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An empirical test of paradigm shifts in marketing

Lemel, Rosa, Ph.D.

City University of New York, 1991

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A

An Empirical Test of Paradigm Shifts in Marketing

by

Rosa Lemel

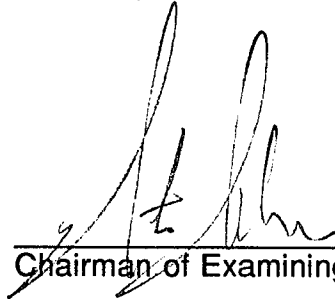
A dissertation submitted to the
Graduate Faculty in Business in partial
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1991

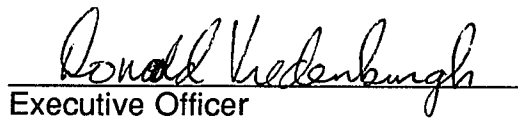
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ABSTRACT

An Empirical Test of Paradigm Shifts in Marketing

by

Rosa Lemel

Advisor: Dr. Steven P. Schnaars

This dissertation investigates changes in research paradigms in the field of marketing. The issue is explored from the point of view of two distinct research philosophies--from the logical empiricists/positivists perspective, and from the relativists/idealists position. Each of these paradigms has contributed to the evolution of research methods in other disciplines. The purpose of this dissertation is to examine if this has been true in the field of marketing as well.

An empirical investigation was conducted using a random sample of articles from three major academic journals in marketing. The journals selected, the Journal of Marketing, the Journal of Marketing Research, and the Journal of Consumer Research, are considered influential and respected refereed journals and constitutes a representative sample of research articles. Thirty-eight detailed questions were answered for each of the sample articles. The resulting data were then used to examine shifts in marketing research methods over a recent thirty year period.

The findings indicate that the research design of published studies has become increasingly sophisticated over the past three decades. This is also the case for data analysis techniques. But there is no indication that data collection is any different now than it was in 1960.

Research topics were also examined as part of this study. The sample indicates that since 1960 there has been less published on quantitative methods in marketing and on specialty topics, such as industrial and international marketing. Conversely, there has been more published on consumer behavior and marketing strategy. The journal editors' influence on the structure and content of published articles is also discussed. Finally, some recently published qualitative/relativistic articles which use nontraditional approaches are examined, and their contributions to the marketing literature is considered.

In examining shifts in research paradigms in marketing over a 30 year period, and understanding the changes that have occurred and the underlying paradigms that influence research, marketing researchers are in a better position to correct deficiencies in data collection techniques and attend to neglected areas of study. It is hoped that the results of this investigation will lead to more empirically and structurally sound research efforts in marketing.

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CHAPTER I

INTRODUCTION

The past quarter century has witnessed a significant expansion of material in the field of marketing as indicated by the increasing volume of books, journal articles, conference presentations and workshops. The gathering and analysis of information has evolved into sophisticated and formalized scientific approaches. The results of these endeavors are then often used to make major marketing decisions. Some of the results find their way back into academic research to be used as input for new marketing problems. Scientific discoveries are regularly published in the marketing literature, in academic journals, industry periodicals, textbooks and government publications. A new crop of researchers then appears and uses this "knowledge" as basic building blocks in its own research studies.

While there is nothing wrong with building upon earlier theories to advance the field of marketing, the researcher should examine the roots of these theories in order to verify their validity. Have they been subjected to rigorous scientific scrutiny both in data collection and in the analysis? Have the findings been replicated?

The Problem

As it now stands, marketing literature seems preoccupied with generating and exploring new theories about consumer behavior or marketing strategy, and much less with the integrity of the research methods themselves or the quality of the resulting information.

Jacob Jacoby (1978, p. 87) is one of the few behavioral scientists who questions the validity and usefulness of research findings. He sounds an alarming note:

Judging from papers which continue to be published in our most prestigious journals and from research reports which often form the basis for important marketing management and public policy decisions, it is all too apparent that **too large a proportion of the consumer (including marketing) research literature is not worth the paper it is printed on or the time it takes to read.** (Emphasis by its author.)

If Jacoby's statement is taken seriously, it arouses suspicions about the credibility of at least some of the research literature and makes it imperative to scrutinize prevailing assumptions and methods. Current research techniques must be inspected to find any weaknesses that can be corrected. Future generations of researchers will then be able to rely more securely on today's theories as basic building blocks for their own pursuit of knowledge.

David Kollat (1972, p. 577) also criticizes research methods in marketing. While acknowledging some advances in the consumer behavior literature, still he states that "...it would not be surprising if 90% of the findings and lack of findings prove to be wrong..."

And there are other problems. Anderson (1983) asserts that much of the research in marketing is scattered and fragmented with little effort by anyone to link results to an established body of theory or research program. A disproportionate effort is made to determine the relationship between an independent and dependent variable at the expense of building knowledge and generating theory, he argues.

Lutz (1979, p. 4) sums up the problem with our research attitudes this way:

For the most part, I believe that we have been experiencing a technological revolution of sorts, with most of our energies being devoted to the discovery and application of increasingly sophisticated mathematical and statistical procedures. This revolution has been a necessary step forward for the discipline, but it has perhaps diverted our attention away from similarly important inquiry into the conceptual foundation of marketing.

These behavioral scientists, and others, thus criticize the very foundation upon which marketing is built. Much is questioned about the scientific method of inquiry, idealism vs. positivism, quantitative vs. qualitative techniques, and so on.

Study Objectives

The purpose of this dissertation is to identify the major research paradigms in marketing and the changes that have taken place since 1960. Chapter II discusses the various research paradigms existing in the field of marketing. Quite a number of models have resulted as a consequence but two major streams of thought have emerged, one advocating a purely quantitative approach, the other promising insights which, it is claimed, can only be provided as a result of qualitative studies.

This dissertation indicates what changes have taken place, and what trends, if any, have occurred since 1960. It ascertains whether marketing science is moving toward a logical positivist philosophy or away from it, toward a relativistic/idealistic approach.

Definition of Paradigm

The term "research paradigm" in this dissertation is used to refer to the philosophical framework that guides scientists in their research. According to Thomas Kuhn (in Deshpande 1983, p. 101), "A paradigm is a set of linked assumptions about the world which is shared by a community of scientists investigating that world." Two major research paradigms are positivism and idealism, each at opposing ends of a philosophical continuum. The evolution of these and other research paradigms is discussed in detail in Chapter II.

Limitations and Scope of Study

This study is delimited to the field of marketing. Therefore only marketing journals are examined here. An examination of research trends and paradigm shifts in other disciplines is beyond the scope of this study. Furthermore, only research trends since 1960 are examined.

Description of Meta Analysis

In a sense the research described here may be considered a meta analysis, defined as a quantitative technique to analyze, integrate, and synthesize the findings of previous studies. It provides sample statistics for over 20 variables, which form the data base from which the required

information was extracted to accept or reject the hypotheses postulated in a following section.

Glass, Barry and Smith (1981) describe the use of this technique for many examples in social sciences research. However, it should be noted, the following dissertation may not be a meta analysis in the purely classic, traditional sense, as will be explained. Conventionally, a meta analysis uses statistically significant relationships across many studies in one area to come to a conclusion about the same area of study. Sawyer and Peter (1983, p. 128) describe the technique as follows: "Meta analysis involves a quantitative review of a research question and focuses on the obtained effect sizes in previous studies on the topic...one attempts to obtain all previous empirical studies pertaining to the research question."

Churchill and Peter (1984, p. 360) further explain: "Meta analysis typically treats the findings of individual studies as dependent variables and examines these findings as a function of one or more independent variables." As an example Sawyer and Peter (1983) cite a meta analysis conducted in the field of marketing, a study by Clarke (1976), which attempts to answer only three specific questions: How long do advertising effects last; do other variables interact with these effects; and if they do, how does the interaction affect advertising carryover? In conclusion Clarke states (ibid., p. 355) "In isolation, none of the papers gives a satisfactory answer to the question of how long advertising affects sales. By putting them together, as has been done here, one achieves greater confidence in the result."

By contrast, this dissertation uses a quantitative approach to integrate the research methodologies used in studies across a 30 year span to answer questions on various subjects. The methodological characteristic of the studies are the independent variables. This may be considered a

special case of meta analysis, or a time series analysis. Regardless, the statistical summary of all the data highlights and explains, it is hoped, observed developments in the field of marketing for the variables addressed in the hypothesis section.

Organization of Dissertation

Following the introduction in Chapter I, Chapter II reviews the literature dealing with research paradigms in general, and specifically those in marketing. These paradigms range from a qualitative approach called idealism or relativism, to a quantitative approach termed positivism or logical empiricism.

Chapter III presents thirteen hypotheses explored in the dissertation. These are concerned with the changes that have taken place since 1960 in the design of research, data collection techniques, data analysis, and research topics.

Chapter IV describes the methodology used in this study--how the data were collected and analyzed.

Chapters V-VIII present the findings for each of the four areas and discusses them in detail. Finally, Chapter IX presents a summary of these results, draws conclusions about paradigm shifts in marketing, and discusses implications for the future including suggestions for further research.

CHAPTER II

LITERATURE REVIEW

It has been argued that marketing thought is now dominated by the empiricists' world view (for example, Arndt 1983, 1985; Anderson 1983, 1986, 1987, 1988; Brodbeck 1982; Deshpande 1983). According to these scholars, the field of marketing is moving along a philosophical continuum from a mostly qualitative to a more quantitative research paradigm. This move can be traced to the evolution of academia in North America. In the 1800's many Americans studied abroad, a large number of them in German universities. They then brought back their newly acquired philosophies to the United States. One group that had a significant impact on the way the philosophy of science evolved was the German Historical School. It was founded to resolve some of the then prevailing problems in Germany such as poverty, its industrial development, and the banking system. The founders of the School were concerned with solving practical economic problems rather than with theoretical or conceptual ideas.

The Evolution of Research Methods

The German School

Jones and Monieson (1990, p. 110) conducted an indepth study on the philosophic origins of marketing thought. They concluded that,

The German Historical School developed a particular version of a positivistic philosophy of science. Their approach to economics might well be considered a paradigm or a research tradition. That research tradition was an inductive-

statistical version of positivism. It combined the exploratory, descriptive process orientation of nineteenth century German Idealism with a faith in the objectivity of facts and a concern with problem solving. Together these intellectual threads were woven into a relatively sophisticated vision of science, one that was used by scholars at the University of Wisconsin and at Harvard to intellectualize marketing practice.

The hefty proportion of the faculty at Harvard and the University of Wisconsin from this school saw to it that the quantitative paradigm became institutionalized. This paradigm is often referred to as "positivism."

The Vienna Circle and the Development of Positivism

Positivism was further developed in the 1920's by a group of scientists and philosophers known as the Vienna Circle (Anderson, 1983). It is their view that factual statements are meaningful only if they can be verified. Still, no matter how many empirical tests are conducted, they can never *guarantee* the truth of a universal statement.

This positivism led to the development of logical empiricism by Carnap (1936, 1937), a less rigorous version which seeks to increase only gradually the evidence towards confirming or refuting statements through the use of statistical methods. Such a research paradigm stresses objectivity and measurement. Based on experiences and observations, an a priori model or theory is postulated, hypotheses are formulated, and then empirical tests are conducted. The theory is either confirmed and tentatively accepted, or if not confirmed, again subjected to further observation and hypothesis testing.

Falsification is an alternative approach to theory justification proposed by Karl Popper (1962). Here the objective is to refute the theory. If it fails the

In this range logical empiricism is a less rigorous form of positivism, and would be to the left of it. The major characteristics of this approach (see Deshpande 1983; Reichardt and Cook 1979) are as follows: facts or causes of social phenomena are sought without subjective interpretation; it uses obtrusive, controlled measurement with an "outsider's" perspective; it

features a quantitative approach which is outcome and verification oriented; and reliability is critical.

Idealism is named for the group of late 18th and early 19th century German idealists (not to be confused with the "German School" referred to above). They believed that the mind was the source of all knowledge. This approach uses uncontrolled, naturalistic observational measurement to gain an "insider's" perspective. It is process and discovery oriented, with validity critical. The goal here is to synthesize the data.

According to Arndt (1985) the logical empiricist paradigm dominates marketing thought and has made its contribution to the field by its approach to scientific inquiry. He warns, however, that too rigid adherence to this paradigm stunts the creative potential of research. (Albert Einstein once noted that "Imagination is more important than knowledge.") Finally, Arndt (p. 21) urges marketing scientists to break free from what he terms the "conceptual colonization of empiricism."

Deshpande (1983, p. 105) also sounds a note of caution. The methods of logical empiricism, he contends "have certain distinct limitations that make them applicable for only certain kinds of problems. By excluding alternative methodologies, marketing scientists are perhaps unknowingly also constraining themselves into a set of only partially appropriate techniques for a limited subset of marketing problems."

Deshpande is also troubled to observe marketing science growing more in the area of hypothesis testing and less in the area of formal theory construction. Reichardt and Cook (1979) see the philosophical continuum as verification vs. discovery. The logical empiricist world view is enamored with verification, at the expense of discovery, they argue.

Alternative Research Paradigms

Other approaches exist to understanding the different methods of conducting research. Below are just a few of these alternative research paradigms.

Descriptive and Interpretive Research

Dichter (1978) calls for studying the merits and uses of qualitative research in terms of its final purpose. He proposes two types of research. One is descriptive research that is based on directly observable facts and is concerned with recording and summarizing these data. The other is interpretative research that is designed to discover why people do things.

Researchers face problems of deduction: Just because something appears a certain way does not imply it is that way in reality. For example, if a consumer purchases an item the reason may appear to be that he prefers it over another. In reality it may be that because this one item was in easy reach he went for it, instead. At the interpretative stage there are also numerous problems such as errors of self diagnosis when asking consumers about their motivations; using the wrong thought model in thinking that motivations follow a linear or additive pattern; and not fully understanding the motivations which are more complex than a model can ever adequately depict.

The Positivist, Humanist, and Value-Centered Models

Blankenship (1971) describes three research paradigms: the positivist, the humanist, and the value-centered model, depending on the aims of the research, the relationship of the researcher with his data, and the relationship with the researcher's audience. His positivist model resembles "empiricism" in the social sciences. Its standards require the researcher to be objective and open minded. Underlying this type of research is an altruistic thirst for truth. The audience is not the general public, but rather people that follow and share knowledge in this field of expertise.

Most of the articles in academic marketing journals could be classified into Blankenship's positivist model. The articles written for journals such as the Journal of Consumer Research, Journal of Marketing, and Journal of Marketing Research follow widely accepted scientific standards and the findings are considered the property of the scientific community.

He terms the second model as Humanist. It relies heavily on intuitive insights and emotional experiences. The researcher becomes intimate with the subject being investigated to gain insight that may be lost if a detached stance is assumed. An example in consumer behavior is the use of focus groups to ferret out the problems and salient characteristics of products. In intimate discussion with a small group of consumers the researcher develops insights on their attitudes towards the item under study. The information gathered in this manner is easily missed in an empirical study with a structured questionnaire. Consumer attitudes towards packaging or the brand name, for example, often suggest a new approach to market a product successfully. However, the researcher could not supply quantitative data to support or justify his recommendations. His "gut feeling," or intuition based on his personal closeness to the consumer and product

does not impress the empiricists or the research community establishment. At best his findings will be published only in anecdotal form as a commentary or perhaps as a proposal for some future research project.

Third is the value-centered model. It involves research ordered by a client who pays for the work and it represents an employer-employee relationship. This research is, for the time being, of little interest to the scientific community and is, therefore, not the subject of this dissertation.

Hirschman's Four Scientific Styles

Hirschman (1985) describes four styles of scientific inquiry in consumer research, depending on how the scientist acquires data, by intuition or sensation. Scientists using intuition to generate data use their imagination to be innovative. Others use their senses to observe and record details and facts. The scientific styles also differ in how the scientist comes to a conclusion when analyzing the data. The two basic ways are through thinking and through feeling. Thinking involves looking for logical and rational processes. Feeling, on the other hand, involves using personal value judgements. Hirschman presents the following table to depict these four scientific styles:

	Thinking	Feeling
Sensing	Analytical Scientist	Particular Humanist
Intuiting	Conceptual Theorist	Conceptual Humanist

Her article highlights the contributions of each of these scientific styles. She argues that acceptance of the different methods of research opens our perspectives of what science is and enriches the field of consumer behavior.

Exploratory, Clinical, and Phenomenological Research

Calder (1977) explains that we must examine different approaches to research by the type of knowledge each seeks. He asserts that confusing the separate approaches leads scientists to reject qualitative research as being "unscientific." Calder concedes that (p. 355), "unlike the case of quantitative research, the relationship of qualitative research to the scientific and everyday knowledge dichotomy is very ambiguous." He then describes the three approaches which would dispel the "ambiguity."

First is the exploratory approach. It is considered prescientific in that its purpose is to generate theoretical ideas and hypotheses. This may then be followed by a quantitative stage of analysis. Even if it is not, the results can still be useful, but should not be represented as fully scientific. Basically it deals with turning everyday real-world knowledge into scientific constructs. One must also take scientific constructs and relate them back to everyday real-world events, according to Calder (p. 356) "cross-validating scientific explanations against everyday ones." He then concludes, "If the two explanations are not consistent, a choice must be made. Given the current development of social science, this choice sometimes will favor the everyday explanation. That is, consumers' explanations will sometimes be favored over theoretical hypotheses."

Whereas the exploratory approach was mainly interested in generating scientific constructs the clinical approach is interested in using

these without numerical analysis, but rather through clinical judgments. This second type of analysis must not be confused with the scientific methods used in quantitative research. The clinical approach explains behavior subjectively, not in terms of scientific causation. Calder calls this type of knowledge "quasi-scientific."

Third is the phenomenological approach. It seeks everyday knowledge, to understand the everyday experience of the consumer. According to Calder, is not meant to have scientific status or generate theories.

Knowledge: Everyday, Scientific, Interpretive

In a more recent article Calder and Tybout (1987) discuss three types of knowledge: everyday, scientific, and interpretive. Everyday knowledge looks at the data as the goal. It seeks to understand the consumer's way of thinking from that person's own perspective. The consumer's thoughts about consumption are the data, and that is what is sought.

For scientific knowledge the data are used to support or refute a theory, an approach akin to the logical empiricism described by Hunt. It is this type of knowledge that Anderson (1983; 1986) and Peter and Olson (1983) criticize because it relies heavily on data which may be incorrect. In defense Calder and Tybout (1987, p. 138) state, "We believe that relativism retreats unnecessarily to the position that scientific knowledge is based not on empirical testing but on social agreement." In fact, Peter and Olson discuss science in terms of its marketing effort. Scientific theories are packaged and distributed through such channels as academic journals, conferences, and even word-of-mouth. Calder and Tybout continue (p. 138),

"Such a view undermines the concept of science and rests upon a clear fallacy. The observation that consensus about data may be erroneous does not imply that it is preferable to avoid the use of data and instead rely on consensus per se. We need not give up the primacy of empirical data in confronting theory and relegate scientists to the role of theory peddlers."

To develop interpretive knowledge, data are used to build an argument for a particular point of view. The authors give the following illustration. Suppose some people are seen to be eating dirt as a part of their daily diet. Everyday knowledge follows observation and might conclude that the people perceive the dirt as a wholesome food. Scientific knowledge looks for a theory about eating dirt that can be subjected to empirical testing such as that the minerals in the dirt make up for those lacking in the person's overall diet. Interpretive knowledge seeks data to support a point of view. For example, to understand the consumption of dirt as a response to a famine in the past.

Calder and Tybout contend that work, such as Freudian Psychology, purported to be scientific is actually interpretive since there have been no serious attempts to refute the ideas empirically. They conclude (p. 140): "It is important to recognize that unless subjected to the rules of empirical science, everyday and interpretive knowledge must stand apart from science, each on its own merits."

In response to Calder and Tybout's article, Holbrook and O'Shaughnessy (1988) counter that there are many different viewpoints in research methodology. There is a need for an interpretive perspective in consumer behavior research. All the social sciences are very different from the natural sciences, and therefore need a different perspective: Human beings have relationships with symbolic and social meanings that are quite

different from atoms and molecules. Therefore, they would prefer the "less scientific" interpretive approach. In their words (p. 402) "...any hope for the scientific study of consumption hinges on our abilities, however fragile and however variegated, to construct meaningful interpretations of consumer behavior."

Tradeoffs in Model Choices

When choosing between quantitative/positivistic and qualitative/idealistic research paradigms the problem of tradeoffs is constantly present. Whenever one method seems to offer an advantage in one area, it falls short in another. One compromise is to combine the best features of two or more research paradigms. This is known as "triangulation." It is also sometimes referred to as MTMM or Multi-Trait-Multi-Method. Jick (1979) distinguishes between the "Between Methods" triangulation, which tests the degree of external validity, and the "Within Methods" triangulation which tests the degree of internal validity. External validity is ascertained by cross validation, i.e. using two or more methods to see if they yield comparable results. Internal validity is controlled by the use of multiple techniques to collect and interpret the data.

This is not a perfect solution, however, because triangulation itself produces its own disadvantages. Jick enumerates just a few: the replication is difficult, time consuming, costly, and demands a certain amount of creativity from the researcher. Still it returns many important benefits: a) the researcher can be more confident in his results, b) the use of multiple methods may help to uncover a dimension to the data that would be missed

when only one method is employed, and c) the use of multiple techniques can lead to the integration of theories that may not have been linked otherwise.

Other Problems in Research

Jacoby (1978) lists 5 categories of problems which he feels need to be addressed: 1) Theories, 2) Methods, 3) Measures, 4) Statistics, and 5) Subject Matter.

The first problem is with current theories. Jacoby derides the "impressive" skills of contemporary researchers as postdiction and post hoc interpretation. Another target is the "Theory-of-the-Month club," which refers to researchers who publish single shot studies and do not stand behind their research. He advocates a "programmatic" commitment to follow-up studies to validate and replicate the original findings and to identify other facets of a theory.

The second category of problems deals with bias as the result of the heavy reliance on verbal report data. Errors occur because of faulty recollection and the respondent's unwillingness or inability to articulate and report events and impressions correctly. Studying actual behavior, or using multiple measures, might provide more accurate data.

Third is the validity of the measures and indices currently in use. Reliability and replication are often ignored. The misuse of statistics is fourth. Jacoby criticizes researchers of multilayering statistical techniques where the output from one statistical procedure is used mindlessly as the input for the next analysis with no regard for the rationale or justification.

Finally, the author is concerned with the important facets of consumer acquisition and behavior which are not adequately studied, such as consumption and disposition.

The great majority of researchers, however, are either satisfied or simply ignore these pleas for change. Research projects continue with traditional approaches despite warnings about internal and external validity. As a consequence, while great strides have been made in the use of sophisticated statistical techniques, and computer generated output, it is still questionable whether a better result is achieved.

Positivism vs. Relativism

Paul F. Anderson (1983) asserts that there is no consensus amongst the research community as to what constitutes "science" and therefore a relativistic stance is needed. He maintains that (p. 25) "...positivism's reliance on empirical testing as the sole means of theory justification cannot be maintained as a viable description of the scientific process or as a normative prescription for the conduct of scientific activities." Relativism claims that truth is relative and contextual. Scientists should then be more accepting of alternative ways of exploring and analyzing data.

Shelby Hunt (1976, 1978, 1984) attacks this research paradigm. In response to Anderson's assertion (1983, p. 26) that science and nonscience do not differ in any fundamental respect, that "...science is whatever society chooses to call a science...", Hunt counters as follows. A person is feeling ill. Based on clinical tests a physician diagnoses the condition as bone cancer. This individual then goes to a palm reader who completely rejects the

physician's diagnosis. Hunt (1984, p. 30) taunts that the relativist's philosophy would accept both diagnoses on an equal basis. He expresses his position as follows.

Relativists reject the claim that empirical testing provides good reasons for preferring the knowledge-claims of medical science over palmistry. Relativists point out that there is no 'unique scientific method.' Science is 'subjective' and that its 'observations are always subject to measurement error' ...relativists would contend that science is a 'social process' and that the primary reason that many people often accept the diagnoses of physicians over the diagnoses of palmists is that people have been in essence 'brainwashed' by the self-serving interests and propaganda of the members of the scientific community. After all, isn't science 'whatever society chooses to call a science?'

Hunt rejects the relativists' notion in favor of the more traditional paradigm of logical empiricism. To him the relativistic approach flies in the face of rationality and objectivity and would find no difference between the knowledge claims of medical science and those of palm reading.

Anderson (1986) counters that the type of relativism attacked by Hunt was never really accepted by advocates of relativism. He then tries to clarify his version which he labels "critical epistemic relativism." He asserts there is no "single scientific method" and that particular beliefs, standards, values, and the "broader cultural milieu" influence knowledge production. According to Anderson (1986, p. 156) "this acceptance of scientific monism has the untoward consequence of committing its adherents to the verisimilitude of the currently accepted body of social scientific knowledge." What makes the relativists paradigm superior to the empiricists is that it "demands to know a theory's mode of production, the criteria by which it is judged, the ideological and value commitments that inform its construction, and the metaphysical beliefs that underwrite its research program." (ibid.)

While the positivists are looking for a "single knowable reality" the relativists counter that science can never converge on this "reality."

Arndt (1985, p. 11) is not as critical of the logical empiricists' paradigm. While admitting that it has led to many breakthroughs he points out that as time passes, certain anomalies come to light that can not be explained by the prevailing theories. At this point marketing science would be free to "capture subjective experiences, conflicts, and liberating forces."

Anderson's articles (1983; 1986) have generated much discussion and commentary, particularly in the pages of the Journal of Consumer Research. In response to Anderson, Cooper (1987, p. 126) asserts that a seemingly "casual attitude towards 'truth and reality'" is the reason research scientists reject the critical relativists' perspective. Logical empiricism builds scientific belief. (p. 127) "The truth of an assertion can be evaluated against the collective evidence in the domain." The problem, he says, is that journals seem unwilling to publish replications or minor variations so that researchers are reticent to pursue issues and build up this "collective evidence." He concludes "...there is an extremely important difference between the practical impediments to seeking truth and the assertion of the critical relativists that there is no truth worth seeking..."

Siegel (1988) adds his voice to the critics of relativism. He agrees with Anderson that science is a social product but, he argues, knowledge is not solely our creation. We can make correct or incorrect inferences, but only (p. 129) "those cognitive creations that pass muster--that are well supported by evidence, that are explanatory, theoretically coherent, and so on--are entitled to the honorific label 'knowledge'."

Anderson (June 1988) rejoins that "truth" is relative to a particular time and place, and there is no guarantee that present day standards lead to

"truth." In a reply to Cooper, Anderson (Dec. 1988) states that critical relativism does not adopt a "casual attitude toward truth and reality" as accused, yet (p. 405) "'truth' is an inappropriate objective for science, and that consumer research will do well to abandon such a quixotic ideal." Anderson asserts that (p. 406) "'data' are not always sufficient to adjudicate among competing research programs and theories."

The Positivism/Idealism Continuum: Summary

The above pages outlined some of the debates concerning preferences for given research methodologies. The reader will find that sometimes different terms for the identical paradigm are used by discussants, and sometimes the same term is defined differently by opposing scholars. For clarification, a synopsis and summary tables of these paradigms are presented below.

Positivism/Logical Empiricism

The least ambiguity revolves about what is meant by positivism and logical empiricism, probably because this viewpoint is so widely entrenched in marketing thought and research. As outlined above, its philosophic origins can be traced back to the German Historical School in the 1800's, to the Vienna Circle (circa 1920), and on to such philosophers and scientists as Rudolf Carnap (1936) and Karl Popper (1962). It is claimed that the rigorous standards of this paradigm elevate marketing theory and thought to the status of a "science." In the 1980's other research paradigms have been

suggested, but scientists such as Shelby Hunt are steadfast in their advocacy of positivism. A summary table of these philosophical approaches is shown in Exhibit 2.1.

EXHIBIT 2.1

EVOLUTION OF PHILOSOPHICAL APPROACHES TO POSITIVISM AND LOGICAL EMPIRICISM

Major Sources	Period	Description
German Historical School	1800's	inductive-statistical version of positivism
Vienna Circle	early 1900's	factual statements are meaningful only if verified, but the truth is never guaranteed. Helped to develop positivism further.
Carnap	1936 - 1937	developed a less rigorous form of positivism called logical empiricism where we gradually increase evidence to confirm or refute theories.
Popper	1962	falsificationism--objective is to refute theory. Need only one negative result to refute it; if theory survives process, it is only tentatively accepted.
Hunt, Brodbeck, Cooper, Siegel	1980's	advocate use of logical empiricism. Claim relativism undermines advances in marketing science.

Idealism/Relativism

Some classics on qualitative research were written in the late 1950's and early 1960's as, for example, the work by Newman (1957), Ferber and Wales (1958) and Dichter (1964). However, since that time not much attention has been paid to the application of this research paradigm. Whatever discussion had taken place before the 1980's was only an undercurrent of isolated voices. After scientists such as Russell Belk, Morris Holbrook, Paul Anderson, and Elizabeth Hirschman broke the ice there has been more, and quite serious discussion about the different types of such research, but not necessarily an increase in the use of qualitative research techniques, it should be noted.

These discussants, referred to above, have contributed much to the terminology of what in toto is called qualitative research. Scientists not only differ on terminology, but also on substance: On data acquisition, analysis, the type of knowledge sought, and even on the relationship of the researcher with the data. The underlying philosophy common to the entire set of qualitative paradigms is to find proper alternative methods because valid data can not always be collected and analyzed by the positivistic approach. It holds that there is no "single scientific method," and that data is not the "be all and end all." Exhibit 2.2 on the following page describes the major contributors to this research paradigm in marketing philosophy in the 1980's and should help clarify the different terms used here.

EXHIBIT 2.2

MAJOR PROPONENTS/DISCUSSANTS OF IDEALISM
AND RELATIVISM (1980'S)

Source	Approach	Description
Dichter	Interpretative	differentiates between types of research in terms of purpose
Deshpande	Quantitative Idealism	concerned with understanding human behavior from the actor's frame of reference
Anderson	Relativism	truth is relative to a particular time and place; "data" are not always adequate
Calder	1. Exploratory 2. Clinical 3. Phenomenological	each qualitative approach differs in the type of knowledge sought: 1. generate facts 2. using scientific constructs through clinical judgements 3. everyday knowledge
Arndt	Alternative and Liberating Paradigms	facilitates generation of different research questions
Hirschman	Analytical Scientist Particular Humanist Conceptual Theorist Conceptual Humanist	four styles differ according to how data are acquired (intuition or sensation) and how analyzed (thinking or feeling)
Calder and Tybout	Type of Knowledge 1. Everyday 2. Scientific 3. Interpretive	differentiates by how each uses data for its goals: 1. uses data to understand consumers' thoughts 2. uses data to support or refute a theory 3. uses data to build argument for a point of view
Holbrook, Olson, and Peter	Qualitative	argues for different viewpoints, argues for more interpretive perspective

CHAPTER III

HYPOTHESES AND DISCUSSION

The research paradigms outlined in Chapter II, and the ongoing debate between advocates of positivism and relativism lead to the hypotheses posed below. These hypotheses are organized into four sections, each concerned with a different aspect of research in marketing. Together they examine the changes and direction marketing has taken since 1960 in the design of research, data collection techniques, data analysis, and research topics. Chapters V-VIII will analyze and discuss the results for each of the hypotheses posed in this chapter. Chapter IX then summarizes and synthesizes the results to come to an overall evaluation of how research paradigms in marketing have changed, and what paradigms dominate the marketing literature today.

Hypotheses Concerning the Design of Research

Paul F. Anderson (1983) argues that we need programmatic research to advance the state of knowledge in marketing. Mere single shot studies with no ties to existing theory and no plans for a follow-up should be frowned upon, at least in published work. Jacoby (1978), a decade ago, called this the "atheoretical shotgun approach."

Alan G. Sawyer and J. Paul Peter (1983) discuss the importance of replication and how it can improve the researcher's confidence in the external validity of a given result. But marketing has not held replication universally in high regard, as evidenced by the general lack of such studies

in the academic literature (Brown and Gaulden, 1980; Leone and Schulz, 1980). Perhaps this can be explained--but not necessarily justified--by realizing that marketing research is often funded by business firms for practical purposes (i.e. to solve an immediate problem) without much regard for theory nor the inclination to "waste" money on what they consider mere duplication which does not benefit them in the short run. While it is generally difficult to determine whether a study is a replication or follow-up, or simply a new area of study, we can at least measure the researcher's attempt at linking his results with previous research findings. This is done here by observing the total number of references cited in the study. If serious attempts are made to link research to an ever growing chain of past findings, there should be an increase in the number of references cited over the years. Thus, it is expected that the following hypothesis will be supported:

H1: The number of references per study has increased significantly since 1960.

Another area of concern is the sources used as references. Marketing may have changed its focus since 1960 and may be building upon the theories and knowledge generated from different disciplines than it did 30 years ago. It may have shifted its reliance away from sociology and psychology to business sources. Or, it could be that the focus has not changed, but rather broadened to include more disciplines. To determine what shifts have occurred in this area the following hypothesis is posed:

H2: The fields/disciplines from which marketing draws its resources have changed significantly since 1960.

A more rigorous research design would be another indication of a positivistic approach. This would include a pretest stage, formally posed hypotheses, and perhaps a mathematical or graphical model to depict the relationship between the variables. While all of these are not essential to a good research design, they would imply a more scientific/positivistic paradigm. It could then be expected that the number of pretests, hypotheses, and proposed models has increased significantly. The following hypotheses are posed:

H3: The incidence of using a pretest has increased significantly since 1960.

H4: Since 1960 there has been a significant increase in the number of hypotheses posed.

H5a: Since 1960 there has been a significant change in the number of proposed models in a research study.

H5b: Since 1960 there has been a significant change in the type of proposed models in a research study.

Hypotheses Concerning Data Collection Techniques

In an editorial in the Journal of Consumer Research Robert Ferber (1977) deplores the pervasiveness of convenience samples. The stated purpose of his editorial was to discourage the use of convenience samples in studies that would be published in the JCR or similar journals. Since consumer behavior is essentially a phase of human behavior, then the apparent rationale for nonrandom sampling is that any conveniently available human being will do as a respondent so long as that subject is breathing. Ferber rejects this reasoning.

