_(	10%	-11%	47%	62%	-8%	-3%	7%	28%	3%	-5%	-2%	4%	-26%	2%
Gurel__L_M_	39%	50%	-12%	20%	7%	48%	-1%	-1%	2%	25%	13%	-1%	10%	15%
LaBat__K_L	52%	8%	-14%	2%	38%	6%	4%	23%	-2%	39%	-5%	-5%	6%	9%
Hair__J_F_	-4%	-10%	13%	6%	15%	0%	-6%	93%	-4%	-3%	-6%	5%	9%	0%
Fairhurst__A_E_	59%	-5%	25%	17%	-4%	11%	10%	-3%	-9%	-9%	-5%	48%	9%	-3%
Tatham__R_L_	-3%	-9%	10%	6%	16%	1%	-5%	95%	-3%	-2%	-6%	0%	1%	-2%
Canton__B_	95%	5%	8%	0%	-2%	7%	-4%	-7%	-2%	10%	-4%	-3%	-5%	-2%
Glock__R_E	4%	-6%	-1%	2%	-4%	-2%	91%	-3%	-6%	4%	-4%	11%	0%	-4%
Kwon__Y_H_	73%	-10%	9%	15%	30%	-5%	-6%	15%	5%	-19%	-7%	-13%	-8%	17%
Dale__J_D_	-4%	-6%	-5%	-4%	-5%	-4%	-2%	-6%	-4%	-6%	-2%	-4%	-3%	-1%
Churchill__G_A__J	3%	-6%	20%	23%	-9%	-5%	-7%	52%	-4%	1%	-8%	14%	60%	23%
Kunz__G_I_	28%	1%	0%	10%	-1%	0%	83%	0%	-4%	28%	-4%	10%	-2%	-2%
Hamilton__J_A_	37%	26%	-6%	3%	38%	35%	3%	-10%	23%	43%	37%	-6%	-6%	1%
Forsythe__S_M___	5%	5%	81%	8%	-7%	10%	-5%	5%	6%	0%	5%	12%	24%	28%
Eicher__J_B_	2%	38%	-6%	-6%	16%	33%	-1%	-5%	9%	6%	76%	-5%	0%	21%
Drake__M_F_	42%	2%	9%	40%	3%	5%	2%	0%	-4%	-9%	4%	23%	-4%	40%
ASTM	-3%	-6%	-8%	-5%	-8%	-5%	-3%	-6%	-6%	1%	-4%	-3%	-2%	-7%
Shim__S_	36%	-3%	35%	55%	-7%	-2%	13%	32%	-3%	24%	-5%	24%	-5%	6%
Dwyer__F_R	-5%	-8%	-2%	2%	-7%	-7%	4%	-5%	-4%	0%	-3%	28%	-5%	0%
Workman__J_E_	22%	7%	28%	20%	-1%	83%	-2%	6%	9%	-2%	0%	4%	-1%	6%
Silberstein__L	-2%	1%	-7%	-5%	97%	1%	-5%	5%	-6%	1%	1%	-4%	-3%	-4%
Hammidi__T_N_	13%	95%	-2%	-3%	-2%	2%	0%	-5%	9%	12%	0%	-3%	-1%	2%
Covin__J_G	-8%	-7%	-6%	3%	-3%	-5%	10%	-4%	-2%	-2%	-3%	-3%	-3%	-3%
Sproles__G_B	54%	24%	16%	4%	-1%	33%	36%	-1%	-2%	-4%	11%	32%	5%	0%
Hirschman__E_C_	85%	-1%	35%	6%	9%	1%	1%	2%	-5%	16%	-4%	19%	1%	5%
Wind__Y	36%	-6%	1%	7%	-7%	-4%	-4%	1%	-9%	-5%	-1%	79%	6%	5%
Wagner__J_	18%	-14%	9%	44%	-12%	-5%	26%	3%	-8%	-10%	-5%	73%	3%	-5%
Wood__E_J_	-7%	-4%	-7%	-4%	-6%	-1%	-3%	-4%	-4%	1%	-3%	-1%	-1%	-2%
Rudd__N_A_	29%	17%	-4%	-3%	81%	26%	5%	3%	3%	34%	6%	-3%	0%	1%
Swinney__J_L_	88%	-6%	20%	3%	-5%	2%	-2%	-4%	3%	-23%	-3%	17%	1%	-4%
Pourdeyhimi__B_	-8%	-6%	-6%	-5%	-5%	-3%	-3%	-4%	-4%	0%	-3%	-2%	-1%	-3%
Striegel_Moore__R	-2%	1%	-7%	-5%	97%	0%	-5%	5%	-5%	0%	0%	-4%	-3%	-4%
Black__W_C____	-2%	-12%	21%	4%	13%	-5%	9%	92%	-3%	0%	-6%	-2%	1%	2%
Monson__T_	0%	-7%	10%	0%	-5%	10%	-6%	-1%	-6%	-4%	-4%	6%	5%	-6%
Solomon__M_R_	58%	32%	3%	21%	17%	35%	5%	5%	4%	23%	9%	-7%	12%	36%
Goldsmith__R_E__	14%	3%	88%	5%	-4%	13%	8%	-7%	0%	0%	-2%	-5%	-7%	-3%
Cash__T_F	3%	3%	-4%	-7%	97%	5%	-1%	4%	-1%	-3%	-1%	-4%	1%	4%
Cahoon__D_	3%	12%	-2%	0%	6%	96%	-1%	-3%	8%	4%	8%	-4%	-2%	2%
Edmonds__E_	3%	12%	-2%	0%	6%	96%	-1%	-3%	8%	4%	8%	-4%	-2%	2%
Abbey__A_	3%	12%	-2%	0%	6%	96%	-1%	-3%	8%	4%	8%	-4%	-2%	2%
Campos__A_	-3%	-4%	-5%	-4%	-1%	-4%	-5%	-1%	-3%	5%	-1%	-2%	-2%	-2%
Summers__T_A_	1%	-10%	17%	4%	-7%	-6%	-2%	5%	-7%	0%	-5%	12%	2%	3%

