Comparison of the Nominal Grouping and Sequenced Brainstorming Techniques of Creative Idea Generation: a Field Study.

Walter Edward Stead
Louisiana State University and Agricultural & Mechanical College

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The Louisiana State University and
Agricultural and Mechanical College,
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COMPARISON OF THE NOMINAL GROUPING AND SEQUENCED BRAINSTORMING TECHNIQUES OF CREATIVE IDEA GENERATION: A FIELD STUDY

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The Department of Management

by

Walter Edward Stead
B.S., Auburn University, 1968
M.B.A., Auburn University, 1972
August, 1976
ACKNOWLEDGMENTS

To acknowledge all of the people who have in some way contributed to the completion of this dissertation would be an insurmountable task. However, there are special individuals who deserve the undying gratitude of this author because without their professional, moral and often very personal support, this dissertation would have never become a reality.

Special gratitude must first be extended to Dr. Jerry A. Wallin, Chairman of my Ph.D. committee. The time and professional advice that Dr. Wallin provided me was critical in the completion of this project. But my gratitude to Dr. Wallin goes far beyond that of simply a professional relationship. If it were not for his uncanny ability to motivate and to provide encouragement during those times when the odds looked overwhelmingly negative, this dissertation may have never been completed. It is these characteristics that make Dr. Wallin, in my opinion, a true credit to his profession.

I would also like to thank Dr. O. Jeff Harris and Dr. Andy Deseran for their diligent assistance while serving as members of my reading committee. Their suggestions were invaluable in improving the quality of this dissertation, and their comments were always provided in a timely manner indicating their true concern for the student.

Special thanks must be extended to Dr. Michael H. Peters. Although not a member of my committee, Dr. Peters willingly gave a
great deal of his time to insure that the statistical analysis performed
in this study was correct. I would also like to extend my thanks to
my fellow graduate students, Mr. Danny Worrell, Mr. William Sharbrough,
Mr. Bill McCartney, and Mr. Alev Efendioğlu for their help in con­
ducting my experiment. I also wish to thank Dr. Raymond V. Lesikar
and Dr. Leon C. Megginson who served as members of my committee.

From a very personal standpoint, I would like to express my
deepest gratitude to my wife's parents, Mr. and Mrs. Tom Garner. The
inspiration that they provided me to continue my schooling and to
pursue my dreams regardless of the odds cannot be expressed in words.
School has taught me a great deal about my profession, but they have
taught me that the pursuit of happiness is the only quest which ulti­
mately has any meaning.

Finally, I must extend to my wife, Jean, a gratitude which
only she can understand. She has provided me with support and
encouragement everyday for three years. She has given me many hours
of technical assistance which were invaluable to the quality of this
dissertation. But my gratitude for her goes far beyond this. Her
love has given me the emotional stability to challenge new worlds
without fear. She has instilled in me a confidence in my own ability,
and a desire to prove that I have something to offer. Without her
this dissertation, this degree, and this life would be insurmountable
obstacles rather than enjoyable challenges. I love you Jean.
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ABSTRACT

A continuous flow of new and different ideas is a necessity for any organization if it wishes to remain successful in a society characterized by constant change. Group processes have long been recognized as effective methods of generating these creative ideas. The purpose of this dissertation is to empirically compare the effectiveness of two group creative idea generating techniques—sequenced brainstorming and nominal grouping.

The many studies performed in the past which have attempted to compare the effectiveness of these or similar techniques have produced a myriad of conflicting results. There are also some very obvious shortcomings in the previous literature which must be dealt with before true effectiveness can be determined. This study was an attempt to deal with these conflicts and shortcomings.

This study was conducted in a field setting and employed a focus problem of true concern and significance to the group participants. The sample included 88 employees of the State of Louisiana who were divided into sixteen groups—eight sequenced brainstorming and eight nominal. The groups were compared on the basis of the quantity of ideas generated, the quantity of unique ideas generated, the quality of the ideas and the satisfaction of the group participants.

After statistical analysis (utilizing primarily analysis of
variance), it was concluded that in terms of overall effectiveness, quantity and satisfaction the sequenced brainstorming groups were more effective than the nominal groups. However, it was also concluded that the nominal groups produced a higher quality of ideas. Regardless of the statistical superiority of one over the other however, it was concluded that both techniques can provide management with excellent techniques for generating a significant number of high quality ideas, especially when the focus problem is one of true concern and significance to the group participants.
CHAPTER 1

INTRODUCTION

I. Purpose

The purpose of this paper is to compare two methods of group creative idea generation—nominal grouping and sequenced brainstorming. The comparison will be made in an attempt to determine which method is the most effective in terms of the quantity of ideas generated, the quantity of unique ideas generated, the quality of ideas generated, and the perceived satisfaction of the group participants.

II. Scope

The groups employed in this study will be specifically formed for creative thinking purposes. Groups which exist simply because of job or work area will not be considered. Also, analysis will be limited to the variables stated above, and effectiveness will be defined in terms of these variables.

III. Limitations

One basic limitation of this study is that the questionnaire used to measure quality and satisfaction has not been scientifically validated. However, questionnaires quite similar to the one employed in this study have been used by authorities in the field when conducting
similar studies.¹ These people consider the questionnaire a valid measure of the two variables. Since others consider it valid and since it is a necessary part of this investigation that previous work be replicated as closely as possible (in order to see if previous results are applicable in a field setting), I feel that this questionnaire will be sufficient and should be used.

Another limitation of the study involves specifically the measure of quality. Quality is obviously (in this case) a highly judgmental, subjective measure. However, no objective instrument for the measure of quality of ideas seems to exist. I feel that this limitation can be effectively dealt with by securing two measures of quality (one from the participants and one from their supervisor). This will be covered in more detail in the methodology chapter.

A final limitation of this study may be that of regulating group size. Because of the sterile, academic environment of previous studies, investigators in the past have been able to regulate group size so that each had the same number of participants. However, because of the nature of this field sample, it will be impossible to have every group exactly the same size. The groups in this study will therefore range in size from a minimum of four to a maximum of seven members (with an ideal size of five to six when possible). This, as

¹As will be explained in more detail in the methodology chapter, the questionnaire employed in this study is actually a combination of two questionnaires used in other similar studies. The first is a quality questionnaire used by Thomas J. Bouchard, Jr., "Personality, Problem Solving Procedure, and Performance," (Ph.D. dissertation, University of California at Berkeley, 1966), pp. 60-61. The second is a perceived satisfaction questionnaire used by Andre Delbecq and Andrew Van de Ven, "The Effectiveness of Nominal, Delphi, and Interacting Group Decision Making Processes," Academy of Management Journal, vol. 17 (1974), p. 609.
will be seen in the methodology chapter, is an acceptable group size range. This limitation may be actually beneficial because, although it would be nice to exactly regulate group size whenever employing one of these methods, it is not practical to think that this would always be possible when using these methods in actual organizational decision making. It is felt, therefore, that the methods should be flexible enough to be utilized when an exact number of participants (say seven) are not available. The variations of group size used in this study may be helpful in determining how flexible these methods are.

IV. A Historical Perspective

A. Allport—Early Studies of Group Influence on the Individual

One of the earliest publications to explore in detail the performance of individuals in groups was written by Floyd Henry Allport in 1924. Included in the book is a review of the studies done in the area of group influence on individual members up to that time. Allport also included many of his own definitions, theories, etc. concerning group influence.

The earliest study reported by Allport was performed by a gentleman named N. Triplett in 1897. In the experiment, children were timed both alone and in groups of two in a variety of acts from winding fishing reels to counting. They were told that the goal was to set a speed record for each act performed. He found that the children worked
faster in groups.\textsuperscript{1}

In a test with twelve year old boys, Dr. August Mayer (in 1903) found some very significant information concerning group effects on individuals. These boys working in groups were found to do more work with less errors and with greater uniformity than when working in isolation. He came to the conclusion that "the work of a single individual is more constant under the social condition."\textsuperscript{2}

Two studies were reported in 1904. The first was conducted by Dr. F. Schmidt in which he compared performance of school children in the classroom with their performance at home. He found that the quality of their work (based on errors made) was better in the social classroom setting. In the same year, Professor E. Meumann performed a study similar to that of Mayer's. He found that younger children worked better in groups, but, as age of the group members was increased, this difference seemed to disappear.\textsuperscript{3}

Allport himself conducted several studies during the years 1916-1919. The studies were very similar to those reported above except that he did not use children as subjects. Instead, graduate students of both sexes with an average age of twenty-five were used. His results showed that "the presence of a co-working group tends to increase the quantity of work done by the individual members but

\textsuperscript{2}Ibid., pp. 262-263.
\textsuperscript{3}Ibid., pp. 264-265.
leaves the quality practically unaffected."¹

Allport also makes a distinction as to the type of group. He defines two group types: (1) Co-acting groups are those in which the members are primarily interested in stimuli other than one another (i.e., a class at school). (2) Face-to-face groups are those in which individuals react mainly or entirely to one another (i.e., a committee discussing a business matter). He points out that most groups are actually a combination of these two pure types.²

Although most of Allport's work was done in the area of co-acting groups, he also drew some conclusions concerning face-to-face groups. He said that "in face-to-face groups, each asserts his opinion as to what should be done, and supports it by suggestion, by logic, or by domination of his personality. . . The conclusion arrived at (by the group) is as likely to be the result of control by ascendant personalities as of rational planning." He goes on to say that group conversation "involves the opposed efforts of two or more persons for expansion and control through language. . ."³

B. Lewin--Group Dynamics

For a period of almost two decades during the 1930's and 1940's, Kurt Lewin and his associates did extensive research in an area which they called group dynamics. Group dynamics can be defined as "the

¹ Ibid., pp. 265-285.
² Ibid., p. 260.
³ Ibid., pp. 286-288.
study of forces which operate within a group.\(^1\)