To be useful for consumer research, he contends, a sample must satisfy three basic criteria. First is the relevance of the sample to the population. A sample of undergraduates asked to rate the advantages and disadvantages of cloth vs. disposable diapers generally does not fulfill this criterion. Secondly, the sample size must be sufficient for the task. With probability samples we can calculate the appropriate sample size to be used, but not so in convenience sampling. Finally, a sample must be representative of the population under study. Probability sampling guarantees each individual in a population a positive probability of being included in the sample, but not a convenience sample, in which the representativeness of the sample is determined subjectively. Ferber concludes (p. 58):

...there is no substitute for probability samples for establishing results on a firm basis and generalizing to broader populations. If a convenience sample is used, its selection has to be justified in terms of the objectives and nature of the study, the relevant characteristics of the sample should be demonstrated, and the results have to be properly qualified. Following this procedure should lead to a much better study. One might then find that a

probability sample is not so expensive after all and leave students to sleep undisturbed in the classroom.

Nearly all marketing research is done by sampling rather than complete surveys. The results are then projected for the entire population. The positivist paradigm would prefer that samples satisfy at least the three criteria stated by Robert Ferber. The relativist paradigm, however, is more accepting (even encouraging) of alternative methods of dealing with data--both in collecting the data and analyzing them. The hypotheses below will identify any shifts that may have occurred in this area:

H6: The use of probability samples has increased significantly since 1960.

H7: Since 1960 sample sizes have increased significantly.

A study conducted by Park and Lessig (1977), among numerous others, produced findings that led them to suspect the validity of generalizations that are made as a result of samples with possibly unrepresentative respondents. In this particular study one sample consisted solely of students, another was made up of housewives. The results of the study indicate significant differences between the students and housewives in terms of their susceptibility to reference group influence. Consequently, Park and Lessig question the external validity of other studies with students or housewives as the subjects that project the results to the general population.

The following hypothesis tests the changes that have occurred in the use of students as respondents. The use of housewives as respondents is

not considered here. This is because housewives are not as homogeneous a group as was once the case in the 1960's. Many housewives may be classified under other categories, such as white collar workers. Students, on the other hand, are easily identifiable. Their common employment as convenience samples warrants further examination.

H8: The use of students as subjects has declined significantly since 1960.

Yet another concern is how data are collected: Is it the actual behavior that is being observed by the researcher or merely verbal reports by respondents regarding their behavior and recorded as fact? Jacoby (1978) has expressed amazement over the reliance placed on verbal report data against the possibility that the recollections may be flawed. It should be remembered that interviewer, respondent, and instrument error are the major contributors to biased results and can not be measured. They can be more insidious than sampling errors--that can be estimated and controlled. Whether improvements occurred in this area might be determined by testing the following hypothesis:

H9: The methods of recording responses have changed since 1960.

But even with objective data collection, problems remain. For this reason Jacoby calls for research with multiple measures of the same or of a variety of dependent variables. The suggested Multi-Trait-Multi-Method (MTMM) techniques have received quite a bit of attention in the past decade or so. They are sometimes referred to as convergent validation and hope to

combine the strengths of different techniques to insure richer and more meaningful data and results.

Deshpande (1983) advocates the use of a "triangulation" of methodologies (i.e. using several techniques) to achieve a balance between quantitative and qualitative paradigms in theory construction and testing. Others such as Bonoma (1985), Campbell and Fiske (1959), and Mintzberg (1979) have also called for an integration of quantitative and qualitative techniques. Thus, the following hypothesis emerges:

H10: MTMM techniques are being applied in data collection in increasing proportion since 1960.

Hypotheses Concerning Data Analysis

The widespread availability of electronic data processing allows computations to take place in a fraction of the time formerly required. As a result more sophisticated analytical techniques have become easier to master and to apply to almost any set of data. The positivists would welcome such a development. This leads to the following hypothesis to be verified.

H11: The number of different statistical manipulations applied to a single research study has increased significantly since 1960.

Another problem is that the types of statistical techniques used may be more closely related to fellow researchers and journalistic standards than

by what is best for the study. Do techniques such as discriminant analysis, factor analysis, or canonical correlation move in and out of vogue? If a technique such as scatter diagrams or cross-tabulation is truly valuable, should they prevail at one point in time, and then be forgotten in another era? Is it possible that there is politics involved when a researcher chooses the type of analysis he will run? Is this fad, or is it progress? With these questions in mind it would be enlightening to see what type of statistical analysis techniques have been employed since 1960, how this looks when plotted over time and in relation to the general progression of research techniques in marketing. This leads us to the following hypothesis:

H12: Since 1960 there has been a shift towards more complex statistical methods.

Hypothesis Concerning Research Topics

The marketing concept postulates that satisfying consumers raises the firm's probability of success in business. In order to satisfy consumers, every important facet of their behavior must be explored: their purchasing decisions, consumption patterns and product disposition. Does a topic explored in any given period follow a "life cycle," where interest grows, rises to a peak, finally declines, then eventually dies, followed by a new cycle on another topic?

The process of theory generation generally begins with some spark of creative thought or "creative leap" followed by qualitative and subjective research. From this creative beginning a study can be designed,

quantitative research conducted, and conclusions drawn as to whether the theory is valid. At that point the theory may be rejected and die, or proceed with another iteration through the loop, with new thoughts and ideas to be tested. If the theory survives it is disseminated to scholars, other researchers, and practitioners by means of various channels such as journals, conferences or word-of-mouth. At any point through this loop the theory may die for any number of reasons, or survive.

Evidently, certain topics have been in vogue during certain eras. Social class, demographics, subliminal persuasion, are all topics for which interest has peaked at different points in time, but are not in the limelight any more. Are these examples typical or exceptional? To answer, this dissertation examines the following:

H13: Research topics have changed over time, with some topics more fashionable than others in a given period.

The complete list of all the hypotheses proposed appears on the following pages.

Hypotheses concerning Design of Research:

- H1: The number of references per study has increased significantly since 1960.
- H2: The fields/disciplines from which marketing draws its resources have changed significantly since 1960.
- H3: The incidence of using a pretest has increased significantly since 1960.
- H4: Since 1960 there has been a significant increase in the number of hypotheses posed.
- H5a: Since 1960 there has been a significant change in the number of proposed models in a research study.
- H5b: Since 1960 there has been a significant change in the type of proposed models in a research study.

Hypotheses Concerning Data Collection Techniques:

- H6: The use of probability samples has increased significantly since 1960.
- H7: Since 1960 sample sizes have increased significantly.
- H8: The use of students as subjects has declined significantly since 1960.
- H9: The methods of recording responses have changed since 1960.
- H10: MTMM techniques are being applied in data collection in increasing proportion since 1960.

Hypotheses Concerning Data Analysis:

H11: The number of different statistical manipulations applied to a single research study has increased significantly since 1960.

H12: There has been a shift towards more complex statistical methods.

Hypotheses Concerning Research Topics:

H13: Research topics have changed over time, with some topics more fashionable than others in a given period.

The hypotheses outlined above are constructed to address different parts of a research study: how it is designed, if it is empirical, how the data are collected and analyzed, and finally, the research topics at hand. The analysis of each of these hypotheses will give us some insight about changes over the past 30 years. The results for each hypothesis will first be examined individually. But more important is the results as a whole. Ultimately Chapter IX will discuss the overall conclusions about research trends and paradigm shifts by looking at the four areas of interest (characterized by the thirteen hypotheses) in terms of the various research paradigms discussed in Chapter II.

CHAPTER IV

RESEARCH METHODOLOGY

The following pages describe the research methodology employed to examine the four areas of interest here (research design, data collection techniques, data analysis, and research topics). The sample design used for this study is presented first. It details how the sample articles were selected. Next a description of the data acquisition form is presented. The form (questionnaire) may be found in Appendix A in its entirety. In this chapter the questionnaire is presented item by item in tandem with the four areas discussed previously. First all items dealing with the identification of an article are presented. Next come all items dealing with research design, then data collection techniques, data analysis, and finally research topics. The items are presented in the order of the hypotheses they deal with rather than in their sequence on the questionnaire. That order differs since the questionnaire was constructed to facilitate the collection and coding of each sample article, not in order of the thirteen hypotheses.

Sample Design

To provide insight into the progression of research in the field of marketing, and to analyze the hypotheses postulated in the previous section, a random sample of articles was selected with the aid of a table of random numbers. Articles published between the years of 1960-1988 were chosen. The Journal of Marketing, Journal of Marketing Research, and Journal of Consumer Research (its first issue in 1974) constitute a sample of influential

academic journals in marketing and therefore this study confines itself to articles from these three journals. As a result any conclusions drawn are limited to academic research in the field of marketing published in respected, refereed journals such as those in our sample. Whether there is a significant difference between the academic literature and that published by industry and the private sector is an open question that warrants its own study.

For the selection of articles, the table of random numbers was used as follows. For each journal the articles for a given quarter were numbered consecutively from 1 to n. For example, in its January 1960 issue the Journal of Marketing featured 16 articles. These were numbered from 01 to 16. Then, starting at a random point in the table, the first 2-digit number was chosen. This number corresponds to the first article to be sampled. The next 2-digits selected an article in the next issue dated April 1960. This process continued until one article from every issue was chosen. Any number that is 00, or greater than 16 was discarded. If an article chosen was an editorial, biography, or book review, then it was discarded and the very next article selected. In this manner four articles per year were chosen from each of the three quarterly journals.

This process was repeated for each of the years 1961-1988 and for the remaining journals. The four articles thus sampled for each year yielded 116 articles each for the Journal of Marketing and Journal of Marketing Research. Since the Journal of Consumer Research has only been published since 1974, just sixty articles could be selected from this journal. Consequently, a total of 292 articles was analyzed. For each article sampled a detailed structured questionnaire was answered. Additional open ended comments or observations were noted at the end. A complete

list of the sample articles used for this study appears in Appendix B. The list is presented chronologically by journal.

Data Acquisition Form

This dissertation investigates issues in the progression of research methods in marketing. Questions were posed as hypotheses and discussed in Chapter II.

The data acquisition form, shown in Appendix A, was developed to gather the information necessary to explore all of the stated hypothesis. It indicates whether marketing has moved along the philosophical continuum from an idealistic approach to a more positivistic research paradigm.

What follows first is an item by item explanation of each question on the data acquisition form. It is designed to test the stated hypotheses, as well as to answer the global question--is research in marketing more sophisticated and gathering more fruitful data than it did 30 years ago? Additionally, this research should uncover what strengths and weaknesses are present in marketing research techniques.

Items Concerning Identification

What follows are the items on the data acquisition form associated with the identification of the article, the journal, the year, and the specific article. Besides tracking the articles under study, these variables may yield important information on their own. A time series analysis shows how much marketing has progressed, and whether it is moving towards a research

paradigm that stresses logical positivism. Has research in marketing progressed in the ten years since Jacoby and others (Jick; Lutz; Kollat; etc.) argued for reform? These items appear as follows:

Item 1 - Journal

The three most respected journals in the field used to analyze research design, data collection techniques, data analysis, and topics of study are Journal of Marketing (code=1), Journal of Marketing Research (2), and Journal of Consumer Research (3).

Item 2 - Article Code

The full citation of every sampled article is recorded. Any article can then be referred back to in case there are discrepancies in the data, any variable needs or warrants further analysis, or to double check the accuracy of the coding. Subsequently a subsample of the articles was selected and reviewed for accuracy.

Item 3 - Year

Nearly thirty years of research is reviewed, from 1960 through 1988. The year variable is coded 60 - 88.

Items Concerning Research Design

The following items on the data acquisition form are related to the hypotheses concerning the design of research, H1 through H5. These items appear as follows:

Item 37 - Number of References

It stands to reason that the more studies cited, the more established research was scrutinized.

Item 38 - Disciplines References Come From

If marketing has shifted its focus and its philosophical outlook since 1960, then it is probably using an entirely different pool of resources than it did 30 years ago, or at the very least has shifted its emphasis away from certain disciplines towards others. If H2 can be refuted this is an indication that marketing has broadened its pool of resources since 1960, in a move towards a more rigorous research paradigm.

Item 19 - Pretest

This variable will answer H3. If we are moving toward a more rigorous research paradigm, an increase in the number of pretests should be evident.

Item 8 - Number of Formally Stated Hypothesis

A shift from the idealistic to the positivistic approach should lead to an increase in formally stated hypotheses reflecting a more carefully thought out design with specific goals and expectations. Formal hypotheses facilitate the execution of follow-up and replication studies, and allow statistical testing.

Item 12 - Is a Model Proposed

The proposed relationship between the variables may be mathematical, graphical, or both. If over the years there are more formally proposed models, it indicates a positivistic approach to research design.

Items Concerning Data Collection Techniques

The validity of results depends on the integrity of the data. Therefore, a sample must be relevant to the problem investigated, representative of the underlying population, and of adequate size. The items below are all intended to explore hypotheses H6 through H10 in order to determine the soundness of the data.

Items 13 and 14 - General and Specific Sampling Method Used

These two items note whether, in general, the sampling method used is (1) a probability sample, (2) a non-probability sample, or (3) whether no information was given about the sample. Then, more specifically, what type of probability or nonprobability sampling method was used.

In any probability sample every item of the population has a nonzero probability of being selected. In a simple random sample, for example, each member of a population has an equal chance of being selected. Other types of popular probability sample designs include systematic sampling, stratified random sampling, and simple one-stage and two-stage cluster sampling. A nonprobability sample does not guarantee every member of the population a chance to get into the sample. Since the selection of respondents does not follow a known sampling distribution the reliability of population estimates resulting from such a sample can not be evaluated mathematically. Quota, convenience, and judgment sampling (also called purposive sampling) are the most widely used nonprobability samples.

Item 15 -Type of Respondent Selected

There has been much discussion about the often inappropriate use of students in samples where the results are to be projected to the general population. The issue here is the contention that these respondents are not necessarily representative of a diverse population in some behavior patterns. If research paradigms are shifting towards a more positivistic one, support for H8 should be found.

Item 16 - Sample Size

One of the criteria discussed by Ferber (1977) is an adequate sample size. H7 gives us an indication of the way we are heading in our research methods. Increasing sample sizes indicate a concern over a possibly low level of confidence in information based on too small a sample.

To test this hypothesis, the sample size for each article is noted. Changes are analyzed over time and also compared with the type of sampling method used (Item 14), the data collection techniques (Item 20 and 22), and the type of statistical techniques used to analyze the data (Items 32, 33, and 34).

Items 17 and 18 - Stated Efforts to Minimize Nonresponse Errors

These questions are important to answer the global question--How far have we come over the past 30 years? Information from the answers is then used in conjunction with other items on the Data Acquisition Form.

Items 20 and 22 - Data Collection Techniques

What was the primary method of data collection, and what types of questions were asked? The answers will confirm or refute H9. Techniques that employ formal questionnaires by mail, phone, or in personal interviews can be considered as following a positivistic approach to gathering data. An informal approach taken by the researcher, such as in personal or phone interviews with no formal questionnaire and open-ended questions, or in a focus group, is considered qualitative.

Item 21 - Use of Multiple Methods to Collect the Data

The use of multiple methods to collect and analyze data has been discussed in an earlier section. It is hoped that the combination of quantitative and qualitative techniques will insure more meaningful data. This approach is sometimes referred to as convergent validation. If we are moving towards a more positivistic research paradigm, we expect to find support here for H10.

Items Concerning Data Analysis

Sophisticated techniques for data analysis have become widely available, particularly over the past 10-15 years. High speed computers that are easily accessible allow researchers to perform calculations, simulations, and model building that once required too much time and money. With the access come other problems. A particular technique may be used legitimately because the data lend themselves to that type of analysis, or only because academic politics or tradition play a role in suggesting the "best" method of analysis. Researchers are pressured to have their findings published. Using the analytical technique in vogue at the time may help, even if not warranted.

The following items on the Data Acquisition Form explore the progression of statistical analyses over the years. An attempt is made to determine whether research methods are becoming more sophisticated, or whether it only appears that way.

Item 32, 33 and 34 - Type of Statistical Technique Used

This variable allows a time series analysis on techniques for data analysis; also an analysis of different statistical techniques across the different research topics, journals, and other factors such as sample design or sample size. A discussion earlier in this paper has quoted researchers who suggest that the use of multiple methods to gather and to analyze data yields richer results than that of a single method only. This set of questions will explore in a quantitative way whether more statistical manipulations are applied to a set of data now than was true in the past. Even so, it does not by itself suggest an automatic improvement of the output, especially in view of the easily employed computer programs designed for sophisticated analyses.

Items Concerning Research Topics

To explore hypothesis H13 first a number of broad categories are outlined, then subcategories defined, and finally more specific topics named. The Global categories are: 1. Consumer Behavior, 2. Marketing Strategy, 3. Quantitative Analysis, and 4. Specialty Topics. Within each of these are various subcategories. For example, Consumer Behavior is subdivided into Demographics, Psychographics, Sociological Analysis, Physiological Research, and topics dealing with the Acquisition of Information.

This particular breakdown as well as those below are based on the categories shown in the annotated subject indices of the three journals in this study. And finally, these subcategories are broken down into specific topic areas. For example, demographics is broken down into age, income, occupation, population density, geographical region, or social class.

Unfortunately the topics are not mutually exclusive or collectively exhaustive. For this reason the Subject Category question is repeated, with item 35 tracking the primary Subject Category classification, and item 36 tracking the secondary Subject Category. Additionally, the catchall category "other" has been added within subheadings to provide for topics of limited interest. A 4-digit code categorizes each topic. For example, "competitive pricing" is coded 2401. The 2 identifies the global category (marketing strategy), 4 stands for the subcategory (pricing and price strategies), and 01 refers to the specific topic (competitive pricing). A complete breakdown of all the categories is shown in Appendix C.

It is hypothesized that significant shifts in research topics over the past three decades are present in the literature. These will be apparent generally, perhaps swinging from Consumer Behavior to Quantitative Analysis. They will also exist in subheadings within global areas, such as a shift from demographics to psychographics. And finally, analyzing the specific topics themselves should provide valuable insight about how interest in a topic appears and disappears.

Summary

This chapter describes in detail the research methodology employed for this dissertation. First the sample design is presented, then an item by item presentation of the questionnaire used. This provides both a description and a rationale behind each of the questions on the data acquisition form as it relates to the hypotheses.

What follows now, in Chapters V-VIII, are the results of data analysis. Each of the following four chapters deals with the hypotheses concerning the respective areas discussed earlier, namely the research design, data collection techniques, data analysis techniques, and topics. The results are presented and discussed in these chapters not only to answer the individual hypotheses, but also to shed light on the issues of paradigms shifts in general.

CHAPTER V

RESULTS AND DISCUSSION 1: SHIFTS IN THE DESIGN OF RESEARCH

This chapter examines what changes have taken place in marketing research design since 1960. Each of 5 hypotheses is analyzed and discussed separately, followed by an overall evaluation whether an evolution has occurred in that period.

Results for Hypothesis 1

Hypothesis 1: The number of references per study has increased significantly since 1960.

Pronounced Increase in Number of Cited References

The number of cited references per study shows a steady upward trend between 1960 and 1988, with the sharpest increase subsequent to 1977. Table 5.1 gives the mean number for each year; it indicates a wide range over the period with considerable variation from year to year.

TABLE 5.1

TOTAL NUMBER OF REFERENCES		
<u>Year</u>	<u>Mean</u>	<u>Standard Deviation</u>
1960	3.8	4.8
1961	3.2	2.5
1962	4.0	2.4
1963	0.8	1.0
1964	3.6	3.2
1965	7.5	13.8
1966	7.0	9.1
1967	10.9	7.9
1968	6.2	4.2
1969	11.5	6.6
1970	15.0	6.8
1971	7.2	5.0
1972	18.5	12.7
1973	24.8	25.6
1974	16.9	7.9
1975	14.0	11.3
1976	36.2	35.1
1977	17.6	12.5
1978	36.0	67.3
1979	29.6	15.0
1980	35.5	23.7
1981	29.2	19.4
1982	42.0	26.7
1983	27.9	17.4
1984	36.0	13.5
1985	35.2	31.4
1986	34.8	32.1
1987	39.1	21.6
1988	85.9	80.2
Overall mean (1960-1988): 22.06 References		

Graphically this is depicted as follows:

EXHIBIT 5.1

TREND TOWARD MORE REFERENCES:
CONTROL CHART FOR THE TOTAL

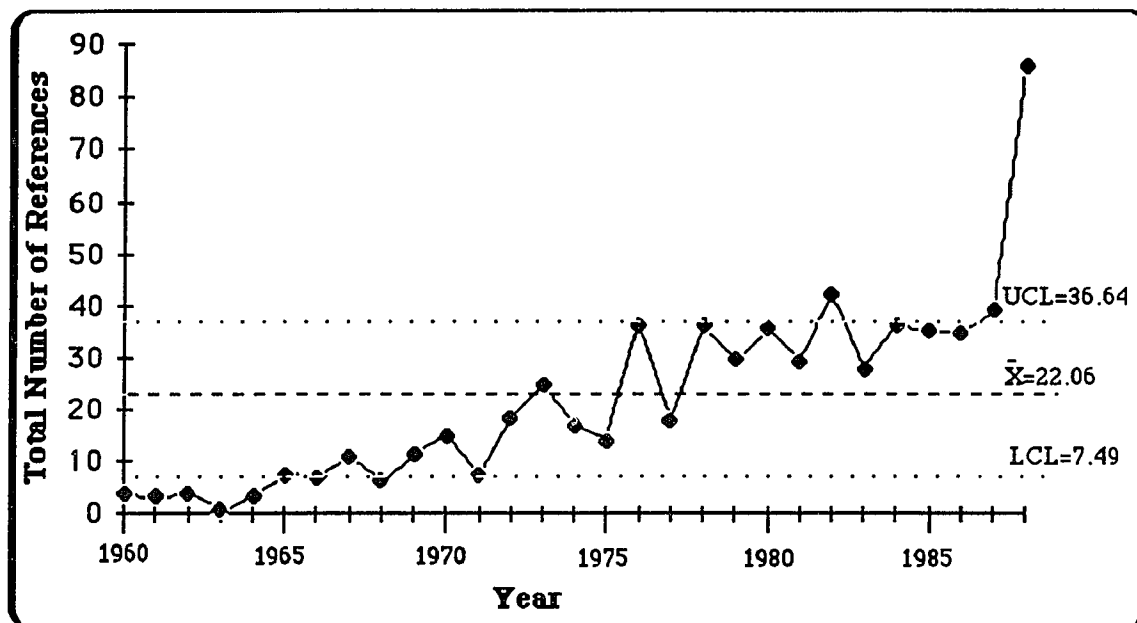


Exhibit 5.1 is a control chart for the total number of references per article over the years. The graph depicts observations outside the control limits indicating an upward pattern over time, as evident by the significant deviation under the lower control limit in the early years and a highly significant rise above the upper control limit in the latest period.

The frequency distribution in Table 5.2 indicates a significant change since the beginning of the period under study: Whereas in the 1960's it was not unusual for a research study to have no citations at all, by contrast, since 1977 not one article appeared without references!

TABLE 5.2

CROSSTABULATION OF TOTAL NUMBER OF REFERENCES

BY YEAR: 1960-1988 (frequency)			
Number of References per Article			
<u>Year</u>	<u>None</u>	<u>1-30</u>	<u>> 30</u>
1960-1964	6	18	0
1965-1968	7	24	1
1969-1972	0	31	1
1973-1976	3	29	11
1977-1980	0	32	16
1981-1984	0	23	25
1985-1988	0	19	29

Table 5.3 shows the results in relative terms. The percentage increase is quite obvious; from 3%, or less, of research studies citing over thirty references in the 1960's the percentage increased by more than ten times to at least 33% in the 1980's.

TABLE 5.3

CROSSTABULATION OF TOTAL NUMBER OF
REFERENCES BY YEAR: 1960-1988

(relative frequency)			
Number of References per Article			
<u>Year</u>	<u>None</u>	<u>1-30</u>	<u>> 30</u>
1960-1964	25%	75%	0%
1965-1968	22	75	3
1969-1972	0	97	3
1973-1976	7	81	12
1977-1980	0	81	19
1981-1984	0	67	33
1985-1988	0	63	37

Increases are Statistically Significant

The Kendall's Tau C statistic is calculated. It measures the association between two ordinal-level variables in a rectangular table regardless of the expected frequency in each cell. It uses information about the ordering of categories of variables by considering every possible pair of cases in a table. Each pair is checked to see if the relative ordering on the first variable is the same as that on the second variable. Tau C assumes values from -1 to +1, with 0 representing no association between the variables. The value of Tau C is +.50955 and is significant at $\alpha=.0000$. It suggests a statistically significant increase in references over the years. The chi-square test of significance is not presented here because the large number of cells with expected frequencies of less than 5 observations makes the results questionable.

Next the Pearson correlation coefficient r is calculated to measure the strength of association. The variables must be at least interval level. The distances between the years here are considered interval level since they are defined in fixed and equal units. Total number of references is also measured at interval level. The Pearson correlation coefficient r of .61680 is significant at $\alpha=.0000$, further evidence of a positive relationship between years and number of references.

Another measure of the strength of association between two variables, the Spearman Correlation Coefficient (Spearman's ρ), is furnished as well. It is a nonparametric statistic which examines the rankings rather than the absolute values of variables. The ρ value of .6566 is also significant at the .0000 level of significance.

The large standard deviations shown in Table 5.1 require further investigation. A one way analysis of variance performed on the data is shown in Table 5.4. It indicates that even in the face of these large standard deviations there is a significant difference between the years for the number of references per article. The F value of 3.8479 is considered statistically highly significant at $\alpha=.0000$.

TABLE 5.4

ANALYSIS OF VARIANCE TABLE FOR TOTAL REFERENCES					
<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Between	87726.2630	28	3133.0808	3.8479	.0000
Within	200303.2424	246	814.2408		
ETA = .5519			ETA-SQUARED = .3046		

The eta-squared statistic is .3046. It indicates that 30% of the variance in the dependent variable references is "explained" by the passage of time.

A time series analysis is now indicated in order to estimate the average increase annually in the number of references. Before deciding on the proper curve a test of linearity is conducted. Between group sum of squares is broken into two components, that accounting for the linear trend, and that which is the result of nonlinear trends. The resulting F value of 73.41 shown in Table 5.5 is significant at $\alpha=.0000$, an indication of a significant linear trend in the data.

TABLE 5.5

TEST OF LINEARITY FOR TOTAL REFERENCES

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>Significance</u>
Linearity	59771.1860	1	59771.19	73.41	.0000
Error	200303.2424	246	814.24		
		$r = .4555$		$r\text{-squared} = .2075$	

The time series analysis produces the following trend line:

$$y = -112.299 + 1.816x$$

(y=total number of references x=years origin=1900)

The positive slope, which has already been established in the previous tests reported above, is statistically significant and shows an average increase of nearly 2 additional references per article every year.

Additionally, the Kruskal Wallis statistic, shows a highly significant ($\alpha=.0000$) value of $H=124.3$. This test does not require a restrictive assumption of a normally distributed underlying universe with equal variances.

A residuals analysis was conducted to uncover possible violations of the independence, normality, and homoscedasticity assumptions. The Durbin-Watson value was calculated as 2.037. At the .01 level of significance this test indicates no evidence of any serial correlation, so that the assumption of independence is satisfied. The initial results, however, were not considered conclusive until further verification.

A normal probability plot was then constructed to test the assumption of normality. The graph, which compares the actual residuals against the expected values of the residuals under the assumption of normality, suggests that this assumption is most likely violated. A histogram depicting the standardized residuals further indicates a somewhat right-skewed distribution rather than the symmetry which the normal distribution requires. Furthermore, a scatterplot of the residuals against the predicted values reveals a possibility of heteroscedasticity.

To correct for these shortcomings a variance-stabilizing square root transformation is applied to the dependent variable. The resulting histogram of the standardized residuals is now approximately normal. A linear trend on the normal probability plot further suggests that a normality assumption is now justified. And, finally, a scatterplot for the residuals indicates no distinctive pattern or trend, apparently fulfilling the assumption of homoscedasticity. The new model is then:

$$\sqrt{y} = -11.25 + .2053x$$

(y=total number of references x=years origin=1900)

An influence analysis was also conducted to identify outliers. Nine values were flagged using the Studentized Deleted Residuals, but none were flagged using Cook's Distance statistic. The nine values that were flagged were carefully reviewed to determine if any measurement or coding errors had occurred. Since none were discovered, and Cook's Distance statistic did not flag these values, all except one were left undisturbed. The one exception was a value for an article with a record 309 references listed. At first, that article was deleted and the statistical tests without it were conducted again. The results, however, did not change materially. Consequently, that observation was also retained since it did not unduly influence the results of the statistical analysis. (Note: It must be remembered that dropping any value from a probability sample blemishes the randomness of the sample and should be done only with extreme caution.)

Comparisons of all possible pairs of group means follows. Of the three different tests undertaken, Student-Newman-Keuls (SNK) is the most powerful, Scheffe the most conservative. The years are grouped into periods of four years each. All of the tests confirm a significant increase in the latest period (the late 1980's) over the earlier periods (before 1977). The result for SNK is presented in Table 5.6.

TABLE 5.6
STUDENT-NEWMAN-KEULS PROCEDURE
REFERENCES BY GROUPED YEARS

<u>Mean</u>	<u>Years</u>	<u>Group</u>	<u>Group</u>						
			1	2	3	4	5	6	7
3.0750	1960-1964	1							
7.9063	1965-1968	2							
13.0625	1969-1972	3							
23.0851	1973-1976	4	*	*					
29.6667	1977-1980	5	*	*	*				
33.7917	1981-1984	6	*	*	*				
48.7500	1985-1988	7	*	*	*	*	*	*	*

(*) denotes pairs of groups significantly different at the 0.050 level

Discussion of Results for Hypothesis 1

What follows is a discussion of the results for hypothesis 1. The findings are discussed first in broad terms, then in terms of research paradigm shifts. More in depth discussion on paradigm shifts is reserved for end of chapter conclusions after all the hypotheses dealing with the design of research have been examined.

Increased Number of References

The total number of references per article gives us some measure of how scholarly research methods have changed over the years, at least in so far as the presentation of a research article is concerned. In the early periods (1960-1964) not one single article sampled had more than ten references. Twenty-five percent of the articles sampled in those years had

no references whatsoever. By contrast, in the late 1980's few, if any, articles were published without references. In fact, between 1985 and 1988 over sixty percent of the articles sampled had more than thirty references. As mentioned above (page 57), in 1988 one article in the sample had 309 references listed. On the surface, then, there is a profound quantitative increase in the sheer number of references cited per article.

Building a Body of Knowledge

It can be assumed that followup studies, and replications of results from previous researchers help build upon and extend the knowledge of our predecessors. These can be done only by consulting the existing literature on the subject. True, there may be no difference in the veracity of the results between one article without references, and another one with many. However, if the author of a research study provides a list of such references there is a chance that he has consulted these sources and worked with them. Whether this is true also when no explicit bibliography is furnished is much less certain.

Avoiding Past Mistakes

Findings from the past give us perspective and help us focus on unanswered questions. Those who ignore past research findings may unknowingly just repeat the same experience without benefiting the research community with new, innovative insights. Or, worse yet, they may repeat flawed assumptions of yesteryear, that led to erroneous conclusions then and again now.

If we stipulate that for articles with zero references no review of past literature was conducted, then how much credence can we assign to the results of studies in the 1960's? It does not seem likely that these authors conducted extensive background research and fail to mention even one reference, citation or footnote.

Today, by contrast, there appears to be a more serious effort to link current research with previously established work. Since 1980 close to eighty percent of the articles sampled show more than twenty references. From the positivistic perspective this could be seen as a move in the right direction, towards more rigorous research standards. From the relativistic viewpoint, however, none of this necessarily indicates something positive. Since, according to this perspective, data is relative to a particular time or place, an extensive review of the past literature does not lend more credence to the research results.

Increased Number of References Statistically Significant

As indicated above, a variety of statistical significance tests confirms the results. Whether the statistical analyses require an underlying normal distribution or not, there is evidence of a strong positive relationship between number of references per article and year published. As the years passed the number of cited references increased significantly. The same result is found whether the absolute values are used in the computation or the order/rankings.

Pairwise comparisons are very revealing. The first three groups of years, namely 1960-1964, 1965-1968, 1969-1972, are not significantly different from each other. Even the period 1973-1976 is only significantly

different from the earliest period (according to both the Tukey and Scheffe methods). This indicates that the observed strong positive upward trend in number of references did not begin with any significant prominence until 1977. It will be interesting to see if the other data analysis results also indicate 1977 as a turning point when research paradigms shifted decisively toward a more rigorous positivist approach.

Results for Hypothesis 2

Hypothesis 2: The fields/disciplines from which marketing draws its resources has changed significantly since 1960.

Composition of Reference Sources:

This hypothesis explores not just the magnitude of references over the years, but, more importantly, also their composition. Has marketing research broadened its pool of resources? Is it not only building upon more and more resources, but also drawing these from a wider variety of sources and disciplines? References belonging to the fields of advertising, economics, marketing, management, psychology, sociology and statistics were fairly simple to classify for this investigation. Most journals featured the discipline it was concerned with in the title (e.g. Journal of Advertising, or Quarterly Journal of Economics). Journals classified as "general business" were journals that published articles of general business interest. Most had the word "business" in their title (e.g. Journal of Business). When there was a doubt about the classification of any journal that publication was carefully

examined to determine the principal thrust of the publication. Also, *Cabell's Directory of Publishing Opportunities in Business and Economics* (Cabell Publishing Co., Beaumont, Texas, 4th edition) was consulted if there was any ambiguity about the publication's field of interest. A detailed listing of the journals encountered and their respective classifications is shown on the data acquisition form (Appendix A). Although most of the cited references were either from academic journals or books, some came from business periodicals and publications. Of these, the most commonly cited were Business Week, Fortune, Forbes, and The Wall Street Journal. Other fields such as engineering, health and nutrition constitute only a negligible amount and were combined into a "miscellaneous" category.

Exhibits 5.2a - 5.2i show the mean number of references per article per year for each of the indicated disciplines. The distribution shows that the field of marketing has realized the most significant gain as a source for references. It should be noted that marketing is a relatively young discipline with much of its scholarly literature published after 1960. The Journal of Consumer Research did not even exist until 1974. This would easily explain that during the 1960's most citations were based on the other disciplines. Since 1970, however, more of the references used have come from marketing itself.