Foucault__M_	-7%	79%	-2%	-12%	17%	25%	-1%	-10%	23%	10%	12%	-4%	-9%	-1%
Kim__M_S_	13%	0%	90%	6%	-5%	14%	0%	17%	-4%	-4%	-4%	-1%	2%	-5%
Ettenson__R_	19%	-14%	5%	45%	-12%	-6%	26%	-2%	-7%	-9%	-3%	75%	-5%	-4%
Slevin__D_P	-7%	-6%	-5%	-2%	-5%	-4%	7%	-5%	-3%	-3%	-3%	-4%	-1%	-1%
Berlyne__D_E_	97%	1%	-1%	6%	-4%	1%	-1%	-4%	-3%	8%	-2%	12%	-1%	-3%
Dickson__M_A_C_	32%	9%	-5%	70%	2%	32%	1%	-1%	4%	19%	5%	-15%	13%	26%
Winakor__G_	92%	16%	11%	2%	-5%	6%	2%	-6%	-4%	0%	0%	13%	-4%	-2%
Hillestad__R_	81%	0%	-6%	-1%	22%	-2%	-1%	13%	6%	-16%	-2%	-2%	0%	10%
Rodin__J	-3%	0%	-7%	-4%	96%	-2%	-5%	4%	-5%	-3%	-1%	-4%	-3%	-3%
Garfield__E_	5%	1%	7%	4%	-5%	6%	-5%	-6%	10%	17%	-3%	-2%	-3%	4%
Stein__P_J	-9%	-5%	-3%	0%	-5%	-3%	8%	-5%	-3%	-2%	-3%	-5%	-1%	-3%
Littrell__M_A_	56%	1%	-10%	62%	8%	20%	2%	2%	0%	14%	4%	-14%	0%	12%
Deshpande__R	13%	-4%	4%	50%	-8%	-2%	9%	-3%	-3%	-4%	-1%	-17%	32%	-1%
Steele__V_	1%	20%	-5%	-5%	3%	38%	1%	-9%	75%	24%	10%	-4%	-1%	5%
Crown__E_M_	1%	-10%	6%	42%	-10%	-2%	4%	-1%	-4%	-7%	-4%	7%	-4%	-6%
Cassill__N_L_	40%	-5%	13%	32%	-4%	-7%	33%	1%	-5%	-8%	-4%	4%	-4%	13%
Morganosky__M_A	55%	-9%	46%	34%	-9%	3%	1%	0%	-6%	-12%	-5%	18%	0%	-3%
Sheth__J_N	53%	1%	-1%	7%	-5%	-8%	26%	2%	0%	22%	-5%	65%	8%	-4%
Davis__F_D	-3%	59%	8%	-2%	1%	26%	1%	-9%	33%	13%	19%	-6%	-9%	24%
Greenberg__B_A_	8%	-1%	82%	23%	-7%	5%	-2%	4%	-2%	0%	-4%	1%	42%	-1%
Holbrook__M_B_	92%	5%	9%	-1%	-1%	3%	7%	0%	-3%	24%	2%	13%	10%	1%
Francis__S_K_	5%	-8%	14%	75%	-10%	2%	23%	5%	-6%	-5%	-7%	25%	-14%	19%
Minshall__B_C_	83%	-7%	26%	1%	-6%	-1%	0%	0%	-5%	-14%	-3%	11%	-4%	5%
Hollies__N_R_S	42%	-5%	-4%	-2%	-8%	-8%	0%	-6%	-2%	-10%	-4%	-2%	-7%	4%
Oliver__B_A_	37%	22%	4%	-4%	-1%	8%	6%	-9%	25%	68%	-2%	-3%	-9%	-4%
Wolins__L_	96%	2%	1%	6%	-4%	0%	2%	-5%	-1%	6%	-2%	10%	-3%	-2%
Freedman__R_J	-7%	13%	-2%	-12%	90%	7%	0%	-10%	5%	8%	13%	1%	-3%	4%
Kaiser__S_B_	25%	64%	9%	0%	10%	35%	7%	-8%	31%	25%	19%	-4%	0%	15%
Rigakis__K_B_	37%	9%	-11%	-1%	-3%	-2%	3%	-6%	0%	36%	-4%	-3%	-2%	-3%
Dickerson__K_G_	13%	5%	37%	30%	-7%	4%	67%	-3%	21%	18%	0%	-3%	-10%	-1%
Kincade__D_H_	-11%	-6%	0%	2%	-6%	-7%	56%	-8%	-6%	-2%	-4%	-5%	-6%	0%
Bitner__M_J	3%	-5%	10%	72%	-8%	3%	0%	6%	-8%	-3%	-4%	36%	0%	4%
Erekosima__T_V_	-1%	5%	-6%	-8%	0%	3%	2%	-2%	-1%	-5%	88%	-5%	2%	-1%
Freitas__A_J_	15%	96%	-5%	-4%	-3%	2%	-1%	-4%	8%	12%	1%	-2%	-1%	1%
Laughlin__J_M_	63%	12%	7%	-2%	4%	0%	36%	4%	17%	47%	-1%	-2%	2%	3%
Johnson__K_K_P_	3%	17%	16%	1%	8%	85%	-2%	-5%	11%	-2%	7%	0%	4%	29%
Bellenger__D_N_	3%	-10%	81%	2%	-9%	-11%	-5%	34%	4%	5%	-5%	0%	11%	10%
Dillman__D_A_	5%	-14%	23%	65%	-13%	-11%	37%	6%	1%	-7%	-6%	9%	17%	0%
DeJonge__J_O	21%	5%	1%	7%	1%	14%	44%	-2%	19%	16%	4%	-9%	4%	6%
U_S__Dept_of_Co	-9%	4%	25%	5%	-3%	-3%	-11%	34%	14%	15%	14%	48%	9%	8%
DeLong__M_R_	76%	15%	4%	-1%	19%	19%	28%	7%	4%	17%	26%	8%	11%	12%
Paek__S_L__	51%	-14%	28%	9%	-10%	-21%	0%	5%	21%	-21%	-3%	-17%	-22%	12%
Chandler__J_L_	23%	92%	-3%	-6%	-3%	3%	-3%	-4%	8%	-10%	3%	-3%	0%	6%
Hall__C_A	2%	95%	-5%	-7%	-5%	3%	-3%	-3%	8%	-8%	2%	0%	2%	2%
Creekmore__A_M_	84%	7%	-8%	2%	0%	-6%	5%	-6%	2%	35%	-4%	-4%	-6%	-2%
Lumpkin__J_R_	6%	-10%	75%	14%	-8%	-12%	2%	35%	0%	-3%	0%	-8%	-10%	8%
Beatty__S_E_	3%	-2%	41%	17%	-9%	-5%	-5%	17%	-4%	0%	-2%	19%	76%	2%
Kim__J_W_	3%	94%	0%	-6%	-5%	3%	-1%	0%	7%	-7%	3%	6%	8%	1%
Craik__J	-1%	38%	9%	-12%	-8%	-1%	0%	-8%	70%	11%	0%	-10%	-8%	6%
Reynolds__F_D_	15%	-5%	69%	9%	-10%	3%	-8%	12%	-2%	-5%	-6%	4%	45%	12%
Brown__P_M_	27%	3%	3%	17%	-6%	0%	76%	2%	4%	-1%	1%	-7%	5%	0%
U_S__Dept_of_Lab	4%	-12%	5%	80%	-6%	-3%	9%	3%	7%	-4%	-3%	1%	-8%	-7%

Winstead__B_M_	7%	-6%	-7%	-7%	90%	1%	-4%	11%	-1%	-14%	-8%	-4%	0%	9%
Moschis__G_P_	-10%	-8%	22%	14%	-10%	-9%	-2%	85%	3%	-3%	1%	-3%	6%	-5%
Welters__L_	-11%	16%	-8%	-6%	6%	5%	-11%	-8%	22%	11%	72%	15%	-8%	7%
Kean__R_C_	39%	34%	14%	-6%	6%	4%	36%	3%	26%	53%	9%	-7%	1%	6%
Goffman__E	5%	38%	9%	5%	6%	25%	-2%	3%	13%	2%	1%	-5%	9%	77%
Darden__W_R	40%	7%	54%	6%	-6%	6%	2%	19%	-2%	31%	-6%	2%	35%	5%
Freeman__C_M	73%	43%	-6%	-2%	0%	3%	-1%	-3%	4%	20%	-3%	-2%	1%	5%
Stone__G_P	1%	34%	20%	8%	-2%	44%	-7%	21%	13%	15%	18%	2%	19%	59%
Hutton__S_S_	11%	43%	2%	-1%	3%	34%	6%	-7%	62%	33%	11%	-2%	-4%	11%
Engel__J_F_	20%	-7%	43%	46%	-12%	-1%	16%	36%	3%	-6%	-1%	21%	44%	-7%
Hamilton__J_	-8%	34%	-1%	-6%	-8%	2%	-3%	2%	73%	-2%	39%	-8%	-3%	-6%
Nagasawa__R_H_	11%	43%	0%	-1%	3%	35%	4%	-7%	64%	31%	11%	-1%	-2%	11%
McCracken__G_	11%	26%	14%	12%	0%	9%	13%	-3%	31%	19%	33%	-12%	-10%	17%
Blackwell__R_D_	23%	-4%	42%	46%	-12%	-1%	23%	37%	6%	-7%	1%	16%	40%	-5%
Salusso_Deonier__	55%	11%	-2%	-10%	45%	9%	-2%	-4%	2%	-15%	10%	2%	5%	19%
Miniard__P_W_	22%	-7%	45%	41%	-11%	2%	19%	38%	-4%	-1%	0%	30%	35%	-6%
Forney__J_C__	6%	-6%	54%	49%	-15%	-5%	9%	33%	-4%	0%	-3%	16%	5%	2%

Continued Oblique Factor Rotation Loadings 1996-2000

Factor	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Feather__B_L_	-4%	2%	-4%	-2%	-18%	13%	-2%	16%	-9%	0%	-6%	17%
Lowe__J_W_G_	-7%	-2%	-1%	-3%	-22%	-10%	-3%	-19%	4%	7%	-7%	-7%
King__C_W	-4%	-5%	0%	16%	-3%	14%	-2%	14%	5%	2%	-4%	1%
Horridge__P_E_	-5%	-4%	43%	17%	-16%	7%	2%	26%	23%	21%	2%	3%
Paoletti__J_B	-5%	-6%	-5%	15%	4%	-15%	-2%	3%	-15%	-14%	-3%	-16%
Hooks__B	-2%	-3%	-3%	19%	3%	-24%	-2%	-4%	-9%	-9%	-2%	-14%
Blumer__H_	-4%	-4%	-7%	15%	-8%	-13%	-3%	-6%	0%	-7%	-9%	-3%
Banner__L_W	-3%	-5%	-3%	4%	3%	-4%	-3%	1%	-12%	-4%	-1%	-15%
Musa__K_E_	-2%	-3%	1%	-4%	2%	8%	0%	1%	-12%	2%	3%	-1%
Fishbein__M	-3%	4%	-3%	6%	24%	5%	1%	8%	18%	-9%	0%	-1%
Chowdhary__U_	-1%	-1%	-2%	0%	0%	49%	0%	-1%	4%	3%	3%	0%
Michelman__S_O_	-1%	-2%	-2%	12%	3%	-11%	-1%	-4%	-8%	-4%	-2%	-6%
Lennon__S_J	-2%	-3%	-1%	15%	8%	14%	-1%	5%	4%	0%	6%	0%
Liskey_Fitzwater__	-3%	-7%	-5%	5%	5%	10%	-1%	10%	3%	0%	-5%	23%
Kimle__P_A_	-2%	4%	-4%	2%	0%	-6%	-3%	-9%	-7%	-3%	-6%	-3%
Miller__K_A_	-6%	-9%	-4%	36%	-12%	4%	-5%	16%	4%	-4%	-9%	17%
Jones__J_C_	-7%	5%	-4%	-4%	0%	-9%	-3%	55%	-5%	1%	-13%	-6%
Fiore__A_M_	-3%	3%	-2%	5%	-5%	1%	-3%	9%	1%	0%	-5%	-1%
Evans__C	-1%	-4%	1%	50%	2%	5%	0%	28%	-6%	-1%	4%	-2%
Roach_Higgins__M	-2%	-3%	-2%	6%	-1%	-3%	-2%	1%	-6%	0%	-1%	-4%
Kadolph__S_J____	0%	13%	-1%	6%	-4%	8%	0%	5%	5%	-3%	2%	-1%
Eckman__M_	0%	5%	0%	4%	0%	9%	-1%	13%	8%	0%	2%	1%
Thompson__J_K	-4%	-2%	8%	1%	-7%	-3%	-1%	-5%	-2%	10%	1%	-4%
Belk__R_W_	2%	-9%	-1%	6%	-1%	-3%	-1%	-2%	24%	-2%	4%	-6%
Abraham_Murali__I	-1%	3%	-1%	0%	0%	7%	0%	4%	8%	-2%	-3%	3%
Wilson__E	-3%	-4%	-1%	54%	-1%	-14%	-2%	5%	-1%	-1%	-4%	-6%
Damhorst__M_L_	-3%	2%	-4%	11%	-1%	9%	-2%	2%	1%	4%	0%	4%
Morgado__M_A_	-3%	3%	-2%	12%	-3%	3%	-2%	3%	1%	1%	-7%	15%
Jarnow__J_	-5%	1%	-2%	3%	15%	1%	21%	-5%	-3%	-8%	-4%	1%
Helvenston__S_I	-1%	-1%	4%	10%	8%	2%	0%	-3%	-11%	-4%	1%	-5%
Lincoln__Y_S_	-6%	-6%	-5%	4%	15%	2%	-6%	-8%	2%	63%	-4%	-4%
O_Neal__G_S_	2%	1%	-2%	-10%	-4%	2%	-2%	1%	-4%	3%	0%	-3%