A great deal of Lewin's research is concerned with a concept which he calls the "group decision." According to Lewin:

Group decision . . . concerns the relation of motivation to action and the effect of a group setting on the individual's readiness to change or to keep certain standards. It is related to one of the fundamental problems of action research, namely, how to change group conduct . . . It is in this wider setting of social processes and social management that group decision should be viewed as one means of social change.\(^2\)

One of the more valuable studies for the purposes of this paper is Lewin's comparison between the lecture and the group decision in terms of which one is the most effective in changing group attitudes. The subjects were six Red Cross groups, and the problem was to increase their use of certain foods (such as beef hearts) to which they had strong psychological aversions. Three of the groups were given attractive lectures linking nutritional problems to the war effort and emphasizing the various positive health factors of the foods being discussed. The other three groups were not given a lecture but, instead, were organized into discussion groups. While only 3 percent of those lectured actually served one of the foods discussed, 32 percent of those involved in group decision served at least one of the foods.\(^3\)

Another related experiment performed by Lewin and his associates tested the difference between the ability of individual instruction and

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\(^3\)Ibid., pp. 330-334.
group decision to create social change. This experiment involved mothers of first born children who were being advised on the proper nutrition of their babies. Half of the mothers were instructed individually for 20 to 25 minutes on the proper nutrition schedule for their children. The other half were given the same instruction in decision groups of six and were allowed to freely discuss the matter. The groups lasted approximately the same length of time as the individual sessions. Whereas, on the average, 80.5 percent of the mothers involved in group decision followed the recommended nutritional schedule of the hospital, only 41 percent of those individually instructed followed the plan.1

From his studies, Lewin came to the conclusion that, if they are conducted properly, group decisions are superior to individual methods of changing social conduct. In explaining this conclusion, Lewin mentions such factors as social versus individual perception, the relationship between motivation and action, and the relationship between the individual and the group.2 The far reaching significance of this and other conclusions of Lewin and his associates in the area of group dynamics is tremendous.

V. Definitional Orientation

A. Definition of Groups

According to Mancur Olson, "a group is a number of individuals

1Ibid., pp. 338-339.

2Ibid., p. 344.
with a common interest."  

Theodore M. Mills defines small groups as "units composed of two or more persons who come into contact for a purpose and who consider the contact meaningful."  

Aubrey Fisher indicates that some form of commonality is necessary for a group to exist, but this commonality may vary from a simple common perception of group existence to specifically defined goals, fates or interactions.

Helen Jennings distinguishes between what she refers to as 'sociogroups' and 'psychogroups'. 'Sociogroups' are those which exist in order to primarily work on some common problem or objective. 'Psychogroups' are constituted when member associations are themselves the only purpose of the group (i.e., social fraternities). She points out that these classifications should not be considered as the only group types but rather as extreme ends of a continuum of group types.

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2Theodore M. Mills, The Sociology of Small Groups (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1967), p. 2. Although it is not a major focus of this study to concentrate on the many theoretical differences between small and large groups, it should be noted here that certain differences do indeed exist. Mills implicitly points out one of the basic differences in the definition above when he makes the statement "...and who consider the contract meaningful." Olson, in The Logic of Collective Action, p. 53, points out that "when the number of participants is large, the typical participant will know that his own efforts will probably not make much difference to the outcome..." Because of the fact that the groups in this study are made up of relatively few participants (four to seven), they should be specifically classified as small groups.


Keith Davis points out that "a distinction should be made between a group and a mere aggregation of people. Generally, a group refers to two or more persons who are interacting with regard to a common, explicit goal." He goes on to discuss the 'committee' which he says is a form of group which meets face-to-face for such purposes as information, advice, decision making, creative thinking, etc.¹

James H. Davis defines a group as "a set of persons (by definition or observation) among whom there exists a definable or observable set of relations." In addition to this, he points out that a major attraction for people to get together is the "collective pursuit of a particular end." He says that "the main thrust of a group is toward achieving some fairly definite outcome..."²

For the purposes of this study, a group will be defined as two or more persons interacting face-to-face in order to accomplish a specific objective or task. In Jennings' terms, this definition would fall into the realm of 'sociogroups'. The face-to-face concept has been extracted from Keith Davis' 'committee' in order that groups in this study be distinguished from groups of incidental formation based on job or work area. The groups in this study will be specifically formed for the purpose of creative thinking. The common thread in all of the above definitions—the commonality of purpose or objectives—also appears in the definition. The concept of interaction is of some importance to this study and, therefore, will be covered in detail

¹Keith Davis, Human Behavior at Work, pp. 439-440.
later in the investigation. Therefore, it should suffice here to point out that the amount of interaction among group members can and will vary according to such factors as group type, member personalities, etc. The above definition implicitly assumes that minimal interaction will be sufficient to define a gathering of individuals as a group.

B. Definition of Brainstorming

The concept of brainstorming for this and all related studies is based on the principles and procedures espoused by Alex F. Osborn in his book, *Applied Imagination*. According to Osborn, "brainstorming means using the brain to storm a creative problem--and to do so in comando fashion, with each stormer audaciously attacking the same objective." He refers to brainstorming as a method of organized ideation (idea generation).

To completely understand brainstorming, it is very important to understand what Osborn means by creative thinking, for it is creative thinking situations in which brainstorming is used and for which it was designed. He says that our minds have four basic mental capacities from a functional standpoint. The first of these is the *absorptive* capacity--"the ability to observe, to apply attention." The second is the *retentive* capacity--"the ability to memorize and to recall." The third is *reasoning*--"the ability to analyze and to judge." Finally, there is the capacity to be *creative*--"the ability to visualize, to foresee, and to generate ideas." Therefore, creative thinking can be

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defined as the ability to generate new or different ideas.\(^1\)

To fully understand brainstorming, one must understand the guidelines upon which all brainstorming sessions are based. Unless these rules are understood, according to Osborn, these idea producing groups may be fruitless. Therefore, the following rules are presented:

(1) Criticism is ruled out. Adverse judgment of ideas must be withheld until later.
(2) Free-wheeling is welcomed. The wilder the idea the better; it is easier to tame down than to think up.
(3) Quantity is wanted. The greater the number of ideas, the more the likelihood of winners.
(4) Combination and improvement are sought. In addition to contributing ideas of their own, participants should suggest how ideas of others can be turned into better ideas; or how two or more ideas can be joined into still another idea.\(^2\)

C. Definition of Nominal Groups

The term nominal group means technically group in name only, which implies that a member of a nominal group may not actually be a member of any group at all. It is this interpretation which has guided a great deal of nominal group research.

Originally, the term nominal group was used by Taylor, Berry and Block in 1958.\(^3\) They used the term in conjunction with an experiment comparing group versus individual performance. (Details of this experiment will be discussed in the next chapter.) Basically, individuals were assigned to work either alone or in groups on a particular

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\(^1\) Ibid., p. 1.

\(^2\) Ibid., pp. 83-84.

problem. Upon completion of their work, the individuals working alone were placed into **nominal groups** in order that there be a basis for comparing individual and group performance. The important thing here is that these nominal groups never actually met in any kind of group setting. Their ideas were simply pooled together by an experimenter as if they had worked as a group. This idea of nominal groups fits very closely the technical definition given above.

A much looser interpretation of the term nominal group had been employed in research by such people as Andre Delbecq and Andrew Van de Ven. In their research of nominal groups, they had the participants actually meet in a group setting. As they see it, the major difference between nominal groups and other types of groups is the degree of interaction which takes place between group members. Delbecq et. al., define nominal groups as groups in which "people work in the presence of each other but write ideas independently rather than talk about them." However, as will be seen in detail later, this nominal grouping process does include minimal participant interaction.

For the purposes of this study, I have chosen the Delbecq et. al., definition. There are several reasons for this choice. First of all, this is the only definition which falls within the scope of the definition of a group being employed in this investigation. To use the more technical definition of Taylor, Berry and Block would mean the elimination of the concept of face-to-face interaction being employed here. Secondly, in a great deal of the current literature,

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there is a process known as the delphi technique which fits very closely to the technical nominal grouping definition. "In the delphi process, isolated and typically anonymous respondents independently write their ideas or reactions. . ."\(^1\) (The delphi technique does have certain aspects, such as the utilization of feedback, which differentiate it from technical nominal grouping. These differences will be presented in the next chapter when the delphi technique is discussed in more detail.) Finally, it would seem much more valuable in practical use to study a grouping technique which actually includes physical group meetings as opposed to pooling of individual ideas. It is of as much interest to this study to identify a group method useful in organizations as it is to explore the theoretical differences between group and individual performance. The Delbecq et. al., nominal grouping definition provides an opportunity to do both.

D. Definition of the Decision Making Process

1. **The Basic Process**

   In the management literature on decision making, there is a wide variety of models and ideas which exemplify the decision making process. However, there seems to be a definite scheme which is common to all of these. Richards and Greenlaw identify four basic steps in this scheme:\(^2\)

   (1) Identify or determine the problem.

   (2) Identify alternative strategies or solutions.

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\(^1\)Ibid., p. 17.

(3) Test the alternative strategies or solutions.

(4) Choose the best alternative—make the decision.

(The scheme presented here represents an ideal model of the rational decision making process. Although the focus of this section is to simply identify where in the process creative idea generating groups can best be utilized and not to critically evaluate the process itself, it should be noted that many well known works have been dedicated to the critical evaluation of this process in light of such factors as man's rational limitations, etc.)