EXHIBIT 5.2a

NUMBER OF REFERENCES

REFERENCES FROM ADVERTISING

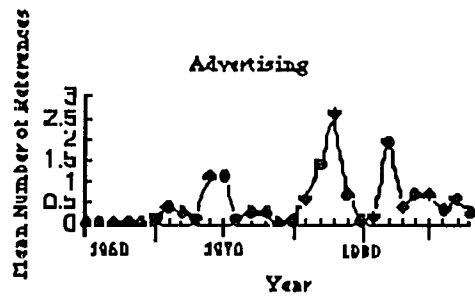


EXHIBIT 5.2b

NUMBER OF REFERENCES

FROM ECONOMICS

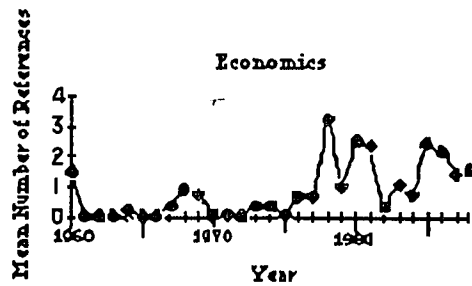


EXHIBIT 5.2c

NUMBER OF REFERENCES

REFERENCES FROM BUSINESS

PERIODICALS

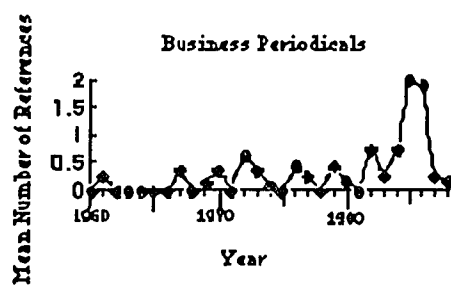


EXHIBIT 5.2d

NUMBER OF REFERENCES

FROM GENERAL BUSINESS

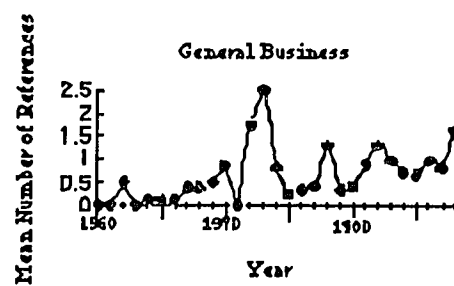


EXHIBIT 5.2e

NUMBER OF REFERENCES
REFERENCES FROM MARKETING

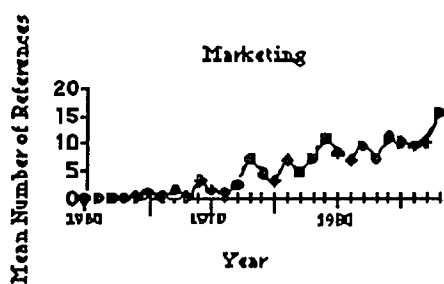


EXHIBIT 5.2f

NUMBER OF REFERENCES
FROM MANAGEMENT

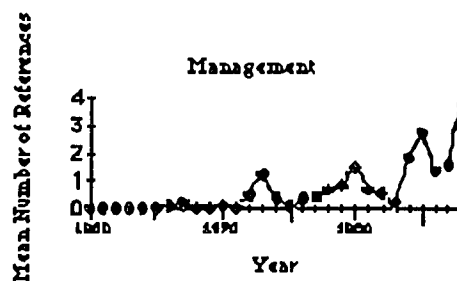


EXHIBIT 5.2g

NUMBER OF REFERENCES
REFERENCES FROM PSYCHOLOGY

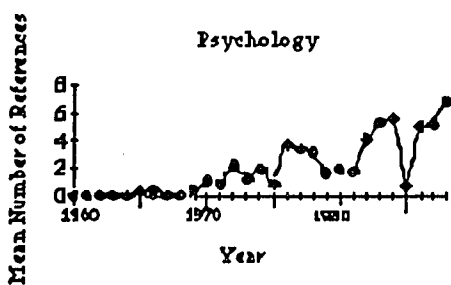


EXHIBIT 5.2h

NUMBER OF REFERENCES
FROM SOCIOLOGY

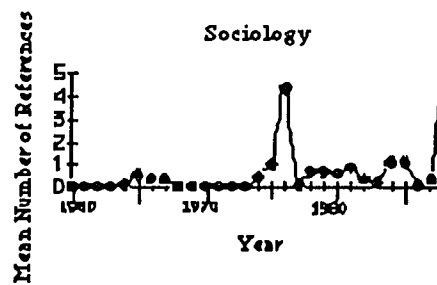
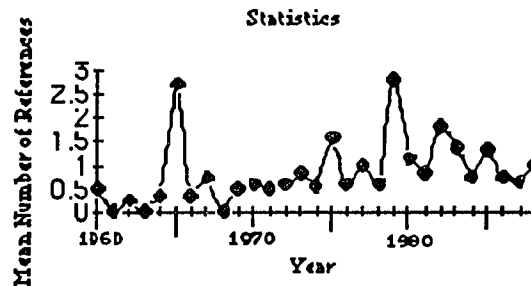


EXHIBIT 5.2i

NUMBER OF REFERENCES FROM
STATISTICS



Kendall's Tau C is shown in Table 5.7 for each discipline. The data show the increased number of references in marketing, management and psychology to have been statistically significant. The increases in advertising, business periodicals, and statistics are modest though still statistically significant.

TABLE 5.7

TAU C FOR EACH DISCIPLINE

<u>Discipline</u>	<u>Tau C</u>	<u>Signif.</u>
Advertising	.07587	.0194
Economics	.11583	.0006
Gen Business	.17494	.0002
Bus. Periodicals	.05041	.0452
Marketing	.52463	.0000
Management	.20995	.0000
Psychology	.24916	.0000
Sociology	.10017	.0014
Statistics	.09098	.0146

A one way analysis of variance for all the disciplines yielded the following results:

TABLE 5.8

ONE WAY ANOVA FOR ALL DISCIPLINES

<u>Discipline</u>	<u>F</u>	<u>Sig.</u>	<u>ETA</u>	<u>ETA-SQUARED</u>
Advertising	1.2427	.1934	.3520	.1239
Economics	0.6544	.9102	.2633	.0693
Gen Business	1.3427	.1234	.3641	.1326
Bus. Periodicals	1.1356	.2973	.3383	.1145
Marketing	4.0660	.0000	.5625	.3164
Management	1.5963	.0334	.3921	.1538
Psychology	1.2099	.2220	.3479	.1210
Sociology	1.3183	.1383	.3612	.1305
Statistics	1.0157	.4483	.3219	.1036

Spearman's rho was computed for references in each discipline over all the years. The results are shown in Table 5.9:

TABLE 5.9

SPEARMAN'S RHO FOR EACH DISCIPLINE

<u>Discipline</u>	<u>rho</u>	<u>Signif.</u>
Advertising	.1348	.013
Economics	.2001	.000
Gen Business	.2080	.000
Bus. Periodicals	.1016	.046
Marketing	.6576	.000
Management	.3349	.000
Psychology	.3391	.000
Sociology	.1903	.001
Statistics	.1429	.009

When rankings rather than the values are used we see that the number of references in most of the disciplines has increased at a level of significance of $\alpha=.01$. The results confirm our expectations: Because the total number of all references has increased over the years, some if not all the components must have done likewise.

The Kruskal Wallis H test, which also uses ranks, shows the differences between the disciplines more clearly:

TABLE 5.10

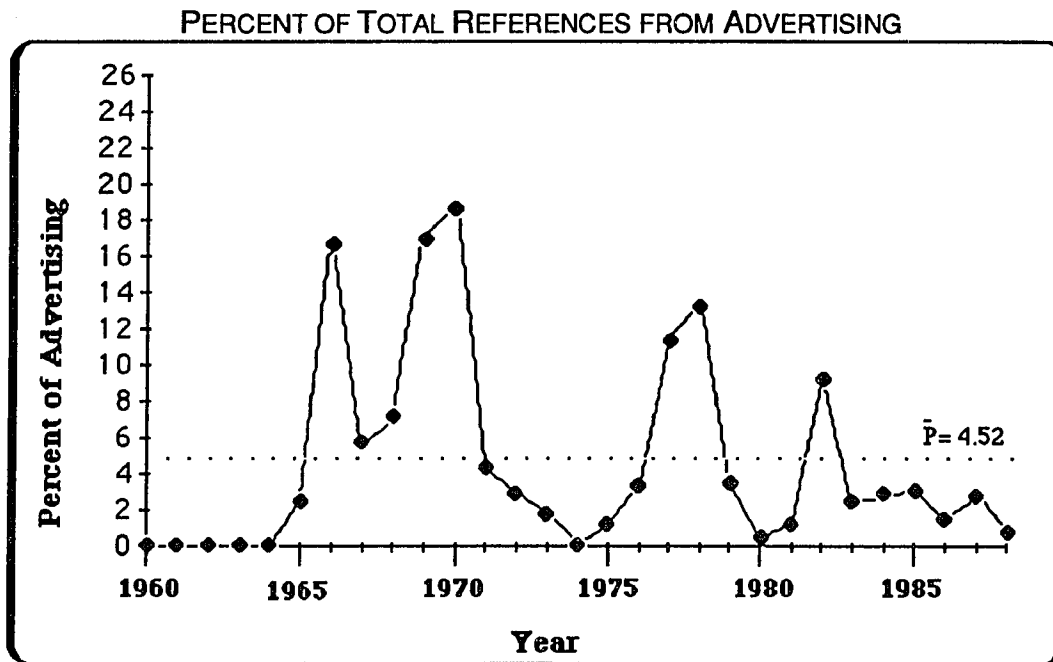
KRUSKAL WALLIS'S H TEST FOR EACH DISCIPLINE		
Discipline	H	Signif.
Advertising	13.4227	.0368
Bus. Periodicals	5.3633	.4981
Economics	13.0030	.0430
Gen Business	13.6188	.0342
Management	34.0829	.0000
Marketing	125.3039	.0000
Psychology	40.1418	.0000
Sociology	15.7566	.0151
Statistics	10.4703	.1062

Again marketing, management, and psychology exhibit the most significant changes in number of references over the years. This is also true, perhaps on a lesser scale, for advertising, economics, general business, and sociology. However business periodicals and statistics apparently have not been consulted as references as often over the years.

The relative changes within each discipline must also be examined. Exhibit 5.3 shows the percent of total references from the field of advertising.

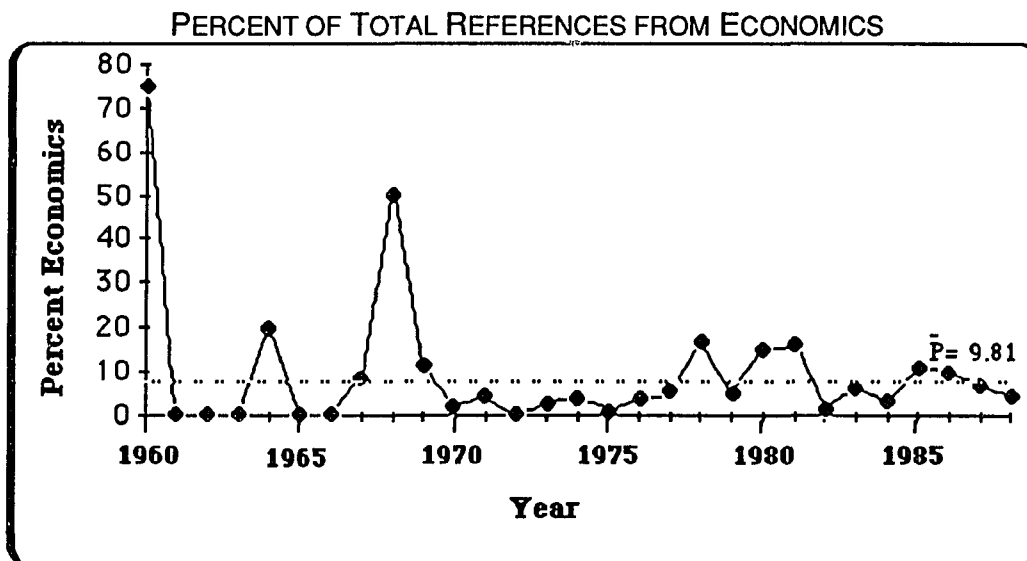
Overall little has changed since 1960. There appear to be surges in 1966, 1969-1970, and then again in 1977-1978. But since 1980 the use of advertising as a resource for references seems to have declined.

EXHIBIT 5.3



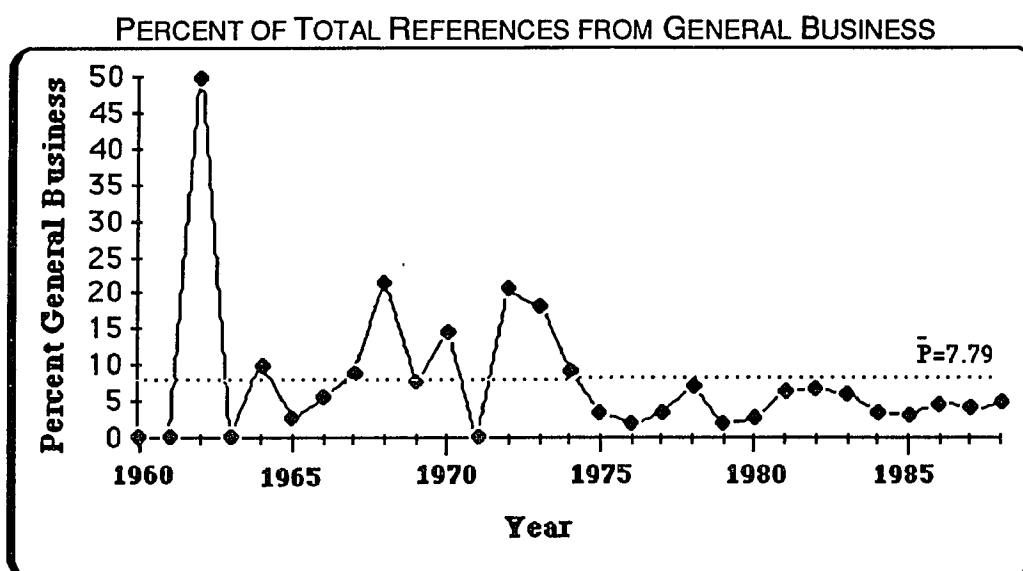
Interest in economics as a source for references has waned over the years. Most of the emphasis on economics journals as references took place in the 1960's. In 1960 roughly seventy-five percent of the references in the articles sampled came from economics journals. In 1968 approximately fifty percent of the references were from economics journals. Since that time, however, on average only about ten percent of the references have come from the field of economics.

EXHIBIT 5.4



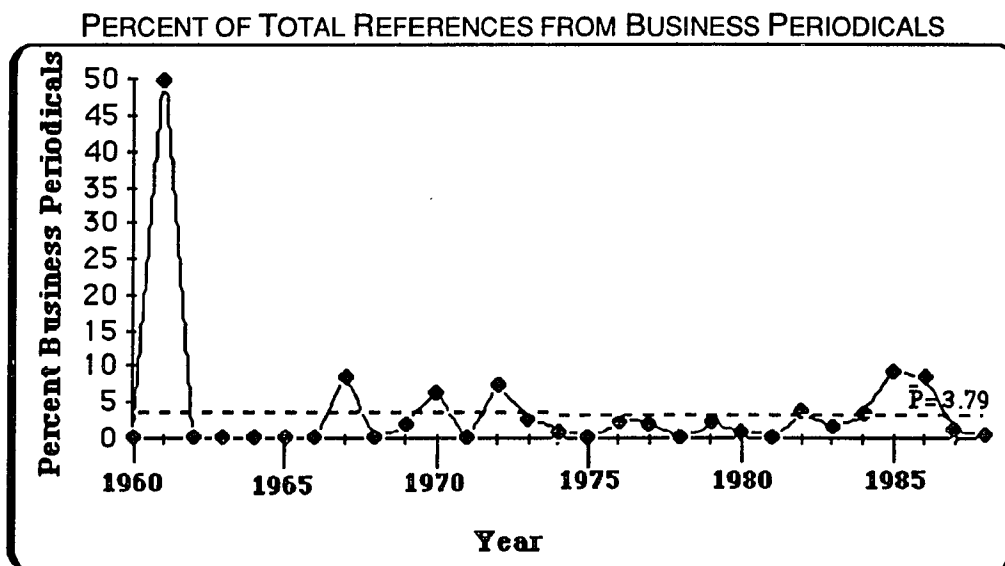
Use of general business journals as references has declined since their peak in 1962 when fifty percent of the references in the sample were from this category (see Exhibit 5.5). Since 1975 there have been relatively few (less than eight percent) references coming from general business journals.

EXHIBIT 5.5



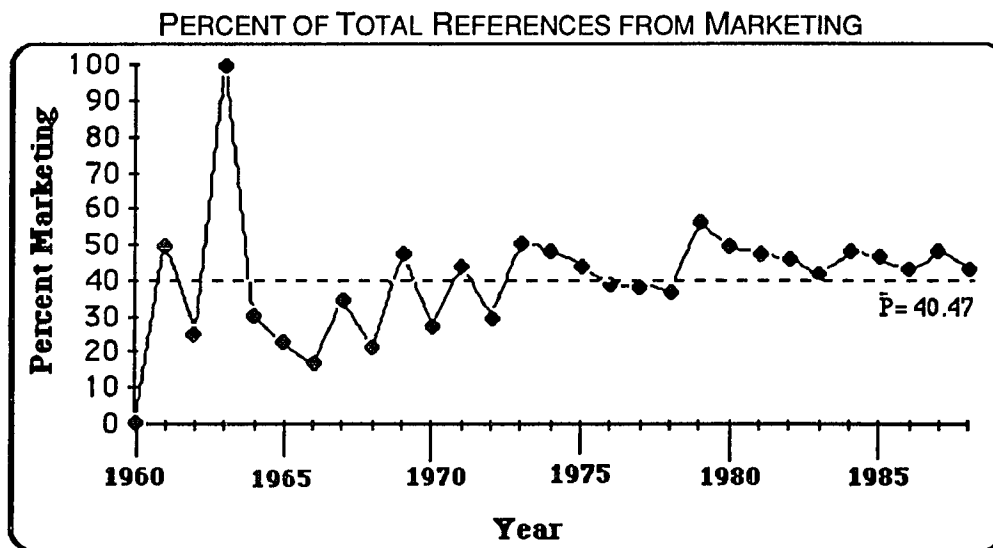
Relatively few references have come from business periodicals such as Forbes or Business Week (Exhibit 5.6). On average less than four percent of the references have come from this area across the 29 years. One exception seems to have occurred in 1961 when fifty percent of the references in sampled articles came from business periodicals. But it must be noted that the average number of references per article in 1961 was only 3.2, and in absolute terms the fifty percent value constitutes just six references from business periodicals.

EXHIBIT 5.6



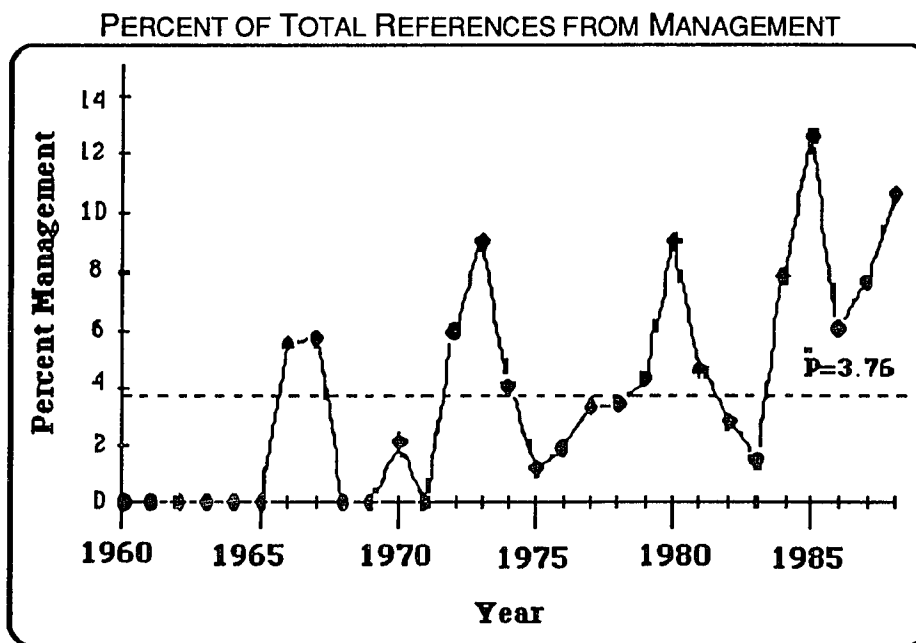
In Exhibit 5.7 we see an obvious upward trend since 1966 in the proportion of total references coming from the field of marketing. Marketing journals, understandably, have always been the largest source of references for research articles in that same field. The upward trend lasted until 1973. At this point it stabilized, with approximately forty percent of the cited references coming from this field. The observation in 1963, where one-hundred percent of the references cited came from marketing journals, seems an anomaly caused by the sampling process and the small number of references altogether in that year.

EXHIBIT 5.7



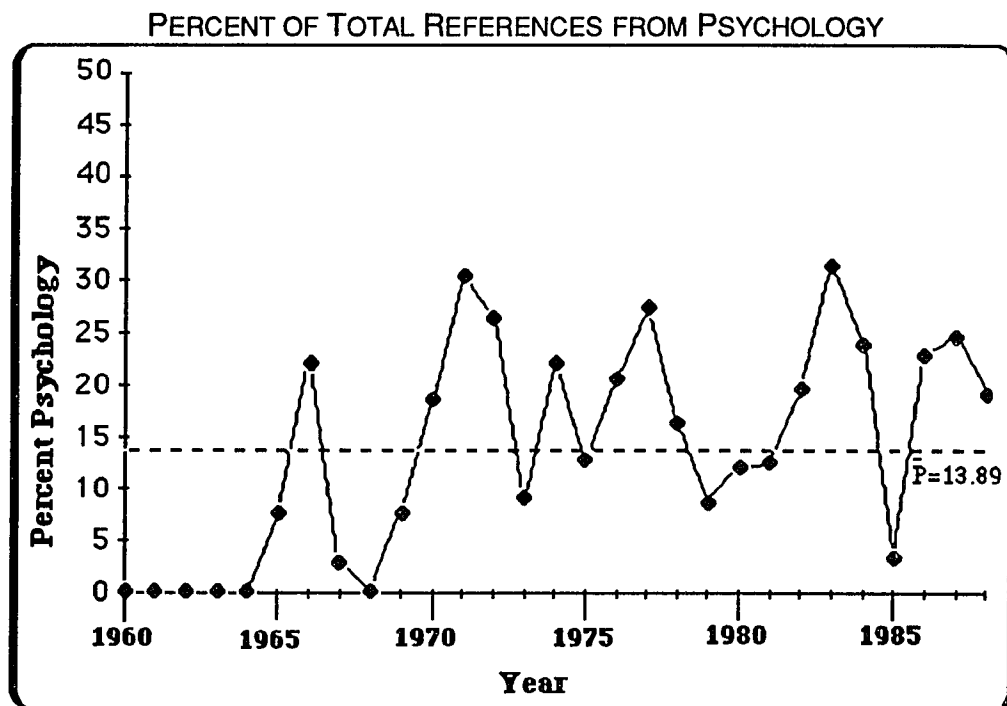
The field of management does not appear to be a prolific source of references (see Exhibit 5.8). Until 1985 at most fewer than ten percent of the references came from management journals, and in most of these years less than four percent. More recently, in 1985 and 1988, that figure has edged up to slightly more than ten percent. Thus, compared with the 1960's and 1970's, a slight upward trend in the 1980's seems to have occurred.

EXHIBIT 5.8



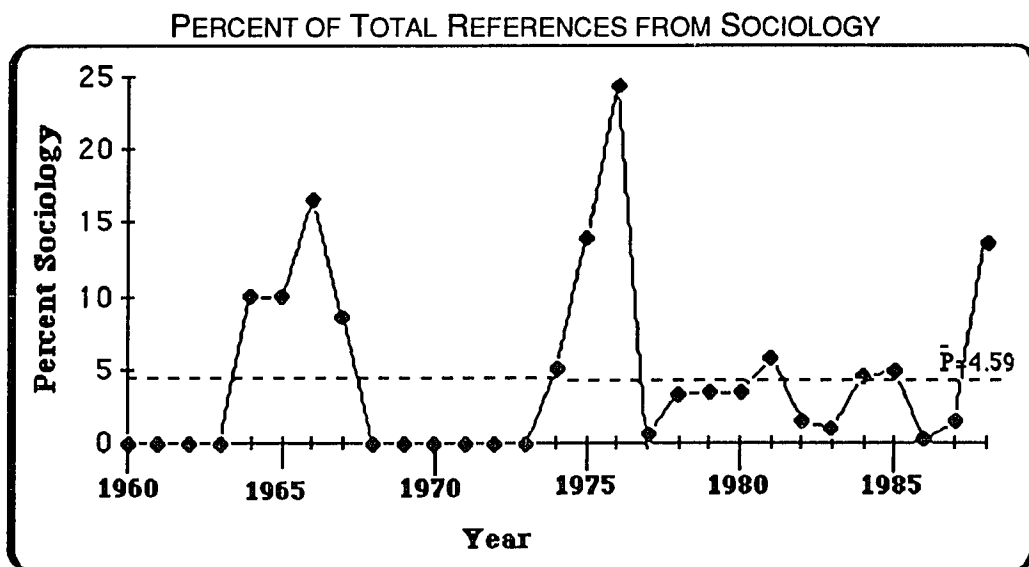
Psychology appears to be a prominent resource for the articles sampled. Since the early 1960's the proportion of references from psychology has shown an upward trend. There was, however, a sharp interruption in 1985 in the use of psychology references. Overall though, a good proportion of the references have come from the field of psychology, on average about fourteen percent of the total.

EXHIBIT 5.9



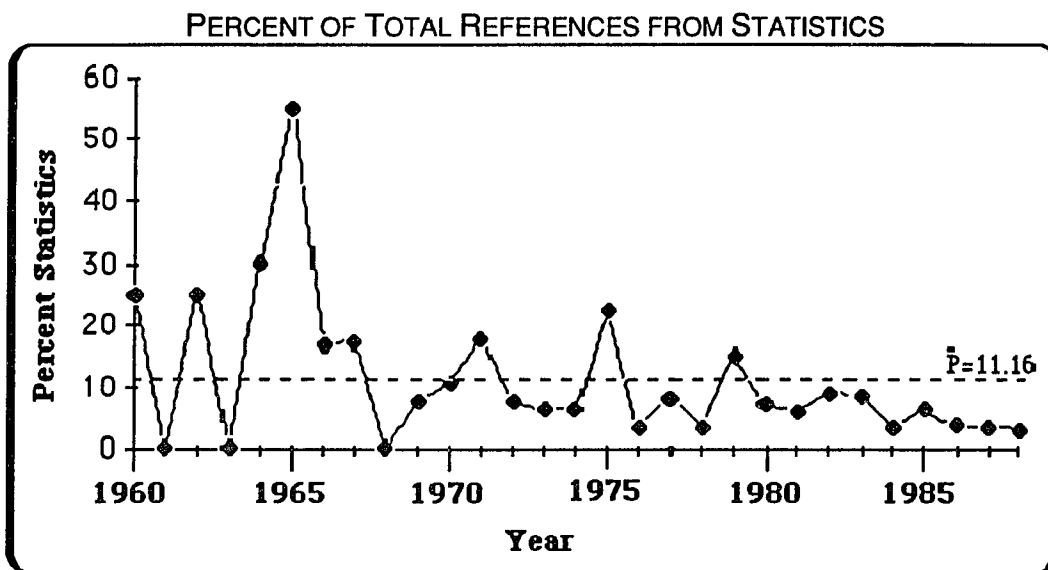
Sociology has also provided some background for research in marketing, although not to the extent that psychology has. Exhibit 5.10 shows overall an erratic, flat trend in percent of sociology sources with sharp peaks in 1966 and 1976 and a relatively moderate rise in 1988. With these particular exceptions, in most of the years only five percent or less of the references have come from sociology.

EXHIBIT 5.10



References from statistics appear to be more prevalent before 1966 than in the years since. As shown in Exhibit 5.11, in most years since then less than ten percent of the references cited have emerged from statistical journals.

EXHIBIT 5.11



To evaluate the statistical significance of the above findings, several alternative tests were conducted. The Spearman Correlation Coefficients shown in Table 5.11 are based on the ranks rather than the absolute values of the data.

TABLE 5.11
SPEARMAN'S RHO FOR RELATIVE CHANGES WITHIN

EACH DISCIPLINE		
<u>Discipline</u>	<u>rho</u>	<u>Signif.</u>
Advertising	.0968	.054
Economics	.1705	.002
Gen Business	-.1426	.011
Bus. Periodicals	.0912	.066
Marketing	.3999	.000
Management	.3307	.000
Psychology	.3024	.000
Sociology	.1763	.002
Statistics	.0422	.243

Kendall's Tau C was computed for each discipline. The results are presented in Table 5.12. The data indicate that marketing, management and psychology show the most significant increase in relative number of references over the years, with advertising and business periodicals having the least, though still statistically significant. Only the field of statistics showed no statistically significant change over the years as measured by the Tau C statistic. It will be noted that these results are similar to those found with the aid of Spearman's Rho test.

TABLE 5.12

TAU C FOR RELATIVE NUMBER OF REFERENCES FOR EACH DISCIPLINE

<u>Discipline</u>	<u>Tau C</u>	<u>Signif.</u>
Advertising	.05689	.0500
Economics	.10176	.0012
Gen Business	.08892	.0108
Bus. Periodicals	.04147	.0683
Marketing	.34772	.0000
Management	.19231	.0000
Psychology	.19691	.0000
Sociology	.08232	.0045
Statistics	.03838	.1672

The results of a Kruskal Wallis test, which also uses ranks rather than absolute values, are shown in Table 5.13. Once again it is confirmed that marketing, management, and psychology have seen the biggest changes over the years in terms of relative number of references coming from these fields. This test finds no significant changes over the years in the use of resources from economics, business periodicals, and statistics.

TABLE 5.13

KRUSKAL WALLIS'S H TEST FOR RELATIVE NUMBER

OF REFERENCES FOR EACH DISCIPLINE

<u>Discipline</u>	<u>H</u>	<u>Signif.</u>
Advertising	38.6020	.0875
Economics	29.7569	.3749
Gen Business	41.2388	.0511
Bus. Periodicals	28.7727	.4241
Marketing	86.0099	.0000
Management	43.8367	.0288
Psychology	48.7660	.0089
Sociology	39.9184	.0672
Statistics	26.6344	.5382

The ANOVA test is not applied here since it can be employed only under condition of homogeneous variances. An analysis indicates that such an assumption is unwarranted. Even an arc-sine transformation left the data heteroscedastic.

Using the least squares method to fit linear trend lines we get the following:

TABLE 5.14

TREND LINES FOR REFERENCES

<u>Discipline</u>	<u>Line of Trend</u>	<u>Significance*</u>
Advertising	$y = 6.266 - 0.020 x$	.8385
Economics	$y = 0.573 + 0.077 x$	.5711
Gen Business	$y = 18.249 - 0.159 x$	.1457
Bus. Periodicals	$y = 3.511 + 0.006 x$	.9566
Marketing	$y = -82.959 + 1.633 x$	.0000
Management	$y = -16.055 + 0.258 x$	.0001
Psychology	$y = -35.485 + 0.628 x$	.0002
Sociology	$y = 7.029 - 0.029 x$	.8600
Statistics	$y = 37.298 - 0.371 x$	.0118

y = relative number of references x = years origin = 1900
 * two-tailed test of significance

The least squares lines can be used most comfortably only with marketing, management and psychology since those disciplines show statistically significant results across all the statistical tests applied. A residual and influence analysis for these disciplines was also conducted. Histograms and p-plots indicated a nearly normal distribution. Furthermore, the Durbin-Watson statistic for each discipline (1.77802 for marketing, 1.5578 for management, and 1.47729 for psychology) indicates no serial

correlation. A scatterplot of the residuals also shows no apparent pattern, a further indication of a good fit to the model.

Pairwise Periodic Comparisons

Pairwise comparisons allow us to determine which groups of years have changed more than others and to make certain conclusions about where sources for marketing studies have come from over the years. Marketing, for example, has been a greater source of references for its own discipline in the years from 1969-1988 than was true for the earlier period 1960-1968.

Psychology also seems to represent a relatively more prominent source of references in 1981-1988 than in other periods. These years according to the Student-Newman-Keuls and Tukey methods, are significantly different from 1960-1968. And the 1973-1976 period is significantly different from the 1965-1968 era.

References from the field of management, according to the Student-Newman-Keuls and Tukey methods, appear to be significantly different in the 1985-1988 period from 1960-1976 and 1981-1984, but not significantly different from the 1977-1980 period.

Finally, pairwise comparisons show that as far as advertising is concerned, the years 1977-1980 are significantly different from the years 1960-1964, 1973-1976, and 1985-1988 according to the Student-Newman-Keuls and Tukey methods.

Changes in Reference Sources Statistically Significant

Table 5.15 summarizes all the results of statistical tests of significance. As stated above, the chi-square test results are questionable since most of the cells had expected frequencies of less than five observations. Therefore chi-square values are not included in the following summary table.

TABLE 5.15

SUMMARY OF STATISTICAL TESTS OF SIGNIFICANCE FOR RELATIVE
NUMBER OF REFERENCES ACROSS ALL DISCIPLINES, 1960-1988

	Spearman rho (sig.)	Tau C (signif.)	Kruskal Wallis(sig)
Advertising	.0968 (.054)	.05689 (.0500)	38.6020 (.0875)
Economics	.1705* (.002)	.10176* (.0012)	29.7569 (.3749)
General Business	-.1426* (.011)	.08892 (.0108)	41.2388 (.0511)
Business Periodicals	.0912 (.066)	.04147 (.0683)	28.77 (.4241)
Marketing	.3999* (.000)	.34772* (.0000)	86.00* (.0000)
Management	.3307* (.000)	.19231* (.0000)	43.8367 (.0288)
Psychology	.3024* (.000)	.19691* (.0000)	48.766* (.0089)
Sociology	.1763* (.002)	.08232* (.0045)	39.9184 (.0672)
Statistics	.0422 (.243)	.03838 (.1672)	26.6344 (.5382)

* denotes values significant at $\alpha = .01$

Discussion of Results for Hypothesis 2

In the preceding pages it has already been established that the overall quantity of all references has increased significantly since 1960. Hypothesis 2 examines which fields marketing research is drawing its resources from and which of the respective fields showed increases or decreases in volume or in proportion.