Watkins__S_M_	4%	26%	-7%	-6%	-13%	-7%	-4%	33%	-13%	-7%	-6%	-7%
Davis__L_L_	2%	-2%	-5%	6%	-12%	30%	0%	1%	5%	-3%	17%	12%
Farrell_Beck__J_	0%	-4%	-1%	1%	5%	-2%	-2%	11%	5%	11%	-3%	-6%
Ajzen__I_	-4%	4%	-3%	6%	32%	-1%	0%	4%	13%	-12%	-6%	-2%
Warner__P_C_	-3%	-1%	-3%	59%	-6%	10%	-1%	-15%	-5%	1%	3%	-6%
Butler__S_	-4%	6%	-5%	1%	-13%	1%	-4%	-7%	-3%	-8%	2%	4%
U_S__Bureau_of_(	-4%	2%	-1%	-8%	-5%	-2%	1%	3%	27%	14%	5%	-4%
Gurel__L_M_	8%	1%	-1%	-20%	-12%	19%	-1%	-1%	0%	7%	3%	8%
LaBat__K_L	-4%	5%	-3%	-2%	-8%	20%	-1%	-6%	3%	5%	0%	43%
Hair__J_F_	-4%	-3%	-2%	0%	-3%	2%	-2%	0%	0%	3%	13%	4%
Fairhurst__A_E_	-6%	-3%	-6%	12%	34%	-3%	4%	-9%	13%	-4%	4%	-1%
Tatham__R_L_	-4%	-2%	-1%	1%	-2%	1%	-2%	-1%	0%	2%	-3%	5%
Canton__B_	0%	3%	1%	-4%	5%	2%	-1%	9%	-2%	5%	-3%	0%
Glock__R_E	-4%	-1%	22%	-1%	-3%	-3%	-2%	6%	11%	2%	-2%	-2%
Kwon__Y_H_	2%	-6%	-6%	-6%	-10%	1%	-2%	-7%	29%	-1%	4%	4%
Dale__J_D_	2%	96%	-3%	0%	-1%	-1%	-2%	1%	0%	-1%	-1%	-3%
Churchill__G_A__J	2%	-5%	-4%	-2%	-2%	-1%	-5%	2%	-9%	1%	14%	-10%
Kunz__G_I_	-5%	3%	23%	-3%	0%	-1%	-1%	1%	11%	14%	-4%	0%
Hamilton__J_A_	-4%	2%	-1%	2%	-3%	6%	-2%	24%	-5%	5%	-4%	-1%
Forsythe__S_M___	-5%	-2%	-7%	7%	-15%	-5%	-4%	-12%	6%	-2%	-4%	-3%
Eicher__J_B_	-4%	-3%	-4%	15%	-4%	-6%	-3%	-4%	-1%	-1%	-3%	-3%
Drake__M_F_	-5%	-5%	-2%	11%	25%	-6%	9%	-5%	44%	12%	-6%	-6%
ASTM	71%	54%	-3%	9%	0%	1%	-3%	-11%	8%	-1%	-2%	-1%
Shim__S_	-7%	4%	-1%	-8%	10%	6%	4%	-3%	21%	7%	-4%	-3%
Dwyer__F_R	-4%	-4%	-2%	-2%	5%	-4%	93%	1%	7%	3%	-3%	-3%
Workman__J_E_	-5%	4%	0%	2%	0%	-1%	-2%	9%	-10%	2%	-7%	0%
Silberstein__L	-3%	-3%	-3%	-2%	-1%	-2%	-2%	1%	-2%	-2%	-1%	0%
Hammidi__T_N_	-2%	2%	-2%	3%	0%	-4%	-1%	-3%	-1%	-1%	-1%	2%
Covin__J_G	-4%	-3%	94%	-1%	-4%	-2%	-1%	-3%	-2%	5%	-2%	-1%
Sproles__G_B	-3%	-4%	-4%	-10%	-2%	13%	-2%	-10%	-28%	-1%	-6%	4%
Hirschman__E_C_	-3%	0%	0%	-7%	14%	-2%	3%	3%	11%	5%	-2%	-6%
Wind__Y	7%	-6%	-5%	-6%	-1%	3%	10%	0%	-1%	-5%	5%	-2%
Wagner__J_	-7%	1%	-5%	-1%	15%	-3%	6%	-4%	1%	0%	14%	0%
Wood__E_J_	96%	-5%	-2%	-3%	-1%	0%	-2%	-2%	0%	0%	-2%	0%
Rudd__N_A_	-2%	3%	-2%	-5%	1%	1%	-1%	-4%	-1%	2%	-1%	3%
Swinney__J_L_	2%	-5%	1%	4%	8%	0%	-1%	-5%	-6%	-3%	3%	-5%
Pourdeyhimi__B_	97%	-2%	-2%	1%	1%	-1%	-2%	-2%	0%	0%	-3%	0%
Striegel_Moore__R	-3%	-3%	-3%	-2%	-1%	-1%	-2%	1%	-2%	-2%	-2%	1%
Black__W_C____	-4%	-2%	1%	0%	12%	-1%	0%	0%	2%	5%	-3%	3%
Monson__T_	-4%	-4%	-3%	-1%	-3%	-10%	-4%	0%	-1%	-3%	91%	-3%
Solomon__M_R_	-2%	2%	-2%	14%	-6%	15%	0%	-6%	2%	6%	4%	10%
Goldsmith__R_E__	-1%	-1%	2%	7%	6%	12%	4%	8%	-10%	-3%	12%	4%
Cash__T_F	-2%	-3%	-4%	4%	-1%	2%	-1%	-1%	3%	-4%	-1%	8%
Cahoon__D_	-2%	-3%	-3%	1%	-2%	2%	-2%	0%	3%	0%	6%	-2%
Edmonds__E_	-2%	-3%	-3%	1%	-2%	2%	-2%	0%	3%	0%	6%	-2%
Abbey__A_	-2%	-3%	-3%	1%	-2%	2%	-2%	0%	3%	0%	6%	-2%
Campos__A_	-3%	-2%	-2%	-2%	1%	-13%	-3%	-1%	-3%	-3%	-3%	83%
Summers__T_A_	-5%	-4%	-5%	-2%	86%	-1%	1%	-2%	4%	10%	-4%	2%
Foucault__M_	-5%	-6%	-3%	7%	-3%	2%	-4%	15%	-1%	-2%	-4%	-1%
Kim__M_S_	-2%	-1%	0%	1%	8%	5%	0%	-2%	-7%	-3%	6%	3%
Ettenson__R_	-7%	2%	-5%	-1%	16%	-2%	7%	-5%	3%	-2%	0%	0%
Slevin__D_P	-3%	-3%	92%	-1%	0%	1%	-2%	-3%	-4%	-7%	-2%	0%