2. Where Nominal Grouping and Brainstorming Best Fit

According to Delbecq et. al., nominal grouping is a "special purpose technique useful in situations where individual judgment must be tapped. . . . It is a problem-solving or idea generating strategy."\(^2\)

It can be seen from the above discussion that nominal grouping has as its basis organized creative thinking. As stated previously,\(^1\)

\(^1\)James G. March and Herbert A. Simon, Organizations (New York: John Wiley and Sons, Inc., 1964), pp. 137-171, discuss the fact that man's ability to follow the rational decision making process is impeded by certain cognitive limitations. For example, they say that it is highly unlikely that a man can know all of the available alternatives or that he can be completely familiar with the consequences of each alternative. In other words man's rationality is bounded by uncertainty and the unknown. This leads them to a discussion of satisficing: "Most human decision making, whether individual or organizational, is concerned with the discovery and selection of satisfactory alternatives. . . ." Similar criticisms of the rational decision making process can be found in Herbert A. Simon, Administrative Behavior (New York: The Macmillan Company, 1961), pp. 79-109, and in David Braybrooke and Charles E. Lindblom, A Strategy of Decision (London: The Free Press of Glencoe, 1963), pp. 37-57.

\(^2\)Delbecq et. al., Group Techniques for Program Planning, p. 4.
Osborn describes brainstorming as a method of organized ideation using creative thinking as a base. Therefore, it can be concluded that both techniques are for use in similar or even identical situations.

It can also be concluded that the best places in the decision process to use the techniques are in the problem and alternative identification stages. It is in these stages that the importance of creative thinking—the importance of generating as many unique ideas as possible—is most amplified. As Richards and Greenlaw most adeptly state:

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Creativity in the form of generation of alternatives is a common need of managers for making decisions in their organizations. Unique or unusual ideas and alternatives to meet organizational problems may defy development by any other means.¹
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Keith Davis reiterates this point when, in discussing the advantage of deferred judgment in brainstorming, he says that it encourages people to propose bold new ideas without worrying about what others may think of them.²

Therefore, this study will concentrate on the areas of the decision making process for which the two methods were designed—problem and/or alternative identification—where creative thinking can best be utilized.

VI. Report Preview

The report will first present a review of the relevant literature. In the review, discussions of such topics as brainstorming, individual versus group problem solving, the pros and cons of interaction

¹Richards and Greenlaw, Management Decisions and Behavior, p. 56.

²Keith Davis, Human Behavior at Work, p. 446.
in creative thinking situations, and the Delbecq/Van de Ven method of nominal grouping will be presented. At the end of the literature review, the hypotheses to be tested in this study will be formulated and presented.

Following the literature review, a discussion of the methodology employed in this study will be presented. Such topics as the selection of the sample, the selection of the focus problem and the selection of the group leaders will be discussed. The methodology chapter will also discuss in detail the nominal grouping and sequenced brainstorming techniques, the measurement of the variables employed in the study, and the statistical evaluation method that will be used.

The final two chapters of the study will be a presentation of the statistical results obtained in analyzing the data gathered (chapter 4) and a discussion of the implications of these results (chapter 5). These chapters are designed to highlight the statistical analyses and to draw certain theoretical conclusions from these analyses.
CHAPTER 2

REVIEW OF THE LITERATURE

I. Orientation to the Chapter

As stated in the introductory chapter, the purpose of this chapter is to review the relevant literature. The manner in which this information is presented is designed with a dual purpose in mind. First of all, the chapter will attempt to explain both of the methods that will be employed in the study and review the literature connected with each. Secondly, it will attempt to highlight the many conflicting results and shortcomings presently found in the literature. Presented in this manner, the literature review should then lead us logically to the formulation of the basic hypothesis of the study.

First to be presented in this chapter is a discussion of the brainstorming technique of creative idea generation. This will include a summary of Osborn's theoretical concepts of brainstorming along with empirical support for the brainstorming method. Secondly, the chapter will present a section of empirical results highlighting the conflicts in the literature between group and individual problem solving abilities. This will be followed by a specific review of the Delbecq/Van de Ven Nominal Grouping technique--including both theoretical discussion and conflicting empirical results. Since the ultimate focus of this study is to explore the shortcomings and conflicts found in the literature, these will be presented in a brief review in the final section.
of this chapter. Then, certain hypotheses designed to explore these shortcomings and conflicts will be formulated.

II. The Brainstorming Technique

A. Osborn--Applied Imagination

As stated in the definitional section of the introduction, brainstorming was developed by Alex F. Osborn as a method of organized idea generation which is designed to utilize the creativity which, according to Osborn, we all possess to some degree. In his own words, Osborn states:

... Creative imagination is itself a basic tool in the acquisition of knowledge; for, knowledge becomes more usable when imaginatively synthesized. ... All human beings, to a greater or lesser degree, possess the imaginative faculty.¹

In this section, a summary of the pertinent ideas (to this study) of Osborn's Applied Imagination will be presented.

1. How is Creativity Developed--How is it Cramped?

In developing the brainstorming technique, Osborn presents factors which he says help creativity to develop and factors which tend to cramp creative thinking. He says that the first thing we must do to develop creativity is to "exercise" our minds. He presents a great deal of evidence which suggests that creative talent can be developed through use just as our bodies can be developed through exercise.²

The second major factor presented which aids in the development of creativity is experience. This, he says, is "the richest fuel

¹Osborn, Applied Imagination, p. vii.
²Ibid., p. 53.
for ideation." He goes on to say that of types of experience, first-hand experience is the most valuable in the development of the creative mind. This statement seems to reduce somewhat, although by no means eliminate, the importance of the other factors which contribute to creativity. These other factors are playing games and solving puzzles, hobbies and fine arts, reading, creative writing, and practicing creative problem solving.¹

The most devastating force affecting creative thinking, according to Osborn, is negative thinking. He says that almost any new idea can be shown logically to be wrong and normally is. (This seems very closely associated with resistance to change.) Another major cause of cramped creativity is previous habit. He says that habit tends to rigidize out thinking. Also cited as obstacles to creative thinking are self-discouragement and timidity.²

2. **Principles of Brainstorming**

   In the definitional section of Chapter 1, four rules which should be followed in any brainstorming session were presented. These rules are primarily based on the three principles of brainstorming. According to Osborn, these principles are actually the result of many studies and conferences with educators, business executives and military officers.

   The first principle of brainstorming is that "ideation can be more productive if criticism is concurrently excluded." This can

¹ *Ibid.*, pp. 54-68.

be easily related to the negative forces of creative thinking discussed above. Obviously, the word criticism is negative in connotation. As stated previously, negative thinking inhibits creative thinking. Also, if people are criticized, they may become discouraged or afraid to openly express themselves.1

The second principle of brainstorming states that "the more ideas the better." Osborn says that groups that use brainstorming generally agree that in creative idea generation, the more ideas that are generated, the more quality you can expect from the ideas.2

The third principle espoused by Osborn seems to be the most controversial and will be of a great deal of interest to this study. This principle states that "group ideation can be more productive than individual ideation." According to Osborn, people working in a group can think up twice as many ideas as people working alone. He says that there is a synergistic effect (that groups which work together can produce more ideas, and thus a higher quality of ideas, than the same individuals working alone).3

B. Empirical Evidence Supporting Brainstorming

Sidney J. Parnes and Arnold Meadow have conducted many experiments on the effectiveness of brainstorming. Two such experiments were run in 1959. The first study was conducted to test the hypothesis that a class of students instructed (for one semester) in the Osborn method of creative problem solving would be more productive in brainstorming sessions than

1Ibid., p. 228.

2Ibid.

3Ibid., pp. 228-229.
untrained subjects. The results were as expected. The brainstorming groups made up of students who had received the course were more productive in five of the seven tests run as compared with the untrained students.¹

The second study seems to be more significant for the purposes of this paper. In this experiment, Parnes and Meadow tested the hypothesis that with untrained subjects—that is, subjects that had not received the creative thinking course—there would be more productivity in the groups that are given brainstorming instructions than in groups that are not instructed in brainstorming procedures. They also tested the hypothesis that if nonbrainstorming instructions are administered to the un instructed groups, this will inhibit their productivity (in terms of the quantity of good quality ideas) even further than giving no instructions at all. The subjects of the experiment were 52 undergraduate students at the University of Buffalo. The students were carefully chosen on the basis of gradepoint average to reduce the chance of bias for any of the groups. The ideas produced by the groups were scored on the basis of quantity and quality. Quality was judged on two criteria: (1) uniqueness and (2) value. The major finding of the study was that "significantly more good quality ideas are produced under brainstorming instructions than under no brainstorming instructions." The difference is even more significant when instructions contrary to those espoused by Osborn were given prior to group meetings.²

²Ibid., pp. 171-176.
Parnes conducted another study which was reported in 1961. In this study, the hypothesis formulated was that "more good ideas will appear in the last half of the subject's total idea output regarding a creative thinking problem than during the first half." The purpose of the test was to specifically examine the idea that as quantity increases, so will quality. "The findings demonstrated significantly more good ideas to appear in the last half than in the first half of the ideas list. A significant relationship was also found between total quantity and total quality scores."\(^1\)

Another significant study which tested the principles of brainstorming was conducted by Edith Weisskopf-Joelson and Thomas Eliseo in 1961. Specifically, they tested Osborn's idea that criticism should be eliminated from brainstorming because it tends to inhibit the members in the production of good ideas. In their experiment, they formed what they called 'critical' and 'noncritical' groups. Identical instructions were given to both groups with one exception. The 'noncritical' group was given the standard brainstorming instruction that there was to be no critical evaluation made of the ideas presented. The 'critical' group was instructed that they were to avoid stupid or silly ideas. They were also told that good ideas often are created by improving on other ideas or by combining two or more ideas. In short, the 'critical' group was to exert criticism while the 'noncritical' group was to avoid it. "The responses obtained under the 'critical' and 'noncritical' condition were compared as to quantity as well as quality." After statistical

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analysis, Weisskopf-Joelson and Eliseo came to the conclusion that the quantity of ideas produced by the 'non-critical' group was significantly higher than that produced by the 'critical' group. They also concluded that the quality of ideas for the 'noncritical' group was equal to or higher than that of the 'critical' group.$^{1}$

In 1972, Thomas Bouchard performed a study to test the effects of a possible modification of Osborn's brainstorming procedures.$^{2}$ Osborn advocates the random injection of ideas in a brainstorming session. That is, the participants are encouraged to speak out on any idea they have whenever they have it. In his experiment, Bouchard used the sequenced procedure of brainstorming—a procedure that Bouchard says he has empirically proven in another study to be superior to random brainstorming (the results of this study are reported in more detail later in this chapter). Under this procedure, the participants are told that there is a sequence which must be followed when generating ideas. No idea is to be given unless it is the participant's turn. Any participant who has nothing to say is to respond with "pass." Each subject is instructed not to get bogged down in trivial matters. (These groups will be referred to as sequenced brainstorming groups throughout the remainder of this paper.)