Reference Sources: A Shift in Emphasis

Altogether, there is strong evidence of a statistically significant change in the proportionate amount of references over the years in the following fields: marketing, psychology, and to some extent management and sociology.

As shown earlier in the discussion of hypothesis 1, an article can easily be dated by just looking to see how many references have been provided. If one were to pick an article with few or no references it is very likely that that article is from the 1960's. If the article has 30 or more references it is most likely from the 1980's.

Analyzing the field or discipline from which these references are derived then provides an understanding about the nature of these articles and the researcher's inclinations. With more emphasis on the behavioral sciences it seems that research in marketing is currently focusing less on quantitative subjects such as economics and statistics as sources for references. This shift in sources used likely follows a similar shift in focus on the topics of research articles. This issue will be discussed further in Chapter VIII which deals with paradigm shifts in this area.

Focus on Marketing Itself

It appears that as research in the field of marketing has evolved, it has shifted its resource emphasis from discipline to discipline over the years. That more attention is paid to the field of marketing is easy to understand. It is a relatively newer discipline (especially compared to economics) and presumably still developing. Decades ago few articles existed, thus few citations. With more volume to draw from the opportunity to do so was seized by marketing researchers. However, the relatively slight influence of statistics is noteworthy: One would presumably expect that research would benefit by increasing application of the improved techniques published in statistics literature. Be that as it may, the remaining hypotheses in this study are likely to throw additional light on that subject.

Results for Hypothesis 3

Hypothesis 3: The incidence of using a pretest has increased significantly since 1960.

Trend Towards More Pretesting

Only those studies that were empirical in nature are included in the analysis of this hypothesis. Of the 275 sampled articles 162 were empirical, the rest theoretical or commentary/essay type. (Trends of empirical studies in marketing is discussed at the end of this chapter.) The screening was necessary because a pretest can only be used in an empirical study.

Additionally, seven articles which were empirical were excluded since they were based on secondary data and the variable "pretest" had to be coded as "not applicable." Therefore we are left with 155 cases.

Exhibit 5.12 shows the level of pretesting over individual years expressed as a percent of all 155 empirical studies examined. While there is a larger proportion of studies that do not use a pretest than do, we see a trend toward more pretesting. However, at the end of the period the percent of studies that do not make use of a pretest stage still outweighs by far those that do.

EXHIBIT 5.12

PERCENT OF EMPIRICAL STUDIES WITH PRETEST:

1960 THROUGH 1988

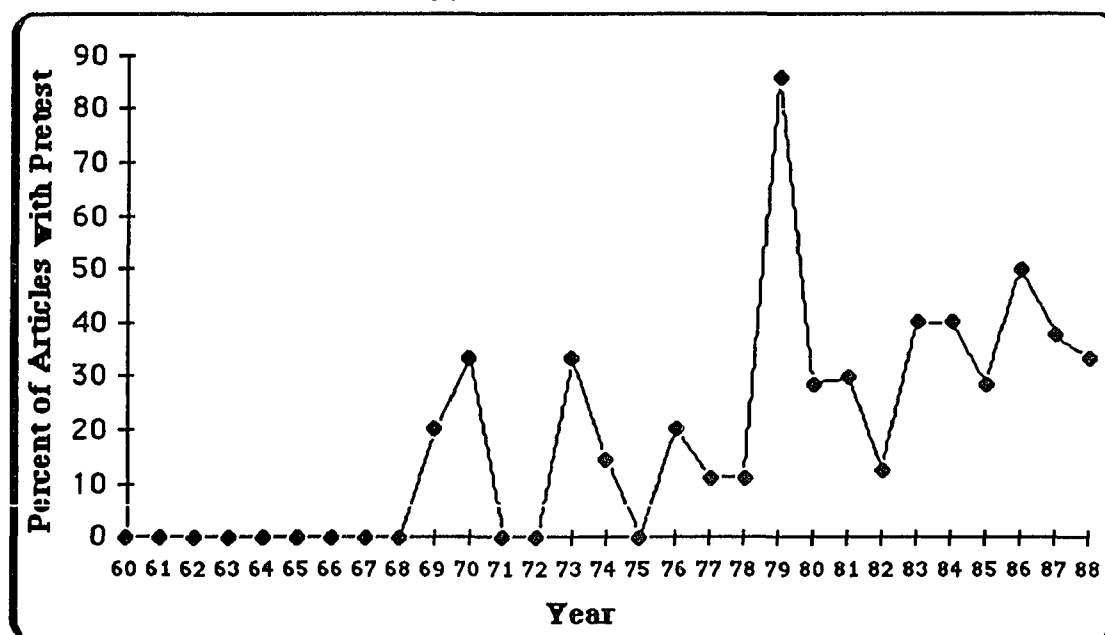


Table 5.16 shows a crosstabulation of the distribution of pretesting for the period sampled.

TABLE 5.16

DISTRIBUTION OF PRETESTING IN EMPIRICAL STUDIES

BY PERIODS: 1960-1988

Years	Pretest	No Pretest
1960-1964	0 (00.0%)	7 (100%)
1965-1968	0 (00.0%)	11 (100%)
1969-1972	2 (12.5%)	14 (87.5%)
1973-1976	3 (12.5%)	21 (87.5%)
1977-1980	10 (31.3%)	22 (68.7%)
1981-1984	12 (31.6%)	26 (68.4%)
1985-1988	10 (37.0%)	17 (63.0%)

Results Are Statistically Significant

Kendall's Tau C results in a value of .5762, which is significant at $\alpha=.0000$. Other measures of association reveal the following. Pearson's R value is calculated at .6754, significant at $\alpha=.00003$, and the Spearman correlation coefficient rho is computed as .7911, significant at $\alpha=.00000$.

An analysis of variance test produced an F value of 3.7775 significant at .0098. A test for the homogeneity of variances reveals a case of heteroscedasticity. The assumption of equal population variances may be violated without serious risk to the validity of the ANOVA F-test only if sample sizes are equal. We do not have equal sample sizes across the years, and therefore the results for the ANOVA test are questionable. An arc sine transformation applied to the data resulted in an F value of 3.1419 significant

at .0222. A test for homoscedasticity resulted in a Bartlett-Box $F=2.683$ with $P=.032$. This implies that there may still be a problem with unequal variances.

Discussion of Results for Hypothesis 3

The pretest stage is a vital part of most empirical research designs. It is in this stage that flaws in many aspects of the study can be identified and more easily corrected before the full research effort is conducted.

It must be noted that the variable "pretest" is treated here as dichotomous and was coded as a '1' or '2' (yes, no) based on what was stated explicitly in each article examined. A research study may have included a pretest stage but if the researcher neglected to state it then the variable was coded as "no pretest." It was assumed that if no pretest was mentioned, probably none was conducted. It is believed that, had it been conducted, nearly all researchers will include a statement of pretest when discussing how the research was designed.

The conclusion then is that although there still exist empirical studies that do not indicate a pretest stage, this neglect appears to be changing. What is even more interesting is the dates when this change appears to be most conspicuous, namely the period 1977-1980. Before that time considerably less pretesting was done: None in the years 1960-1968, and very little from 1969-1976. Subsequently the proportions increased considerably and reached a level of some thirty-seven percent in the final period under study (1985-1988). The year which was apparently a turning point for the quantity of cited references, 1977, was also a significant date in

this case. It remains to be seen whether this date also plays a role in the hypotheses to follow.

Results for Hypothesis 4

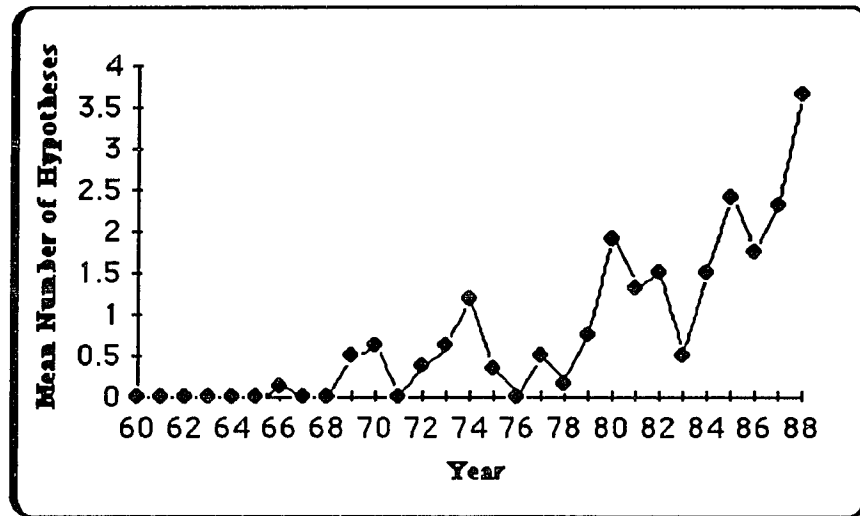
Hypothesis 4: Over the past 30 years there has been a significant increase in the number of hypotheses posed.

Significant Increase in Number of Hypotheses Posed

As shown in Exhibit 5.13, the mean number of hypotheses per article has risen over the past 30 years. In the period between 1960 and 1964 not one article featured any explicitly stated hypotheses. But by 1985-1988 more than 20% of the articles show at least one stated hypothesis, if not more.

EXHIBIT 5.13

MEAN NUMBER OF HYPOTHESES PER ARTICLE ANNUALLY:
1960-1988



Kendall's Tau C is computed as .1183. This value is significant at $\alpha=.0001$, and indicates a strong positive relationship between years and number of stated hypotheses. Pearson's R is .2529, significant at $\alpha=.00001$. Additionally, Spearman's rho .2281 is significant at $\alpha=.00007$.

An analysis of variance further confirms a significant difference in number of hypotheses over the years. The ANOVA table, shown in Table 5.17, indicates an F value of 3.2190 which is statistically significant at $\alpha=.0045$.

TABLE 5.17

ANALYSIS OF VARIANCE TABLE FOR NUMBER OF HYPOTHESES					
Source	SS	DF	MS	F	F Prob.
Between Groups	192.8325	6	32.1388	3.2190	.0045
Within Groups	2675.7129	268	9.9840		
Total	2868.5455	274			

A test of linearity can be conducted since the level of measurement of the independent variable is at least at the ordinal level (see Table 5.18). When between group sum of squares is broken into two components, that accounting for the linear trend, and that which is the result of nonlinear trends, the resulting F value of 18.4111 is highly significant at $\alpha = .0000$. This indicates a significant linear trend in the data up to this point in time.

TABLE 5.18

TEST OF LINEARITY FOR NUMBER OF HYPOTHESES					
Source	SS	DF	MS	F	Signif.
Linearity	158.0823	1	158.0823	15.8336	.0001
Deviation from Linearity	34.7502	5	6.9500		

A time series analysis produces the following trend line.

$$y = -6.6138 + .09889x$$

(y = number of hypotheses; x = years; origin = 1900)

A two-tailed test of significance shows the slope significantly different from zero at $\alpha=.0001$. The positive sign of the slope indicates an uptrend in the number of hypotheses posed over the years. The Durbin-Watson statistic was calculated as 1.96, indicating no problem of serial correlation. A p-plot, however, shows a skewed distribution. Furthermore, a scatterplot of the residuals shows a pattern, indicating that the model may not be a good fit. A square-root transformation was therefore applied to the data. The new model is $\sqrt{y} = -1.91959 + .029644x$. With the transformation the data seem to be more nearly normally distributed, and now there appears to be no pattern of the residuals in the scatterplot either.

Pairwise comparisons are also conducted on the grouped years. All possible pairs of group means are tested using Student-Newman-Keuls. Since one particular article in Group 7 (years 1985-1988) had an atypical twenty-nine hypotheses, the results of a pairwise comparison might have been unnecessarily skewed. To prevent such a distortion from biasing the results, the data are categorized into the following five groups: 0 (i.e. no hypotheses), 1-5, 6-10, 11-15, and more than 15 hypotheses. After the data are collapsed in this manner, a pairwise comparison using the Student-Newman-Keuls procedure shows that the recent group of years (1985-1988) is most different from the early years 1960 through 1976. The results for the Student-Newman-Keuls is shown in Table 5.19.

TABLE 5.19

<u>STUDENT-NEWMAN-KEULS PROCEDURE HYPOTHESES BY GROUPED YEARS</u>									
		Group							
<u>Mean</u>	<u>Years</u>	<u>Group</u>	1	2	4	3	5	6	7
.0000	1960-1964	1							
.0313	1965-1968	2							
.1163	1969-1972	4							
.1250	1973-1976	3							
.2500	1977-1980	5							
.3542	1981-1984	6							
.5208	1985-1988	7	*	*	*	*			

(*) denotes pairs of groups significantly different at the 0.050 level

Discussion of Results for Hypothesis 4

It is clear that there has been an increase in the number of hypotheses posed in journal articles over the years. The incidence of formally posed hypotheses probably implies a more scientific/positivistic research paradigm than would be the case in their absence.

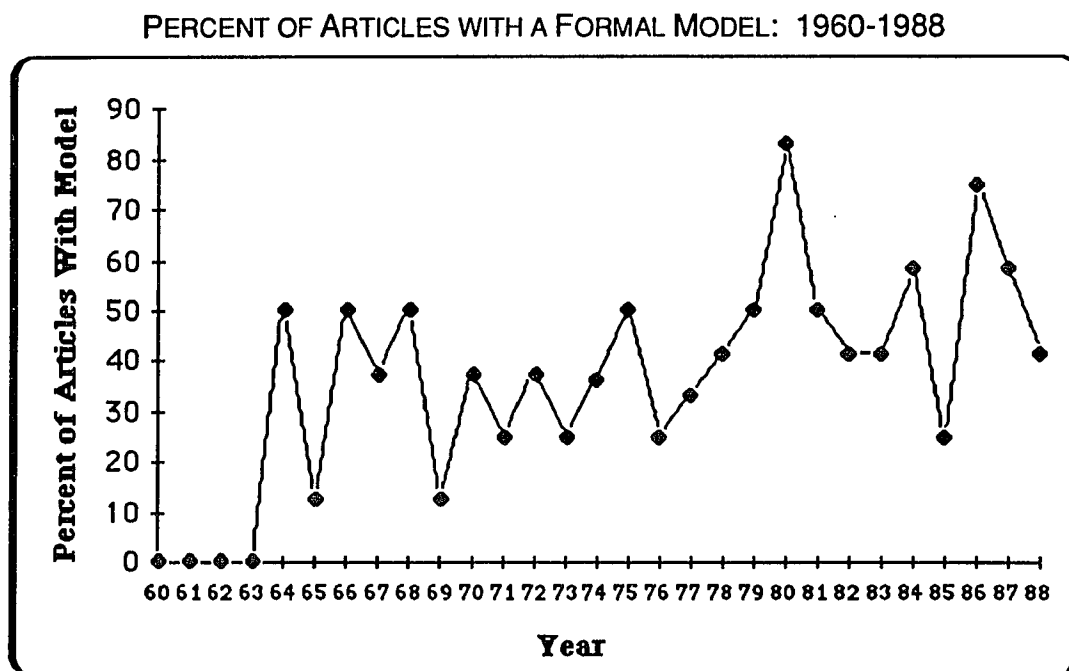
Still, it must be conceded that just because no hypotheses are stated (in the earlier years) does not necessarily mean the researcher had none in mind. Perhaps the editors' more demanding policies in recent years have had some impact on the posing of hypotheses in a research article. Explicitly stating these in the published article at least focuses more clearly on the research concern(s) to be addressed. Be that as it may, an increase in the number of stated hypotheses is evident and it is statistically significant.

Results for Hypotheses 5a and 5b

Hypothesis 5a: Since 1960 there has been a significant change in the number of proposed models in a research study.

Exhibit 5.14 shows the percent of articles with formally posed models over all the years. An article may present a model that is graphical, mathematical, or both. Appendix D shows examples of graphical and mathematical models taken from the sample. It is clear from the graph that we have moved from finding no models in any of the articles sampled in the very early years of this study, to having approximately half the articles with some type of model.

EXHIBIT 5.14



The Increase is Statistically Significant

Measures of association indicate a strong relationship between “year” and the variable “model.” Table 5.20 shows values for Kendall's Tau C, Pearson's R, and Spearman's rho. All of these values are statistically highly significant. An analysis of variance was conducted on the grouped years. The resulting F of 3.25 is significant at .0193. A test for homoscedasticity shows no violation of the required assumption of equal variances.

TABLE 5.20

MEASURES OF ASSOCIATION FOR MODEL

<u>Statistic</u>	<u>Value</u>	<u>Significance</u>
Tau C	.46564	.00070
Pearson's R	.64859	.00007
Spearman's rho	.69134	.00028

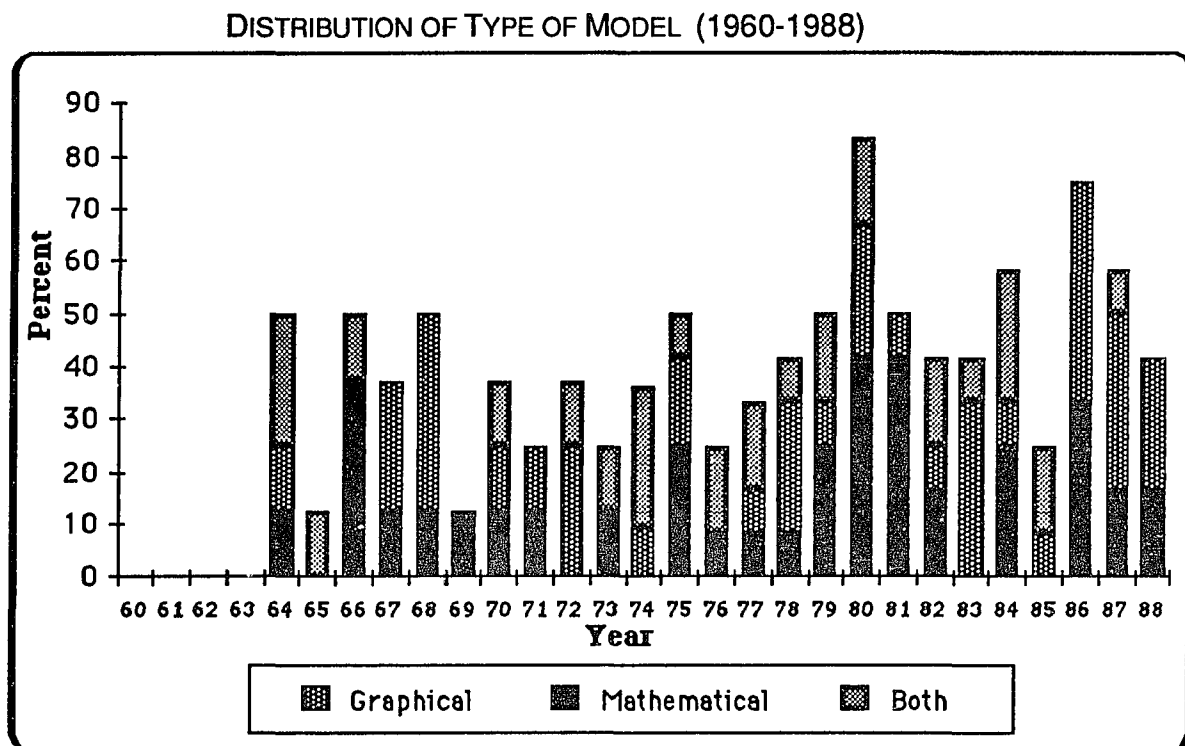
Little Change in Type of Models

Hypothesis 5a: Since 1960 there has been a significant change in the type of proposed models in a research study.

After establishing that there has been an increase in the existence of models in the design of research articles, it must be determined whether there was a change in the type of models that have been used. The distribution in Exhibit 5.16 shows the major types of models reported in the

sampled articles of this study. There appears to be no discernible difference over the years in terms of type of model posed, mathematical, graphical, or both. Formal tests of significance follow below.

EXHIBIT 5.15



No Significant Difference in Types of Models

Table 5.21 shows the results of Kendall's Tau C, Pearson's R and Spearman's rho. It confirms that there is no relationship between type of model and year.

TABLE 5.21

<u>MEASURES OF ASSOCIATION FOR TYPE OF MODEL</u>		
<u>Statistic</u>	<u>Value</u>	<u>Significance</u>
Tau C	-.0774	.23960
Pearson's R	-.06910	.23456
Spearman's rho	-.07181	.22590

An analysis of variance produces an F value of .5096. This value is not statistically significant, thus confirming that there is no difference in type of model over the years.

Finally a Kruskal Wallis test yielded a value of 2.7991 significant at .8336. This result also shows no evidence of a relationship between year and type of model.

Discussion of Results for Hypotheses 5a and 5b

It is apparent from the data that today there are many more studies which cite the use of formal models than was the case 30 years ago. In fact, currently half of all the articles sampled feature formal models. By contrast, in the early 1960's none of the articles did. The turning point appears to be, again, the 1977-1980 period.

It is now commonly assumed that a model, whether mathematical or graphical, helps the researcher in theory generation and construction. (See Appendix D for sample models.) It also helps scholars to understand what

underlying relationships the earlier researcher set out to examine. When a formal model is stated, future researchers can build more easily upon that as a foundation. The result is probably more comprehensive, more clearly focused research and findings.

It is interesting that although there has been a significant increase in the total incidence of a formal model, there is no statistical evidence to suggest a difference in type of model over the years. This increase in number may be a result of the editor's favoring structured articles regardless of model type. The choice of a particular model may be dictated by the requirements of a given study, mathematical, graphical, and sometimes both.

Again it must be emphasized that the inclusion of some type of model does not by itself suggest something positive. But if this variable is taken in tandem with others discussed in this chapter, it suggests a composite picture of more attention to the details of a structured research article. This conformance to scientific standards commonly accepted in many disciplines shows the positivistic approach in effect.

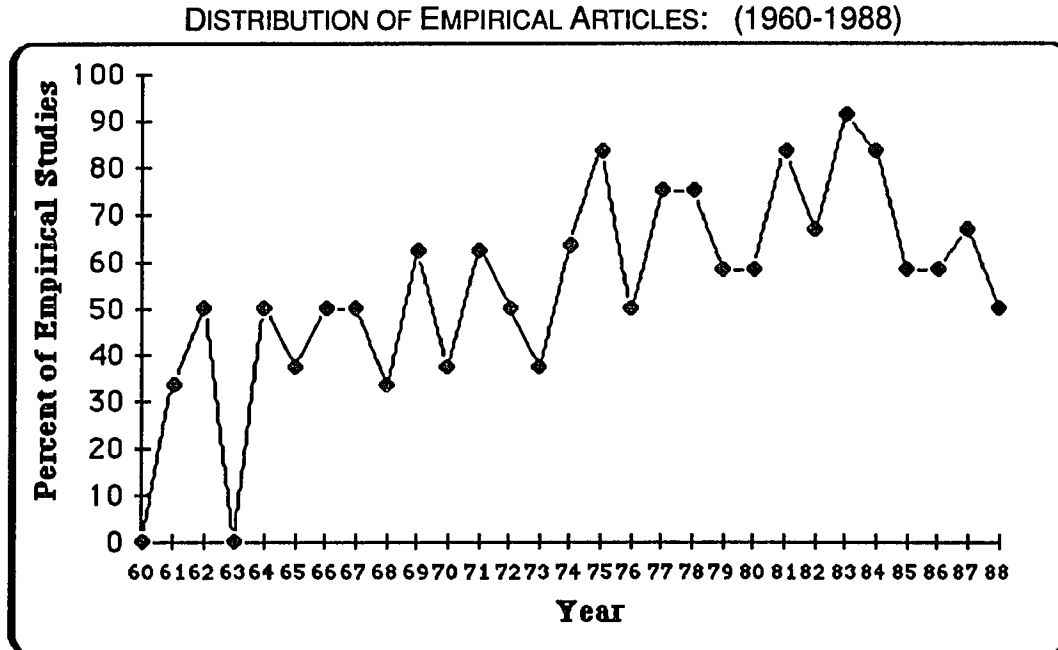
Some Conclusions on the Design of Research

Other variables that are not included in the above hypotheses concerning the design of research articles were also investigated in this study and found to have changed significantly over the years. These are worth mentioning briefly, for the sake of completeness, even though they are considered to be playing only a minor role in this research.

More Empirical Studies

This study classifies an article as either empirical or nonempirical. As a byproduct of the analysis it was found that there has been a statistically significant increase in the proportion of empirical studies over the years. Exhibit 5.17 shows that in the early 1960's there were far more nonempirical studies than empirical ones. In the late 1960's to early 1970's they appeared in about equal numbers. Finally, in the late 1970's there is a clear shift towards more empirical studies. But, interestingly, the trend seems to have been arrested or reversed. By 1988, again, an equal number of empirical and nonempirical articles was found.

EXHIBIT 5.16



More Coauthoring

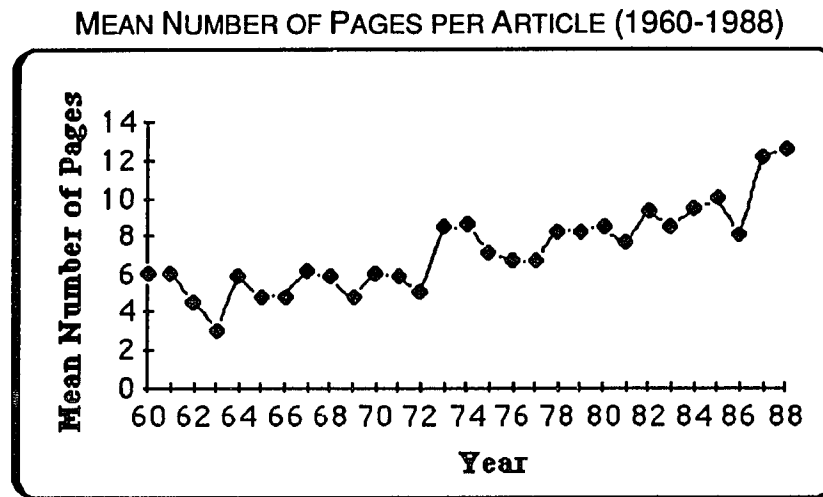
The evidence points to a clear trend away from sole authorship toward more coauthoring. There may be many reasons for this. It is widely known that there is much more pressure to publish today than was the case 30 years ago. There is only approximately the same number of pages contained in each of the prestigious journals as in the 1960's. With so many more potential authors, and little additional space for all to be published, one remedy is to "double up," to have 2, 3 or even 4 names to a single article. Though a larger number of journals exists today than was the case years ago, the pressure is to publish in the handful of most prestigious, established journals as exemplified by those chosen for this study.

One could speculate that the pooled efforts of two or more authors results in a better research article. With more complex issues to analyze, each researcher can work on his specialty, with the combined effort possibly having a synergistic effect. But that depends on whether coauthors are chosen on the basis of expertise or merely for the sake of convenience.

Article Length Increases

The average number of pages per article has also changed over the years. In 1960 the mean length articles sampled was six pages. In 1961 the average was still six pages. In 1962 it fell to 4.5 pages, and in 1963 the average length of an article was down to only three pages! But, as shown in Exhibit 5.17, since 1977 the average article length has been over 8 pages, rising to 12.3 in 1987 and 12.7 in 1988.

EXHIBIT 5.17



Additional Developments:

The results in Table 5.22 show that over the years the number of authors, pages, formulas presented, and the number of empirical studies conducted have all increased significantly. The only exception is the number of statistical tables, which did not change significantly over the years.

It is evident at this point that there was a clear change in the quantitative aspects in the design of research articles. This change reflects positivism's influence in the research arena in marketing. An influence of relativism on research in the field of marketing has not been detected in the variables examined in this chapter. Subsequent chapters in this dissertation deal with different areas and aspects of research in marketing. Therefore any final conclusions on the overall change in research paradigms in

marketing must wait until all evidence for the remaining hypotheses is analyzed.

TABLE 5.22

SUMMARY OF STATISTICAL TESTS OF SIGNIFICANCE
FOR ADDITIONAL VARIABLES CONCERNING
DESIGN OF RESEARCH ARTICLES

Variable	Pearson's R (Signif)	Spearman's rho (sig)	Tau C (Signif)	Kruskal- Wallis(Sig)	ANOVA F (Signif)
Authors	.33540** (.00000)	.33654** (.00000)	.27328** (.0000)	40.8333** (.0000)	2.7312** (.0000)
Formula	.10102* (.04728)	.11285* (.03082)	.07149* (.0296)	35.0397 (.1687)	.8628 (.6687)
Length	.53449** (.00000)	.53982** (.00000)	.37213** (.0000)	110.6397* (.0000)	5.937** (.0000)
Figures	.00552 (.46368)	.04015 (.25363)	.02965 (.2547)	31.0081 (.3167)	.9653 (.5197)
Tables	.04325 (.28548)	.04208 (.29070)	.03146 (.2889)	34.2627 (.1285)	1.3369 (.1473)
Classification	.23038** (.00006)	.21718** (.00014)	.24383** (.0000)	24.6825** (.0004)	1.5495* (.0432)

* denotes values significant at $\alpha = .05$

** denotes values significant at $\alpha = .01$

Where:

Authors - Number of authors per article

Formula - Number of formulas presented

Length - Number of pages per article

Figures - Number of figures, charts or graphs

Tables - Number of tables displaying results of data analysis

Classification - Empirical or non-empirical classification

1977: A Turning Point

As stated in the preceding pages, there seems to be a precipitous shift, occurring in about 1977 or shortly thereafter, towards quantity: more references, pretesting, formally stated hypotheses, empirical studies, and even more pages per article! A logistic regression was run for two groups of years: Group 1--Before 1977; Group 2--1977 and After. Table 5.23 shows the logit model with the most significant variables to distinguish between the two groups. These were: total number of references per article, length of article in pages, whether or not there was any type of model (mathematical, graphical, or both) and whether or not a pretest was conducted for an empirical study. Because of the problem of multicollinearity, variables such as number of formulas, figures, or tables did not improve the fit of the model. The aforementioned variables were found to be highly correlated with the total number of references and length of article.

TABLE 5.23

SUMMARY TABLE FOR LOGISTIC REGRESSION			
	Regression Coeff.	Standard Error	Coeff./S.E.
TOTREF	.35481	.06076	5.84
LENGTH	.40892	.13656	2.99
MODEL	.30285	.16281	1.86
PRETEST	.53840	.12398	4.34
	Intercept	Standard Error	Intercept/S.E.
	2.90	.29110	9.96

A two-group t-test was also used to test the years before 1977 against the years after that period. The results in Table 5.24 show highly significant t-values for most of the variables. A pooled variance t-test was applied except when the assumption of equal population variances was violated. In those cases a separate variance t-test was used, (see note below Table 5.24).

TABLE 5.24

TWO-GROUP T-TEST:

GROUP 1 - BEFORE 1977

GROUP 2 - 1977 AND AFTER

<u>Variable</u>	<u>T Value</u>	<u>2-tail prob.</u>
Total References	-6.86*	.000
Pretest	4.01*	.000
Hypotheses	-3.99*	.000
Model: Yes/No	3.34	.001
Type Model	3.42*	.001
Authors	-4.29	.000
Classification	-3.54	.000
Length (#pages)	-8.35*	.000
Formulas	-1.39	.166
Figures	.30*	.763
Tables	-.36	.716

*assumption of equal population variances violated; used separate variance t-test.

A Mann-Whitney test was also performed on the data. This test is similar to the Kruskal Wallis one except that it examines the hypothesis that two independent samples came from populations having the same distribution. The Kruskal Wallis test applies to more than two independent samples and is an extension of Mann-Whitney. It is a nonparametric statistic

and does not require assumptions about the shape of the underlying distribution. Additionally, the ordinal scale of measurement is sufficient. Even though it is not as powerful as the t-test it, too, was able to detect a significant difference between the two periods in most of the variables. Table 5.25 shows the results of this analysis.

TABLE 5.25

MANN-WHITNEY TWO GROUP TEST			
GROUP 1 - BEFORE 1977			
GROUP 2 - 1977 AND AFTER			
<u>Variable</u>	<u>U</u>	<u>Z</u>	<u>2-tail prob.</u>
Total References	3295	-9.3207	.0000
Pretest	2127	3.4329	.0006
Hypotheses	7938	-3.6641	.0002
Model: Yes/No	7596	-3.2754	.0011
Type Model	7462	-3.3784	.0007
Authors	6764	-4.4071	.0000
Classification	7483	-3.4713	.0005
Length (#pages)	5173	-7.2058	.0000
Formulas	8381	-1.9550	.0506
Figures	8773	-1.1065	.2685
Tables	2775	-0.1404	.8883

Table 5.26 shows the results of other measures of association. Again there is very strong evidence of a break between the two periods with respect to all variables shown except for the number of tables.

TABLE 5.26

PEARSON'S R AND SPEARMAN'S RHO FOR TWO GROUPS:

GROUP 1 - BEFORE 1977

GROUP 2 - 1977 AND AFTER

<u>Variable</u>	Pearson's R (Significance)	Spearman's rho (Significance)
Total References	.37306 (.00000)	.56309 (.00000)
Pretest	-.27663 (.00025)	-.27663 (.00025)
Hypotheses	.19494 (.00058)	.22012 (.00012)
Model: Yes/No	-.19787 (.00049)	-.19787 (.00049)
Type Model	-.20111 (.00040)	-.20409 (.00033)
Authors	.13510 (.0469)	.26620 (.000)
Classification	.20971 (.00023)	.20971 (.00023)
Length (#pages)	.38816 (.0000)	.4715 (.000)
Formulas	.06213 (.2212)	.1256 (.019)
Figures	.08991 (.1329)	.0491 (.209)
Tables	.01260 (.43816)	-.01595 (.42191)

Conclusion

From the logical empiricists' perspective (i.e. positivism) there have been significant gains in the design of research in marketing. Positivism seeks facts or causes without subjective interpretation (Reichardt and Cook 1979) and seems to dominate the marketing literature today, at least as evidenced by hypotheses 1-5. The results from each of these hypotheses shows that more facts and figures are being included in research articles, which this school of thought considers its ideal.

The changes noted in the pages above are not necessarily to be interpreted as an improvement in the caliber of research articles today. As Anderson (1986) cautioned, truth is relative to a particular time and place, and numerical data are not always adequate in the search for it. None of the results found in this section show a shift towards the relativistic paradigm. In fact, it can be argued that the results point in the opposite direction--that researchers are more interested in and more satisfied with numerical rather than interpretive data.