Berlyne__D_E_	0%	3%	-1%	-2%	0%	-2%	-2%	7%	-1%	-2%	1%	-1%
Dickson__M_A_C_	-1%	2%	0%	0%	-5%	11%	1%	2%	-3%	24%	2%	4%
Winakor__G_	2%	-1%	-2%	-7%	-1%	2%	-2%	4%	-13%	-1%	-4%	2%
Hillestad__R_	2%	0%	-2%	30%	-8%	6%	-1%	-13%	12%	3%	10%	2%
Rodin__J	-3%	-3%	-3%	-3%	-2%	-1%	-2%	1%	-1%	-3%	-2%	2%
Garfield__E_	-4%	-3%	-2%	2%	-2%	72%	-4%	5%	-3%	-2%	-11%	-14%
Stein__P_J	-3%	-3%	-1%	0%	-3%	-1%	97%	-1%	-3%	-4%	-1%	-1%
Littrell__M_A_	-1%	2%	2%	-5%	-6%	6%	1%	1%	1%	30%	4%	3%
Deshpande__R	-4%	-9%	-7%	6%	32%	-2%	-5%	3%	0%	60%	-6%	-3%
Steele__V_	-3%	-4%	-1%	13%	-2%	10%	-2%	12%	-3%	3%	1%	1%
Crown__E_M_	-1%	85%	-4%	0%	-5%	-4%	-3%	5%	-5%	-8%	0%	-3%
Cassill__N_L_	-3%	-5%	34%	-3%	11%	-8%	5%	4%	56%	-1%	-2%	-8%
Morganosky__M_A	-1%	1%	-2%	5%	-5%	-3%	-1%	0%	1%	-5%	48%	-1%
Sheth__J_N	-6%	5%	-3%	-5%	-2%	9%	5%	-15%	2%	7%	0%	1%
Davis__F_D	-3%	-3%	-2%	50%	1%	-4%	-1%	20%	-3%	0%	-3%	-3%
Greenberg__B_A_	-2%	-1%	0%	2%	4%	-6%	0%	4%	0%	0%	7%	-1%
Holbrook__M_B_	-1%	2%	-2%	-1%	-2%	-7%	-3%	-1%	-6%	-2%	-5%	-1%
Francis__S_K_	-6%	6%	-1%	-2%	-11%	6%	-1%	-6%	-17%	6%	5%	3%
Minshall__B_C_	0%	-5%	-1%	2%	34%	3%	-2%	-2%	-1%	15%	2%	-3%
Hollies__N_R_S	80%	-6%	-5%	-10%	-10%	-7%	-2%	12%	-9%	-6%	4%	-5%
Oliver__B_A_	-5%	2%	-1%	10%	-3%	38%	-3%	14%	1%	4%	-4%	4%
Wolins__L_	4%	1%	-2%	-3%	-2%	-4%	-1%	9%	-4%	-3%	0%	-1%
Freedman__R_J	-3%	-3%	-2%	6%	4%	-7%	-2%	6%	-2%	-2%	-2%	-9%
Kaiser__S_B_	-5%	-2%	-4%	16%	2%	9%	-3%	9%	-3%	-3%	0%	-2%
Rigakis__K_B_	-1%	81%	-3%	-10%	-1%	2%	-2%	3%	-1%	2%	-4%	4%
Dickerson__K_G_	0%	2%	17%	14%	-8%	8%	6%	23%	6%	-3%	10%	1%
Kincade__D_H_	-3%	-5%	67%	-4%	-3%	-5%	0%	7%	25%	-4%	1%	-2%
Bitner__M_J	12%	8%	-2%	-7%	-15%	1%	-2%	7%	-7%	-14%	10%	-2%
Erekosima__T_V_	-3%	-1%	-4%	5%	-4%	0%	-1%	-12%	6%	-4%	-1%	4%
Freitas__A_J_	-2%	2%	-2%	-3%	-1%	2%	-1%	-2%	0%	1%	-1%	4%
Laughlin__J_M_	2%	8%	-3%	-6%	1%	15%	3%	-4%	-9%	-7%	6%	-3%
Johnson__K_K_P_	-3%	0%	-2%	12%	0%	-3%	-2%	-1%	-4%	-3%	-5%	1%
Bellenger__D_N_	-4%	-3%	-4%	-9%	8%	-8%	-3%	-4%	6%	5%	-7%	-7%
Dillman__D_A_	-8%	-2%	27%	-6%	16%	-10%	9%	1%	19%	9%	-7%	-8%
DeJonge__J_O	-1%	9%	-2%	14%	-5%	20%	2%	60%	5%	-2%	7%	0%
U_S__Dept_of_Co	-7%	-4%	19%	-1%	-5%	-24%	13%	14%	8%	41%	-13%	-13%
DeLong__M_R_	-1%	1%	-5%	14%	-7%	8%	-1%	-9%	2%	-4%	2%	9%
Paek__S_L__	11%	-11%	-10%	-23%	-12%	-24%	-3%	-1%	22%	-10%	-6%	-12%
Chandler__J_L_	-2%	-2%	-2%	18%	-2%	2%	-1%	-5%	9%	0%	2%	1%
Hall__C_A	-2%	-1%	-2%	-11%	-4%	10%	-1%	-1%	3%	3%	-1%	4%
Creekmore__A_M_	3%	7%	-1%	-14%	-2%	-1%	-3%	2%	-2%	3%	1%	1%
Lumpkin__J_R_	-3%	-5%	-1%	-14%	17%	-5%	2%	1%	25%	-2%	4%	-6%
Beatty__S_E_	-4%	-5%	-4%	-5%	-2%	-3%	-4%	2%	1%	8%	12%	-8%
Kim__J_W_	-2%	-1%	-4%	-11%	-8%	15%	-2%	-5%	5%	2%	-1%	4%
Craik__J	-6%	-6%	-7%	35%	-13%	5%	-5%	5%	12%	1%	-7%	5%
Reynolds__F_D_	-5%	-6%	1%	-10%	29%	-12%	-1%	1%	1%	12%	5%	-7%
Brown__P_M_	9%	-2%	-7%	1%	-10%	-8%	-2%	8%	-25%	14%	-3%	-3%
U_S__Dept_of_Lat	-4%	4%	13%	0%	-12%	-10%	1%	-6%	-12%	33%	6%	-4%
Winstead__B_M_	-2%	-2%	-3%	5%	-3%	8%	0%	-4%	10%	0%	1%	9%
Moschis__G_P_	-3%	-5%	-8%	-7%	2%	-10%	-5%	-5%	2%	-13%	-8%	-9%
Welters__L_	-3%	-3%	-1%	6%	0%	-5%	-3%	23%	2%	8%	-2%	-5%
Kean__R_C_	-2%	6%	-2%	-9%	15%	16%	3%	0%	-9%	-2%	3%	0%

Goffman__E	-4%	-1%	-1%	11%	15%	10%	0%	2%	-5%	5%	-4%	2%
Darden__W_R	-6%	1%	-2%	-8%	35%	-7%	-3%	-7%	-11%	10%	-10%	-2%
Freeman__C_M	-1%	6%	-1%	29%	0%	2%	-1%	-13%	18%	4%	1%	4%
Stone__G_P	-5%	-3%	-4%	-1%	-3%	-2%	-5%	1%	-12%	0%	-10%	-5%
Hutton__S_S_	0%	3%	1%	-1%	5%	19%	2%	21%	-4%	2%	4%	3%
Engel__J_F_	-5%	1%	-5%	0%	0%	-9%	-4%	-10%	-7%	-14%	-9%	-8%
Hamilton__J_	-5%	-3%	-8%	-14%	0%	3%	-5%	-1%	10%	-8%	-2%	1%
Nagasawa__R_H_	0%	3%	1%	-1%	5%	15%	1%	21%	-3%	4%	4%	5%
McCracken__G_	-2%	-6%	-1%	51%	13%	7%	1%	26%	2%	33%	0%	0%
Blackwell__R_D_	-5%	1%	-4%	13%	1%	-11%	-3%	-10%	-6%	-14%	-9%	-8%
Salusso_Deonier__	-3%	-3%	-1%	42%	0%	2%	0%	-11%	22%	-1%	3%	-2%
Miniard__P_W_	-4%	4%	-5%	3%	-4%	-6%	-3%	-11%	-10%	-15%	-7%	-7%
Forney__J_C__	3%	2%	-3%	1%	-7%	-15%	-2%	6%	-22%	-7%	-11%	-6%

Oblique Factor Rotation Loading 2001-2006

Factor	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Sontag__M_S__	30%	-2%	3%	31%	67%	0%	-11%	8%	-10%	-7%
Nagasawa__R_H_	8%	-9%	-6%	80%	24%	-1%	-2%	-2%	2%	-2%
Markus__H_R	71%	-6%	-2%	6%	36%	-10%	-13%	2%	-20%	-8%
Feinberg__R_A	13%	2%	74%	5%	1%	25%	-6%	2%	33%	-1%
Workman__J_E_	25%	11%	6%	7%	7%	82%	15%	2%	24%	-6%
Roach-Higgins,M_E_	75%	6%	2%	10%	24%	34%	4%	3%	22%	-7%
Davis__F	14%	1%	-7%	81%	30%	13%	-5%	-3%	26%	-4%
Koh__A_	5%	0%	34%	8%	-6%	7%	-1%	8%	72%	8%
Hutton__S_S_	5%	-9%	-8%	88%	21%	-8%	-2%	1%	-2%	-3%
Stone__G_P	21%	4%	-1%	37%	65%	11%	-13%	-3%	9%	-14%
Johnson__K_K_P	61%	12%	0%	10%	8%	54%	2%	-1%	24%	-6%
Lennon__S_J	83%	12%	16%	18%	25%	23%	-1%	5%	6%	-8%
Miller__K_A_	21%	-6%	-4%	21%	67%	-7%	-11%	3%	14%	-13%
Donthu__N	-2%	4%	56%	-2%	-1%	-1%	-6%	7%	-1%	7%
Rudd__N_A_	89%	16%	9%	17%	23%	0%	-3%	7%	-4%	-5%
Eicher__J_B_	71%	-2%	-2%	17%	45%	12%	13%	0%	29%	-2%
Baker__J	-5%	79%	38%	-6%	-6%	2%	-6%	-4%	6%	-4%
Kallal__M_J_	-5%	-7%	-8%	-11%	14%	17%	81%	-7%	3%	-1%
Arthur__L_B_	44%	-1%	18%	27%	41%	-9%	-3%	-3%	1%	-7%
Babin__B_J	-5%	96%	2%	-6%	-6%	-1%	-4%	-4%	-1%	-4%
Farrell_Beck__J_	23%	-8%	-7%	64%	14%	3%	12%	3%	17%	3%
Davis__L_L_	61%	37%	33%	18%	14%	46%	4%	5%	1%	-6%
Westbrook__R_A	-4%	96%	3%	-5%	-5%	5%	-5%	-4%	-2%	-5%
Glaser__B_G_	8%	-10%	-6%	21%	87%	-2%	-2%	-1%	-6%	22%
Rabolt__N_J____	4%	2%	27%	14%	32%	36%	-11%	64%	-5%	-6%
Kang__J_K	2%	44%	50%	-4%	-2%	26%	2%	10%	-5%	-1%
Cassill__N_L_	1%	1%	21%	-6%	-12%	80%	18%	22%	4%	11%
Darden__W_R	-6%	92%	24%	-7%	-6%	6%	-7%	-7%	-3%	-6%
Dickerson__K_G_	5%	-6%	18%	3%	-4%	43%	9%	65%	24%	11%
Lee__S_	-11%	1%	41%	-14%	-12%	2%	-8%	-4%	10%	-3%
Eastlick__M_A	-3%	14%	93%	-1%	-3%	-2%	-5%	5%	2%	9%
Holbrook__M_B_	15%	84%	6%	6%	-3%	38%	-2%	8%	11%	-7%
Damhorst__M_L_	65%	-1%	6%	43%	29%	39%	4%	9%	14%	-6%