Half of the groups in the experiment used the sequenced procedure

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exactly as described above. The other half used the same procedure with one additional modification. They employed what is known as the synectic technique in these groups. This technique attempts to have the group members identify more with the central idea or object of discussion. To accomplish this, the synectic groups were given the following example of synectics and told to follow such a pattern:

Each of you in turn gets to play a central part of the problem while the group works on it. For example, if the problem were 'think up as many brand names as you can for a new spray deodorant,' one of you would get on the table and sit down, close your eyes, and play the can of deodorant. . . .

There was no statistically significant difference between the two methods in most of the groups run. A significant difference did show up in some of the groups (favoring synectics). Both methods are considered superior to random brainstorming. Therefore, it can be concluded that the sequenced brainstorming groups (whether or not the synectic feature is added) can definitely increase the effectiveness of the brainstorming method of idea generation.

III. Individual vs. Group Problem Solving

A. Shaw--An Early Study

The earliest scientific experiment concerning the ability of groups versus individuals to solve complex problems was reported by Marjorie Shaw in 1932. In the study she carefully observed the groups and tried to discover in detail the social interaction processes taking place. "This tactic represented a substantial methodological advance

\[1\] Ibid., p. 419.
In Shaw's experiment, several complex problems requiring real thinking in order to reach a solution were chosen. Each problem required several steps which must be performed in a certain order if proper solutions were to be discovered. "The problems were given to single individuals and to small groups of cooperating individuals (each with four members), in order that the abilities of these two might be compared." Each problem was chosen with the idea that it should be practically impossible for any individual or group member to instantaneously come up with the correct solution.\(^2\)

From her study, Shaw came up with the following five conclusions:\(^3\)

1. Groups will normally arrive at a larger proportion of correct solutions than will individuals.
2. The reason that groups reach more correct solutions is that they have the benefit of error checking and quick rejection of incorrect suggestions.
3. Most incorrect solutions were rejected by other group members rather than the member originally making the suggestion (which should explain the quick rejection conclusion stated in number 2).
4. All of the group members do not take an equal part in

\(^{1}\)James H. Davis, *Group Performance*, p. 38.


\(^{3}\)Ibid., pp. 314-315.
terms of the amount of participation in solutions to the problems.

(5) In terms of erroneous solutions, individuals tend to err much sooner than do groups.

With her research, Shaw has opened the door for the study of group decision making effectiveness. She has provided us with insight into why groups may perform better and a method of studying this performance.

B. Conflicting Results

1. Pro-Individual Studies

The possible problems which can be created by interaction between members of problem solving groups have been the focus of many studies. In 1954, Guetzkow and Gyr warned against certain types of group interaction in decision making groups. They studied two types of group conflict: (1) Substantive conflict which involves intellectual opposition among group participants, and (2) Affective conflict which is tension created by the problem situation itself. They say that for a group to reach a consensus decision in the face of either type of conflict, there must be no interaction involving the expression of personal, self oriented needs. They go on to say that in many affective conflict situations, consensus can only be reached through reduction or elimination of interaction. It is stated that to reach high consensus in groups with affective conflict, participants must "withdraw from the problem situation and have little interest in what

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is being discussed... and withdraw from interpersonal contact with each other."¹

The first study which attempted to test the effect that member interaction had on the outcome of group creative thinking efforts was performed for the Office of Naval Research by Yale Professors Donald W. Taylor, Paul C. Berry and Clifford H. Block. The experiment was designed to answer the title question of the article, "Does Group Participation When Using Brainstorming Facilitate or Inhibit Creative Thinking."²

In the experiment, Taylor, Berry and Block chose as their subjects 96 juniors and seniors in Professor Taylor's Psychology of Personnel Administration class. The subjects were divided into 24 groups of four members each. Twelve of the groups followed the traditional brainstorming format as described by Osborn (discussed earlier). The other twelve groups were actually not groups at all but, instead, were individuals assigned to work alone on the same problems as the 'real' groups. These individuals were then assigned to 'nominal' groups. That is, their individual responses were randomly pooled into the twelve, four man groups and the results were scored as if the individuals had worked together.³ (As was pointed out in the definitional section of chapter 1, Taylor, Berry and Block employed the technical definition of nominal groups, meaning that the participants

¹Ibid., pp. 380-381.

²Taylor, Berry and Block, "Does Group Participation When Using Brainstorming...," p. 23.

³Ibid.
never actually met in a group setting but instead generated their ideas alone and then had these ideas pooled.)

Three problems were selected for use in the experiment. The first, known as the 'tourist' problem, asked the question, "What steps can you suggest that would get more European tourists to come to the U.S.?" The second problem was known as the 'thumbs' problem. It asked, "What practical benefits or difficulties will arise if people had an extra thumb?" The final problem, known as the 'teacher's' problem, dealt with the projected rise in school attendance in the 1970's. It asked, "What different steps might be taken to insure that schools will continue to provide instruction at least equal in effectiveness to that now provided?"  

The groups were compared on the basis of three variables: (1) the quantity of ideas produced, (2) the quality of ideas produced, and (3) the uniqueness of the ideas produced. There were comparisons made between real and nominal group performance as well as real group versus individual performance.

Taylor, Berry and Block came to the conclusion that "the performance of the real groups is markedly inferior to that of the nominal groups with respect to all of the measures of performance employed." They concluded that participation inhibits brainstorming for two reasons. First of all, even though strong emphasis is placed on avoiding criticism in brainstorming, the authors feel that an individual working in an interacting group does not feel totally free from

1Ibid., p. 28.

2Ibid., p. 23.
criticism although it may not be expressed. Secondly, they suggest that individual members of groups tend to have their train of thought channeled in limited directions. Therefore, interaction reduces the number of different ideas that the group produces.¹

Dunnette, Campbell and Jaastad (1963) replicated the Taylor, Berry and Block study with two different occupational groups, research scientists and advertising men. They chose as their sample 48 researchers and 48 advertising men from Minnesota Mining and Manufacturing Company. They used the same three problems employed by Taylor et. al., ('thumbs,' 'tourist,' and 'teachers') plus one entitled the 'people' problem which supposed that nutritional and physiological advances have increased the average height of the male to 80 inches and doubled his average weight.²

Dunnette et. al., came to the same basic conclusion as Taylor, Berry and Block. They state that:

Our results confirm those of Taylor et. al., and tend to refute Osborn's argument that individuals are stimulated by group brainstorming to produce more ideas than when brainstorming alone. Of special interest is our finding that group interaction has an inhibiting influence for advertising people. . .as well as for technical research personnel and for college students at Yale University.³

They did say that interaction was useful in "warming up" for individual brainstorming sessions. They found that the individual

¹Ibid., p. 43.
³Ibid., p. 35.
brainstormers were more productive after some personal interaction with other participants. However, in interacting brainstorming sessions, they say that groups "fall into a rut" and follow the same train of thought.¹

Campbell extended the study further in 1968. Again he used an industrial sample (80 second and third line managers from a midwestern public utility) and a simple hypothetical problem which had no real meaning to the group. (Campbell asked the participants to suggest solutions to the N. R. F. Maier 'change of work procedure' problem. Basically, the problem involves an attempt by management in a large manufacturing firm to change the assembly line procedure in a particular section from the present system of job rotation to a system in which each employee performs the same job all of the time.) The purpose of the study was to compare the quality of solutions generated under three experimental conditions: (1) individual solutions, (2) individual solutions after hearing group discussion with no criticism, and (3) group solution after discussion. Each participant solved the problem individually, then met in a group to discuss the problem and solve it individually again after discussion. Finally they reached a group consensus decision on the same problem. He came to the conclusion that group interaction is indeed an inhibitory factor in group decision making. He found that the nominal groups were superior to the interacting groups in all comparisons made. That is, the interacting groups were inferior to both the individual after discussion and the individual

¹Ibid., pp. 35-36.
before discussion.\(^1\)

In 1969, Rotter and Portugal hypothesized that the optimal problem solving condition lies somewhere between the purely individual solution and the total group consensus effort. They felt that both individual action and group interaction had a place in the problem solving situation. Students from the University of Long Island were used for the experiment, and the problems used were the 'tourist' and 'teachers' problems. Again, they used the design of Taylor and his associates in terms of real and nominal groups. Their study did not confirm their original hypothesis. Like Taylor et. al., and Dunnette et. al., Rotter and Portugal found that interaction was an inhibiting force. They state unequivocally that "individual production of ideas is superior to production within a group." One reason for this was the traditional explanation of the channeling of ideas. They also speculated that in interacting situations, ideas which were not considered socially acceptable were withheld by participants.\(^2\)

Thomas J. Bouchard is one of the most involved scholars in the field of nominal versus group brainstorming. His Doctoral dissertation was in this area, and he has published no less than six articles dealing with the subject. His first publication in the area was a research monograph which basically summarized his dissertation (both have the


same title). Published in 1969, there were actually two experiments performed in the study. The first experiment was a replication of the Taylor, Berry and Block study involving as subjects 48 students in a basic psychology course. The same three hypothetical problems discussed earlier in this paper were used in the experiment. The results were the same. The quantity and quality of ideas produced in the nominal brainstorming groups was superior to the ideas produced under the interaction situation.¹ (These results seem only to prove that the experiment designed by Taylor, Berry and Block will produce consistent results. It seems that authors would change the experiment somewhat to find if the results can be applied universally to all group ideation situations.)