When comparing typical articles from the 1960's with those from the late 1980's one can differentiate between the two approaches immediately. At first glance the articles from the late 1980's seem to follow much more rigorous standards of scientific research, from the positivist's perspective. In an item by item comparison (using the results for hypotheses 1-5) the 1980's articles are significantly different from those in the early 1960's. The articles of late appear to conform to certain now commonly accepted standards, some of which are explicitly stated in the first or last pages of a journal. It is very likely an article cannot get published today if it is not of expected length, contains at least 15-20 references, has a model of some sort, numerical tables, and formally stated hypotheses. The more mathematical and

statistical notations the better. Research articles in the late 1980's also appear similar to each other in structure. Most begin with a brief introduction, then a literature review, a methodology section, followed by a presentation of results, and finally some discussion and conclusion. Research articles which do not conform to these conventions seem to have little chance of being published in these academic journals. The uniformity in presentation is more likely the result of screening rather than accidental.

In contrast, the typical 1960's article includes some of the same components but in an unstructured format over the entire article, usually four or five pages long. Looking back over nearly thirty years of publications it can be concluded that there have been significant changes towards more formality in the design and structure of research articles. The logical empiricists should applaud these changes. But to the relativists there is no evidence that any meaningful change has taken place in the variables presented so far, regardless of the observed increases in quantity.

Exhibit 5.18 summarizes the findings discussed in this chapter. The following chapters explore what changes have occurred in data collection techniques, data analysis, and research topics.

EXHIBIT 5.18

SUMMARY TABLE OF RESULTS FOR HYPOTHESES 1-5

Hypothesis	Results	Comments
1	Significant increase in the number of references cited.	The positivistic paradigm is in effect here. The relativist would not find any comfort in these findings.
2	The composition of references has changed with proportionately more coming from psychology, management, and marketing itself.	As the field of marketing matures, more of the references can, and do come intrinsically.
3	Trend toward more pretesting.	Shows commonly accepted scientific standards in effect. Editors' actual or perceived preferences probably at work here.
4	Significant increase in the number of hypotheses posed.	This variable also shows conformance with the expected presentation of articles.
5a	The proportion of articles with a model has increased.	This increase in the presentation of formal models also reflects a conformance to the commonly accepted standards on the <u>structure</u> of a research article. Again, the editors' demands, or their perceived demands, is probably at work here.
5b	Although the proportion of articles presenting a formal model has changed, the type of model presented has not.	While there is an increase in <u>number</u> , there is no change in type. Presumably this is because the purpose and content of the research article dictates the appropriate type of model.
Other Findings	There has been a significant increase in the proportion of studies that are empirical in nature, the average length of an article, the number of authors per article, and the number of formulas presented.	Taken as a whole, we see evidence of the positivistic paradigm at work in the design of research. None of the variables discussed thus far reflect relativistic influences in marketing.

CHAPTER VI

RESULTS AND DISCUSSION 2:

SHIFTS IN DATA COLLECTION TECHNIQUES

This chapter presents the results from data analysis for those hypotheses concerned with changes in data collection techniques over the years. Only empirical articles were included.

Results for Hypothesis 6

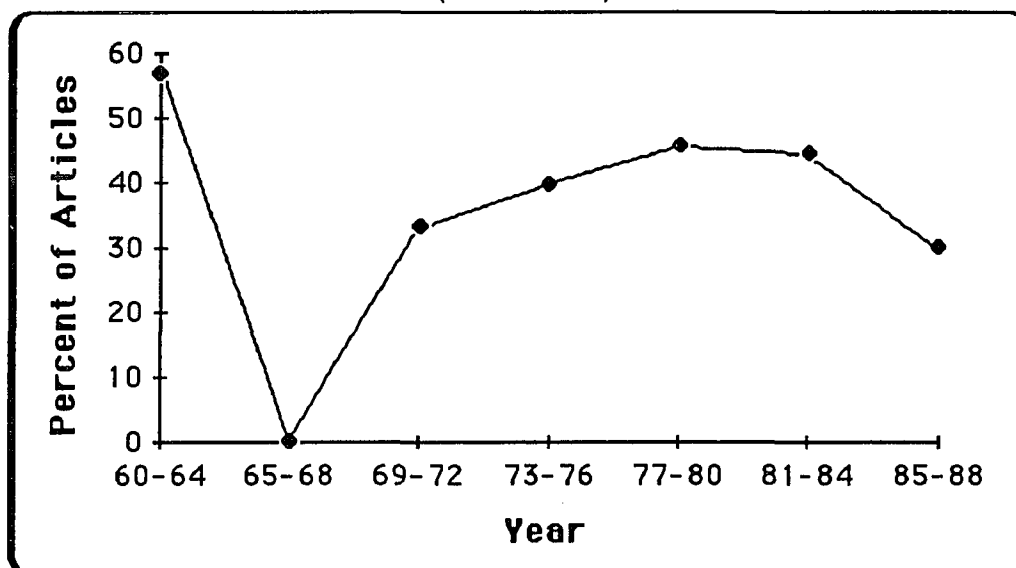
Hypothesis 6: The use of probability samples has increased significantly since 1960.

A Shift To More Probability Sampling Has Not Occurred

Exhibit 6.1 shows the relative percentage of probability samples over the years. It appears that little has changed in the last thirty years. The majority of empirical studies have been, and continue to be done by nonprobability sampling methods. Only once, in the first period of years, did probability sampling methods outnumber nonprobability methods. This finding may be attributed to the small number of empirical studies that were conducted in that period--only 7 out of 24 articles! Of those, four use simple random sampling, one uses a systematic random sample, and the remaining three are based on convenience samples. Aside from that period's findings, however, the overall trend seems to favor nonprobability sampling methods, and to refute the hypothesis.

EXHIBIT 6.1

PERCENT OF ARTICLES
USING PROBABILITY SAMPLING METHODS
(1960-1988)



Statistical tests of significance confirm this assumption. Pearson's R value is .02311 with an observed significance level of .40488. Spearman's correlation coefficient rho is likewise non-significant with a value of .03345 and an observed significance level of .36373. Kendall's Tau C is .03669, also not significant $\alpha = .26315$.

TABLE 6.1

STATISTICAL TESTS OF SIGNIFICANCE FOR PROBABILITY VS.

NONPROBABILITY SAMPLING METHODS		
<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	.02311	.40488
Spearman's rho	.03345	.36373
Kendall's Tau C	.03669	.26315
ANOVA F	.99630	.47990
Kruskal-Wallis	5.39570	.49420

Similarly, an analysis of variance test provides no evidence of a difference between the groups of years with respect to probability or non-probability sampling. The ANOVA test resulted in an F value of .9963 with an observed significance level of .4799.

The Kruskal-Wallis test, which, unlike the 1-way ANOVA measures the mean ranks of the groups, resulted in similarly non-significant values. The Kruskal-Wallis test statistic was computed as 5.3957 with an observed level of significance of .4942.

Discussion of Results for Hypothesis 6

No Apparent Trend Towards More Probability Sampling:

The findings presented in Chapter V show a change in variables that are indicative of a positivistic research paradigm. The relativist might argue that these changes are irrelevant. The issue of probability vs. nonprobability sampling, however, deals more directly with the integrity of the data, and of the research results based on them. In a probability sample every element

in the population has a known, nonzero probability of being selected. This fact allows the application of powerful analytical techniques which are invalid with respect to data gathered in a nonrandom, subjective manner.

In this study a few probability sampling methods are classified. These include simple random, systematic, stratified random, cluster samples, and random digit dialing. Non-probability samples consist of quota, judgement, and convenience samples. The analysis shows that convenience samples far outweigh the use of any other sampling method. Simple random sampling is a distant second. Other methods seem to be popular only in specific periods of years. For example, cluster sampling and judgment sampling are found in the sample only in the period of 1969-1972. Predictably, random digit dialing, a more recent phenomenon, shows up only in 1981-1988.

As stated above, there are advantages to gathering data by probability sampling methods, because the reliability of the resulting estimates can be computed objectively but cannot be done with data generated by a nonprobability sample. This approach is espoused by positivists. But there is a cost to gathering such more useful information, both in time and in money. With modest budgets and the pressures of tight deadlines on researchers it is perhaps understandable that so much research is based on quick and easily conducted convenience samples.

On the other hand, relativists castigate the prevailing "data über alles" (Anderson 1988, p. 406) attitude. If richer information can be gathered by nonprobabilistic methods, then the relativist would prefer such an approach. The writer feels that at least when such alternative methods of collecting data are not possible or appropriate, then relativists and positivists alike should encourage the use of probability sampling methods.

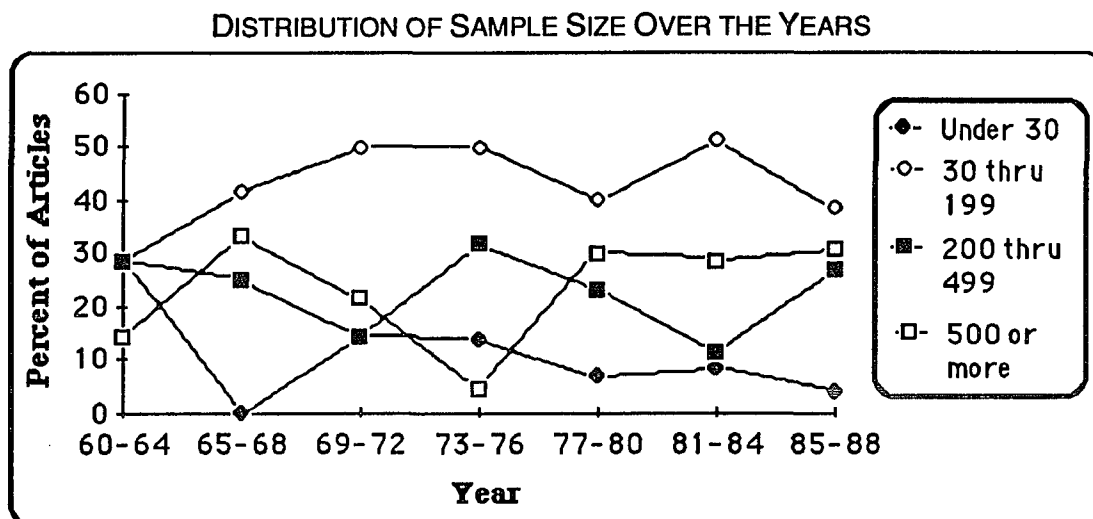
Results for Hypothesis 7:

Hypothesis 7: Since 1960 sample sizes have increased significantly.

Sample Sizes Stable

Hypothesis 7 is rejected. Data analysis indicates no significant changes in sample sizes over the period studied. This is true for any of the four categories into which the data were grouped (see Exhibit 6.2): At one extreme are the studies with fewer than thirty observations. These are labeled "small samples" by statisticians and the results typically considered questionable. The next group contains research based on sample sizes of thirty and under two hundred, still considered relatively "small" but more acceptable than the first group. The next segment can be viewed as "large" samples--two hundred and under five hundred. And at the other extreme are the research efforts based on generally adequate five hundred or more observations.

EXHIBIT 6.2



None of the statistical tests of significance conducted shows any evidence to support hypothesis 7. Pearson's R was computed as .0955 which is considered nonsignificant at $\alpha=.12577$. Spearman's rho similarly yields a value of .10114 with an observed level of significance of .11224. Other tests of significance provide similar results. Kendall's Tau C was computed as .08344 with an observed level of significance of .08985. The Kruskal Wallis statistic is 7.2809 with an observed level of significance of .2956. Finally an ANOVA run on the data resulted in a value for F of 1.1997, non-significant at $\alpha=.2517$. Table 6.2 summarizes these results.

TABLE 6.2

STATISTICAL TESTS OF SIGNIFICANCE FOR

SAMPLE SIZE		
<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	.09550	.12577
Spearman's rho	.10114	.11224
Kendall's Tau C	.08344	.08985
Kruskal Wallis	7.28090	.29560
ANOVA F	1.19970	.25170

Discussion of Results for Hypothesis 7No Significant Variation in Sample Sizes

The method of selection and the number of interviews or observations are two important facets of sampling. The results of statistical analysis indicate that sample sizes have been about the same over the past three decades. The most widely used sample size is 30 through 199 observations. Relatively few of the studies have sample sizes below 30. The relatively large proportion of the studies with sample sizes of 500 or more is noteworthy in view of the considerable expense incurred thereby.

At a minimum the analysis confirms that there has been no deterioration in the data gathered as a result of sample sizes. Whatever changes took place were insignificant. The fewer than 10% of the empirical studies in the sample based on less than thirty observations are not necessarily suspect. Pilot studies, for example, may require no more than this number.

The adequacy of sample sizes larger than 30 depends on the required reliability of estimates based on the given study. For example, if a percentage estimate with a possible error of $\pm 5\%$ is acceptable, then a sample of 100, and sometimes less, may be sufficient.

The results shown for this hypothesis do not differentiate between random and nonrandom sampling. The remarks above are basically true for all probability samples. Estimates based on nonprobability sampling methods are invalid except under the assumption that the data found in such a study would be the same if random selection methods had been employed. If such an assumption is correct then there is no difference in the required sample size: If, say, 100 observations are enough for a given purpose they are sufficient regardless whether the data collection was, in fact, random or not. And if the assumption is incorrect, no parameter estimates should have been computed and the sample size is of no consequence.

Results for Hypothesis 8

Hypothesis 8: The use of students as subjects has declined significantly since 1960.

Percentage of Student Respondents Unchanged

There is no evidence of a decline in the use of students over the years. As Exhibit 6.3 indicates, the use of students as respondents in research studies has remained approximately 20% for much of the past 3 decades.

EXHIBIT 6.3

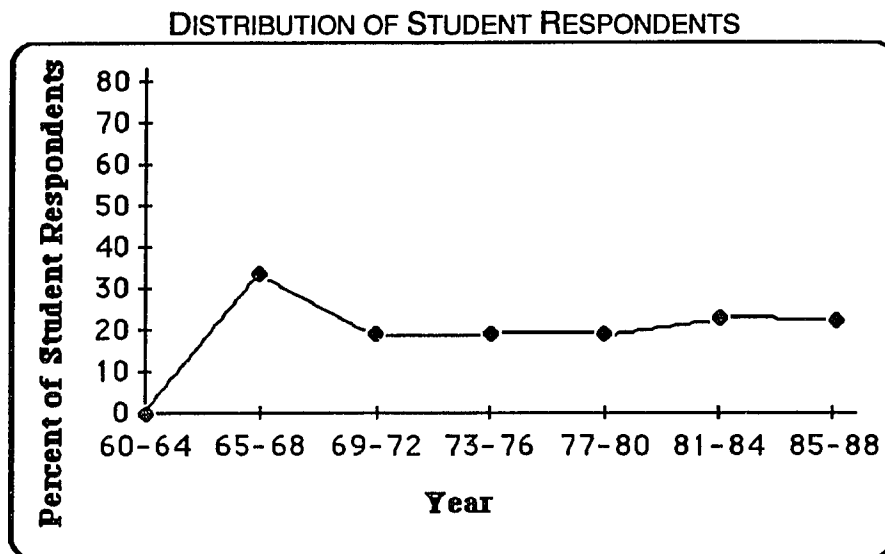


Table 6.3 shows a summary of the statistical tests of significance run to analyze the data. They provide no evidence of any decrease in the use of students in sampling over the years. It should be noted that, on average, the majority of samples have been drawn from sources other than students. These include professionals, workers at jobsite, business firms, shoppers, and others. Still, the 20% of samples with student respondents seems out of line with the isolated studies in which their selection would have been appropriate.

TABLE 6.3

STATISTICAL TESTS OF SIGNIFICANCE FOR STUDENT

RESPONDENTS (1960-1988)

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.03702	.41030
Spearman's rho	-.04871	.38268
Kendall's Tau C	-.02812	.38583
Kruskal Wallis	1.43740	.48740
ANOVA F	.51470	.60190

Discussion of Results for Hypothesis 8

Sampling gives a helpful estimate of an underlying universe only if it is a miniature replica and thus representative of it. If the universe under study consists of students, then the respondent will also come from this group, and correctly so. If this is not the case, for example in a study on the purchasing behavior of elderly men, then a group of students may not be a representative sample.

If testing hypothesis 8 had shown a significant decline in the number of studies based on conveniently available student respondents, it could have been an indication of greater care in the design of the sample. No such decline is apparent.

The issue here is similar to the concern with nonprobability sampling. Basically, estimates of parameters and of their error rate are rooted in probability theory which requires random selection of respondents from the proper population. Computing statistical estimates such as the standard

error of a convenience sample is entirely improper--unless it is certain that random selection would have resulted in identical results.

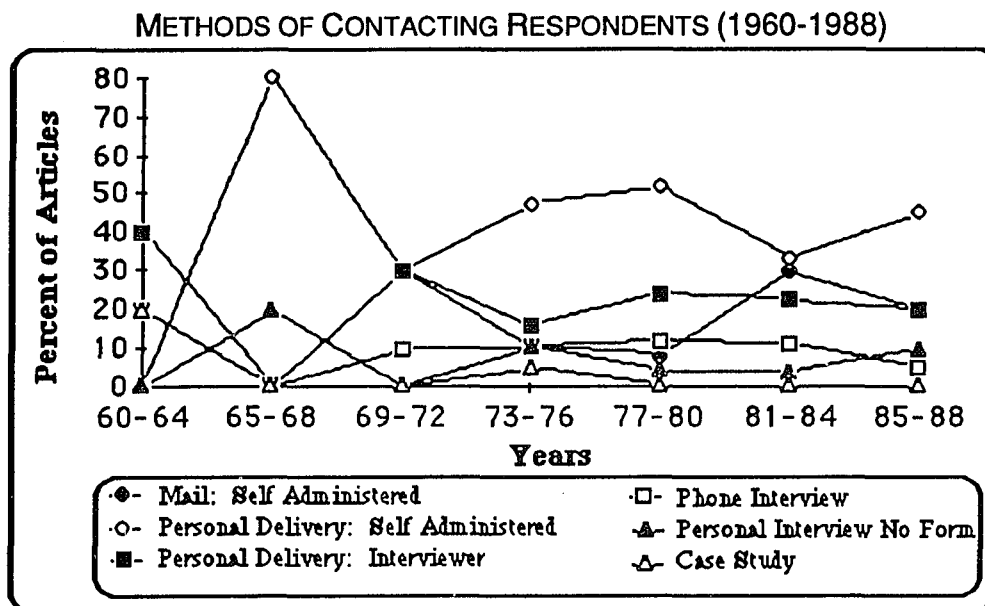
The same must be said about the exclusive selection of students as respondents from a heterogeneous population in which many members are not students. There is statistical validity to the results only if it can be correctly assumed that an alternative selection of respondents from the general population would have led to the same findings as those resulting from the study of a students only sample. Such an assumption would have to be formally verified before adopting it.

Results for Hypothesis 9

Hypothesis 9: The methods of recording responses have changed since 1960.

This hypothesis examines: 1. The way respondents are contacted, and 2. Once contacted, the types of questions asked. Data collection may be accomplished by a mailed or hand-delivered questionnaire, and by personal or telephone interview. The answers may be elicited by dichotomous, multiple choice, or open ended questions, by rating scales, or actual observations of behavior. The distribution of the methods of contacting respondents illustrated in Exhibit 6.4 shows no apparent changes in the years under study.

EXHIBIT 6.4



No Change in Methods of Contacting Respondents

Table 6.4 summarizes the results of statistical tests of significance. They confirm that there has been no significant change in the way data have been collected since 1960. The most common survey method continues to be by a personally delivered questionnaire that is self administered by respondents. This is probably explained by the large percentage of convenience samples that are used, where subjects are simply handed a questionnaire and asked to fill it out.

TABLE 6.4

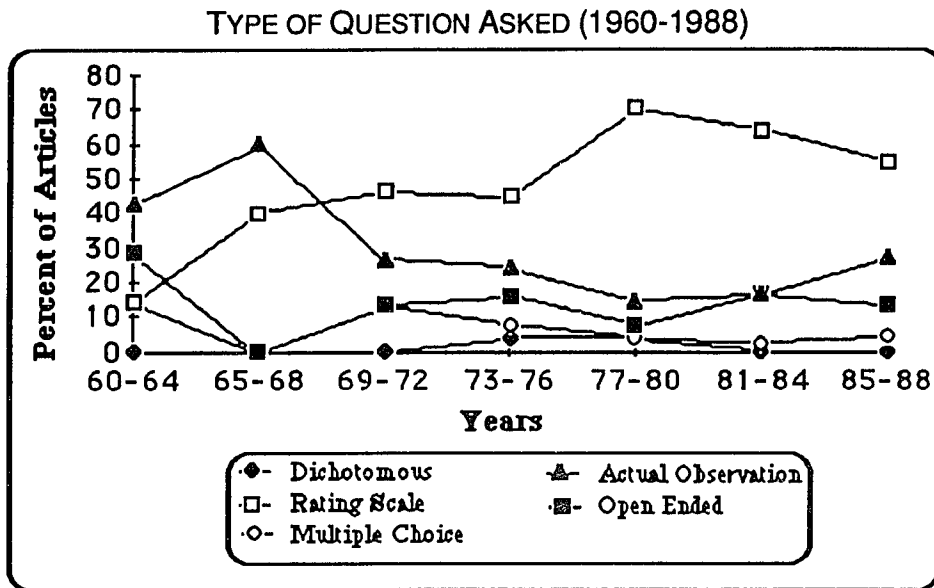
STATISTICAL TESTS OF SIGNIFICANCE FOR METHOD OF
RECORDING RESPONSES
(1960-1988)

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.05641	.23791
Spearman's rho	-.10888	.08391
Kendall's Tau C	-.08295	.08985
Kruskal Wallis	24.61720	.54070
ANOVA F	.91600	.58590

Questionnaire Format Unchanged

The second part of this hypothesis deals with how questions were asked. As Exhibit 6.5 depicts, there has been no change in the format of questionnaires over the years. Possibly an increase in the proportion of open ended questions (which require more active participation by the respondent) may have indicated a move towards a relativistic approach. But that did not happen.

EXHIBIT 6.5



The results of statistical tests of significance presented in Table 6.5 show no evidence of a change in the way data have been collected over the years.

TABLE 6.5

STATISTICAL TESTS OF SIGNIFICANCE IN TYPES OF
QUESTIONS ASKED (1960-1988)

Statistic	Value	Signif.
Pearson's R	-.03507	.32885
Spearman's rho	-.04177	.29885
Kendall's Tau C	-.03032	.31107
Kruskal Wallis	28.84130	.31840
ANOVA F	.89080	.62040

Discussion of Results for Hypothesis 9

No Changes Apparent in Recording Responses

There is no evidence of any change over the years in the methods by which responses are gathered or in the construction of questionnaires used in surveys. In these the data are mostly collected with a self administered questionnaire. This method of data collection is fast and economical. It is preferred for the same reason that (nonprobability) convenience samples and a captive student respondent pool are employed rather than more sophisticated methods which might yield more accurate data.

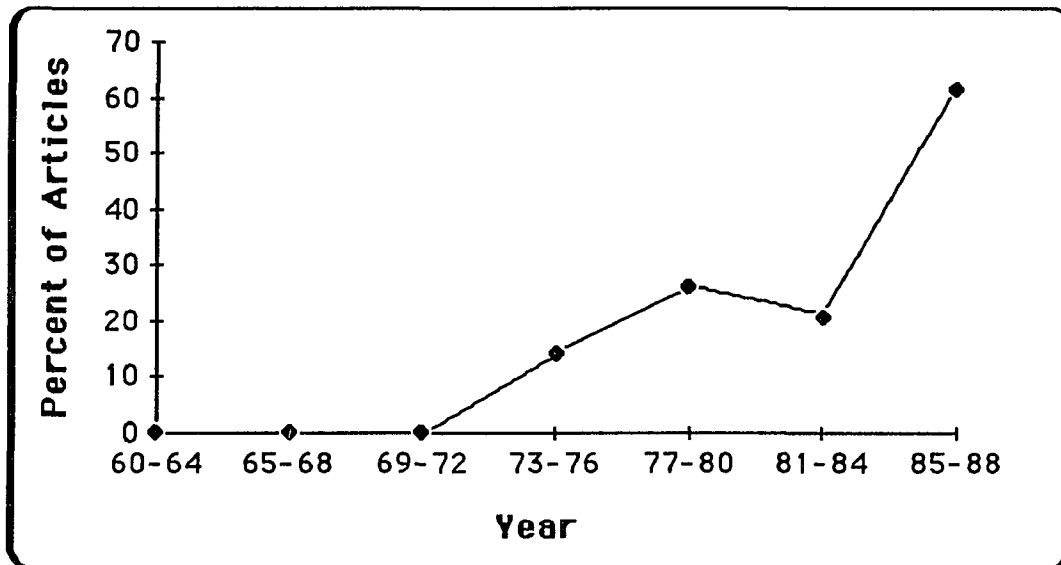
More Reliability Measures Presented

Nor has there been any significant change in the type of questions asked. Given their nature it is not surprising that most marketing studies utilized some sort of rating scale to collect data from respondents. In the earlier years no reliability measure for these scales was given. Since the mid 1970's, however, there is a clear upward trend in the use of a reliability measure for rating scales as shown in Exhibit 6.6.

EXHIBIT 6.6

USE OF RELIABILITY MEASURES FOR RATING SCALES

(1960-1988)



percent of articles with rating scales which include reliability measures

Statistical tests confirm a significant increase in the presentation of reliability measures since 1960 (Table 6.6).

TABLE 6.6

STATISTICAL TESTS OF SIGNIFICANCE FOR USE OF

RELIABILITY MEASURES (1960-1988)

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.17826	.01162
Spearman's rho	-.19167	.00728
Kendall's Tau C	-.17661	.00705
Kruskal Wallis	10.4250	.10790
ANOVA F	1.3601	.13250

Indeed, in the most recent years more articles featured a reliability measure than did not. This appears to be the only change in recording responses since 1960. This change shows the positivist paradigm in effect, ensuring that commonly accepted scientific standards are met. The relativist, on the other hand, is not as concerned with the objectivity of the numbers but rather with the richness of the data. This is not necessarily ensured by an increase in the use of reliability measures.

Results for Hypothesis 10

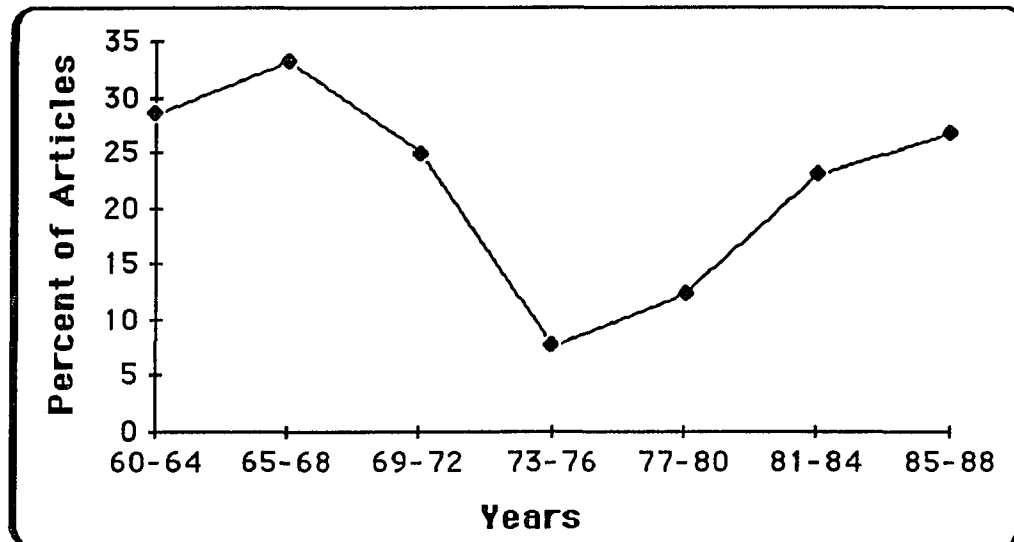
Hypothesis 10: MTMM techniques are being applied in data collection in increasing proportion since 1960.

There is no significant change in the proportion of multiple methods used to collect data since 1960. This is depicted in the graph in Exhibit 6.7.

EXHIBIT 6.7

USE OF MULTIPLE METHODS TO COLLECT DATA

(1960-1988)



As shown in Table 6.7, none of the statistical tests of significance showed any evidence to support Hypothesis 10.

TABLE 6.7

STATISTICAL TESTS OF SIGNIFICANCE USE OF MULTIPLE
METHODS TO COLLECT DATA

(1960-1988)

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	.08845	.13152
Spearman's rho	.01666	.41665
Kendall's Tau C	.00986	.43127
Kruskal Wallis	30.1429	.26170
ANOVA F	1.4635	.08470

Discussion of Results for Hypothesis 10

In many cases multiple methods to collect data is desirable. By collecting the data using multiple methods, we are more confident that the data are accurate. In some studies this refinement may not be feasible or necessary, but often it is useful and requires but a little more effort and foresight on the part of the researcher. This usually entails the additional expenditure of time and money, but the resulting richer information may be worth it. One example would be gathering data by interview then supplementing or verifying by observation.

But despite the likely benefits of using multiple methods there is no obvious move toward an increased use of them. Perhaps the pressures of publishing in a short time span and in quantity prevents researchers from taking the extra time. If the research community does not insist on the use of more rigorous methods to insure more accurate data, then most researchers are not eager to make the extra effort on their own. They may feel their time and energy is better spent on additional publications rather than a higher level of sophistication.

End of Chapter Conclusions

The hypotheses explored in this chapter have all dealt, basically, with changes in the methodology of data collection in the last 30 years. Most of these hypotheses deal directly or indirectly with the accuracy and representativeness and thus with the usefulness of the data to understand

and forecast phenomena in the field of marketing. In essence there is no evidence of a concentrated effort to improve the integrity of data collection techniques in the period since 1960. Researchers are still using the same proportion of nonprobability (predominantly convenience) samples, the most common sample size is still under 200, and the proportion of captive students as respondents is the same as it was in 1960. Furthermore, methods of recording responses and the use of multiple methods to collect data have remained in status quo.

Room for Improvement

In comparison with other aspects of a research project, not enough consideration seems to be given to the data themselves--the basic building blocks of the study. Regardless of one's philosophical position, positivist or idealist, the current methods of data collection merit review.

In a recent interview this writer had with him, Dr. Richard Lutz, the editor of the Journal of Consumer Research, lamented the fact that recently hired PhD faculty members are expected by their departments to publish prolifically but do not seem to have been given the necessary training in skillful research methods. He commented that too many articles submitted to him have inadequate experimental designs, unrepresentative samples, or employ faulty questionnaires.

But, in the opinion of this writer, these shortcomings are not explicitly enough criticized and publicized. This failure implies a message that an article may be accepted for publication as long as it looks sophisticated. The package should include impressive models, elaborate formulas, lots of references, tables, and charts and the right "buzzwords" currently in vogue.

Integrity of the data and the validity of the sample are welcome but not crucial. Consequently, the data collection component of the research project is often assigned to a student or a graduate assistant, without close and continual supervision by the authors whose name will head the final product.

If one considers the numerous published surveys in the entire field of business that profess to be based on responses from the top executives in the 100 largest, Fortune listed, U.S. firms, one wonders whether these officers ever have time left to attend to corporate affairs after having spend the better part of a working day answering personally the multitude of questions directed to them in numerous questionnaires daily. Are they really the source for all the findings based on their presumed answers?

It seems that positivists as well as idealists would applaud improvements in the area of data collection which is such an important part of the research process.

A summary table of the findings discussed here is presented in Exhibit 6.8 on the following page.

EXHIBIT 6.8

SUMMARY TABLE OF RESULTS FOR HYPOTHESES 6-10

Hypothesis	Results	Comments
6	no change in proportion of nonprobability samples	No apparent progress has been made to improve the usefulness* of samples. The heavy reliance on convenience samples remains unchanged since 1960.
7	sample size unchanged	The average number of observations has remained between 30 and 200. This size is considered small but adequate for statistical analysis.
8	proportion of students unchanged	These subjects are readily available to the academic researcher, for an effortless "convenience" sample. Questions about their representativeness of the population and relevance to the problem studied remain.
9	Methods of recording responses unchanged: 1. Rating scale is primary tool for eliciting responses with increasing reliability measures used; 2. Respondents contacted by self-administered questionnaire	From the positivist's point of view the increased use of reliability measures for rating scales represents a desirable quantitative improvement.
10	The proportion of multiple methods used to collect data has not increased.	Multiple methods might contribute to an improvement in data accuracy but time and cost considerations discourage their use.

*Note: The relativist might argue that probability samples do not represent an improvement in usefulness. Semantics aside, most researchers would disagree and consider that a probability sample is more desirable.

CHAPTER VII

RESULTS AND DISCUSSION 3: SHIFTS IN DATA ANALYSIS TECHNIQUES

This chapter deals with the progression of data analysis techniques since 1960. First we examine the volume of statistical manipulations applied to empirical studies, and then the specific statistical methods used and how these have changed over the years.

Results for Hypothesis 11

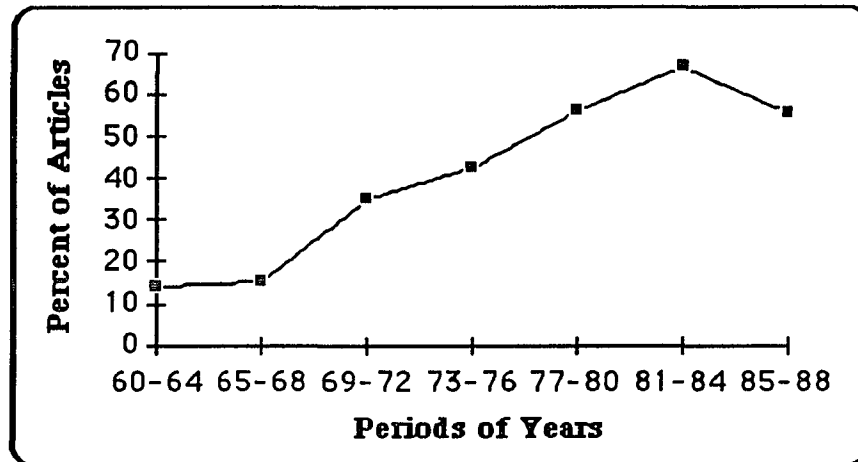
Hypothesis 11: The number of different statistical manipulations applied to a single research study has increased significantly since 1960.