Morganosky,M_A	11%	32%	25%	-5%	-4%	53%	-12%	58%	-7%	-12%
Laughlin__J_	-8%	-8%	-7%	-6%	-5%	-3%	-2%	-6%	-4%	-6%
Kaiser__S_B_	56%	-4%	-3%	63%	31%	8%	7%	0%	13%	-6%
Kwon__Y_H_	41%	5%	65%	10%	7%	33%	5%	5%	8%	-1%
Craig__J_S_	-14%	-10%	-2%	-6%	6%	0%	-5%	10%	-1%	96%
Drake__M_F_	29%	19%	71%	-5%	-8%	51%	-6%	-3%	6%	-7%
Cash__T_F	98%	-3%	-2%	2%	3%	-2%	0%	-1%	-4%	-3%
Pine__B_J	0%	-2%	-9%	-4%	-5%	-2%	13%	-4%	-4%	-5%
Brush__C_G	-11%	-9%	1%	-4%	11%	-2%	-7%	-5%	-1%	95%
Dickson__M_A_	-4%	-5%	30%	-1%	14%	-1%	-5%	1%	4%	19%
Morgado__M_A_	56%	-3%	1%	19%	5%	22%	9%	-1%	33%	1%
Fiore__A_M_	91%	-1%	-2%	5%	16%	21%	8%	5%	5%	-4%
Gamble__G	-9%	-7%	-6%	-5%	-4%	-4%	-11%	-6%	-4%	-5%
Hillestad__R_	95%	0%	1%	6%	5%	8%	2%	-3%	8%	-2%
Oliver__M	27%	-3%	-3%	21%	10%	0%	15%	0%	1%	-2%
Shim__S_	28%	34%	80%	-8%	-2%	0%	-4%	8%	8%	11%
Ridgway__N_M	1%	94%	16%	1%	-5%	-4%	-2%	4%	-6%	-2%
Moschis__G_P_	-2%	48%	39%	-2%	-2%	-1%	5%	-4%	-1%	3%
Cohen__J_B_	13%	70%	39%	-3%	2%	24%	-5%	13%	-2%	-5%
DeLong__M_R_	81%	0%	2%	8%	28%	11%	29%	1%	24%	1%
Belleau__B_D	7%	-8%	-5%	5%	8%	0%	1%	0%	0%	0%
Kincade__D_H_	-6%	50%	9%	-15%	-5%	-7%	24%	57%	0%	18%
Jasper__C_R_	1%	2%	56%	14%	-7%	36%	18%	9%	-5%	0%
Thompson__J_K	96%	-3%	-2%	-4%	-5%	-6%	-2%	-4%	-10%	-2%
Rodin__J	92%	-5%	-4%	-7%	-7%	-8%	-2%	-6%	-13%	-2%
Striegel_Moore,R	92%	-5%	-4%	-7%	-7%	-8%	-2%	-6%	-13%	-2%
Collier__B_J_	-7%	-7%	-4%	-6%	-2%	-5%	-14%	-5%	-1%	-5%
Ajzen__I_	-7%	5%	93%	-7%	-2%	-4%	-3%	0%	-2%	0%
Fishbein__M	-7%	6%	95%	-6%	-2%	-3%	-3%	0%	-1%	-1%
Sternquist__B_J_	-3%	-8%	1%	1%	-3%	24%	-8%	84%	-1%	-3%
Kotsiopulos__A_	46%	18%	37%	23%	6%	-1%	-3%	17%	20%	9%
Lincoln__Y_S_	22%	-11%	-3%	14%	77%	-6%	26%	3%	11%	22%
Rawwas__M_Y_A	-8%	-4%	-1%	-5%	-5%	0%	-5%	6%	-4%	-4%
Vitell__S_J	-8%	-4%	-1%	-5%	-5%	0%	-5%	6%	-4%	-4%
ASTM	1%	-7%	-1%	-7%	-5%	-2%	35%	0%	6%	11%
Watkins__S_M_	18%	-7%	-6%	-2%	17%	4%	85%	0%	5%	-4%
Fundaburk__E_L	5%	-7%	3%	17%	-2%	16%	-6%	4%	-2%	-4%
Summers__T_A_	-11%	1%	36%	-10%	-10%	0%	-9%	-9%	-6%	-6%
Istook__C_L	9%	-7%	-8%	9%	-2%	-11%	77%	-1%	2%	-5%
McCracken__G_	2%	-7%	-6%	52%	14%	-3%	17%	-5%	67%	26%
Price__J	-2%	-9%	-7%	-4%	-8%	5%	29%	-1%	-3%	3%
Paek__S_L__	-2%	5%	72%	10%	-7%	26%	6%	5%	-6%	-2%
Dillman__D_A_	2%	8%	9%	-4%	-8%	51%	-9%	32%	1%	24%
Fallon__A	99%	-2%	-2%	0%	-1%	-3%	2%	-2%	-1%	-2%
Kean__R_C_	-11%	-1%	1%	-5%	-5%	0%	-4%	4%	1%	8%
Feather__B_L_	77%	0%	1%	9%	5%	5%	11%	-3%	9%	-1%
Kimle__P_A_	94%	-5%	-2%	12%	8%	15%	-1%	2%	-1%	-2%
Tung__R_L	-14%	-11%	-12%	-7%	-6%	16%	-4%	89%	-2%	13%
Bloch__P_H	21%	94%	8%	0%	-7%	-6%	1%	-3%	-1%	-2%
Moreno__J_M_	96%	-5%	-4%	0%	11%	-4%	4%	-3%	-1%	0%
Lohse__G_L	-5%	12%	67%	-6%	-8%	20%	-12%	-7%	1%	-4%

Littrell__M_A_	38%	-5%	17%	26%	36%	16%	5%	-3%	30%	24%
Kunz__G_I_	-2%	5%	0%	-4%	-5%	-1%	11%	-2%	-2%	6%
Freedman__R_J	93%	25%	4%	-5%	-5%	-6%	0%	1%	-5%	-2%
Kahn__B_E	-5%	92%	0%	-9%	-7%	-3%	-8%	0%	-3%	4%
Salusso_Deonier, C	86%	-3%	-2%	8%	5%	4%	19%	-1%	11%	2%
Michelman__S_O	73%	-4%	-3%	34%	17%	10%	7%	0%	28%	-6%
Richins__M_L	81%	49%	12%	-4%	-7%	-3%	1%	-1%	-3%	-1%
Horridge__P_E_	-8%	1%	10%	-7%	12%	-6%	12%	11%	22%	87%
LaBat__K_L	30%	-8%	-5%	-8%	8%	4%	77%	-3%	26%	9%
U_S__Dept_of_Commerce	-2%	1%	30%	10%	-9%	46%	21%	19%	-9%	12%
Grewal__D	-13%	46%	77%	-10%	-7%	-7%	-10%	1%	2%	-5%
Strauss__A_L_	12%	-13%	-8%	24%	87%	0%	13%	-5%	0%	13%
Hirschman__E_C	-2%	90%	12%	-2%	0%	-11%	3%	0%	4%	1%
Cerny__C_A	23%	-7%	-12%	11%	75%	-9%	23%	-2%	31%	9%
U_S__Bureau_of_Census	3%	21%	31%	8%	1%	43%	-3%	4%	-4%	4%
Lee__M_Y	32%	79%	3%	-5%	-10%	27%	-4%	-3%	-3%	-3%
Sparks__D_	77%	4%	0%	-5%	-10%	-2%	5%	-10%	11%	-1%
Chandler__J_L_	10%	4%	6%	90%	29%	7%	-3%	0%	-2%	-5%
Belk__R_W_	11%	48%	-3%	-4%	28%	-14%	6%	2%	43%	7%
Corbin__J_	11%	-13%	-8%	22%	85%	-2%	18%	-5%	2%	-2%
Hegland__J_E_	62%	-4%	-1%	22%	26%	11%	15%	-11%	41%	-6%
Nelson__N_J_	14%	-6%	-13%	23%	29%	3%	41%	-3%	69%	3%
Eckman__M_	10%	8%	11%	16%	-3%	84%	-8%	27%	-9%	-9%
Freitas__A_J_	4%	-8%	2%	94%	8%	9%	-3%	-2%	4%	-4%
Hammidi__T_N_	4%	-8%	2%	94%	8%	9%	-3%	-2%	4%	-4%
Kadolph__S_J	5%	4%	15%	18%	-3%	78%	-7%	28%	-14%	-8%
Miniard__P_W_	-5%	50%	61%	10%	-5%	23%	-5%	4%	-11%	1%
Engel__J_F_	-6%	47%	61%	9%	-5%	24%	-5%	2%	-13%	1%
Blackwell__R_D_	-6%	47%	61%	9%	-5%	24%	-5%	2%	-13%	1%