The second experiment run by Bouchard again was very similar to those already discussed. Students were used for the experiment as were the 'thumbs', 'teachers' and 'tourist' problems. In this experiment, he injected the 'critical' group concept of Weisskopf-Joelson and Eliseo (discussed earlier). He compared individual brainstorming groups with interacting brainstorming groups with interacting 'critical' groups. The 'critical' groups were used to test the significance of feedback on group problem solving efforts. Again, the results were in favor of the nominal brainstorming groups. They outperformed both the interacting brainstorming and 'critical' groups. Feedback turned out to be an insignificant factor in this experiment.²


²Ibid., p. 16.
Other related studies performed by Bouchard include one in 1972 in which he attempted to test the effects of training, motivation, and personality on the outcomes of nominal and interacting groups. Several training, motivational, and personality variables were added to the experiment which was otherwise handled very similarly to those previously described. Although he found no evidence to support various hypotheses concerning training, motivation and personality, he again found nominal brainstorming to be superior to interacting brainstorming. However, the difference between the two procedures was not nearly as much as had been found in previous studies. He attributed this to the fact that in this experiment he used the sequenced brainstorming procedure (discussed earlier).¹ This is the empirical evidence that Bouchard referred to when he stated that the sequenced procedure had been proven to be superior to the random method espoused by Osborn (see section II-B, this chapter).

Bouchard along with Melana Hare performed a study in 1970 which was designed to test the effects of different group sizes on the performance of nominal and interacting brainstorming groups. They found again that nominal groups were superior in creative thinking situations. Other than the group size variable, the procedure for the experiment was the same as before—using students as subjects and the 'thumbs' problem.² (The group size dimension will be discussed at some length


during the methodological chapter and, therefore, will not be dwelled upon here.)

Two studies by Bouchard along with some associates were reported in 1974. The conclusions were very much the same as his others. Both studies used a problem in which the question was asked, "What would the consequences be if everyone in the world went blind?" The first study concluded that nominal groups are superior to interacting groups even when participation is forced in the interacting groups. The second study concluded that it is better to have groups break down into subgroups and then pool their ideas.

In summarizing the pro-individual studies that have been reviewed in this section, one major point should stand out. That is, there is a great deal of empirical evidence available which strongly suggests that individuals working alone perform in a superior manner to groups when such variables as quantity of ideas generated, quantity of unique ideas generated, and quality of ideas generated are taken into consideration. However, as will be seen in the next section (Pro-Group Studies), there is also a great deal of empirical evidence which is in conflict with these pro-individual studies.

2. Pro-Group Studies

In 1962, Tuckman and Lorge conducted a study with 420 ROTC
cadets. Seventy, five-man groups were formed and given a complex problem to solve with which they had no prior experience. The remaining 70 individuals were given the same problem to take home and work on individually. The following day these 70 individuals submitted written solutions to the problem. Next, they were placed into 14 groups of five each and required to resolve the problem. The results indicated a significant superiority of the re-solve groups over the individuals. Yet, when compared with the 70 groups which had solved the problem with no prior experience, the re-solve groups proved to be no better. This leads to the conclusion that interaction was the superior force.¹

Hall, Blake and Mouton (1963) conducted research to test the hypothesis "that decisions made by groups after interaction are better than decisions based on statistical pooling of individual judgments."² From this general hypothesis, two specific hypotheses were formulated.³

(1) Under conditions requiring complex judgments, emergent group decisions are significantly superior to those represented by the averaging of individuals' judgments made under alone conditions.

(2) Decisions resulting from group interaction approximate or equal the best individual judgment rather than the worst individual judgment.

The subjects of the experiment included 22 groups of managerial


³Ibid., p. 149.
personnel from all levels of the hierarchy. Each group had from six
to eight members and were matched according to education, occupation
and managerial level. Forty college students were also chosen for the
experiment. Twenty-eight of them were formed into five groups with
the remaining 12 participating as individuals for control purposes.
In the test, the participants viewed the film, *Twelve Angry Men*,
which is the story of how one juror swayed the eleven others to find
a defendant not guilty. Each subject then, alone, predicted the order
in which the jurors would change their vote to not guilty. Next, they
met in the group settings and were required to decide unanimously on
the same problem. The individual predictions were then pooled and an
average score was taken for each group as if they had worked together.\(^1\)

After scoring and statistical analysis, it was concluded that
both hypotheses were indeed true (to the .001 level of significance).
According to the authors, these results showed that (1) group scores
will normally be equal or superior to individual scores arrived at by
pooling, (2) this pooled score is significantly inferior to those pro-
duced through group interaction, and (3) the group judgment approaches
the best rather than the worst individual judgment.\(^2\)

One of the most contradictory studies to the results of Taylor,
Berry and Block was done by M. R. Paskov in 1974. He tested the hy-
pothesis that if the task and situation have true significance to the
group members, the interacting brainstorming groups will outperform

\(^1\)Ibid., pp. 149-150.

\(^2\)Ibid., pp. 153-154.
nominal groups in the quantitative generation of ideas. Again, the
Taylor, Berry and Block definition of nominal groups was used. His
basic criticism of Taylor et. al., and others who have done similar
studies (i.e., Bouchard) was that the problems used by the researchers
had no true significance to the subjects of the experiments. He
therefore decided to choose a problem which had actual significance
to his subjects.2

The subjects of the experiment were 90 undergraduate students
enrolled in four basic speech classes at the University of Illinois.
The problem that he chose to use was "what can be done to solve the
grading problems at the University of Illinois?" The subjects were
divided into eighteen groups—nine interacting and nine nominal.3

The results supported the hypothesis. "The number of ideas
generated by real groups...was significantly greater than the
number of ideas generated by the nominal groups."4

C. Possible Explanation of Conflicting Results

In 1967, Norman R. F. Maier published an article in which he
attempted to analyze the conflicting results of studies which were
trying to answer the question whether or not interaction was an asset
or liability in problem solving. He came up with a list of what he

1 Marijan R. Paskov, "Brainstorming in a Naturalistic Setting:
A Comparison of Nominal and Real Group Performance," (PhD dissertation,

2 Ibid., p. 46.

3 Ibid., pp. 27-29.

4 Ibid., p. 36.
referred to as 'group assets' and list of 'group liabilities' which he said could at least partially explain the controversial findings.

The first group asset he discussed was the "greater sum of knowledge and information." He explained this in more or less of a synergistic fashion. According to Maier, "there is more information in a group than in any of its members."\(^1\)

The second group asset mentioned by Maier, "the greater number of approaches to the problem," seems relatively controversial itself in light of much of our previous discussion. Maier says that individuals tend to fall into a rut in their thinking, whereas groups have the possibility of a greater divergence in their ideas.\(^2\) As stated earlier, one of the main arguments given against groups is that they often channelize their thinking in one direction.

Another group asset in problem solving mentioned is "participation in the problem solving increases acceptance." Maier says that for a solution to be effective, it normally must receive the support of those who are to carry it out. "Insofar as group problem solving permits participation and influence, it follows that more individuals accept solutions when a group solves a problem than when one person solves it. When one individual solves a problem, he still has the task of persuading others."\(^3\)


\(^2\)Ibid., p. 240.

\(^3\)Ibid.
The final group asset mentioned by Maier is "better comprehension of the decision." This takes into consideration the communication advantages enjoyed by groups. When an individual makes a decision, he must then communicate it to those who are to carry it out. Failure in the communication process can reduce the merits of the decision. Many organizational problems can be traced to situations very similar to this. According to Maier, the chances of such communication failures occurring can be greatly reduced when individuals work together on a problem solution. Everyone then has a much better understanding of the full implications of the decision. They know better what obstacles may be in their way and how they may go about eliminating or reducing these obstacles. He says that "communication is maximized when the total problem-solving process is shared."\(^1\)

Social pressure is the first group liability discussed. It is a major force making for conformity. The desire to be accepted by the group often tends to silence criticism and disagreement. Therefore, there is a chance that a majority opinion which is not completely logical or applicable will be accepted by the group.\(^2\)

The second liability discussed is the 'valence' of solutions. In the explanation of this liability, Maier refers back to another study (Hoffman and Maier, 1964). He says:

\[\ldots\text{Each solution may receive both critical and supportive comments.}\ldots\text{If the number of negative and positive comments for each solution are algebraically summed, each may be given a 'valence index'.}\ldots\text{The first solution that receives a positive valence value of 15 tends to be adopted to the satisfaction of}\]

\(^1\text{Ibid.}\)
\(^2\text{Ibid., p. 241.}\)
all participants about 85% of the time, regardless of its quality. Higher quality solutions introduced after the critical value for one of the solutions has been reached have little chance of achieving real consideration. . . Since a solution's valence is independent of its objective quality, this group factor becomes an important liability in group problem solving. . .

The third group problem solving liability is individual domination. Very often in interacting group situations a dominant individual or group of individuals will tend to monopolize the discussion. They engage in more group participation and use their influence to persuade the remaining members of the group to their way of thinking. They often use stubborn persistence to wear down those who oppose their views. The problem here is that factors which contribute to the creation of a dominant personality are independent of those factors which make for a good problem solver. Therefore, it is entirely possible that the best problem solver and the most dominant personality in the group will not be the same person. This situation could very easily lead to a solution of less quality than may be desired.