More Statistical Manipulations

Since 1960 there is a trend toward applying an increasing number of statistical methods to the same data in a given research article. Exhibit 7.1 shows the proportion of articles which featured three or more statistical techniques for data analysis. It indicates that this was true for more than half of all articles since 1977, but for considerably fewer in the earlier years.

EXHIBIT 7.1

PERCENT OF ARTICLES USING THREE OR MORE
STATISTICAL TECHNIQUES



All statistical tests confirm this to be a significant uptrend. Table 7.1 summarizes these findings. They clearly support Hypothesis 11.

TABLE 7.1

STATISTICAL TESTS OF SIGNIFICANCE FOR
NUMBER OF STATISTICAL TECHNIQUES

USED TO ANALYZE DATA		
Statistic	Value	Signif.
Pearson's R	.2965	.0001
Spearman's rho	.2788	.0002
Kendall's Tau C	.3166	.0001
Kruskal-Wallis	36.7138	.0793
Anova F	3.0828	.0070

Discussion of Results for Hypothesis 1.1

The trend towards using more statistical methods in data analysis is not surprising. With the current easy availability of computers for that purpose many statistical analyses can be performed in record time. It is unclear, however, whether this change has resulted in something positive as far as the research results are concerned.

Multiple Data Analysis Techniques: Benefits and Pitfalls

The application of a variety of statistical techniques can do more than merely impress the editor of an academic journal. Diverse methods use different approaches to arrange the raw data, to examine variation within each of the groups and between them. Any one method may be handicapped by restrictive assumptions, for example, about the unknown population's (statistical) distribution and variation. Another, perhaps less powerful method, based on different or less restrictive assumptions might then complement and supplement the first one.

Sometimes, when the initial analysis is inconclusive, a (mathematical) transformation of the raw data may yield a new set of data which strengthens and confirms the first tentative results. A small sample size may invalidate one method but be perfectly acceptable in another. Examined one way, a descriptive picture may emerge, analyzed differently a cause and effect relationship may come to light. And, not least, when sharply conflicting results emerge as a result of the different analyses it will give the researcher pause for thought, and possibly prevent the release of a flawed study.

Of course, some researchers may start out with a large number of methods, but publish only the results of the 3-4 which confirm each other, omitting those that bring the results into question. But aside from the question of the researcher's integrity, the benefits of multiple techniques are limited by the accuracy and validity of the raw data. This is evident in the case of secondary data where the researcher had no control over their collection. But even in the case of primary data there may be a question of validity--especially so in a nonrandom sample design, as has been discussed in Chapter VI.

It may thus be concluded that multiple data analysis techniques may be preferable to using only one provided that the researcher has integrity and the raw data has been collected with careful attention to issues of representativeness and accuracy.

Results for Hypothesis 12

Hypothesis 12: There has been a shift towards more complex statistical methods.

To examine this hypothesis, statistical methods are divided into 3 groups. The first group deals with purely descriptive statistics - namely crosstabulations and frequency distributions. The second group deals with the older traditional methods of statistical analysis: regression, correlation, z and t tests, chi-square, and basic analysis of variance techniques. The last group deals with more advanced multivariate techniques: factor analysis, cluster analysis, path analysis, LISREL, and other multivariate techniques.

Other statistical methods such as Bayesian analysis and time series analysis did not constitute a large enough proportion of the sample to be classified separately. Instead, they were included in the "other" category.

Descriptive Statistics

Below are the results of changes in the two most commonly used descriptive techniques, crosstabulations and frequency distributions. These techniques are used basically to describe the population or sample data without making inferences about the population parameters.

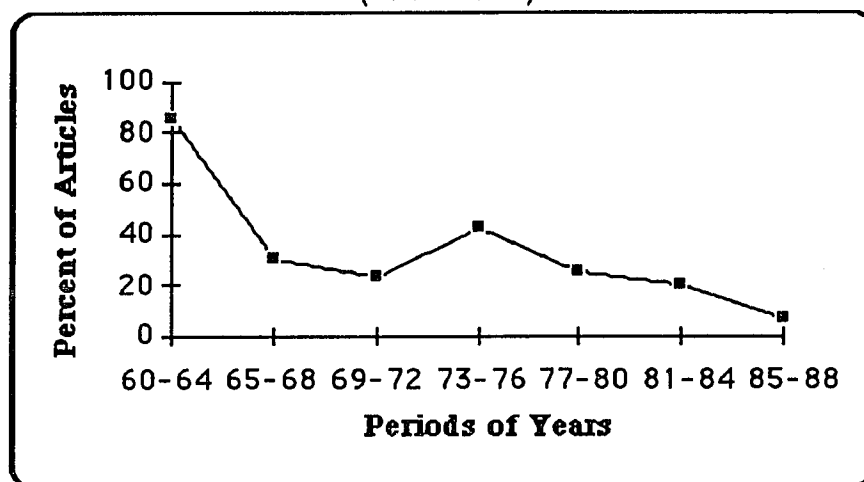
Frequency Distributions

A tabular and graphic frequency distribution was the primary method of analyzing and presenting data in the early 1960's. However since the early 1970's there has been a marked decrease in the number of frequency distributions featured in published research articles. They are still featured in business reports and probably in research studies at some earlier stage in the data analysis, but not in the final published article. Exhibit 7.2 shows the use of frequency distributions over the years. In the early 1960's (1960-1964) nearly 90% of the articles sampled used a frequency distribution to present and analyze the data. By the late 1980's, however, virtually none of the articles sampled did so.

EXHIBIT 7.2

PERCENT OF ARTICLES USING FREQUENCY DISTRIBUTIONS

(1960-1988)



Statistical tests of significance give evidence of a significant decline in the use of frequency distributions in research articles. Table 7.2 shows highly significant values in all of the statistical tests used.

TABLE 7.2

STATISTICAL TESTS OF SIGNIFICANCE FOR USE OF

FREQUENCY DISTRIBUTIONS

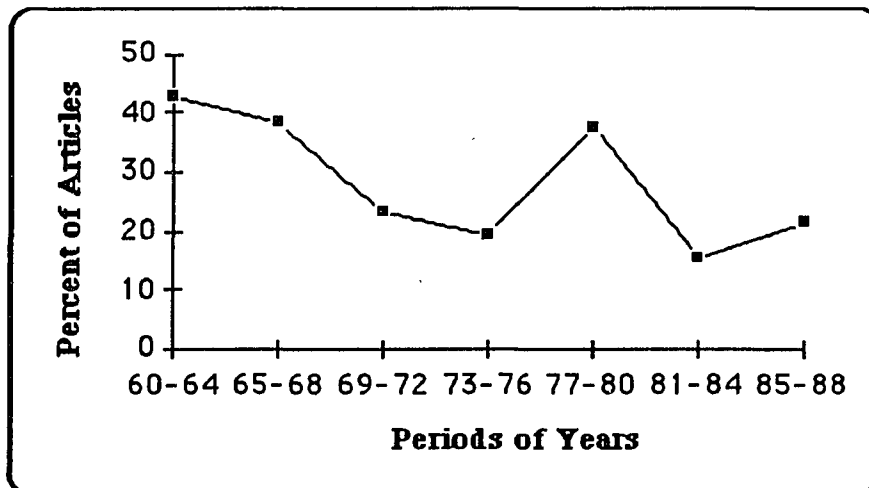
Statistic	Value	Signif.
Pearson's R	.2839	.0001
Spearman's rho	.2735	.0002
Kendall's Tau C	.2744	.0002
Kruskal-Wallis	51.0182	.0024
Anova F	4.1138	.0007

Crosstabulation

From a high of nearly 45% of all articles in the early 1960's crosstabulations declined to only about 20% of all articles in the late 1980's (see Exhibit 7.3). But there is a sudden upward shift in the late 1970's, to almost the same level as in the early 1960's! This is reversed in the early 1980's to only about 15% of all articles sampled. The percentages found for frequency distributions and crosstabulations are not mutually exclusive. Many research studies present both.

EXHIBIT 7.3

PERCENT OF ARTICLES USING CROSSTABULATIONS
(1960-1988)



It is hard to determine by visual inspection of the graph in Exhibit 7.3 if there has been a statistically significant decline in the use of

crosstabulations in research articles. Statistical tests of significance do not provide clear enough evidence of a downward trend (see Table 7.3). None of the results was highly significant. Pearson's correlation coefficient r , Spearman's rho, and Kendall's Tau C are statistically significant, but only at a .10 level of significance.

TABLE 7.3

STATISTICAL TESTS OF SIGNIFICANCE FOR USE OF
CROSSTABULATIONS

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	.1162	.07051
Spearman's rho	.1099	.08195
Kendall's Tau C	.1085	.08324
Kruskal-Wallis	33.1748	.15710
Anova F	1.2782	.27040

Traditional Statistical Methods of Data Analysis

The results of data analysis for traditional inferential statistics is shown below. These methods are easily understood and implemented, and the resulting output is not very complicated. Still, these techniques are powerful tools for analyzing data and drawing inferences.

Use of Z Tests and T Tests Increases

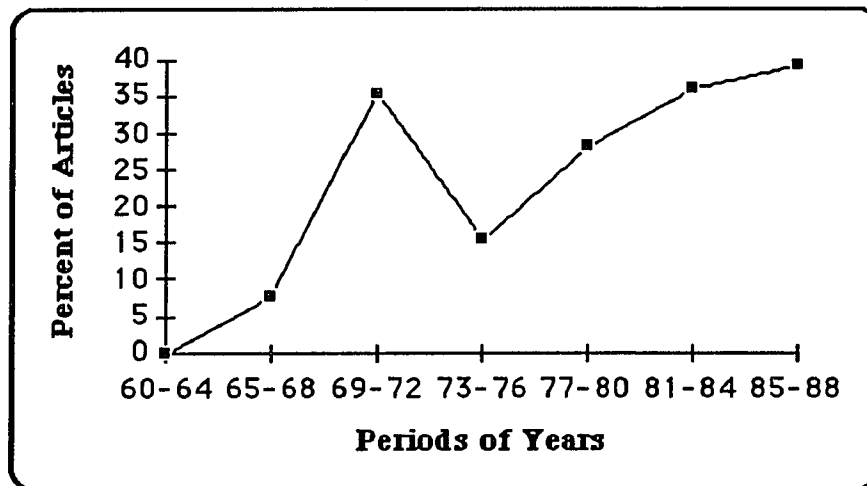
As Exhibit 7.4 illustrates, the use of z and t tests has apparently increased over the years. Between 1960 and 1964 none of the articles

sampled used a z or t test. By the late 1970's nearly 40% of all articles sampled used this method. The uptrend was interrupted once, in the mid-1970's (1973-1976) when there was suddenly a marked decline in their use. This was followed by a sustained but gradual increase since then.

EXHIBIT 7.4

PERCENT OF ARTICLES USING Z OR T TESTS

(1960-1988)



Statistical tests evaluate the significance of the apparent increase in the use of z and t tests. Table 7.4 shows highly significant test statistic values for Pearson's r, Spearman's rho, and Kendall's Tau C. The one-way ANOVA was significant only at $\alpha=.10$, while the Kruskal-Wallis test showed no significance at all.

TABLE 7.4

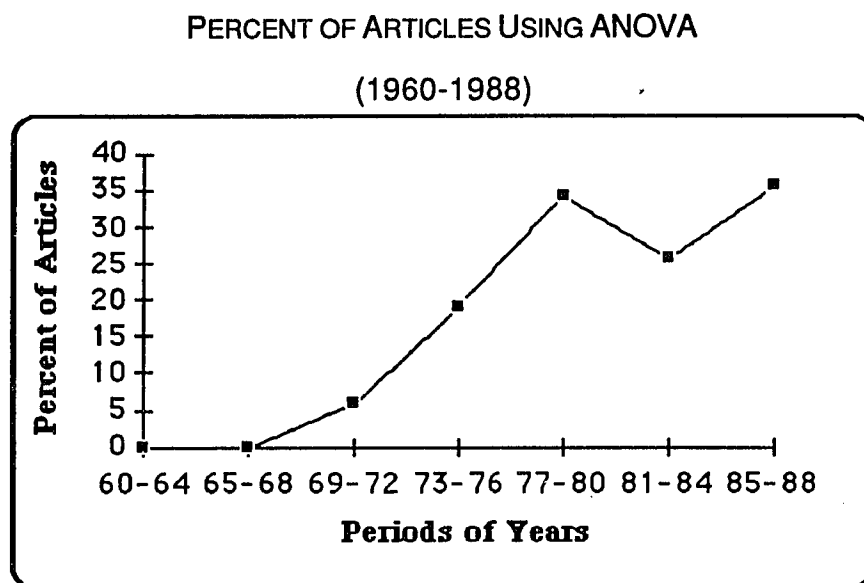
STATISTICAL TESTS OF SIGNIFICANCE FOR USE OF

Z OR T TESTS		
<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.2100	.00366
Spearman's rho	-.2042	.00457
Kendall's Tau C	-.2077	.00343
Kruskal-Wallis	28.8468	.31810
Anova F	1.8650	.09020

Analysis of Variance

No analysis of variance was performed in the articles sampled in the years 1960 through 1968. Since 1970, however, the use of ANOVA has grown to 35% of the sampled articles in the late 1970's and 36% in the late 1980's (see Exhibit 7.5), with but one decline, to 25%, in the early 1980's (1981-1984).

EXHIBIT 7.5



All but one of the statistical tests confirm a highly significant increase overall in the number of research articles using analysis of variance. The exception was the Kruskal-Wallis test (see Table 7.5). Because of the way the data were coded only extreme differences in the mean rankings of the groups could be detected by this statistical test. Since all the other tests were highly significant we may reasonably conclude that there has been a notable increase in the use of ANOVA in research articles since 1960.

TABLE 7.5

STATISTICAL TESTS OF SIGNIFICANCE FOR

USE OF ANOVA		
<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.2623	.00037
Spearman's rho	-.2479	.00073
Kendall's Tau C	-.2364	.00023
Kruskal-Wallis	23.842	.58500
Anova F	2.465	.02640

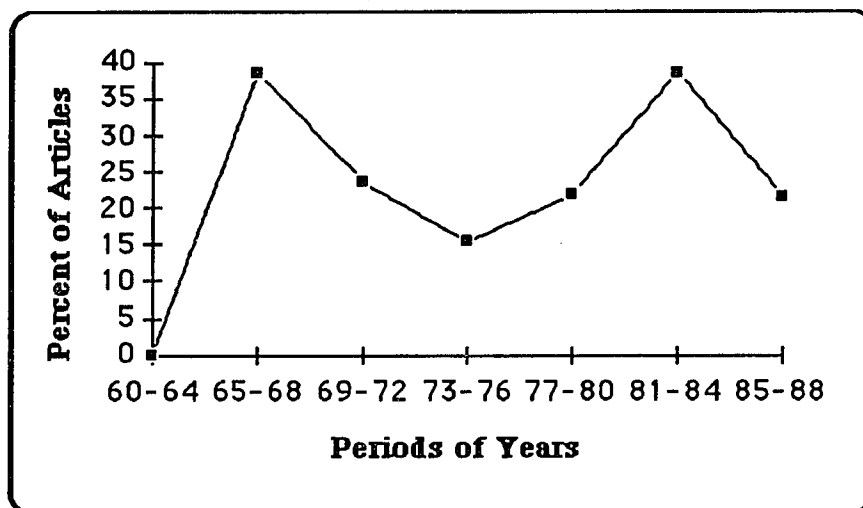
Regression Analysis

The use of regression techniques does not seem to have followed a pronounced trend over the years. During the early 1960's (1960-1964) not one article featured a regression analysis. Since 1965 (see Exhibit 7.6) up to 40% of the articles sampled have used regression techniques as part of the data analysis. A decline in the use of this technique in the early to mid 1970's was followed by a resurgence in 1981-1984. The last period of years (1985-1988) shows a decrease, but this analysis is still used in 21% of the articles sampled for 1988.

EXHIBIT 7.6

PERCENT OF ARTICLES USING REGRESSION ANALYSIS

(1960-1988)



As expected all statistical tests conducted (see Table 7.6) show no evidence to suggest any change (either up or down) in the use of regression in research articles. It is clearly a technique that is being used in research articles as the occasion dictates, but no trend or pattern of use is apparent from the data.

TABLE 7.6

STATISTICAL TESTS OF SIGNIFICANCE FOR
USE OF REGRESSION

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.0677	.19609
Spearman's rho	-.0676	.19635
Kendall's Tau C	-.0668	.19110
Kruskal-Wallis	33.7170	.14230
Anova F	1.5080	.17880

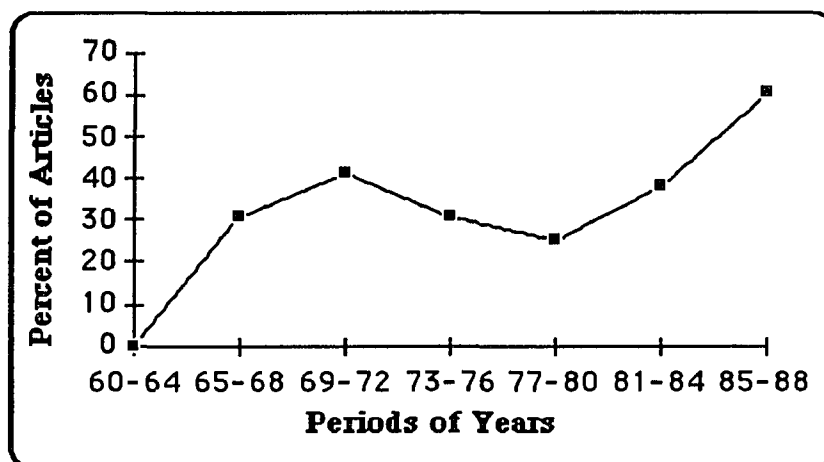
Correlation Analysis

Correlation analysis seems to be quite a popular technique for analyzing data. It was presented throughout the period, except for the first group of years (1960-1964). As Exhibit 7.7 shows, since 1965 at least 25% of the articles sampled used correlation analysis in each grouping of years. In the most recent period (1985-1988) that figure jumps to 60%. It should be noted that the computations for correlation and regression analysis are usually conducted simultaneously either manually or in the more popular computer programs. The data presented here suggest that some researchers present only the results of correlation, others of regression analysis, and some present both.

EXHIBIT 7.7

PERCENT OF ARTICLES USING CORRELATION ANALYSIS

(1960-1988)



Tests of significance confirm that this increase over the years in the use of correlation analysis is statistically significant. As Table 7.7 shows, all tests of significance except Kruskal-Wallis were highly significant. A pairwise comparison using Student-Newman-Keuls found the most significant differences between the most recent group of years (1985-1988) and the first and fifth groups of years (1960-1964 and 1977-1980).

TABLE 7.7

STATISTICAL TESTS OF SIGNIFICANCE FOR USE OF CORRELATION		
<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.2012	.00512
Spearman's rho	-.2064	.00421
Kendall's Tau C	-.2256	.00440
Kruskal-Wallis	28.1890	.34920
Anova F	2.3910	.03080

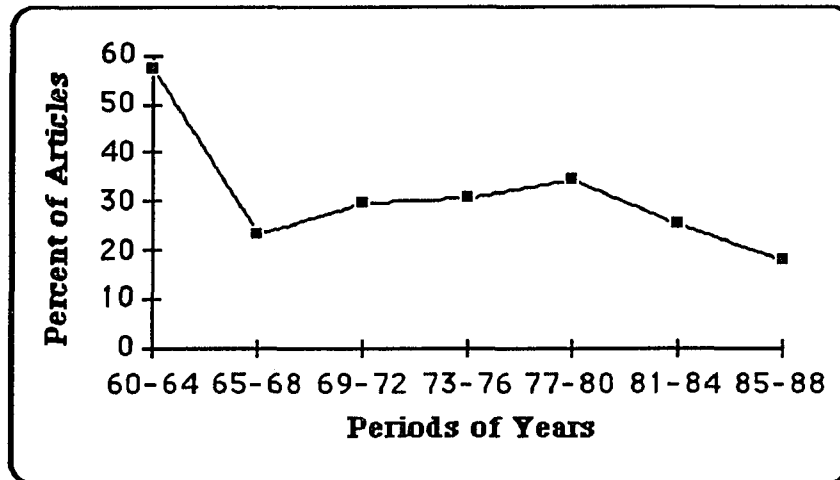
Chi Square

Chi square, while quite popular in the early 1960's, has not enjoyed as much popularity since then. Exhibit 7.8 shows little change (downward if any) in the use of chi square since its peak in the early 1960's. At that time a record 57% of the articles sampled used a chi square analysis as at least one of the methods of analysis.

EXHIBIT 7.8

PERCENT OF ARTICLES USING CHI SQUARE

(1960-1988)



Approximately one quarter of the articles still use this technique, which is a relatively high proportion and indicates that chi square is still relied upon to provide insight when analyzing data. None of the tests in Table 7.8 show any significant changes in use of chi square over the span of thirty years. Only Pearson's r , Spearman's ρ , and Kendall's Tau C are marginally significant if we are willing to use an α of .10.

TABLE 7.8

STATISTICAL TESTS OF SIGNIFICANCE FOR

USE OF CHI SQUARE

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	.1121	.07777
Spearman's rho	.1116	.07867
Kendall's Tau C	.1143	.07376
Kruskal-Wallis	27.6828	.37470
Anova F	.8813	.51010

Advanced Multivariate Techniques

This group of statistical techniques uses more sophisticated methods than the previous group. A major distinction is the difficulty in operationalizing the techniques. It would be quite difficult to do the computations for any of the techniques in this section manually. An increased level of sophistication is needed on the part of the researcher to use these methods, and also to understand the resulting output.

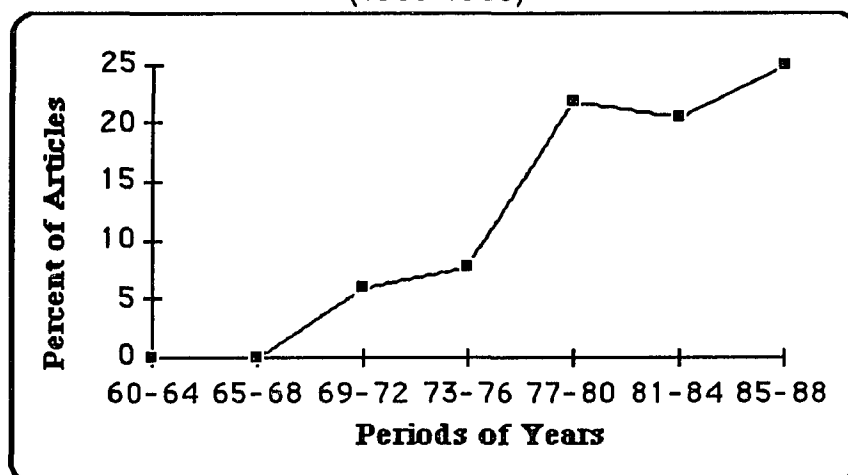
Factor Analysis

Factor analysis has become ever more popular. As Exhibit 7.9 shows, since 1977 there has been a surge of interest in using this technique. Nearly a quarter of the articles sampled since then (through 1988) have used factor analysis.

EXHIBIT 7.9

PERCENT OF ARTICLES USING FACTOR ANALYSIS

(1960-1988)



As Table 7.9 shows, the initial statistical tests of significance did not all confirm the obvious upward trend the graph depicts. Kendall's Tau C, Pearson's r , and Spearman's ρ show highly significant test statistics indicating a clear change over the years in the use of factor analysis. The one-way ANOVA F , and the Kruskal-Wallis test, however, did not. But this is most likely because of the way these statistics categorize the data. There appears to be very little difference within the period before 1977, and likewise very little difference in the period after 1977. The analysis, which included all the years, did not pick up large enough discernable differences.

TABLE 7.9

STATISTICAL TESTS OF SIGNIFICANCE FOR
USE OF FACTOR ANALYSIS

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Pearson's R	-.2307	.00160
Spearman's rho	-.2261	.00190
Kendall's Tau C	-.1855	.00078
Kruskal-Wallis	26.3956	.44150
Anova F	1.6606	.13420

When the data are reanalyzed with only two groups--before 1977, and 1977 and after, a different picture emerges this time with highly significant values in all tests conducted. These results are shown in Table 7.10.

TABLE 7.10

STATISTICAL TESTS OF SIGNIFICANCE FOR USE OF FACTOR
ANALYSIS FOR TWO GROUPS:

	GROUP 1-BEFORE 1977	GROUP 2-1977 AND AFTER
<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Chi Square	8.9936*	.00271
Pearson's R	-.2356	.00127
Spearman's rho	-.2356	.00127
Kendall's Tau B	-.2356	.00031
Kruskal-Wallis	8.9381	.00280
T-Test	3.0700	.00300

*Results for the chi-square analysis are valid in this case.

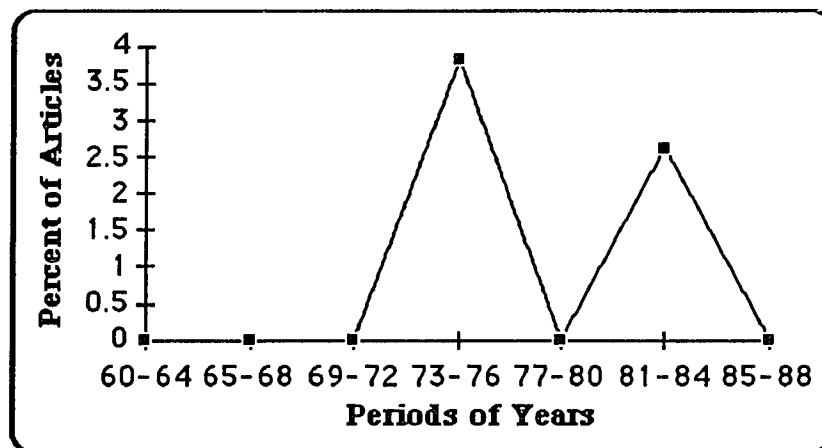
Other Multivariate Techniques

Other multivariate techniques have been used over the years to analyze data, but no significant trends could be statistically confirmed possibly because of the small number of cases using these methods. For example, no cases using path analysis were found in the years 1960 through 1972, 1977 through 1980, nor in 1985 through 1988. Between 1973 and 1976 slightly less than 4% of the articles used path analysis, and in 1981-1984 less than 3% of the articles used a path analysis (see Exhibit 7.10)

EXHIBIT 7.10

PERCENT OF ARTICLES USING PATH ANALYSIS

(1960-1988)



The graphs for cluster analysis, LISREL, and similar methods look very much like Exhibit 7.10. As expected tests could not discern a significant trend over the years in the use of these multivariate techniques. But it is obvious from the graphs that there has been sporadic interest in one type or another over the years. They are used, abandoned, and may or may not reappear in the future.

Discussion of Results for Hypothesis 12

The data seem to show clear usage patterns of statistical techniques over the years. In the early 1960's (1960-1964) descriptive statistics predominated. Then in the next ten years attention shifted to the analytical methods of regression, correlation, z and t tests, and chi square. Finally, in the last ten year period (1977 through 1988) more sophisticated multivariate techniques were added to the traditional statistical methods just mentioned. As a result, the articles in the later years (1977 and after) have more statistical manipulations applied in a given study than do those prior to 1977. An item by item summary of each of the statistical techniques and their usage patterns over the years follows:

Descriptive Statistics

Dominant Period--early 1960's.

Frequency Distributions-While used continually to describe data in every period analyzed, their peak was back in the early 1960's. They have been featured less often ever since except for one period (1973-1976) in which their use rose moderately.

Crosstabulation-This method has been used most dominantly in the early 1960's, and again in the late 1970's. It has, however, been featured in articles published in all other periods as well, but to a lesser degree.

"A Study of Wholesale Trading Areas," by Jac Goldstucker (Journal of Marketing, April 1962, pages 22-25) is typical of research conducted in that period. The objective of the study was to ascertain what factors are relevant to decisions concerning territorial coverage of a given trading area. For that purpose the author presents a map on which he plotted the percentage changes in sales volume over a period of 29 years in each sales territory covered by the firm under study. An analysis is then conducted which essentially consists of looking for segments on the map in which a substantial increase in sales volume had occurred.

Further into the 1960's research becomes a bit more sophisticated, relatively speaking. It would likely include a frequency distribution and crosstabulations. One typical example that could be cited from the sample taken is an article by Donald F. Fox and Stuart U. Rich entitled "Perceived Risk and Consumer Decision Making, the Case of Telephone Shopping,"

(Journal of Marketing Research, November 1964, pages 32-39). Frequency distributions and crosstabulations of the data are presented, followed by an evaluation of the varying percentages found in each category. The discussion leads the authors to conclude that the degree of perceived risk will lead the consumer to her decision whether or not she will shop by telephone for a given product.

Research of this type was perfectly acceptable for publication during the 1960's. But not any more--no doubt a result of the efforts of advocates for the positivistic paradigm.

Traditional Statistical Techniques

Dominant Period--mid 1960's to mid 1970's, but continues to influence data analysis through the 1980's.

Z and T Tests-This method was not applied to any great extent except in the 1969-1972 period and then again in the 1980's.

ANOVA-This technique was not used much in the 1960's or early 1970's.

But by the late 1970's it became a dominant method of analyzing data, and has remained so ever since.

Regression-In the mid 1960's (1965 to 1968) regression played a very important role in the analysis of data. It has remained important in statistical analysis, but not to the same extent as earlier.

Correlation-Correlation analysis has been prominently used in research articles since 1965. Its results are published more often than those of regression analysis.

Chi Square-This technique is the only inferential statistical tool used prominently in the early 1960's (1960-1964). It is usually performed hand in hand with crosstabulations which were also popular at the same time. It continues as an important part of statistical analysis to date.

More advanced statistical methods appear in the literature of the next decade, the 1970's, as exemplified by a study by C. Samuel Craig, Brian Sternthal, and Clark Leavitt (note the three co-authors), "Advertising Wearout: An Experimental Analysis," (Journal of Marketing Research, November 1976, pages 365-372).

To examine the effects of print advertising frequency on brand name recall the authors utilize a 3x4 factorial design with respondents randomly assigned to each of the twelve cells. The analysis was done by means of ANOVA, and treatment means were compared with a Student-Newman-Keuls test. The results of the analyses showed the various interaction effects. They were presented in a series of seven tables and three exhibits. These gave the article a highly quantitative look. The overall image was dramatically different from that of the largely descriptive textual presentation in the 1960's.

Advanced Multivariate Techniques

Dominant Period--late 1970's through 1980's

Factor Analysis-It was used only moderately in the early 1970's, but reached prominence in the late 1970's, which continues into the 1980's.

LISREL-Not found in the sample except in the mid 1970's and then again in the early 1980's.

Path Analysis-Not found until the mid 1970's and then again in the early 1980's, in the same time period as LISREL.

Cluster Analysis-Used primarily in the period 1969 through 1976. Not found in any of the articles sampled since 1976.

Other Multivariate Techniques-Other multivariate techniques have been applied off and on through the 1970's and 1980's. These include discriminant analysis, canonical correlation and the like. Although all types of multivariate techniques have dominated the research articles in the 1980's, there does not seem to be any particular one (except factor analysis) that is used more often than any of the others.

Advanced Level of Recent Studies

Towards the latter part of the 1970's and 1980's the level of statistical analysis became increasingly sophisticated. Rigorous quantitative methods of multivariate analysis are applied together with the more traditional ANOVA and regression analyses. Many articles include a detailed description of the experimental designs employed and the rationale for their use.

Factor analysis was the most prominently employed of the "Advanced Multivariate Techniques." Since 1977 it was included in 20-25% of all the empirical articles sampled. Typical is an article entitled "Using Consumer Perceptions and a Contingency Approach to Improve Health Care Delivery," by Margaret L. Friedman and Gilbert A. Churchill, Jr. (Journal of Consumer Research, March 1987, pages 492-510). The discussion section describes in esoteric terms the method of data analysis as exemplified by the following (page 501): "A two-factor solution was obtained using both the scree test and eigenvalues greater than one criterion. A varimax rotation of the solution was performed...the convergent, discriminant, and nomological validities of the dependent measures were investigated." Five tables, three exhibits, and an appendix illustrate all the data analysis performed.

Many of the articles examined in the 1980's offer mathematical models and numerous impressive formulas. A case in point is "Intervention Analysis of a Field Experiment to Assess the Buildup Effect of Advertising," by Lakshman Krishnamurthi, Jack Narayan, and S. P. Raj (Journal of Marketing Research, November 1986, pages 337-345). First an ARIMA model, then a procedure called "double prewhitening" is applied, followed by another ARIMA model in which all the series (input and output) are presented simultaneously as a vector process. The entire article is devoted

to the model building process. It is highly quantitative with thirteen complicated formulas scattered throughout.

The resulting mathematical models of this and other similar research articles of the 1980's require a high degree of sophistication and skill in quantitative analysis. It is hard to visualize any practitioners actually using any of these models to make business decisions involving considerable financial risk. The authors are not much help in this respect. Rarely is it shown how the models can be realistically exploited, and if they are, what possible drawbacks can be expected. From a positivistic perspective these articles can probably be considered as contributing to the growth of marketing science. The relativists would prefer articles with more substance, or an "interpretive approach" to data analysis, as it is referred to.

Currently, articles using an interpretive, relativistic approach are rarely found in scholarly journals. To the extent that such study exist, they are most likely to have been published in the Journal of Consumer Research, as for example articles by Elizabeth Hirschman and Morris Holbrook. Discussion of their work appears in Chapter IX.

Table 7.11 shows the percentage of articles in a given period of years using one of the specific statistical techniques cited. Since any article can conceivably use more than one statistical method to analyze the data the percentages in a given column can add up to more than 100%.