Continued Oblique Factor Rotation Loading 2001-2006

Factor	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Sontag__M_S__	3%	0%	-1%	9%	2%	1%	12%	-9%	-4%	23%	32%
Nagasawa__R_H_	6%	-2%	-4%	12%	-6%	-3%	-6%	6%	23%	3%	27%
Markus__H_R	1%	-3%	-5%	-26%	-1%	-2%	13%	-14%	-8%	8%	26%
Feinberg__R_A	-1%	-3%	-6%	11%	-4%	-3%	34%	1%	0%	2%	24%
Workman__J_E_	5%	-5%	-3%	17%	-2%	-2%	6%	-2%	-6%	-2%	24%
Roach-Higgins,M_E_	7%	2%	0%	31%	2%	1%	1%	-4%	-5%	1%	22%
Davis__F	1%	-7%	-7%	7%	-5%	-4%	-3%	-6%	-2%	4%	21%
Koh__A_	-13%	6%	-3%	-3%	-5%	1%	-16%	-6%	4%	21%	20%
Hutton__S_S_	2%	-1%	-4%	6%	-5%	-3%	-9%	3%	18%	5%	20%
Stone__G_P	6%	-8%	-6%	18%	-1%	-5%	6%	-13%	-16%	33%	19%
Johnson__K_K_P	1%	7%	-4%	40%	-4%	-1%	-7%	-1%	-3%	2%	17%
Lennon__S_J	5%	-2%	-3%	13%	3%	-1%	9%	-5%	-6%	0%	14%
Miller__K_A_	16%	-3%	-2%	23%	-2%	-3%	11%	-7%	-3%	36%	14%
Donthu__N	67%	-6%	-3%	-8%	-2%	-1%	21%	-3%	0%	-2%	12%
Rudd__N_A_	2%	0%	-1%	-1%	1%	1%	14%	-6%	-5%	5%	11%

Eicher__J_B_	8%	2%	1%	33%	0%	0%	4%	1%	2%	0%	9%
Baker__J	-10%	-3%	-4%	-5%	9%	-5%	-22%	-10%	-7%	3%	9%
Kallal__M_J_	-8%	-8%	-2%	-13%	-5%	-4%	-5%	-5%	-6%	1%	8%
Arthur__L_B_	40%	-6%	-6%	18%	-9%	-6%	-11%	-1%	29%	35%	8%
Babin__B_J	-4%	-6%	-3%	-1%	3%	-4%	-4%	-4%	-4%	1%	8%
Farrell_Beck__J_	6%	4%	3%	1%	-1%	3%	-22%	32%	16%	-32%	8%
Davis__L_L_	7%	-6%	-2%	15%	0%	-2%	19%	4%	0%	6%	8%
Westbrook__R_A	-6%	-6%	-4%	0%	2%	-4%	-2%	-4%	-6%	-1%	8%
Glaser__B_G_	7%	-5%	-4%	6%	-2%	-4%	-1%	-2%	2%	1%	7%
Rabolt__N_J____	31%	-4%	-8%	-5%	-5%	1%	-22%	-7%	8%	9%	7%
Kang__J_K	35%	11%	-4%	-6%	16%	1%	-33%	-10%	7%	-1%	6%
Cassill__N_L_	-1%	3%	-1%	-14%	-9%	1%	10%	1%	-3%	11%	6%
Darden__W_R	-8%	-6%	-5%	1%	0%	-4%	2%	1%	-5%	-1%	6%
Dickerson__K_G_	0%	-6%	-1%	1%	-3%	6%	33%	2%	22%	-2%	6%
Lee__S_	-14%	78%	-7%	-4%	-10%	-6%	-19%	-3%	-11%	6%	6%
Eastlick__M_A	10%	1%	-2%	-5%	-2%	-1%	12%	1%	-7%	2%	6%
Holbrook__M_B_	7%	0%	-5%	10%	1%	0%	-3%	-6%	1%	-7%	5%
Damhorst__M_L_	8%	1%	-2%	27%	2%	1%	2%	4%	8%	-4%	5%
Morganosky,M_A	8%	-5%	-4%	3%	16%	5%	5%	-4%	-7%	-12%	5%
Laughlin__J_	-4%	-5%	-4%	3%	-4%	95%	0%	-3%	-5%	-5%	4%
Kaiser__S_B_	4%	2%	-2%	33%	-2%	-2%	0%	3%	12%	3%	3%
Kwon__Y_H_	6%	-6%	1%	6%	4%	0%	39%	6%	17%	11%	3%
Craig__J_S_	4%	-3%	-4%	1%	-4%	0%	1%	-2%	-4%	-1%	3%
Drake__M_F_	-4%	2%	-6%	4%	-5%	-4%	-6%	2%	-3%	13%	3%
Cash__T_F	-1%	0%	-2%	-3%	0%	-1%	1%	-4%	-3%	-5%	3%
Pine__B_J	-1%	95%	-3%	4%	-3%	-5%	2%	-2%	-1%	-5%	3%
Brush__C_G	9%	-4%	-2%	2%	-1%	-3%	1%	0%	-4%	-3%	3%
Dickson__M_A_	85%	-5%	-4%	5%	15%	-2%	-9%	-1%	-1%	0%	2%
Morgado__M_A_	10%	-1%	-5%	34%	-4%	-1%	-2%	0%	53%	7%	2%
Fiore__A_M_	3%	13%	-1%	10%	1%	1%	-4%	3%	6%	-16%	2%
Gamble__G	-3%	-4%	82%	2%	-5%	-3%	-5%	-10%	0%	-4%	2%
Hillestad__R_	1%	-2%	-2%	16%	-2%	-2%	1%	6%	1%	4%	2%
Oliver__M	-2%	3%	-3%	78%	-1%	0%	-1%	-2%	8%	-1%	2%
Shim__S_	7%	2%	-1%	0%	2%	4%	2%	-3%	1%	15%	2%
Ridgway__N_M	3%	-4%	-1%	-4%	1%	0%	20%	-2%	-1%	-1%	1%
Moschis__G_P_	8%	-5%	0%	-6%	60%	2%	-19%	-8%	14%	2%	1%
Cohen__J_B_	5%	8%	-4%	0%	-9%	-1%	-28%	14%	-8%	-20%	1%
DeLong__M_R_	8%	4%	8%	16%	1%	0%	6%	6%	2%	-10%	1%
Belleau__B_D	1%	0%	1%	-3%	0%	0%	-3%	91%	1%	-10%	1%
Kincade__D_H_	-10%	21%	-7%	-13%	-8%	1%	-2%	-12%	-1%	10%	1%
Jasper__C_R_	-5%	-9%	5%	-8%	3%	-2%	62%	3%	3%	0%	0%
Thompson__J_K	-3%	-4%	-4%	-12%	-2%	-3%	1%	-6%	-3%	1%	0%
Rodin__J	-2%	-4%	-6%	-21%	-4%	-4%	3%	-7%	-1%	1%	0%
Striegel_Moore,R	-2%	-4%	-6%	-21%	-4%	-4%	3%	-7%	-1%	1%	0%
Collier__B_J_	-5%	-3%	64%	5%	-6%	-3%	-3%	-16%	2%	-13%	0%
Ajzen__I_	23%	1%	-3%	2%	2%	-2%	-11%	3%	-3%	-5%	0%
Fishbein__M	17%	1%	-2%	1%	1%	-2%	-10%	4%	-2%	-5%	-1%
Sternquist__B_J_	5%	-7%	3%	3%	24%	3%	5%	8%	-6%	5%	-1%
Kotsiopulos__A_	-2%	12%	-2%	-6%	0%	18%	2%	-10%	4%	53%	-1%
Lincoln__Y_S_	2%	0%	1%	-9%	-5%	-1%	-11%	23%	8%	-21%	-1%