The final group problem solving liability is the "conflicting secondary goal: winning the argument." Even though the main goal of the group may be to reach the best solution possible to the problem being discussed, along the way there are going to be a variety of possible alternatives as to what the best solution is. Once preferences are expressed, members will begin to take sides in the argument and engage in a battle of wits to convert those still wavering on neutral ground. When this situation occurs, there is a distinct possibility

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1Ibid.
2Ibid., pp. 241-242.
that the main goal of the members will shift from finding the best solution to winning the argument. This goal is unrelated to the quality of the problem solution and, therefore, can very easily lead to a sub-optimum solution to the problem being adopted by the group when the final decision is made.¹

Maier comes to the conclusion that when evaluating group versus individual problem solving, the total decision making situation must be taken into consideration. Such factors as the nature of the problem must be considered. The goal to be achieved must be evaluated in terms of what quality of decision is required, is high acceptability and understanding of the solution necessary, will innovation likely be important in reaching an acceptable solution, what are the time requirements of the problem solving situation, etc. "If liabilities inherent in groups are avoided, assets capitalized upon, and conditions that can serve either favorable or unfavorable outcomes are effectively used, it follows that groups have the potential which in many instances can exceed that of a superior individual functioning alone, even with respect to creativity."²

IV. Nominal Grouping--The Delbecq/Van de Ven Method

As was stated in the definitional section of the introduction, there are actually two definitions for a nominal group. The original and most technical definition (employed in all of the studies reviewed to this point in the chapter) is group in name only implying that no

¹Ibid., p. 242.
²Ibid., p. 247.
group meeting is actually held; but, instead, ideas of individuals are simply pooled. The second definition of nominal groups developed by Andre Delbecq and Andrew Van de Ven employs an actual group setting but very little group interaction. It still has the essential ingredient of individual idea generation, but this is carried out in the physical presence of other group members. This Delbecq/Van de Ven method of nominal grouping has only been used in two empirical studies with conflicting results. The purpose of this section is to review in detail these two conflicting studies. A general review of other literature employing the Delbecq/Van de Ven method (none of which is empirical) will also be presented.

A. Empirical Results of the Delbecq/Van de Ven Method

Delbecq and Van de Ven (1974) conducted the first empirical study of their nominal grouping technique (often referred to in the literature as NGT). The purpose of the study was to compare the effectiveness of three types of groups--nominal, interacting and delphi--with respect to the quantity of ideas generated and the perceived satisfaction of the group participants.¹

They used as their definition of interacting groups the traditional discussion group format in which the problem is introduced by a discussion leader followed by relatively unstructured group discussion. The information generated in such groups is normally pooled or in some

way synthesized through voting or consensus.¹

NGT also utilized a group leader (often known as a grouper) to introduce the problem to the group members. After introduction of the problem, each member silently and individually generates their ideas concerning the specified problem. Following this, each member is asked in round robin fashion to present one of his ideas. This process is continued until all ideas have been presented and recorded by the grouper on a blackboard, sheet of paper, etc. (The group members are encouraged prior to the listing to summarize their ideas into as short a phrase as possible in order to expedite the listing task of the grouper and thus making the group session more vigorous.) There is no discussion during the listing phase. After the listing phase, there is limited interaction among the group members. This interaction has as its main purpose to clarify the ideas with some evaluation possible. The meeting may be concluded with a rank voting procedure in order that the group decision or consensus may be reached.²

The Delphi technique is very similar to the more technical form of nominal grouping (discussed earlier). It employs group participants who are physically dispersed and who never meet face-to-face. The members are sent a set of carefully designed questionnaires in order to solicit their ideas and judgments on a particular topic. The questionnaires are interspersed with feedback of opinions from earlier questionnaires and other participants. This is a variation from

¹Ibid., pp. 605-606.
²Ibid., p. 606.
technical nominal grouping (which does not employ feedback).  

As stated previously, the effectiveness of the various types of groups was measured in terms of quantity of unique ideas and the perceived satisfaction of the group members with the process. "The greater the quantity of ideas generated through a decision making process, the greater the number of ideas that are considered in making a decision, and the greater the potential for creative decision making."  

Group satisfaction was measured by administering a short questionnaire at the end of each group for all three methods. The questions asked were: (1) "To what extent did you feel free to participate and contribute your ideas?" (2) "To what extent did you feel your time was well spent in this meeting/completing the delphi questionnaires?" (3) "How satisfied are you with the quantity of ideas generated by your group?" (4) "How satisfied are you with the quality of ideas generated by your group?" (5) "To what extent do you feel the group meetings/series of delphi questionnaires is an effective way to deal with the problem?" Each item was scored on a five point scale and the total computed.  

The problem selected for the experiment was to define the job description of a part-time student counselor in a university owned or approved dormitory. The sample included 20 nominal groups, 20 interacting groups, and 20 delphi groups (each consisting of seven members). The members were selected from heterogeneous backgrounds and included  

1Ibid.  
2Ibid., p. 608.  
3Ibid., p. 609.
students, faculty, student housing administrators and academic administrators. The leaders selected were mostly graduate students.¹

Three hypotheses were selected for the study: (1) "The NGT process will be more effective than the delphi process." (2) "The delphi technique will be more effective than the interacting group process." (3) "The NGT process will be more effective than the interacting group process." Since it is hypothesis number three that is of interest in this study, it is the one that will be dwelled upon here.²

The results show that in terms of quantity, the nominal groups produced significantly more ideas than did the interacting groups. As a matter of fact, "the nominal groups generated nearly twice as many as did the interacting groups." In terms of group satisfaction, the NGT groups were again superior, significantly better than interacting groups.³

The results of the other hypotheses tested showed a significant superiority of the delphi technique over the interacting process in terms of quantity. There was no significant difference between the two in terms of satisfaction. The NGT process proved significantly better than the delphi technique for both measures of performance.⁴

The second empirical study of the Delbecq/Van de Ven method of nominal grouping was conducted under the direction of Thad Green and

¹Ibid., pp. 608, 613.
²Ibid., p. 610.
³Ibid., p. 615.
⁴Ibid.
was reported in 1975. The experiment used as its subjects 70 undergraduate students in an automatic data processing course selected from a population of 300. The participants in the study were divided into six nominal groups, three interacting groups employing permissive leaders, three interacting groups employing democratic leaders, and two interacting groups employing authoritarian leaders. Each group had five members. It was hypothesized that "the performance of nominal groups in the task of problem identification exceeds that of interacting groups using permissive, democratic, and authoritarian styles of leadership."

The nominal grouping technique employed followed the same basic format as described by Delbecq and Van de Ven. First, there was a general assembly meeting where everyone was oriented to the problem. Then the participants were broken down into their respective five man groups.

In the permissive groups, the leader performed in a very passive manner. He offered no input into the group and he listed each idea exactly as it was given to him by the group member. The democratic leader was also a recorder primarily, but he did offer aid to the group by asking such questions as, "are you sure that is a problem" or "hasn't that already been identified," or "remember that we are to identify as many problems as possible." The authoritarian leader exerted as much influence as possible to make sure that the group was on the right track and moving along as vigorously as possible. He

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would do such things as cut off discussion if he felt that it was becoming too drawn out, etc. None of the interacting leaders were allowed to contribute any ideas to the problem area being discussed.¹ (For this reason, it seems that the different leadership styles were relatively vague in terms of their normal definitional usage. For example, it seems that a leader that has no actual input into the decision of the group but simply acted as a monitor to see that the group functioned properly and as rapidly as possible could hardly be called authoritarian. Since all groups, nominal and interacting, concluded their sessions by voting on what they thought were the five most important problems identified in the meeting, and since none of the leaders took part in this voting, this researcher is of the opinion that they were all democratic to some degree.)

The groups were evaluated on three criteria. The first was the total number of different problems identified by each group. The second was the total number of unique responses identified. Uniqueness was measured by counting any response that was identified in only one group. The third measure of performance was quality. This measure was evaluated on three factors: (1) pervasiveness, a measure of how many people were affected by the problem; (2) frequency, measured by how many times a particular problem was identified; and (3) severity, determined by evaluating how the consequences of the problem could be or were detrimental.²

The results of this experiment, contrary to those of Delbecq

¹Ibid., pp. 66-68.
²Ibid., pp. 68-69.
and Van de Ven, showed no statistically significant difference between the performance of nominal groups and the performance of interacting groups regardless of the type of leadership employed. Two conditions were cited by the author as possible explanations of the contradiction. First, all of the subjects were quite aware of the problems and were adversely affected by them. Secondly, all of the subjects were volunteers and, therefore, it can be assumed that they were quite willing to cooperate and communicate freely about the problem area. Therefore, the author concludes, under such conditions, nominal groups are not superior to interacting groups regardless of the leadership style employed.¹

B. Other Delbecq/Van de Ven NCT Literature

In 1971, Delbecq and Van de Ven published an article which reviewed the literature to date concerning the effectiveness of nominal groups versus interacting groups. Most of that review contained literature already covered in this paper. However, at the conclusion of the article, they synthesized the literature in order to come up with which situations would be best served by nominal grouping methods in the decision making process and which ones would be more suitable for interacting groups.