TABLE 7.11

PERCENTAGE OF ARTICLES IN THE SAMPLE USING A SPECIFIC STATISTICAL
TECHNIQUE IN A GIVEN PERIOD OF YEARS
(1960-1988)

Statistic	1960 - 1964	1965 - 1968	1969 - 1972	1973 - 1976	1977 - 1980	1981 - 1984	1985 - 1988
Frequencies	85.7	30.8	23.5	42.3	25.0	20.5	7.1
Crosstabs	42.9	38.5	23.5	19.2	37.5	15.4	21.4
Z or T-test	0.0	7.7	35.3	15.4	28.1	35.9	39.3
ANOVA	0.0	0.0	5.9	19.2	34.4	25.6	35.7
Regression	0.0	38.5	23.5	15.4	21.9	38.5	21.4
Correlation	0.0	30.8	41.2	30.8	25	38.5	60.7
Chi-Square	57.1	23.1	29.4	30.8	34.4	25.6	17.9
Factor Analysis	0.0	0.0	5.9	7.7	21.9	20.5	25.0
LISREL	0.0	0.0	0.0	3.8	0.0	2.6	0.0
Path Analysis	0.0	0.0	0.0	3.8	0.0	2.6	0.0
Cluster Analysis	0.0	0.0	5.9	7.7	0.0	0.0	0.0
Other Multivar.	0.0	15.4	23.5	23.1	18.8	25.6	10.7

End of Chapter Conclusions

This chapter has presented evidence which indicates a pronounced trend towards more rigorous and increasingly sophisticated statistical analysis, and a greater volume of it at that. An examination of the data indicates that the mid to late 1970's appear to be a turning point toward the use of more thorough statistical analysis. When the data are split into two groups--before 1977 and 1977 and after, we observe highly significant values for all tests, an indication that there is a difference between these two groups. Table 7.12 shows the results of these tests.

TABLE 7.12

STATISTICAL TESTS OF SIGNIFICANCE ON THE NUMBER OF
STATISTICAL TECHNIQUES APPLIED TO A RESEARCH ARTICLE
FOR TWO GROUPS:

<u>Statistic</u>	<u>Value</u>	<u>Signif.</u>
Chi-Square	11.7561	.00061
Pearson's R	-.2694	.00026
Spearman's rho	-.2694	.00026
Kendall's Tau B	-.2694	.00138
Kruskal-Wallis	11.6835	.00060
T-Test	3.5400	.00100

A technical note may be in order at this point: Tau b was used instead of Tau c because the crosstabulation table was square in which case Tau b is more appropriate. Kendall's Tau is very similar to Spearman's rho in that the coefficients are calculated based on the amount of lack of agreement between two sets of ordinal rankings. Since the basic concepts underlying

these two statistical coefficients are similar, the resulting values are usually quite similar. In this case Tau b yielded the same results as both Spearman's rho and Pearson's r.

Not only has there been significant change since 1977 in the number of statistical methods applied but also for the type of methods used. All tests of significance show evidence of change between the two periods. When the data were then reanalyzed for specific statistical techniques, they showed a significant difference for four of these, namely: ANOVA, factor analysis, z and t-tests, and frequency distributions, as shown in Table 7.13.

TABLE 7.13

STATISTICAL TESTS OF SIGNIFICANCE ON FOUR DATA ANALYSIS TECHNIQUES FOR
DIFFERENCE BETWEEN TWO GROUPS:

Statistic	T-test	Chi-Square	Tau B*	Kruskal-Wallis
ANOVA	3.31 (.001)	10.37 (.001)	-.253 (.000)	10.308 (.001)
Factor Analysis	3.07 (.003)	8.99 (.003)	-.236 (.000)	9.405 (.002)
Z or T-Test	2.36 (.019)	5.47 (.019)	-.184 (.007)	5.591 (.019)
Frequency Distributions	-3.09 (.002)	9.13 (.002)	.237 (.002)	9.554 (.002)
Number of Statistical Methods Used	3.71 (.000)	12.83 (.000)	.281 (.000)	13.76 (.000)

(values in parenthesis are observed significance levels)

*Pearson's r and Spearman's rho yielded identical results in this analysis and are therefore not presented here.

While other methods have experienced ups and downs in usage throughout the years, these four techniques appear to have seen more significant changes in usage patterns when comparing the pre-1977 years with those after.

The results shown in Table 7.12 indicating a turning point in 1977 are quite interesting in light of the evidence of a similar turning point for the hypotheses presented in Chapter V. A final evaluation and discussion of the significance is presented in Chapter IX, where all the findings of this dissertation are summarized and discussed.

The results for hypotheses 11 and 12 are shown in Exhibit 7.11 below.

Exhibit 7.11

Summary Table of Results for Hypotheses 11 and 12

Hypothesis	Results	Comments
11	There is evidence of an increase in the number of statistical manipulations applied in a single research article	The logical empiricist should applaud these results. The relativist, however, does not put as much emphasis on the data, and therefore would not be impressed by these results.
12	There is evidence of a change in <u>type</u> of statistical methods applied over the years	Again, this change reflects a positivistic approach at work. But the increased attention to data analysis is not necessarily appreciated by the relativist.

CHAPTER VIII

RESULTS AND DISCUSSION 4: SHIFTS IN RESEARCH TOPICS

The preceding chapters have dealt primarily with the structure of empirical studies, and what changes have occurred since 1960 in terms of research design, data collection techniques, and data analysis. This chapter examines how the content area of research articles has changed since 1960. Have researchers shifted emphasis from one topic to another randomly, or have they moved from one issue to another in a methodological, predictable manner? Is interest in some topics recurring and cyclical in nature? Do specific events within the scientific community spurn more research on a given topic? Hypothesis 13 is formulated to explore the relationship of topics over time and shed some light on at least some of these questions.

Results for Hypothesis 13

Hypothesis 13: Research topics have changed over time, with some topics more fashionable than others in a given period.

As each of the articles used in this study was coded for analysis, the specific topic (and a secondary topic, if any) was identified. These were then grouped under a limited number of subheadings. For example, articles dealing variously with population density, age, income, or occupation, were all classified under the subheading "demographics." Subheadings with a

common theme were then combined and classified under one global heading. For example, demographics, psychographics, sociological analysis, physiological research, and information acquisition were all classified under the global heading of consumer behavior since all of these shape consumers' perspective in the market place. A complete list of all the topics (global, subheadings, and specific) may be found in Appendix C.

One final note. Most of what is published and thus receives exposure is selected by a journal's editor. There may be research interest among scholars in other areas as well, but because of editorial restrictions such studies, even if undertaken, may never get published. Editors' preferences and policies thus help to shape the patterns observed in published research topics over time. Any observed changes may thus reflect editorial decisions as much, or even more than the personal interests of marketing scholars. At the same time, however, the selection of an editor is also influenced by the respect they command from scholars and colleagues in their discipline.

Global Topics

As mentioned above the individual topics were first combined into subheadings, and then into four global areas. These are: 1. consumer behavior, 2. marketing strategy, 3. quantitative methods in marketing, and 4. specialty topics. Articles on consumer behavior are primarily concerned with the consumer's perspective, while those classified under marketing strategy relate to the seller's perspective and strategies for selling. Articles classified under quantitative methods in marketing deal primarily with research tools. Finally, specialty topics deal with subjects that don't quite fit into the first

three categories. They deal with very specialized interests, such as government and marketing, international marketing, or industrial marketing.

The results of the data analysis are shown in Table 8.1. Statistical tests of significance show a significant increase in consumer behavior topics when we use Kendall's Tau C, Pearson's R or Spearman's rho.

Kendall's Tau C, Pearson's R, and Spearman's rho did not yield any significant results for marketing strategy topics. The Kruskal-Wallis and one-way ANOVA tests, by contrast, did show significant changes in the relative number of articles in this area over the years. These changes, though moderate, still indicate some increase in articles covering topics in marketing strategy.

There appears to be some evidence of less interest in topics dealing with quantitative methods in marketing. Again the Kruskal-Wallis and ANOVA tests suggest statistically significant changes downward. The same is true for articles dealing with a variety of specialty topics. Kendall's Tau C, Pearson's R, and Spearman's rho all point to a significant decrease in the volume of such articles.

TABLE 8.1

STATISTICAL TESTS OF SIGNIFICANCE FOR GLOBAL TOPICS

<u>Statistic</u>	<u>Consumer Behavior</u>	<u>Marketing Strategy</u>	<u>Quantitative Methods</u>	<u>Specialty Topics</u>
Pearson's R	.13377 (.01327)	.00305 (.47991)	-.04976 (.82313)	-.09576 (.05654)
Spearman's rho	.12073 (.02273)	.02015 (.36969)	-.05783 (.95714)	-.08747 (.07399)
Kendall's Tau C	.13181 (.02276)	.02206 (.37616)	.05919 (.16349)	.08019 (.08628)
Kruskal-Wallis	8.9613 (.17580)	12.4060 (.05350)	11.8845 (.06460)	4.5338 (.60480)
Anova F	1.5102 (.17480)	2.1183 (.05150)	2.0252 (.06260)	.75150 (.60870)

(Significance in Parentheses)

Apparently, consumer behavior and marketing strategy are deemed more closely related to the field of marketing, whereas articles dealing with quantitative methods or specialty topics appear to be of less interest to the marketing research community, (or perhaps their editors). One possible explanation may be that more academic journals are being published that cater to the needs of specialized topics. These articles then properly find their way into those journals, such as The Journal of Business Ethics, The Journal of Industrial Economics, or Advances in International Marketing and the like, instead of the more basic journals scrutinized in these pages. An in-depth analysis of the reasons and significance of the above findings is reserved for the discussion section of this chapter.

Subheadings

All specific subheadings were analyzed to see which have shown significant changes over the years. Table 8.2 shows the results of only the subheadings with significant results.

TABLE 8.2

STATISTICAL TESTS OF SIGNIFICANCE FOR SUBHEADINGS

Global	Subheading	Statistic	Value	Signif.
Consumer Behavior	Information Acquisition:	Kendall's Tau C	.12498	.03758
		Pearson's r	.18577	.04842
		Spearman's rho	.15823	.07915
		Anova F	1.4509	.20700
		Kruskal Wallis	8.4208	.20890
Marketing Strategy:	Advertising:	Kendall's Tau C	.20049	.04705
		Pearson's r	.14512	.08618
		Spearman's rho	.18297	.04216
		Anova F	1.2708	.27970
		Kruskal Wallis	7.4881	.27810

(Table 8.2 Continued)

Global	Subheading	Statistic	Value	Signif.
	Channels of Distribution:			
		Kendall's Tau C	-.13230	.07684
		Pearson's r	-.16072	.07588
		Spearman's rho	-.15630	.08175
		Anova F	1.8080	.03430
		Kruskal Wallis	5.0955	.53160
Quantitative Methods:				
	Forecasting:			
		Kendall's Tau C	-.28231	.00156
		Pearson's r	-.28339	.00450
		Spearman's rho	-.29830	.00293
		Anova F	2.4294	.03330
		Kruskal Wallis	13.2113	.03980
Specialty Topics:				
	International Marketing:			
		Kendall's Tau C	-.22131	.00420
		Pearson's r	-.24904	.01248
		Spearman's rho	-.27014	.00736
		Anova F	1.9038	.02320
		Kruskal Wallis	38.2607	.05730

(Table 8.2 Continued)

Global	Subheading	Statistic	Value	Signif.
	Industrial			
	Marketing:			
		Kendall's Tau C	-.10311	.13456
		Pearson's r	-.21102	.03459
		Spearman's rho	-.16483	.07879
		Anova F	3.3672	.00580
		Kruskal Wallis	16.9323	.00950
	Retailing:			
		Kendall's Tau C	-.13741	.01935
		Pearson's r	-.18736	.05023
		Spearman's rho	-.19638	.04243
		Anova F	3.8658	.00000
		Kruskal Wallis	13.1862	.04020

The two topics that have shown significant increases over the years are information acquisition and advertising. Information acquisition includes topics such as information overload, information processing, negative information, source credibility, and word of mouth. At first, none of the sampled articles investigated information acquisition, not until 1974. (This is the year the Journal of Consumer Research had its inaugural issue. More about this in the discussion part of this chapter.) Since then, as the focus of marketing has turned toward the consumer, much interest has been generated on how these consumers search for and process information and this is reflected in the resulting research efforts in this direction.

The increased interest in advertising has led to articles investigating advertising effectiveness, methods of advertising research, and the effects of advertising.

Topics that show significant decreases since 1960 are those focusing on channels of distribution, forecasting, international marketing, industrial marketing, and retailing.

It must be pointed out that the three journals analyzed here by no means feature an identical selection of articles. Indeed, statistical tests indicated highly significant differences between the journals in terms of how their topics have changed over the years. Table 8.3 shows the results. All tests show evidence of difference between the three journals for global topics as well as for subheadings.

TABLE 8.3

STATISTICAL TESTS OF SIGNIFICANCE FOR DIFFERENCES

	BETWEEN THE JOURNALS	
<u>Statistic</u>	<u>Global</u>	<u>Subheadings</u>
Kendall's Tau C	-.33810 (.00000)	-.33132 (.00000)
Pearson's R	-.40736 (.00000)	-.37194 (.00000)
Spearman's rho	-.36923 (.00000)	-.36782 (.00000)
ANOVA F	27.1528 (.00000)	21.9289 (.00000)
Kruskal-Wallis	37.9464 (.00000)	39.0306 (.00000)

(significance in parenthesis)

Less pronounced change is found when each of the journals is analyzed individually. The selection of topics in the Journal of Marketing has not changed radically in the last 30 years. There is slightly more emphasis today on consumer behavior and less on quantitative methods in marketing than was the case years ago. The Journal of Marketing Research, on the other hand, has about the same number of articles in these two areas as in the 1960's, but a notable increase in articles dealing with marketing strategy, particularly in the areas of decision tools, marketing management, advertising, and product strategy. Emphasis on specialty topics such as international marketing and retailing has also diminished. Finally, in the Journal of Consumer Research the number of articles dealing with topics in consumer behavior and specialty topics has remained nearly constant. There has been, however, a slight shift toward more articles in marketing strategy at the expense of quantitative methodology.

Discussion of Results for Hypothesis 13

Basically, there appears to be no clearcut evidence across the board in support of hypothesis 13 with respect to the entire field of marketing. Some conclusions, however, may be drawn about a few individual topics and some observed trends over the last thirty years.

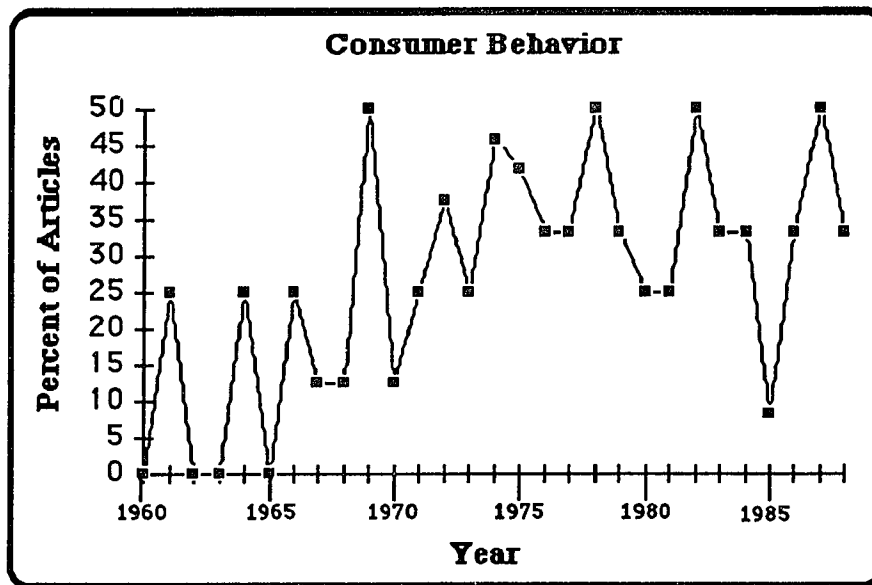
Exhibit 8.1 shows the proportion of topics in consumer behavior over the years. The trend is overall upward. But occasionally there also appear some downward fluctuations from year to year, suggesting that there is also a cyclical component in evidence. During the same period there appears to be a decrease in articles dealing with quantitative methods in marketing and

specialty topics. This suggests a concentration on topics specific to marketing and consumer behavior and away from those that straddle other fields. In a world that is becoming more and more specialized, with so much information to be dissected, perhaps this finding is not so unusual. Marketing, like the rest of the world, may be more introspective. Topics that may better be covered in other fields seem to be passed over in favor of topics that "specialize" in marketing or consumer behavior and especially so in information acquisition and advertising.

EXHIBIT 8.1

PERCENT OF ARTICLES WITH CONSUMER BEHAVIOR TOPICS

1960-1988



But mere statistics do not tell the whole story. For example, some consumer topics surfaced in the late 1980's that were nontraditional in nature, and probably would never have been published a decade or two earlier. The following may illustrate it. An article appearing in the Journal of Consumer Research in December 1986 (pages 374-381) was surprisingly unorthodox in both content and structure. The article, entitled "The Semiology of Cinematic Consumption: Symbolic Consumer Behavior in 'Out of Africa'," by Morris B. Holbrook and Mark W. Grayson, uses largely subjective methods to interpret symbolic consumer behavior in the film "Out of Africa." The authors' opinions are based primarily on quotations from scenes in the movie. They interpret various types of consumption behavior and its apparent meaning. Aside from the authors' subjective approach, the choice of a film as the focus for marketing analysis also departs sharply from the traditional.

Also based on the entertainment field is a study by Elizabeth C. Hirschman (Journal of Consumer Research, December 1988, pages 344-359) entitled, "The Ideology of Consumption: A Structural-Syntactical Analysis of 'Dallas' and 'Dynasty'." This article analyzes scenes from the then popular television shows to illustrate what the author sees as secular consumption as against sacred consumption. Data collection and analysis is more structured than it is in Holbrook's article, though still highly nontraditional. Twenty-four episodes were intensely studied on a scene-by-scene basis. The principal characters were categorized as either "secular consumers," "virtuous entrepreneurs," or "sacred consumers," and the path of actions for each consumer/character was traced to its outcome. For example, it was suggested that characters indulging in "secular products" (such as luxurious dwellings, chauffeured limousines, cocktail parties, fur

coats, and fine liqueurs) paid a spiritual price for these products. Such consumers were portrayed as lonely, unloved, envied, and distrusted.

The emergence of these articles on the pages of the Journal of Consumer Research leads us to ask: What research topics are appropriate for marketing in general, and for consumer research in particular? In 1987 the Association for Consumer Research polled its membership on that question. Respondents voiced two concerns about the topics covered in the Journal of Consumer Research. One criticism was that there should be more articles of managerial and "real world" relevance. Another demand was that "the Journal of Consumer Research become more truly interdisciplinary in its content and less reflective of what is perceived to be a marketing/psychology research paradigm" (Editorial, Journal of Consumer Research, September 1988, p. 138). Richard Lutz, editor of the Journal of Consumer Research, sums up the results of the survey as follows: "The interesting underlying current in these two concerns is the desire for more breadth and diversity in research approaches, while adopting a sharper focus on the study of consumer behavior per se." (ibid.)

Morris Holbrook (June 1987, pages 130-131) observes that so far there is little agreement about what is meant by "consumer research." He continues, "I therefore urge my fellow consumer researchers to regard our discipline as a field of inquiry that takes consumption as its central focus and that therefore examines all facets of the value potentially provided when some living organism acquires, uses, or disposes of any product that might achieve a goal, fulfill a need, or satisfy a want...consumer research encompasses almost all human activities, regarded from the viewpoint of consummation."

Jerome Kernan (June 1987, p. 133-134) agrees with Holbrook's observations, saying of Holbrook "...his bold efforts have inspired other researchers to explore previously uncharted areas of the consumer domain." So what is consumer research? In conclusion Kernan says, "...we might conclude that consumer research is as elusive as jazz: each can be described; each *must* be felt; but neither will concede its quintessence." A definitive, universally accepted definition remains as elusive as ever.

The View from the Editor's Desk

Dr. Roger A. Kerin, the current editor of the Journal of Marketing confirmed in a telephone interview with this writer (January 1990) that topics of interest to the academic community seem to come and go in cycles. He pointed to international marketing as an example. This topic sparked much research interest in the 1960's, then there was very little interest in the late 1970's and early 1980's. Now, according to Dr. Kerin, research in this area is popular again.

As for editorial influences on the content area of the published articles, Dr. Kerin insisted that the Journal of Marketing is not influenced by the choice of a topic, but rather by the "research design and scholarly nature of the work." However, based on the findings here, and the clusters of articles in any given year with similar topics, this writer finds it hard to believe that editorial policy has nothing to do with the decision which topics get exposure and which do not. At least on a subconscious level on the part of the editor, this is likely to be the case, or so it seems from an analysis of the evidence.

This writer also interviewed Dr. Richard Lutz, the current editor of the Journal of Consumer Research (by telephone, October 1990), and asked him what topics are most likely to find their way into the pages of the Journal of Consumer Research, and if he notices any recent trends in the type of topics accepted for publication. He replied that the final selection depends entirely on the pool of articles that are originally submitted for consideration. Of these, he finds an inordinate number which are either uninteresting or on subjects which had been exhaustively treated in the past. In general, he asserted, he is now seeing more "humanistic" articles than in the past, i.e. research on materialism and consumption with an eye on the consumer's well being.

This writer also interviewed the editor of the Journal of Marketing Research, Dr. Michael Houston, (telephone interview, October 1990). Asked to explain why there aren't any more Hirschman/Holbrook type articles being published, he replied that work of this caliber and style are seldom submitted to the Journal of Marketing Research. He has received only approximately four in the last two years. If such an article is rejected for publication, it is because of poor quality of execution rather than topic choice. Dr. Houston believes that he is widely, but incorrectly, viewed as opposed to that type of research, and strongly asserts that he has no such personal bias. His impression of research trends is that scholars are not becoming less positivistic, but that there is an emerging group who address postpositivistic/interpretive/qualitative issues.

The Stated Editorial Policy

The stated* editorial policy of the Journal of Marketing, with regard to which topics are published is quite broad. The journal focuses on five areas in particular.

1. "Solutions or guidelines for framing, integrating, or implementing marketing processes, both domestically and globally."
2. "Critical syntheses and reviews of relevant areas within marketing."
3. The "integration of marketing with its allied disciplines."
4. "New procedures or approaches to marketing problems."
5. "Innovative work on theory that brings to light new concepts, perspectives and methods, and questions current paradigms."

*From Cabell's Directory of Publishing Opportunities in Business and Economics, Cabell Publishing Co., Beaumont, Texas, 4th edition, pages 793-794.

These five areas of editorial focus thus do not seem to limit, at least officially, the marketing topics that may be considered for publication in the Journal of Marketing, as Dr. Kerin had stated in the telephone interview.

The other journals examined here also formally allow a wide variety of marketing topics. The Journal of Marketing Research (as does the Journal of Marketing) seeks to provide "the highest quality information about new and emerging developments in marketing thought and practice" (Cabell, page 810). This broad editorial policy statement would permit great latitude in the choice of topics to be considered for publication. Likewise, the Journal of Consumer Research would also accept a diversity of topics, as its editorial objectives state: "the Journal of Consumer Research is explicitly an interdisciplinary journal that is intended to foster research insights from a variety of disciplinary perspectives" (Cabell, page 636).

If the editors follow the stated editorial policies as guiding principles, then they should be concerned more with other factors than content area when making a decision whether to publish a specific article. If this is the case why then do we see trends away from certain topics towards other seemingly more "fashionable" ones? One explanation may be that perhaps it is the researchers who choose to jump on the bandwagon and explore the latest "hot" topics. Perhaps they believe that there is a better chance of the research being published if the topic is fashionable. Or maybe all the attention the topic is getting has sparked their own interest in exploring it. And thus, as Dr. Lutz has explained, the published articles are determined by the pool of submitted articles. If these are concentrated in a currently fashionable area, so will the resulting publication choices.

Generating Knowledge

Be that as it may these shifts in emphasis bring about analyses in depth of at least some marketing facets. This helps expand our pool of knowledge and generates fresh theories and concepts. And, as usual, benefits are achieved at a cost, in this case the neglect of other currently less popular areas. At this writing these include the efficacy of distribution channels and of industrial marketing and purchasing.

The other change over time that emerges as a result of the analyses in these pages is an apparent predominance of articles of rather broad impact and away from more esoteric fields. Here the cost to scholars may be negligible--as long as specialized journals exist and stand ready to step into the breach.

Most likely the number of such journals will continue to increase, reflecting a widespread phenomenon in most disciplines. As developments in many fields of science and technology expand to ever more advanced levels they dictate a concurrent high level of skill, scholarship and, often, specialization. Hence the need for specialized journals in numerous fields including marketing. This allows the long established, traditional, more conservative journals, such as those studied here, to concentrate on broader, more basic, more general topics, as long as they are closely related to marketing per se.

Whatever the reason, on the surface this seems to be a good way of building up the pool of knowledge for new concepts and theories on a particular topic. But this is done, invariably, at the expense of less research in other, not so appealing areas. As stated, channels of distribution or industrial marketing appear to be the current black sheep.

CHAPTER IX

SUMMARY AND CONCLUSIONS

The purpose of this dissertation, as stated in Chapter I, is to see what conclusions may be drawn about the research paradigms in marketing today, and what changes have occurred since 1960. Four areas of the research process are scrutinized: 1. the design of research, 2. data collection techniques, 3. data analysis, and 4. research topics. This dissertation explores the changes that have occurred in these four areas formally, by the 13 hypotheses presented in Chapter II. What follows below is an interpretation of the results.

Changes Found in the Design of Research

The first five hypotheses are postulated to determine if any changes have occurred since the 1960's in the design of research. The analysis shows measurable changes for all of the hypotheses. It was found that there are significantly more references per article, instances of pretesting, hypotheses posed, formal models presented, empirical studies published, co-authoring, formulas presented, and longer articles published.

A closer look at reference citations reveals a change not only in the number per article over the years, but also in the type of references. A shift in focus seems to have taken place away from some disciplines and toward others. Overall there is more attention paid to sources from marketing, psychology, and management, and less to statistics and general business. This apparently accompanies the observed shift in the topics of research

articles. As shown in Chapter VIII, there are fewer articles written on quantitative methods topics and general business subjects and more on marketing itself. It is then understandable that the references for these articles have shifted focus appropriately along with the content area.

Increases in the other areas mentioned above, such as more pretesting and more formulas presented, also point to a more scientific/positivistic research paradigm.

No Changes Found in Data Collection Techniques

The variables used to measure changes in data collection techniques speak more directly to the accuracy and integrity of the data which, sine qua non, affect the integrity of the entire research project. It is on this front that no changes have occurred to date. The data in a sample must be relevant to the problem investigated and representative of the population referred to and the size of the sample adequate. Without these prerequisites the data and any inferences drawn from them is suspect, even if the research design is otherwise flawless.

The results presented in Chapter VI show no significant changes in data collection techniques. There is the same proportion of nonprobability samples (particularly convenience samples) today as in the early 1960's. Sample sizes have remained stable, and there is no change in the proportion of students in the samples thus raising questions about the validity of the data.

How respondents' answers are elicited is another issue of concern. The respondents verbal reports are often flawed by faulty memory,

unwillingness to tell the truth, or simply misunderstanding the questions. Yet the results of this dissertation do not indicate a change in the way data have been obtained over the years. The most popular method continues to be the self administered questionnaire, leaving the door open for the problems enumerated above, and possibly resulting in questionable data. Using multiple methods to collect data may help insure more accurate information. But again no change was found in the proportion of studies using multiple methods.

Changes Found in the Application of Data Analysis Techniques

The results for hypothesis 11, show that more statistical manipulations are applied to analyze a set of data. With so many statistical packages available and the relative ease of running them on a computer (as opposed to doing the calculations manually) this is a simple matter. An additional statistical procedure can be applied in minutes by changing a few lines of code. But the ease with which the data can be manipulated makes it too simple for the uninitiated in statistics to apply any test of significance to any set of data whether justified or not. Even a poorly qualified research assistant can be assigned to enter the data and run the statistical analysis.

Similarly, the results for hypothesis 12 suggest changes in the use of specific techniques over the years. More complex multivariate techniques are used now besides the traditional, more elementary, statistical methods such as chi square analysis, ANOVA, or simple linear regression analysis. These results (for hypotheses 11 and 12) suggest the potential for a more

thorough approach to statistical analysis, provided the data are collected and coded properly and the statistical procedures are correctly applied.

Changes Found in Content Area of Research Articles

There has been some shift in the type of topics published. More articles are dealing with consumer behavior and marketing strategy topics and fewer with quantitative methods in marketing or specialty topics such as industrial marketing.

Apparently the major journals in marketing concentrate on topics relevant to marketing practice itself. Other topics dealing with quantitative methods or esoteric areas are then left to specialized journals concerned specifically with those topics. The marketing journals appear to have sharpened their focus and, in the process, become more specialized themselves.

By focusing on specific areas the established journals encourage more in-depth research on topics such as information acquisition. But in emphasizing more fashionable topics, whether consciously done or not, these journals neglect other less popular topics such as channels of distribution or industrial marketing.

The appearance of some topics in the literature seems to be cyclical in nature. This allows for the reexamination of previous theories and the opportunity to build on past knowledge. But then there are topics that are treated once, never to reappear. Interest in these "orphan" topics should be encouraged by journal editors and fellow research scientists. The neglect can be due to the difficulty of obtaining data or simply the lack of interest by

the research community. As a result the research conducted back in the 1960's and early 1970's may be the most current available for some of the less popular topics.

Exhibit 9.1 summarizes the results discussed here and in Chapters V-VIII. The exhibit shows changes in the design of research and the application of data analysis techniques, manifested in a quantitative way. Changes in data collection techniques were not in evidence.

There are also changes in the types of topics researched over the years. The reasons for the shift in focus are open to speculation. However, if topics are chosen merely because it is easier to obtain data in that area, or because the author anticipates that a fashionable topic will be more likely to be published and more quickly so, then the contribution such an article would make to the advancement of knowledge about marketing is doubtful.

EXHIBIT 9.1

SUMMARY TABLE OF RESULTS FOUND

Design of Research	Data Collection Techniques	Data Analysis	Research Topics
- more references (more from psychology, management, and marketing; less from statistics and general business) - more pretesting - more hypotheses posed - more formal models (no difference in type of models) - more empirical studies - more coauthoring - article length increases - more formulas presented	- no shift to probability samples - no shift to larger samples (most sizes n=30-199) - no change in proportion of students and housewives used (20% students, 10% housewives) - no change in way data are obtained (primarily self-administered questionnaire) - no change in format of questions (primarily rating scales, but increased use of reliability measures found) - no change in proportion of multiple methods used to collect data	- more statistical manipulations applied (since 1977 3 or more techniques were used in over 50% of the articles sampled) - use of statistical techniques follows a pattern (have moved from descriptive to traditional to more advanced multivariate techniques)	- more consumer behavior topics (more on information acquisition) - more marketing strategy topics (more on advertising, less on channels of distribution) - less quantitative methods topics (less on forecasting) - less specialty topics (less on international marketing, industrial marketing, and retailing) - appearance of some topics are cyclical (perhaps neglecting less popular but equally important areas?) - topics appear to be more specialized to marketing itself

1977 Found to be a Turning Point

As the variables were analyzed one time period kept emerging as a turning point for changes in many of the variables measured in this study. That was approximately in 1980.

Even though for several variables a moderate uptrend has been measured for the entire length of time since 1960, it is much more pronounced when comparing just two time periods with each other, namely all the years before 1977-1980 against the more recent years since.

This measurable change has been accentuated by the wide availability, capacity, and capabilities of computers in the 1980's. Unfortunately, data collection is essentially the same as it was in the early 1960's.

Conclusions on Paradigm Shifts in Marketing Research

As stated, this dissertation investigates what direction research paradigms in the field of marketing have taken. Have we shifted towards a more positivistic (logical empiricist) approach to research or to an idealistic (relativistic) one?

In defense of the positivistic approach, called logical empiricism, are such scholars as May Brodbeck and Shelby Hunt. The origins of this research tradition trace back to the German Historical School, and to social theorists such as Auguste Comte (1830-1842, *Cours de Philosophie Positive*, Paris: Herman) and Emile Durkheim (1895, *Les Regles de la*

Methode Sociologique, Paris: Felix Alcan). They argue that scientific reality has to be measured through the senses, otherwise it does not exist.

As scientific methods matured many scholars began to question the appropriateness of these techniques when applied to the study of human beings. One such critic is Max Weber (1922, *The Methodology of the Social Sciences*, Glencoe, Ill: Free Press) who advocates a method which seeks to understand the individual from his or her own subjective perspective. Contemporary consumer behavior researchers devoted to this type of paradigm include Paul F. Anderson, J. Paul Peter, Jerry C. Olson, Morris Holbrook, and Elizabeth Hirschman.

Positivists vs. Idealists

The positivist research paradigm uses primarily quantitative, objective methods to gather information. Only the facts are recorded, reliability and replicability are critical. This approach is outcome oriented, with the results being most important. In contrast, the idealist research paradigm uses qualitative methods for observing and understanding the data. The perspective is subjective, process oriented, with the act of observing the subject a vital part of the endeavor.

Countless articles have been written over the years debating the two research paradigms. But the two approaches are not irreconcilably opposed to each other. Most researchers following the positivistic approach do not ignore all other facets of their research except cold hard facts. Nor would researchers following a relativistic approach equate the diagnosis of medicine with one by palmistry. Neither paradigm is superior to the other in all situations. Both approaches appear to have something useful to offer.

Paradigm Shifts in the Design of Research Towards Positivism

If we evaluate the trend in research design during the last 30 years through the eyes of the logical empiricist there have been significant and worthwhile changes. The results found in this dissertation indicate a trend toward a positivistic research paradigm and represent a positive change in the design of research from the logical empiricists' perspective.

From the idealist or relativist perspective these changes over the years are inconsequential. The underlying thrust of the relativistic paradigm is to lead to what Reichardt and Cook (1979, p. 9-10) describe as a "phenomenological, inductive, holistic, subjective, process-oriented, and social anthropological world view." None of the changes noted in the research design accomplish this. Since science is subjective, and (see Peter and Olson 1983) relative to a particular context and period of time, then more references to other studies do not contribute much in this type of paradigm. In fact, Anderson (1986) points out "...critical relativism is skeptical of all claims to scientific knowledge because it recognizes that there are multiple scientific objectives and alternative methods for attaining these objectives." Since the relativist rejects the premise of "a single knowable reality" then the intensified quantification contributes little to the idealists' paradigm.

Both sides have valid points. For example, the logical empiricist is concerned that the scientific method be applied properly to advance scientific knowledge. Unfortunately many research articles published in academic journals today do more for the advancement of the authors' careers, instead. Many such articles are laden with esoteric formulas and models that only the authors and perhaps the journal's reviewers have actually read.