Rawwas__M_Y_A	4%	-3%	-3%	0%	96%	-3%	4%	0%	-3%	-1%	-1%
Vitell__S_J	4%	-3%	-3%	0%	96%	-3%	4%	0%	-3%	-1%	-1%
ASTM	-1%	0%	88%	-7%	2%	0%	5%	10%	-5%	8%	-1%
Watkins__S_M_	-6%	1%	0%	27%	-2%	-3%	-1%	-6%	0%	-3%	-1%
Fundaburk__E_L	4%	-1%	-5%	5%	-1%	-2%	3%	-2%	90%	-1%	-1%
Summers__T_A_	-6%	-8%	-6%	2%	-4%	-5%	15%	77%	-6%	10%	-1%
Istook__C_L	4%	31%	5%	12%	-1%	-1%	7%	-1%	2%	-5%	-2%
McCracken__G_	23%	-4%	0%	1%	-7%	-4%	0%	4%	4%	-13%	-2%
Price__J	1%	-2%	79%	-7%	4%	-1%	12%	23%	-7%	12%	-2%
Paek__S_L__	-8%	-8%	1%	-2%	1%	-2%	57%	9%	4%	-2%	-2%
Dillman__D_A_	1%	18%	-4%	-1%	-3%	62%	-16%	-2%	-2%	14%	-3%
Fallon__A	-3%	-2%	-1%	1%	-2%	-2%	-2%	0%	0%	1%	-3%
Kean__R_C_	4%	5%	-2%	-3%	1%	97%	4%	0%	4%	3%	-4%
Feather__B_L_	-3%	0%	-1%	54%	-3%	-1%	-6%	1%	7%	12%	-4%
Kimle__P_A_	3%	1%	-3%	-5%	-2%	0%	-7%	0%	11%	-13%	-4%
Tung__R_L	-5%	-5%	-8%	1%	-7%	-1%	-1%	-7%	2%	-4%	-5%
Bloch__P_H	3%	-4%	-2%	0%	2%	-2%	0%	-2%	5%	9%	-5%
Moreno__J_M_	-1%	0%	-2%	-7%	-3%	-1%	-7%	8%	4%	-11%	-5%
Lohse__G_L	-14%	40%	-2%	13%	-8%	-1%	-12%	21%	-9%	-4%	-5%
Littrell__M_A_	49%	-2%	-7%	7%	-2%	6%	-8%	5%	28%	-5%	-5%
Kunz__G_I_	2%	96%	-2%	-1%	1%	13%	2%	-3%	7%	3%	-6%
Freedman__R_J	-3%	-3%	-3%	-5%	-3%	-3%	-1%	-3%	0%	4%	-6%
Kahn__B_E	0%	23%	-4%	-1%	-5%	9%	5%	1%	1%	1%	-6%
Salusso_Deonier, C	1%	1%	21%	14%	-1%	0%	-7%	24%	4%	4%	-7%
Michelman__S_O	-2%	-1%	-2%	37%	-2%	-2%	-1%	-2%	-2%	11%	-7%
Richins__M_L	-5%	-5%	-2%	1%	3%	-2%	-6%	-4%	5%	10%	-8%
Horridge__P_E_	13%	8%	9%	-8%	-1%	15%	1%	-1%	4%	6%	-8%
LaBat__K_L	2%	5%	32%	-2%	-5%	-3%	17%	11%	0%	6%	-8%
U_S__Dept_of_Commerce	1%	-7%	34%	-5%	15%	4%	46%	31%	-2%	9%	-9%
Grewal__D	13%	2%	-6%	-5%	-3%	-4%	-13%	3%	-1%	-1%	-9%
Strauss__A_L_	1%	-6%	-6%	3%	-2%	-4%	-4%	-3%	-3%	-5%	-11%
Hirschman__E_C	25%	-3%	-3%	-3%	-5%	-1%	8%	4%	1%	-1%	-11%
Cerny__C_A	12%	0%	2%	-7%	-5%	0%	-4%	19%	9%	-22%	-11%
U_S__Bureau_of_Census	75%	-1%	-4%	-9%	2%	4%	-6%	-2%	7%	0%	-11%
Lee__M_Y	-1%	17%	-2%	8%	-7%	-1%	2%	10%	2%	10%	-12%
Sparks__D_	3%	-6%	-5%	15%	-10%	-6%	-4%	17%	10%	34%	-13%
Chandler__J_L_	4%	-5%	-4%	-2%	0%	-1%	14%	-6%	-2%	7%	-14%
Belk__R_W_	50%	-3%	-1%	10%	-1%	-1%	10%	-2%	-1%	7%	-15%
Corbin__J_	-6%	-7%	-6%	-5%	-4%	-4%	-5%	-3%	-3%	-6%	-16%
Hegland__J_E_	5%	-6%	-2%	28%	-4%	-5%	10%	-1%	-3%	19%	-16%
Nelson__N_J_	10%	-3%	1%	13%	-3%	-3%	11%	-4%	-5%	-10%	-18%
Eckman__M_	7%	0%	-2%	3%	4%	1%	3%	-1%	22%	-10%	-18%
Freitas__A_J_	-5%	-5%	-4%	1%	1%	-2%	11%	-5%	-5%	1%	-21%
Hammidi__T_N_	-5%	-5%	-4%	1%	1%	-2%	11%	-5%	-5%	1%	-21%
Kadolph__S_J	8%	-2%	-2%	-3%	4%	1%	7%	1%	29%	-7%	-27%
Miniard__P_W_	14%	4%	-2%	-10%	19%	9%	9%	-5%	27%	4%	-29%
Engel__J_F_	13%	1%	-2%	-9%	20%	9%	17%	-1%	28%	5%	-29%
Blackwell__R_D_	13%	1%	-2%	-9%	20%	9%	17%	-1%	28%	5%	-29%

Appendix C:

Interfactor Correlations for all three time periods

1990-1995

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
1	100%	8%	-1%	10%	-11%	6%	11%	9%	-13%	-28%	-14%	3%	11%
2	8%	100%	-23%	-1%	-1%	3%	-9%	2%	-5%	-20%	7%	-18%	13%
3	-1%	-23%	100%	2%	-16%	-30%	6%	4%	7%	-12%	-1%	-16%	6%
4	10%	-1%	2%	100%	7%	5%	15%	-28%	7%	5%	1%	4%	-22%
5	-11%	-1%	-16%	7%	100%	17%	15%	8%	5%	17%	1%	-9%	7%
6	6%	3%	-30%	5%	17%	100%	10%	6%	-2%	8%	9%	-3%	5%
7	11%	-9%	6%	15%	15%	10%	100%	1%	13%	8%	4%	6%	-1%
8	9%	2%	4%	-28%	8%	6%	1%	100%	1%	2%	1%	1%	21%
9	-13%	-5%	7%	7%	5%	-2%	13%	1%	100%	1%	-24%	13%	5%
10	-28%	-20%	-12%	5%	17%	8%	8%	2%	1%	100%	-10%	29%	5%
11	-14%	7%	-1%	1%	1%	9%	4%	1%	-24%	-10%	100%	-11%	3%
12	3%	-18%	-16%	4%	-9%	-3%	6%	1%	13%	29%	-11%	100%	4%
13	11%	13%	6%	-22%	7%	5%	-1%	21%	5%	5%	3%	4%	100%
14	10%	1%	2%	9%	22%	8%	12%	12%	17%	9%	-10%	15%	10%
15	-8%	-3%	-19%	4%	-9%	-21%	2%	6%	-7%	-5%	-2%	-3%	-10%
16	11%	3%	13%	10%	3%	-10%	2%	1%	-20%	-1%	-15%	2%	0%
17	9%	-7%	-17%	0%	-4%	-33%	-8%	-5%	-3%	6%	-4%	13%	4%
18	3%	-18%	-11%	-3%	-4%	6%	-1%	-1%	-14%	4%	-13%	-34%	-1%
19	-19%	11%	4%	1%	-7%	-2%	1%	0%	-14%	5%	1%	-6%	-1%
20	6%	2%	2%	5%	5%	-1%	6%	4%	1%	6%	-1%	-5%	6%
21	-17%	4%	-9%	-1%	5%	2%	-10%	-1%	-5%	12%	-4%	-9%	-2%
22	-8%	13%	7%	-3%	-8%	9%	0%	9%	7%	16%	14%	2%	10%

1990-1995 Continued

Factor	14	15	16	17	18	19	20	21	22
1	10%	-8%	11%	9%	3%	-19%	6%	-17%	-8%
2	1%	-3%	3%	-7%	-18%	11%	2%	4%	13%
3	2%	-19%	13%	-17%	-11%	4%	2%	-9%	7%
4	9%	4%	10%	0%	-3%	1%	5%	-1%	-3%
5	22%	-9%	3%	-4%	-4%	-7%	5%	5%	-8%
6	8%	-21%	-10%	-33%	6%	-2%	-1%	2%	9%
7	12%	2%	2%	-8%	-1%	1%	6%	-10%	0%
8	12%	6%	1%	-5%	-1%	0%	4%	-1%	9%
9	17%	-7%	-20%	-3%	-14%	-14%	1%	-5%	7%
10	9%	-5%	-1%	6%	4%	5%	6%	12%	16%
11	-10%	-2%	-15%	-4%	-13%	1%	-1%	-4%	14%
12	15%	-3%	2%	13%	-34%	-6%	-5%	-9%	2%
13	10%	-10%	0%	4%	-1%	-1%	6%	-2%	10%
14	100%	-17%	-5%	-6%	-8%	-18%	6%	-2%	-4%
15	-17%	100%	23%	9%	-13%	16%	-7%	-4%	-18%
16	-5%	23%	100%	2%	-23%	-3%	0%	-22%	0%
17	-6%	9%	2%	100%	11%	10%	-6%	5%	5%
18	-8%	-13%	-23%	11%	100%	-4%	7%	11%	-4%
19	-18%	16%	-3%	10%	-4%	100%	1%	-19%	-5%
20	6%	-7%	0%	-6%	7%	1%	100%	4%	6%
21	-2%	-4%	-22%	5%	11%	-19%	4%	100%	10%
22	-4%	-18%	0%	5%	-4%	-5%	6%	10%	100%