According to the authors, nominal groups are best employed in the following situations: (1) at the beginning of the decision making process (or other phases) where fact-finding or problem identification is necessary, and (2) when it is necessary to avoid dominance by a small

¹Ibid., pp. 71-72.
number of group members. Interacting groups seem better suited to situations (1) that require the formulation of specific solutions through the synthesis of information, (2) when evaluation of information is necessary in order to assess possible solutions, and (3) when group consensus or agreement is a requirement. They suggest that when individual judgment is desired in the final decision, the nominal grouping independent voting technique should be used.\(^1\)

The final recommendation of the article is what the authors refer to as "the optimal combination of processes for creative problem solving." They say that nominal grouping should be used in the first phase for the generation of ideas. This should be followed by a structured interacting group format, preferably a recorded round-robin technique (referred to by Bouchard as the sequenced procedure of brainstorming which was discussed earlier), and by some informal discussion and evaluation in the second phase. Then nominal group voting should be used in the final stage to get a more independent judgment in the final decision stage.\(^2\)

One of the original uses of their method of nominal grouping espoused by Delbecq and Van de Ven was for program planning. In a paper presented to the Academy of Management in 1970, they pointed out the advantages of using nominal grouping when it is necessary to incorporate the opinions of clients and resource experts in the planning


\(^2\)Ibid., p. 211.
of new programs for an organization. They say that "one of the objectives of client and expert involvement is... innovation and creativity in program planning." This, according to the authors can best be facilitated by the use of nominal grouping.\(^1\)

In addition to the usual list of reasons why nominal grouping should be superior to interacting grouping found in many Delbecq/Van de Ven articles (such as focusing on one train of thought, allowing everyone to participate fully in the process, and the avoidance of evaluation and elaborating comments during the fact-finding stages) they presented many reasons why nominal group techniques are uniquely suited to the situation of involving experts and clients in the program planning process. First of all, it allows interfacing of clients, experts and organization men to be easier than in interacting situations. It reduces arguments over semantics and facilitates better the participation of non-professionals in groups which also include several professional people. It also creates sufficient tension in the organizational setting to justify new change programs.\(^2\) (This paper with only slight revisions was published in 1971.\(^3\))

Two other uses of the nominal grouping technique have been espoused by Thad Green in conjunction with other authors. Green and

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\(^2\) Ibid., pp. 214-219.

Mosley (1974) recommend that NCT be used in conjunction with OD programs. They recommend that it be used in this vain to identify organizational strengths as well as problems. Green and Pietri (1974) recommend that nominal grouping can be used as a method of improving upward communication in organizations. They say that when using it for this purpose, the groups should be composed of persons of equal rank and authority. No one of superior authority to the rest of the group members should be present. This format, according to the authors, neutralizes the inhibiting effect of formal authority relationships. "Communicating in a noninteracting way and in the absence of superiors depersonalizes individual inputs and reduces the fear of reprisal by one superior."

V. Formulation of the Hypothesis

In the literature reviewed, one important fact above all else stands out. That is that the literature is replete with conflicting results as to which is the more effective idea generation technique—nominal or interacting groups. This conflict stands out regardless of the nominal grouping technique employed. Taylor et al., Bouchard, Dunnette et al., etc. have all concluded that individuals working alone and then pooling their results are more effective and more productive than interacting brainstorming groups. Yet Hall, Blake and


Mouton say this is not so. Paskov, in a dramatic contradiction of previous results, showed very significantly that interacting brainstorming was superior to nominal brainstorming. Delbecq and Van de Ven developed their method of nominal grouping based largely on the work of Taylor et. al., Bouchard, etc. When they empirically tested their method against interacting groups, they found nominal groups again to be superior. Yet Green could find no significant evidence to back up these results.

Paskov and Green brought to bear a very significant factor concerning these findings although they worked completely independent of each other. That is, when the problem being discussed by the group is of true significance or concern to the participants, they will be much more willing to interact with each other. Under such conditions, each participant is more likely to express himself, resisting group domination by a few individuals and other inhibitory factors of group interaction. Most of the studies that found nominal groups to be superior used such nonsensical problems as "what if everyone had another thumb," or "suppose we wanted more European travelers to visit the U.S." Even though Delbecq and Van de Ven did not use a problem that was quite as unrealistic as those employed in other studies, they chose one which did not have nearly the personal interest or emotional impact as those chosen by Paskov and Green.

Conspicuous by its almost complete absence from the literature is an empirical study of nominal versus interacting groups conducted outside the academic community. All studies except the ones conducted by Dunnette, Campbell and Jaastad have chosen students as their subjects.
Although Dunnette et. al., employed an industrial sample, they used the same nonsense problems as the others whose studies they replicated. No one has ever compared the two methods using a problem of true significance to the participants and choosing a field setting for the experiment.

In summary then, two basic points should be made here: (1) In the wide variety of empirical studies performed in this area, the results are conflicting and therefore inconclusive; and (2) there are two basic shortcomings in the literature which must be explored before the usefulness of either technique is determined. The first shortcoming involves the problem selection dimension, and the second shortcoming involves extending the study to a field setting.

In order to explore fully these conflicts and shortcomings, this study will compare the effectiveness of nominal groups and sequenced brainstorming groups in a field setting employing a problem of true concern and significance to the participants. Effectiveness will be measured as a function of four variables. The variables chosen for this experiment are: (1) quantity of ideas generated, (2) quantity of unique ideas generated, (3) quality of ideas generated, and (4) satisfaction of the group participants. (Although all of these variables have been used in other studies, they have never been combined into one study. Yet it seems that if true effectiveness is to be measured, all of these variables should be incorporated.)

Specifically stated, the following general hypothesis has been chosen for this study. (The hypothesis is stated in the null because of the fact that the conflicts and shortcomings in the literature do not seem to give any indication as to the results which might be
expected.):

In a field setting employing a problem of true concern and significance to the group participants, there is no significant difference between the effectiveness of nominal groups and sequenced brainstorming groups as measured in terms of quantity, uniqueness, and quality of ideas generated and satisfaction of the group participants.

Using this general hypothesis as a basis, five specific hypotheses are formulated in order that the two group methods can be compared as to their effectiveness. These hypotheses are (stated in the null):

1. There is no significant difference in overall effectiveness between sequenced brainstorming groups and nominal groups.

2. There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the quantity of ideas generated.

3. There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the quantity of unique ideas generated.

4. There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the satisfaction of the group participants.

5. There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the quality of ideas generated.

The methodology employed in testing the hypotheses in this study will be presented in the next chapter.
CHAPTER 3

METHODOLOGY

I. Orientation to Chapter

The purpose of this chapter is to explain in detail the methodology used in conducting this study. First, the selection of the sample will be discussed. This will include discussions on (1) the participants who took part in the experiment, (2) how these participants were divided into groups, and (3) the justification of the group sizes employed in the study. Following the selection of the sample, discussions will be presented on the selection of the focus problem used in the study and the selection of the group leaders who participated.

The next two sections of this chapter will deal with the specific procedure of each group type. First, the nominal grouping procedure will be discussed. This will be followed by a section on the sequenced brainstorming procedure. After the procedures have been presented, the measurement of the variables employed in the study will be discussed. The first variable discussed will be quantity. This will be followed in order by uniqueness, quality, and satisfaction. The final section of this chapter will deal with the statistical methods that will be employed in the analysis of the data gathered.

II. Selection of Sample

A. The Participants in the Experiment

The sample selected for use in this study included 88 participants
from the Division of Family Services, Louisiana Health and Human Resources Administration, a public agency which is a part of the Louisiana State government. The Family Service Division is basically responsible for the statewide administration of such programs as food stamps, assistance payments, social services (i.e., day care centers), medical services and blind services.

The 88 participants were drawn from three levels within the division. These included: (1) Parish Directors, responsible for the administration of all of the above mentioned programs at the parish level; (2) Area Consultants, responsible for the transmission of information and advice from the State to the parish level on matters within their area of specialization (i.e., food stamps or assistance payments); and (3) Supportive Staff of Social Services, responsible for providing support at the State Office level for the parish social service programs. These levels are represented graphically on the organization chart (Figure 1).

B. The Division of Participants into Groups

The 88 participants were divided into 16 creative thinking groups, eight nominal and eight sequenced brainstorming. The groups ranged in size from a minimum of four members to a maximum of seven members. The nominal groups included two four-man groups, three five-man groups, one six-man group, and two seven-man groups (a total of 43 nominal group participants). The sequenced brainstorming groups included one four-man group, one five-man group, and six six-man groups (a total of 45 sequenced brainstorming group participants).
Figure 1. Organization Chart, Division of Family Services

*Areas from which participants were taken
C. The Justification of Group Size Selection

As was stated in the limitations section of the first chapter, previous experiments have enjoyed the luxury of being able to exactly regulate the group size dimension. However, such regulation proved to be impossible in the field setting from which this sample was drawn. The participants were on a schedule which brought a different number to each grouping session. Yet, unlike previous experiments using students, extra participants could not be told that their services would not be required. These groups were conducted in conjunction with a training program, and the State expected everyone to participate. Therefore, although the experimenter made a conscientious effort to keep group size from varying any more than necessary, exact regulation was impossible.

It is the opinion of the experimenter that the conditions cited above which prevented exact regulation of size are not unique to this particular sample but, instead, are characteristic of what can be expected when working in a field setting. Whereas, when using students in his class, a researcher can choose the exact number of participants he desires and schedule them so that an equal number will be present at each session, it seems that very seldom would he have such absolute authority in the field. I.E., suppose as a consulting project, a consultant has planned to run four nominal groups of five participants each. Yet, upon arriving, he finds that only 18 participants were available instead of the expected 20. Since the company hiring the consultant probably would expect all 18 individuals to have the opportunity to participate in a group, the consultant would have to adjust his group membership (probably having two five-man groups and two four-man groups).
On the other hand, the researcher using his own students but otherwise in the same situation (expecting 20 participants but only having 18) would have the option to release three of the participants, run three groups of five members each, and possibly reconvene a fourth group later.

The researcher in this study therefore chose to use a range of group size from four to seven. This range was arrived at by examining the group size used in previous relevant studies. Taylor, Berry and Block used a group size of four in finding nominal groups superior to brainstorming groups.\(^1\) This same number was employed in the experiments of Dunnett, Campbell and Jaastad,\(^2\) Bouchard,\(^3\) and Campbell\(^4\) in which the results were very similar to the Taylor et. al., experiment. In proving their nominal grouping technique superior to interacting groups, Van de Ven and Delbecq employed groups of seven members each.\(^5\) In the studies with somewhat conflicting results, Green\(^6\) and Paskov\(^7\) both employed five-man groups.