The Shape of a Typical Research Article

One of the articles used in the sample for this dissertation is published in the Journal of Marketing Research under the title "Estimating Brand Positioning Maps Using Supermarket Scanning Data" (Steven M. Shugan, JMR vol. 24, February 1987, pages 1-18) This article is representative of how research articles of late have been adhering to the rigorous demands of the logical empiricists. Eighteen pages long, with 43 references, this article features 45 separate equations plus an appendix with "Derivations of Equations." The author develops what he calls Shugan's DEFENDER model to study the effects a brand's price and position have on its sales by using supermarket scanning devices to obtain the data. He presents a simulated data illustration for estimating brand positioning maps.

To the positivist more of this type of research is needed to understand and further knowledge of brand differentiation. Hard verifiable and replicable data analyzed in a scientific way with objective mathematical equations are needed to advance science in this area. The relativist looks at this type of article as just number crunching for the purpose of publication, and wonders what retailer will ever read and understand, much less use the knowledge generated by this research. To the relativist's perspective it would be more meaningful to understand brand differentiation from the consumer's perspective, through conducting focus groups, or by interviewing individual consumers in depth rather than scanning data into a machine to look for patterns.

Judging by the results of this dissertation, currently the logical empiricists paradigm is firmly rooted in academic journals. One must adhere to today's commonly accepted scientific standards to be taken seriously. But this writer has become convinced that, unfortunately, a large percentage of

articles is rarely referred to again. After reading hundreds of such articles one gets the feeling that "scientific method" boils down to inventing your own model of some "construct," testing this model empirically, and then publishing the results.

No Paradigm Shifts Observed in Data Collection Techniques

The only area that shows no change since 1960 is in data collection techniques. A large proportion of the research published in academic journals still consists of convenience samples with interviews of students who generally may not be representative of the general population.

This study finds no change in the way data are collected either. The research articles published today still use primarily self administered questionnaires and only a single method to collect the data. The format of the questions posed has also not changed, with rating scales the most commonly used.

It should be noted that alternative techniques of collecting data have not caught on in the academic research journals. Despite the richness of data collected in open ended questioning or in focus groups such data seldom appear in the academic journals in the field of marketing.

Perhaps it is the nature of the data such as emerge from focus groups that does not lend itself to publication in the academic journals. One can hardly disagree that focus groups are best used early on, in the exploratory stage of the research process. But it is the subsequent statistical analyses used to test hypotheses which the academic journals seem to want. Anecdotal and descriptive findings do not make for "scholarly research." Though they can provide the creative underpinnings for a research project,

they do not provide the hard scientific data and the final results which journals seek. So while the results of focus groups and depth interviews provide rich and useful information to marketing practitioners and academicians alike, they are kept private by the sponsor who financed the study, or the researcher.

It may be legitimately asked why the results of focus groups are often considered only exploratory. Reynolds and Johnson (1978) conducted an item-by-item analysis comparing the results gathered in a focus group with those obtained through traditional quantitative research. The results from the two studies were in accord on every item except one. In the one instance (banking) where they were not in agreement sales data collected at a later date showed the qualitative research was more accurate than the quantitative. But despite evidence such as this and the instincts of professionals that qualitative data can contribute a wealth of information, quantitative methods continue to be favored.

Besides focus groups, individual questionnaires can be constructed so as to measure responses in a qualitative manner. While they are difficult and more time consuming to code and tabulate, their open ended questions seem to invite more spontaneous answers and may thus be more appropriate for gathering data in marketing--especially in consumer behavior research. The open ended question allows the respondent the freedom to express attitudes without having to conform and limit the answer to predetermined categories. Along with the attitudes the respondent's reasoning may also be explored. The expressed rationale for a particular attitude may be as enlightening as the attitude itself. Open ended questions thus provide an outlet for a multitude of useful responses that do not fit into the rigidity of a precoded questionnaire. Additionally, off beat and

unanticipated responses may prompt the researcher to explore issues he otherwise would not have considered.

It must be concluded that, basically, there has been no measurable change in the way data are collected. The only change noteworthy is the increased use of reliability measures. The apparent reasons for the seeming lack of attention to data collection techniques are two fold. First is the obvious problem of limited resources. Assuring that data are accurate by duplicating the questioning process as has been advocated is costly and time consuming. The simplest route to data collection continues to be with a paper and pencil questionnaire, especially if it is administered to captive students. Asking open ended questions of respondents who are representative of the population and are relevant to the problem being studied (for example the development of microwavable dinners for single working mothers) is costly. Authors who are eager to publish articles in academic journals are typically under pressure to do so. With careers on the line these researchers need to get their research completed and submitted for publication as quickly as possible. With resources in limited supply the academic researcher is often forced to take less than ideal shortcuts.

Blame also lies with the editors of the academic journals themselves and the standards they have set for an acceptable research article. They are hardly detached from the academic pressures of publishing, themselves being academicians. Still, if as much attention were paid to the way data are collected as to the design of the research and the data analysis, then the findings of this study would likely be quite different.

Paradigm Shifts in Data Analysis Techniques

In light of the above discussion the results in the data analysis techniques section were predictable. There has been a shift toward applying more statistical manipulations of data, as well as more complex multivariate techniques as against the traditional linear regressions or analysis of variance. The prevailing attitude is one of "data über alles" (Anderson 1988, p. 406) and that ample data hold the key to scientific knowledge.

From the positivistic viewpoint research methods have improved considerably since the early 1960's when most empirical studies used a simple method to present and analyze the data, typically by frequency distributions and crosstabulations. We have moved away from merely descriptive statistics, first to traditional research methods such as t tests, ANOVA and regression, then on to complex multivariate techniques.

It is the feeling of this writer that interest in specific statistical techniques has moved in and out of fashion. But because of the small number of cases observed which choose one advanced multivariate technique over another, for example LISREL or logit analysis, it was not possible to confirm such a trend empirically in this dissertation. Future study on trends and fashions in the use of statistical techniques might be rewarding. A survey of academic researchers may indicate a preference at a given time for one method over another perhaps reflecting a perception that this technique is currently in vogue and that an article using it is more likely to get published, rather than one with an alternative technique that suits the data best but is presently out of favor.

It should be noted at this point that there were two extremely nontraditional approaches to data analysis in the sample as described

below. Two researchers broke with tradition and published empirical studies with innovative qualitative approaches. These mavericks were Elizabeth C. Hirschman and Morris B. Holbrook, researchers who have a tradition of breaking tradition. Well respected, these researchers presumably would have no trouble getting their work published despite their novel approach to analyzing data. They are just the people needed to pave the way for others to break away from the traditional quantitative approaches and into new frontiers.

Professor Holbrook's article, published with graduate student Mark W. Grayson (December 1986) is entitled "The Semiology of Cinematic Consumption: Symbolic Consumer Behavior in *Out of Africa*." Here the authors use an interpretive approach to examine consumption symbolism in a movie as an illustration of how artwork can be used to understand consumer behavior.

The other novel approach to data analysis is Hirschman's (December 1988) article entitled "The Ideology of Consumption: A Structural-Syntactical Analysis of 'Dallas' and 'Dynasty'." Here two television programs are examined to "describe the ideology of consumption encoded within" (p. 357) these two shows. The methodology section describes use of the interpretive approach to decode the consumption ideology. Notes were taken on a scene-by-scene basis where the actors' actions and the settings were recorded and an in-depth qualitative analysis of the episodes ensued without the use of any traditional positivistic methods of data analysis.

Articles such as these two that appeared in the sample are rare, but they exist. Studies similar to Hirschman's would be unheard of in the 1960's and probably would not have been published then. The trend today is still towards a heavier quantitative and positivistic approach to data analysis.

But we see some ground breaking, as shown by the two described here. Articles such as these are negligible in number, but their very existence is evidence of at least a tentative acceptance of such work, possibly on an experimental basis.

Shifts in Research Topics

Consumer research is a discipline that can embrace a diversity of interests. It has grown out of other disciplines, and borrowed from many fields, but its main concern is with the acquisition, usage and disposition of products. These "products" may be (Holbrook and Hirschman 1982) tangible or intangible goods, services, even places, people, ideas and events.

This dissertation identifies trends away from heavily quantitative research topics (such as forecasting methods) and specialty areas such as industrial or international marketing. This may be because other business journals have appeared to act as a forum for just these types of investigations.

In the 1980's a new genre of topics has started appearing in the marketing journals, particularly in the Journal of Consumer Research. These articles deal with the emotions, moods, fantasies, symbolism, and ritualisms of consumer behavior. Topics such as these are difficult to quantify, and have therefore utilized qualitative means for measurement and analysis. These types of articles did not appear in any great number in the sample. But the fact that they have appeared shows an opening up or acceptance of these nontraditional topics in consumer behavior.

Holbrook (June 1987, p. 130), in attempting to answer what topics are appropriate in consumer behavior research, asserts that consumer researchers should "...examine all facets of the value potentially provided when some living organism acquires, uses, or disposes of any product that might achieve a goal, fulfill a need, or satisfy a want." That statement basically covers all human, animal, and vegetative activities. Is it then to be commonly accepted that consumer behavior research can cover any topic?

While debate about the definition of consumer behavior will surely continue, Holbrook has opened for researchers an avenue for nontraditional topics. Kernan (June 1987, p. 133) declares about Holbrook "...his bold efforts have inspired other researchers to explore previously uncharted areas of the consumer domain."

Because of researchers such as Holbrook the field of marketing in general, and consumer behavior in particular, appears to be changing. While it still embraces the positivistic approach to research we are starting to see some nontraditional topics and alternative approaches to research. Perhaps this is the dawn of a new post positivistic era.

Implications for the Future

Recently, there has been much abstract discussion, mostly in favor of the potentially rich information yielding qualitative/interpretive/relativistic approach to research. A series of articles discussing the philosophy of research paradigms, and encouraging a diversity of methods appears in the marketing literature. However, the fact is that the majority of articles today is still positivistic in nature. Jerry Olson's (1981 in Anderson 1986) claim that

"rumors of positivism's death were not greatly exaggerated" appears premature. So while the philosophical discussions about research in the academic journals, at the ACR meetings and AMA conferences persist, the actual research continues to be constructed predominantly in a logical empiricist manner--and to be published that way. What is needed, perhaps, is less philosophical discussion and more diversity in applications.

More Resource Allocation Required

It is up to the academic and business community to allocate more resources to insure samples with more accurate responses. The energy and money spent on sophisticated computer equipment and up to date statistical software for common use is a necessary cost of supporting research in general and is justified. But often neglected are adequate resources for the individual researcher's project. In their absence the pressure on the academician to publish quickly and often is a contributing factor to the use of samples of questionable quality. The time and money saved by the use of computers for speedy computations in the research process could perhaps best be invested in the data collection stage.

More Study of Neglected Topics

Another area of concern for the future of research in marketing is the choice of topics. Marketing seems to be moving into a more specialized, limited direction but to neglect some of the currently less fashionable topics in the field. These may conceivably deserve as much (or more) attention as others. In some areas the only knowledge in existence is 10-15 years old

and obsolete. Studies in neglected areas should be encouraged, either by occasional preferential publication for such research articles (without compromising basic editorial policy on standards), or by periodically devoting specific or special journal issues to them.

Suggested Areas for Further Research

Aside from replication and extension of this study to see if the past trends found here are valid and continuing, there are other areas that should be addressed.

First, this study has been limited to marketing research. Trends in other fields in business, and in other disciplines should be studied, as well. Then a similar study on research published in trade and government publications, and other non-academic research as well as unpublished research such as doctoral dissertations should be conducted. These would determine if there are similar shifts in other areas of research, or if the findings here only apply to academic research articles, and then only to those in marketing.

Second, this study has only examined the academic literature since 1960. A natural extension of this study would go back to the turn of the century and chart the progress we have made since then, and not just in the field of marketing or business related subjects, but for research trends in general. By stepping even further back to see how far we have come this century in all types of research endeavors we would probably get a better sense of what we are heading towards now and into the 21st century.

APPENDIX A

DATA ACQUISITION FORM

1. Journal: 1 - JM 2 - JMR 3- JCR
2. Article Code: _____
3. Year: _____
4. Number of Authors: _____
5. Is this article a Review or Comment of a previous article?
 1 - negative comment, different author 4 - follow up, different author
 2 - positive comment, different author 5 - follow up, same author
 3 - mixed comment, different author 6 - not review, comment,
 or follow-up
6. This study may be classified as a
 1 - Theoretical Presentation, no empirical research
 2 - Empirical Study
 3 - State-of-the-Art review
 4 - commentary/essay
 9 - other
7. Length in Pages: (not including references) _____
8. Number of formally stated hypothesis: _____
9. Number of mathematical expressions/formulas presented: _____
10. Tables of Results from Data Analysis: _____ -9 NA
11. Other Tables, Figures, Charts or Graphs: _____ -9 NA
12. Is there a proposed formal model?
 1 - yes, mathematical 3 - yes, both mathematical and graphical
 2 - yes, graphical 4 - no
13. Sampling method used:
 1 - probability 2 - non prob 8 - no inf 9 -NA
14. Type of sampling method (more specific):
 01 - simple random sample 08 - focus group
 02 - systematic sampling 09 - census
 03 - stratified random sample 10 - random digit dialing
 04 - cluster sample 97 - other
 05 - quota sample 98 - no info. given
 06 - convenience sample 99 - not applicable
 07 - judgement sample

- 15. **Type of respondent selected:**
 01 - student 09.- professionals
 02 - housewife/homemaker 10.- empirical studies
 03 - students & housewives 11.- workers at job site
 04 - head of household (male) 12.- homeowners
 05 - head of household (female) 97.- other
 06 - head of household (unspec.) 98.- unspecified
 07.- shoppers 99.- not applicable
 08.- general population
- 16. **Sample size:** _____ -9 - NA
- 17. **Any stated attempt to contact non-respondents?**
 1 - yes 2 - no 9 - NA
- 18. **How many non-respondents (% of total)?**
 98 - none mentioned 99 - NA:
- 19. **Was a pretest administered?(if not specified code as no)**
 1 - yes 2 - no 9 - NA
- 20. **Data collection techniques (Primary):**
 01 - self administered mail questionnaire 08 - focus group
 02 - self administered hand delivered questionnaire 09 - case study
 03 - interviewer administered questionnaire in person 97 - other
 04 - interviewer administered questionnaire by phone 98 - not specified
 05 - questionnaire: not specified how administered 99 - not applicable
 06 - personal interview with no formal questionnaire
 07 - phone interview with no formal questionnaire
- 21. **Were multiple methods used to collect the data (no if none specified)?**
 1 - yes 2 - no 9 - NA
- 22. **Type of questions asked (Primarily):**
 01 - dichotomous 05 - actual observation
 02 - multiple choice 97 - other
 03 - open-ended 98 - not-specified
 04 - rating scale 99 - not applicable
- 23. **Number of questions asked:_____** -9 - na -8 - not spec. -7 - >999
- 24. **Number of items asked to rate: _____** -9 - na -8 - not spec. -7 - >999
- 25. **Number of attributes asked to rate: _____** --9 - na -8 - not spec. -7 - >999
- 26. **Type of rating scale used:**
 01 - Likert scale 97 - other
 02 - Likert-type scale 98 - not specified
 03 - Semantic Differential scale 99 - not-applicable
 04 - Rank-Order scale
 05 - Lampert Pollimeter
 06 - Personality scale

- _ _ **27. Number of points on scale:** _____ (-9 - na : -8 not specified)
- _ **28. Reliability measure for the scale?** 1 - yes 2 - no 9 - NA
- _ _ _ **29. Value of coefficient alpha, if given** _____ -8 - not given -9 - NA
- _ _ **30. Experimental Design: Treatment / subsequent measurement**
 01 - After-only without control group 04 - Cross-Sectional Design
 02 - Before-After without control group 97 - other
 03 - Before-After with Control Group 98 - not spec. 99 - NA
- _ _ **31. Experimental Design: Controlled Design**
 01 - blind study -8.- not specified
 02 - double blind study -9 - not applicable
 03 - subjects fully informed
- _ _ **32.**
- _ _ **33.**
- _ _ **34. Type of statistical technique used (primary, secondary, additional):**
 01 - multiple regression 07 - LISREL
 02 - correlation analysis 08 - path analysis
 03 - ANOVA / MANOVA 09 - time-series analysis
 04 - factor analysis 10 - Bayesian analysis
 05 - chi-square / goodness of fit 11 - residuals analysis
 06 - z/t-test 97 - other
 07 - cross tabs 98 - not specified
 08 - frequency distrib. 99 - not applicable
 09 - other multivariate
- _ _ _ _ **35. Subject Category (Primary)** _____
- _ _ _ _ **36. Subject Category (Secondary):** 9999 if none _____

37. Number of references: _____

38. Journals used as references?

A. Advertising Journals:

- _____ 1. Journal of Advertising
- _____ 2. Advertising Age
- _____ 3. Journal of Advg Research
- _____ 4. Other
- _____ 5. Proceedings

B. Economics:

- | | |
|-----------------------------|--------------------------------------|
| _____ 1. Econometrica | _____ 8. J. of Economic Literature |
| _____ 2. Ame Eco Review | _____ 9. Quarterly J. of Economics |
| _____ 3. Am.J.of Agr Eco. | _____ 10. J. of Industrial Economics |
| _____ 4. Journal of Finance | _____ 11. J. of Financial Economics |
| _____ 5. J. of Eco Theory | _____ 12. J. of Law and Economics |
| _____ 6. J. of Poltcl Eco | _____ 13. Economic Journal |
| _____ 7. Eco Geography | _____ 14. Other |
| | _____ 15. Proceedings |

C. Gen Bus Journals:

- _____ 1. Harvard Business Review
- _____ 2. J. of International Bus Studies
- _____ 3. Journal of Business
- _____ 4. Columbia J. of World Bus.
- _____ 5. Other
- _____ 6. Proceedings

D. Business Periodicals:

- _____ 1. Business Week
- _____ 2. Fortune
- _____ 3. Forbes
- _____ 4. Wall Street J.
- _____ 5. Other

E. Marketing Journals:

- _____ 1. J. of Mktg
- _____ 2. J. of Mktg Rsrch
- _____ 3. J. of Cnsmr Research
- _____ 4. J. of Retailing
- _____ 5. Advncs in CnsRsr
- _____ 6. Other
- _____ 7. Proceedings

F. Management Journals:

- _____ 1. Management Sci.
- _____ 2. Admin. Sci. Qu.
- _____ 3. Mgt. Intrntl Rev.
- _____ 4. Acadmy of Mgt. J
- _____ 5. Other
- _____ 6. Proceedings

G. Psych Journals:

- _____ 1. J. of Applied Psychology
- _____ 2. J. of Abnormal and Social Psyc.
- _____ 3. J. of Personality and Social Psyc.
- _____ 4. J. of Mathematical Psychology
- _____ 5. J. of Experimental Social Psychology
- _____ 6. American Psychologist
- _____ 7. Psychological Bulletin
- _____ 8. Psychological Review
- _____ 9. Psychometrika
- _____ 10. Behavioral Science
- _____ 11. J. of Soc. Psych.
- _____ 12. Other
- _____ 13. Proceedings

H. Sociology Journals:

- _____ 1. Rural Sociology
- _____ 2. Amer. J. of Socio
- _____ 3. Amer. Socio Rev
- _____ 4. Social Science Res
- _____ 5. Sociometry
- _____ 6. J. of Social Issues
- _____ 7. J. of Mar & Fam
- _____ 8. Human Relations
- _____ 9. Other
- _____ 10. Proceedings

I. Statistical Journals:

- _____ 1. Journal of Amer. Stat. Assoc.
- _____ 2. Public Opinion Quarterly
- _____ 3. Biometrika
- _____ 4. Other
- _____ 5. Proceedings

J. Unpublished Papers: _____

K. Other Proceedings: _____

L. Books: _____

M. Other Journals: Write names below:

N. Other: (Monographs, briefs, etc.): _____

APPENDIX B

LIST OF SAMPLE ARTICLES IN CHRONOLOGICAL ORDER BY JOURNAL

Journal of Marketing:

Hirsch, Werner Z., "Decision Making in Industrial Marketing," *Journal of Marketing*, vol. 24, Jan. 1960, 21-27.

Wedding, Nugent, "Advertising, Mass Communication, and Tax Deduction," *Journal of Marketing*, vol. 24, April 1960, 17-22.

Wasson, Chester R., "What is 'New' About a New Product?" *Journal of Marketing*, vol. 25, July 1960, 52-56.

Politz, Alfred, "The Dilemma of Creative Advertising," *Journal of Marketing*, vol. 25, Oct. 1960, 1-6.

Talley, Walter J. Jr., "How to Design Sales Territories," *Journal of Marketing*, vol. 25, Jan. 1961, 7-13.

Weidenbaum, Murray L., "The Military Research-and-Development Market," *Journal of Marketing*, vol. 25, April 1961, 38-41.

Goldman, Marshall I., "The Marketing Structure in the Soviet Union," *Journal of Marketing*, vol. 25, July 1961, 7-14.

Spector, Aaron J., "Basic Dimensions of the Corporate Image," *Journal of Marketing*, vol. 25, Oct. 1961, 47-51.

Orenstein, Frank E., "Are Automobile Dealers Good Judges of Media Allocations?" *Journal of Marketing*, vol. 26, Jan. 1962, 76-78.

Goldstucker, Jac L., "A Study of Wholesale Trading Areas," *Journal of Marketing*, vol. 26, April 1962, 22-25.

Warshaw, Martin R., "Pricing to Gain Wholesalers' Selling Support," *Journal of Marketing*, vol. 26, July 1962, 50-54.

Heskett, J. L., "Ferment in Marketing's Oldest Area," *Journal of Marketing*, vol. 26, Oct. 1962, 40-45.

Davidson, William R., and Alton F. Doody, "The Future of Discounting," *Journal of Marketing*, vol. 27, Jan. 1963, 36-39.

Christian, Richard C., "Innovate for Success," *Journal of Marketing*, vol. 27, April 1963, 78-79.

Christian, Richard C., "It May Pay to Think Small," *Journal of Marketing*, vol. 27, July 1963, 80-81.

Tahir, Abe M. Jr., "Marketing Government Surplus Property," *Journal of Marketing*, vol. 27, Oct. 1963, 27-30.

Massy, William F. and Jim D. Savvas, "Logical Flow Models for Marketing Analysis," *Journal of Marketing*, vol. 28, Jan. 1964, 30-37.

Pessemier, Edgar A., "Forecasting Brand Performance Through Simulation Experiments," *Journal of Marketing*, vol. 28, April 1964, 41-46.

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APPENDIX C

SUBJECT CATEGORIES

1 - Consumer Behavior:

1 - Demographics

- 01 - Age
- 02 - Income
- 03 - Market Segmentation (in General)
- 04 - Occupation
- 05 - Population Density
- 06 - Geographical Region
- 07 - Social Class
- 99 - Other

2-Psychographics: Activities, Interests, and Opinions

- 01 - Attitude Formation and Change
- 02 - Brand Loyalty
- 03 - Cognitive Dissonance
- 04 - Consumer Attitudes
- 05 - Consumer Satisfaction/Dissatisfaction
- 06 - Impulse Buying
- 07 - Life Style
- 08 - Multiattribute Attitude Models
- 09 - Opinion Leaders
- 10 - Perceived Risk
- 11 - Personality/ Consumer Characteristics
- 12 - Self Designated Opinion Leaders
- 13 - Self-Perception
- 14 - Semantic Differential Scale
- 15 - Symbolic Consumer Behavior
- 99 - Other

3 - Sociological Analysis

- 01 - Culture/Subculture/Cross-Culture
- 02 - Family Decision Making
- 03 - Family Life Cycle
- 04 - Group and Interpersonal Influence
- 05 - Need Hierarchy
- 06 - Reference Groups
- 07 - Role Theory
- 08 - Self-Actualization
- 09 - Social Class
- 10 - Social Influence
- 11 - Social Responsibility
- 12 - The Family
- 99 - Other

4 - Physiological Research

- 01 - Hierarchy of Human Needs
- 02 - Physiological Responses to Stimuli
- 03 - Self Actualization
- 99 - Other

5 - Information Acquisition

- 01 - Information Overload
- 02 - Information Processing
- 03 - Negative Information
- 04 - Source Credibility
- 05 - Word of Mouth
- 99 - Other

2 - Marketing Strategy:**1 - Decision Tools for Marketing Strategy**

- 01 - Bayesian Decision Making
- 02 - Profit Maximization
- 03 - Programming Models
- 99 - Other

2 - Advertising and Sales Promotion

- 01 - Advertising Effectiveness
- 02 - Advertising Research
- 03 - Comparative Advertising
- 04 - Deceptive Advertising
- 05 - Effects of Advertising
- 06 - Media
- 07 - Selling a New Product
- 99 - Other

3 - Product Strategy

- 01 - Acquisition Patterns
- 02 - Adopter Categories
- 03 - Change Agents
- 04 - Communication Networks
- 05 - Decision Making Process
- 06 - New Products
- 99 - Other

4 - Pricing and Price Strategies

- 01 - Competitive Pricing
- 02 - Monopolies
- 03 - Price Research
- 99 - Other

5 - Distribution and Channels of Distribution

- 01 - Direct vs. Indirect Marketing
- 02 - Logistics Management
- 03 - Multiple Channels
- 04 - Rack Jobbers
- 05 - Storage and Transportation
- 99 - Other

6 - Sales Management and Selling

- 01 - Sales Performance
- 02 - Sales Techniques and Evaluation
- 03 - Sales Territory
- 04 - Salesmanship Courses
- 99 - Other

3 - Quantitative Analysis:**1 - Marketing Research Techniques**

- 01 - Bayesian Statistics
- 02 - Causal Modeling
- 03 - Computer Applications
- 04 - Conjoint Analysis
- 05 - Experimental Design
- 06 - Interviewing Techniques
- 07 - Management Science
- 08 - Market Research
- 09 - Markov Chains
- 10 - Multidimensional Scaling
- 11 - Multivariate Statistics
- 12 - Operations Research
- 13 - Quality Control
- 14 - Questionnaire Construction
- 15 - Regression Analysis
- 16 - Reliability
- 17 - Response Factors
- 18 - Sampling and Data Collection Techniques
- 19 - Scaling Techniques
- 20 - Simulation
- 21 - Validity
- 99 - Other

2 - Forecasting and Economic Analysis

- 01 - Market Success
- 02 - Production Scheduling
- 03 - Sales Forecasting
- 99 - Other

4 - Specialty Topics:**1 - Government and Marketing**

- 01 - Government Regulation
- 02 - Labeling and Information Disclosure
- 03 - Product Safety and Product Liability
- 04 - Public Policy
- 99 - Other

2 - International Marketing

- 01 - Africa
- 02 - India
- 03 - Middle East
- 04 - Soviet Union
- 05 - Underdeveloped Nations
- 06 - World Markets

3 - Industrial Marketing

- 01 - Industrial Buying
- 02 - Industrial Selling
- 99 - Other

4 - Agricultural Marketing

- 99 - Other

5 - Retailing

- 01 - Chain Stores
- 02 - Dept. Stores
- 03 - Discount Stores
- 04 - Downtown Shopping Districts
- 05 - Drug Stores
- 06 - Franchising
- 07 - Inventory Control
- 08 - Profits
- 09 - Self Service
- 10 - Shopping Centers
- 11 - Trading Stamps
- 12 - Wheel of Retailing
- 99 - Other

6 - Miscellaneous

- 01 - Ethics
- 02 - Health and Nutrition
- 03 - History and Trends
- 04 - Leisure and Recreation
- 05 - Time
- 99 - Other

EXAMPLES OF PROPOSED MODELS

Example of Proposed Mathematical Model:

General Model: Value of food used at home
+ Household Processing of food into meals
= Value of meals consumed at home

Algebraically this is expressed as:
$$X = V + R$$

Where:

X = Value added

V = U x I

U = Average price of meals eaten away from home

I = Total number of meals from home food supply eaten by family members

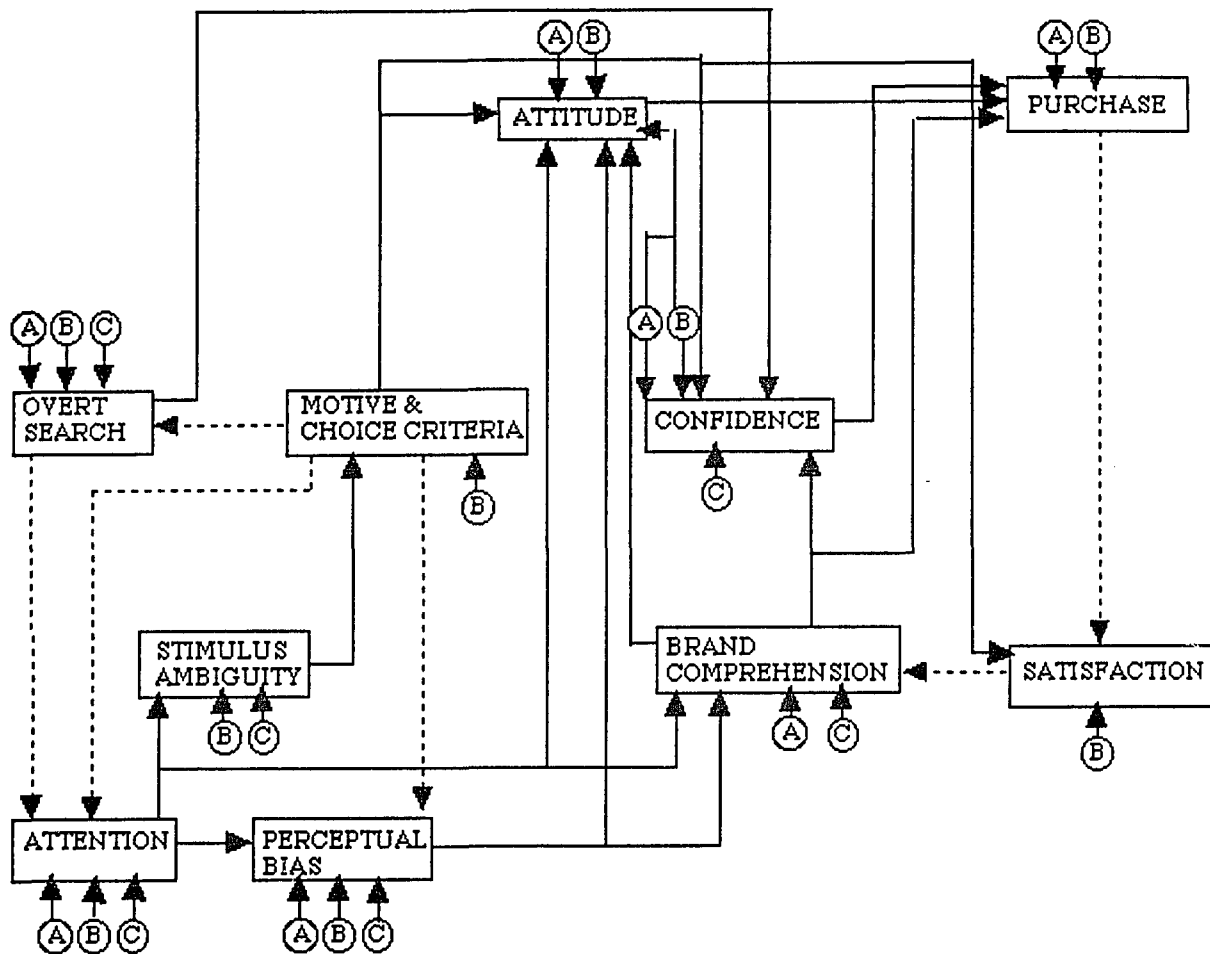
R = Value of the food supply used to prepare meals at home and adjusted to reflect value of food stamp and WIC subsidies

Sample article used was:

Bivens, Gordon E., and Carol B. Volker, "A Value-Added Approach to Household Production: The Special Case of Meal Preparation," *Journal of Consumer Research*, vol. 13, Sept. 1986, pp. 272-279.

Example of Proposed Graphical Model:

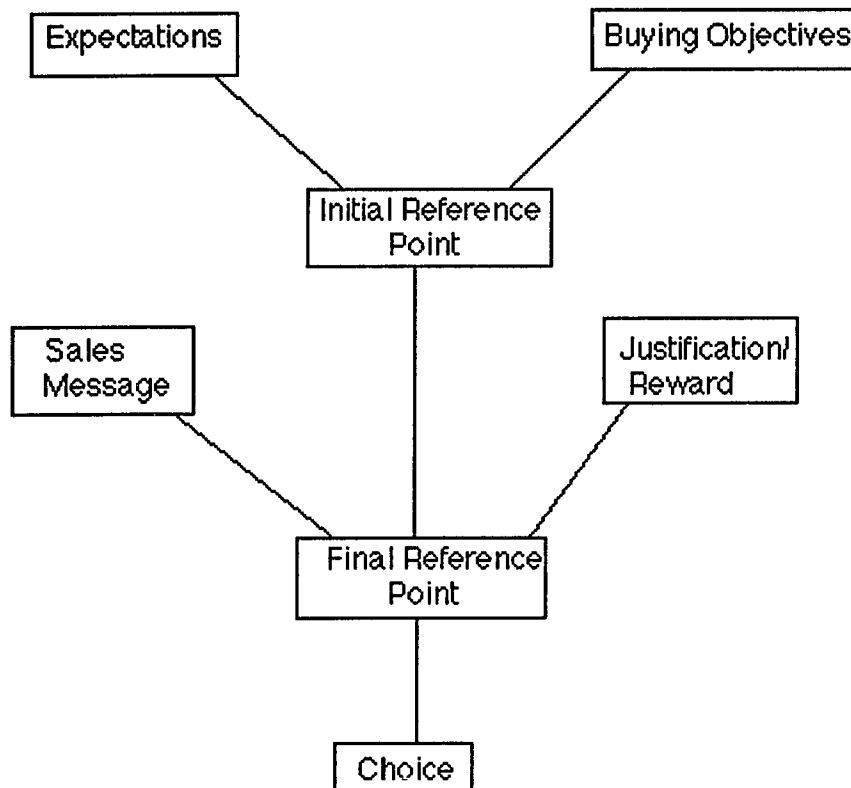
- (A) = Market Input Variables
 (B) = Socio-economic Variables
 (C) = Media Habits



Sample article used:

Lehmann, Donald R., Terrence V. O'Brien, John U. Farey, and John A. Howard, "Some Empirical Contributions to Buyer Behavior Theory," *Journal of Consumer Research*, vol. 1, December 1974, pp. 43-55.

Example of Proposed Graphical Model:



Sample article used:

Puto, Christopher P. "The Framing of Buying Decisions," *Journal of Consumer Research*, vol. 14, December 1987, pp. 301-315.

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