1996-2000

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
1	100%	-8%	-13%	-7%	-8%	-5%	-30%	11%	7%	-10%	1%	-5%	-20%
2	-8%	100%	5%	0%	5%	-6%	8%	12%	-13%	-28%	-19%	6%	2%
3	-13%	5%	100%	-16%	13%	-10%	3%	-30%	-13%	-7%	16%	-15%	10%
4	-7%	0%	-16%	100%	10%	-14%	-28%	-10%	2%	12%	1%	-10%	-18%
5	-8%	5%	13%	10%	100%	-15%	7%	-18%	12%	-20%	-10%	14%	9%
6	-5%	-6%	-10%	-14%	-15%	100%	4%	6%	-7%	-11%	-17%	-4%	-11%
7	-30%	8%	3%	-28%	7%	4%	100%	-5%	2%	-13%	0%	-4%	4%
8	11%	12%	-30%	-10%	-18%	6%	-5%	100%	-3%	-4%	-1%	-8%	-22%
9	7%	-13%	-13%	2%	12%	-7%	2%	-3%	100%	-9%	-5%	11%	14%
10	-10%	-28%	-7%	12%	-20%	-11%	-13%	-4%	-9%	100%	-6%	-9%	0%
11	1%	-19%	16%	1%	-10%	-17%	0%	-1%	-5%	-6%	100%	-5%	4%
12	-5%	6%	-15%	-10%	14%	-4%	-4%	-8%	11%	-9%	-5%	100%	7%
13	-20%	2%	10%	-18%	9%	-11%	4%	-22%	14%	0%	4%	7%	100%
14	-11%	-15%	-5%	-9%	3%	-22%	11%	-7%	-1%	-12%	-21%	9%	-5%
15	-10%	2%	7%	3%	6%	1%	6%	5%	6%	2%	3%	8%	8%
16	-7%	5%	13%	-13%	9%	-1%	1%	1%	11%	-17%	8%	1%	3%
17	25%	-4%	-2%	9%	3%	-9%	-17%	7%	11%	-6%	3%	-3%	-2%
18	12%	-11%	-12%	2%	-9%	-10%	-9%	17%	-16%	-1%	-9%	-2%	-6%
19	6%	-5%	-15%	2%	-2%	-11%	-2%	24%	18%	2%	-4%	0%	-21%
20	-12%	-9%	4%	8%	-2%	-20%	-13%	1%	-12%	6%	6%	-4%	-7%
21	8%	1%	9%	0%	0%	1%	-7%	3%	2%	-2%	2%	-15%	3%
22	1%	9%	-12%	-20%	17%	-1%	12%	11%	-13%	-31%	-11%	15%	24%
23	-18%	9%	-13%	-6%	-4%	22%	8%	-6%	-6%	5%	6%	-4%	4%
24	-9%	8%	15%	-9%	4%	0%	20%	-8%	0%	-18%	4%	2%	11%
25	-8%	-1%	-5%	-3%	-10%	-12%	8%	8%	9%	11%	-1%	-3%	16%
26	2%	6%	18%	2%	6%	0%	3%	-6%	11%	-10%	9%	12%	0%

1996-2000 Continued

Factor	15	16	17	18	19	20	21	22	23	24	25	26
1	-10%	-7%	25%	12%	6%	-12%	8%	1%	-18%	-9%	-8%	2%
2	2%	5%	-4%	-11%	-5%	-9%	1%	9%	9%	8%	-1%	6%
3	7%	13%	-2%	-12%	-15%	4%	9%	-12%	-13%	15%	-5%	18%
4	3%	-13%	9%	2%	2%	8%	0%	-20%	-6%	-9%	-3%	2%
5	6%	9%	3%	-9%	-2%	-2%	0%	17%	-4%	4%	-10%	6%
6	1%	-1%	-9%	-10%	-11%	-20%	1%	-1%	22%	0%	-12%	0%
7	6%	1%	-17%	-9%	-2%	-13%	-7%	12%	8%	20%	8%	3%
8	5%	1%	7%	17%	24%	1%	3%	11%	-6%	-8%	8%	-6%
9	6%	11%	11%	-16%	18%	-12%	2%	-13%	-6%	0%	9%	11%
10	2%	-17%	-6%	-1%	2%	6%	-2%	-31%	5%	-18%	11%	-10%
11	3%	8%	3%	-9%	-4%	6%	2%	-11%	6%	4%	-1%	9%
12	8%	1%	-3%	-2%	0%	-4%	-15%	15%	-4%	2%	-3%	12%
13	8%	3%	-2%	-6%	-21%	-7%	3%	24%	4%	11%	16%	0%
14	-4%	12%	9%	-2%	19%	6%	-4%	10%	9%	-12%	3%	0%
15	100%	-3%	5%	4%	8%	-5%	3%	-6%	3%	7%	-5%	6%
16	-3%	100%	6%	1%	7%	-8%	4%	6%	3%	7%	2%	1%
17	5%	6%	100%	5%	13%	6%	1%	-16%	-9%	-21%	-3%	5%
18	4%	1%	5%	100%	-3%	5%	4%	2%	-18%	10%	0%	-7%
19	8%	7%	13%	-3%	100%	-5%	-9%	-2%	-3%	-2%	9%	17%
20	-5%	-8%	6%	5%	-5%	100%	-5%	0%	-7%	-6%	-30%	-54%

1996-2000 Continued

Factor	15	16	17	18	19	20	21	22	23	24	25	26
21	3%	4%	1%	4%	-9%	-5%	100%	-3%	-7%	-5%	-1%	-2%
22	-6%	6%	-16%	2%	-2%	0%	-3%	100%	10%	-10%	-1%	0%
23	3%	3%	-9%	-18%	-3%	-7%	-7%	10%	100%	-19%	-1%	-12%
24	7%	7%	-21%	10%	-2%	-6%	-5%	-10%	-19%	100%	-3%	-5%
25	-5%	2%	-3%	0%	9%	-30%	-1%	-1%	-1%	-3%	100%	-5%
26	6%	1%	5%	-7%	17%	-54%	-2%	0%	-12%	-5%	-5%	100%

2001-2006

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13
1	100%	-8%	8%	8%	-17%	-14%	-12%	7%	-5%	9%	1%	0%	1%
2	-8%	100%	-22%	5%	0%	-12%	-1%	-1%	-4%	9%	-6%	0%	5%
3	8%	-22%	100%	4%	6%	-36%	7%	7%	-2%	-3%	-14%	-12%	8%
4	8%	5%	4%	100%	-36%	-8%	14%	2%	-6%	10%	4%	-1%	0%
5	-17%	0%	6%	-36%	100%	7%	-12%	-4%	-8%	-4%	-33%	5%	7%
6	-14%	-12%	-36%	-8%	7%	100%	5%	-30%	-3%	8%	8%	-1%	-3%
7	-12%	-1%	7%	14%	-12%	5%	100%	-3%	-25%	-5%	8%	-13%	-21%
8	7%	-1%	7%	2%	-4%	-30%	-3%	100%	4%	-14%	-7%	-5%	1%
9	-5%	-4%	-2%	-6%	-8%	-3%	-25%	4%	100%	-22%	-12%	-1%	-1%
10	9%	9%	-3%	10%	-4%	8%	-5%	-14%	-22%	100%	-6%	-3%	-3%
11	1%	-6%	-14%	4%	-33%	8%	8%	-7%	-12%	-6%	100%	10%	-4%
12	0%	0%	-12%	-1%	5%	-1%	-13%	-5%	-1%	-3%	10%	100%	2%
13	1%	5%	8%	0%	7%	-3%	-21%	1%	-1%	-3%	-4%	2%	100%
14	-11%	3%	28%	-4%	-11%	-30%	12%	18%	-46%	24%	-5%	-10%	2%
15	4%	-6%	-11%	-2%	2%	-6%	-3%	-4%	12%	5%	-10%	10%	-7%
16	3%	3%	7%	1%	0%	-11%	6%	-11%	-4%	-14%	-2%	-12%	0%
17	-1%	12%	12%	-9%	-1%	-10%	-5%	-4%	-6%	6%	-8%	14%	-8%
18	-9%	11%	-16%	0%	3%	-1%	-9%	5%	-7%	-7%	3%	-1%	-19%
19	-16%	8%	-10%	-28%	7%	-4%	-4%	-9%	4%	-6%	-25%	3%	5%
20	-20%	-18%	-25%	-3%	10%	7%	7%	2%	10%	-6%	-1%	1%	-5%

2001-2006 Continued

Factor	14	15	16	17	18	19	20
1	-11%	4%	3%	-1%	-9%	-16%	-20%
2	3%	-6%	3%	12%	11%	8%	-18%
3	28%	-11%	7%	12%	-16%	-10%	-25%
4	-4%	-2%	1%	-9%	0%	-28%	-3%
5	-11%	2%	0%	-1%	3%	7%	10%
6	-30%	-6%	-11%	-10%	-1%	-4%	7%
7	12%	-3%	6%	-5%	-9%	-4%	7%
8	18%	-4%	-11%	-4%	5%	-9%	2%
9	-46%	12%	-4%	-6%	-7%	4%	10%
10	24%	5%	-14%	6%	-7%	-6%	-6%
11	-5%	-10%	-2%	-8%	3%	-25%	-1%
12	-10%	10%	-12%	14%	-1%	3%	1%
13	2%	-7%	0%	-8%	-19%	5%	-5%
14	100%	-5%	6%	2%	-12%	-6%	-19%
15	-5%	100%	-4%	-5%	7%	-1%	3%
16	6%	-4%	100%	3%	1%	-6%	-5%
17	2%	-5%	3%	100%	-1%	11%	-20%

2001-2006 Continued

Factor	14	15	16	17	18	19	20
18	-12%	7%	1%	-1%	100%	-3%	13%
19	-6%	-1%	-6%	11%	-3%	100%	2%
20	-19%	3%	-5%	-20%	13%	2%	100%