### III. Selection of the Focus Problem

A pertinent dimension in this study is to use a problem which

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1 Taylor et. Al., "Does Participation When. . .," p. 23.
2 Dunnette et. al., "The Effect of Group. . .," p. 31.
3 Bouchard, "Personality, Problem Solving. . .," p. 59.
4 Campbell, "Individual Versus Group. . .," p. 206.
5 Van de Ven and Delbecq, "The Effectiveness of. . .," p. 613.
7 Paskov, "Brainstorming in a Naturalistic. . .," p. 29.
is of true concern and significance to the group participants. The problem selected was, "How can communication be improved between State Staff, Parish Directors, and Area Consultants?" This problem seems to fit the true concern and significance requirement for two reasons.

First of all, the organizational relationships between the three positions are such that effective communication between them is essential to the effectiveness of any of the positions (see the organization chart, Figure 1). For example, the major function of the Area Consultant is to transmit information and advice from the State Staff to the Parish Directors. Also, in order to accomplish the mission of the administration of programs from the State level, the State Staff must be able to communicate to the Parish Directors how the programs are to be administered, for it is the Parish Director who is directly responsible for program administration. Such interrelationships make effective communication vital.

Secondly, questionnaires filled out by each participant prior to meeting for the first time indicated that effective communication was indeed a problem in administering programs. (These questionnaires were administered to the participants by those responsible for the overall conduct of the training sessions, and the results were transmitted to this researcher by Dr. Jerry Wallin.)

IV. Selection of Group Leaders

The group leaders used for both the nominal and sequenced brainstorming groups are graduate students in the Ph.D. program in Management at Louisiana State University (Mr. William Sharbrough, Mr. William McCartney, Mr. Danny Worrell, and Mr. Alev Efendioglu). All
have considerable education in the general aspects of group processes. In addition, each group leader was given a training program in the specific nominal and sequenced brainstorming procedures. The author of this study, having had prior experience in conducting both nominal and interacting groups, served as trainer for the rest of the group leaders as well as a group leader himself.

V. The Nominal Grouping Technique

As stated in the previous chapter, the nominal grouping technique utilized in this study was developed by Delbecq and Van de Ven in 1968. It has as its basis the many studies conducted by such people as Taylor, Berry and Block; Dunnette, Campbell and Jaastad; Bouchard and others. The following is a detailed summary of how a nominal grouping session was conducted in this study.

A. The Orientation Phase

In the orientation stage of the process, all participants met in a general assembly type session. In the general assembly, all of the participants were first introduced to the group leaders. They were then oriented to the focus problem of the group meeting. In orienting them to the problem, two important factors besides the problem itself were stressed. First of all, they were told not to discuss the problem with their fellow participants. Secondly, they were encouraged to think silently about the problem so that they would be able to perform at their best when the actual session began.

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1 Delbecq, Van de Ven, and Gustafson, Group Techniques for Program Planning, p. 7.
Since it was highly unlikely that any of the participants were familiar with the nominal grouping format, the next task of the general assembly leader was to tell them how a session is conducted. When this was done, the participants were broken down into their respective nominal groups.

For purposes of control, each nominal group was given an N number, and each participant was given a participant number. For example, if there were 15 participants in a general assembly, they were divided into three nominal groups, 1N, 2N, and 3N. Each participant was randomly assigned a number from one to five. All material completed by any participant was identified by a combination of these two numbers (i.e., participant number three in group 2N was to place the number 2N3 on all materials which he completed during the session). These numbers were assigned to each group and participant as they were broken down into nominal groups. It was the responsibility of the group leaders to make sure that the numbers were included on all forms and written material turned in by the group members. The group leaders were also responsible for placing the N number of the group on the list of ideas generated by that group.

After all participants had been assigned to groups and given their numbers, they were re-oriented to the focus problem, reminded that they should not discuss the problem with other participants and that they should think about the problem, introduced to their specific leader, and then adjourned to the meeting place. The general assembly meetings took approximately ten to fifteen minutes.
B. The Nominal Group Phase

At the beginning of each nominal grouping session, the group leader re-oriented the members as to the focus problem and answered any questions that the participants had concerning the nominal group procedure. He then provided each participant in his group with a listing form. Essentially, this form had the focus problem stated at the top and otherwise was completely blank. Each participant was then instructed to place his assigned number (including group and individual number as explained previously) at the top of the form.

1. Listing

During listing, each participant listed on the form provided as many ideas as possible about the problem area under consideration. The participants were encouraged prior to the beginning of the listing that they should state their ideas in a short, terse phrase--leaving out all unnecessary words and phrases. This was important since the listing had a ten minute time limit and the group members were striving to identify as many ideas as possible. (This time period, used in a similar experiment,¹ was considered to be adequate in terms of two dimensions. First of all, it was short enough to exert time pressure on the participants to work as fast as possible in generating the ideas and to state these ideas as succinctly as possible. Secondly, the time period was long enough to give the participants adequate time so that almost

¹This time limit was used in the experiment by Green, "An Empirical Analysis of Nominal and Interacting Groups," p. 68. Also, this researcher, in observing the groups that participated in the study which is the subject of this paper, found that very few of the participants used the full ten minute period and none seemed particularly pressed for time.
all of them could complete the assigned task.\textsuperscript{1} 

2. **Recording**

After the listing was completed, the next step was for the group leader to record the ideas generated by the participants on a flip chart. This was done in round-robin fashion. Beginning with any participant in the group, the leaders solicited one idea from each group member. The group member provided the leader with an idea stated as he had it on his listing form. The leader then recorded the idea legibly and in relatively large letters on the flip chart. This round-robin procedure was continued until all of the ideas generated by the group were recorded. (Pretesting on a wide variety of problems has shown that approximately four times the time allowed for the listing phase is required to complete the recording phase.\textsuperscript{2} Therefore, it should have taken about 40 minutes to complete recording. This factor was used as an integral part of the selection of time for the brainstorming groups.) The group leader numbered each idea presented by the group in consecutive order so that they could be more easily identified by the members during the voting which occurred next.

3. **Voting**

After all ideas were recorded, the next step was for the group participants to vote on the five ideas which they considered most important. The participants were instructed by the leader to list five items

\textsuperscript{1}Green, "An Empirical Analysis of. . .", p. 68

\textsuperscript{2}Ibid.
which they felt were the most important ones identified by the group. The ideas were listed in order from the most to the least important of the five. (Each participant was provided a blank piece of paper for voting.)

After they had completed the voting, the participants were then asked to fill out a short questionnaire designed to measure two of the variables employed in this study, quality of ideas produced and satisfaction of the group participants (the measurement of these variables will be discussed later in the chapter). After these questionnaires were completed, the meeting was adjourned.

VI. **Sequenced Brainstorming Procedure**

The interacting group method chosen for use in this study is the sequenced brainstorming method, which is a modification of the Osborn method of brainstorming and was developed by Thomas J. Bouchard, Jr. (see previous chapter). The primary difference between this and the Osborn method is the fact that the participants interact in an orderly, round-robin fashion rather than interjecting their ideas at random. There are four reasons why this method was chosen for this research study. First of all, as reviewed earlier, the sequenced method, according to Bouchard, is superior to the random method of idea generation. Secondly, Delbecq and Van de Ven suggest that such a procedure be used when interacting groups are necessary. They feel that when the "recorded round-robin" technique is used in interacting situations, it helps to balance participation, increases the quantity
of ideas produced, etc.\textsuperscript{1} The third reason is that, in reviewing the literature, no other method seemed to duplicate the nominal grouping technique as closely as does the sequenced brainstorming method. The only basic difference between the two seems to be the interaction factor. Finally, Bouchard's study is the only one which empirically tests this method. It seems, therefore, that more empirical evidence would be desirable.

A. The Orientation Phase

The purpose of the orientation was basically the same as it was for the nominal groups. The participants were oriented to the focus problem, introduced to the respective group leaders, broken down into groups, and assigned a number. The numbering system was exactly the same as for the nominal groups except that the 'N' was replaced with an 'I'. Therefore, the groups were numbered 1I, 2I, 3I, etc.

In explaining the group procedure, the leader of the orientation session very carefully went over the guidelines for a brainstorming session as stated by Osborn (i.e., criticism is ruled out, free-wheeling is welcomed, quantity is desired, and combination and improvement is sought). In addition to this, he explained to the group that a round-robin format would be followed in which ideas are expressed by members (and recorded by the leader) only when it is the member's turn to speak. Members who have no ideas when it is their turn were instructed to signify with the word "pass."

Prior to adjourning the orientation assembly, the participants

\textsuperscript{1}Van de Ven and Delbecq, "Nominal Versus Interacting Group Processes for Committee Decision Making Effectiveness," P. 209.
were reminded not to discuss the problem with other participants, to think about the problem, and re-oriented as to what the focus problem was. The meeting was then adjourned and the groups proceeded with their leader to the designated meeting place.

B. The Sequenced Brainstorming Phase

The brainstorming sessions began as did the nominal group sessions, with an orientation from the leader reiterating the problem to be discussed and the method to be used.

Next, beginning with any participant and proceeding in a round-robin fashion, the group leader solicited the ideas of the group. Like the nominal groups, the participants were encouraged to be as succinct as possible in stating ideas. As each idea was stated, the leader recorded it on a flip chart in the same manner as in the nominal groups. The leader then proceeded to the next idea. Except for control purposes, i.e., reminding the group against criticism or other brainstorming rule violations, the leader did not interact with his group. He definitely did not interject any of his own ideas concerning the problem of discussion.

Each brainstorming session was allowed a maximum of 50 minutes to generate ideas. This time was arrived at by adding the time required in the listing phase of the nominal groups to the time required for recording in those groups. This method has been used in several other group experiments and is considered by the author to be the simplest and most reliable manner to reduce any variation in group performance
which may be caused by time.\(^1\)

The session was completed with a voting phase exactly like the one employed in the nominal groups. Upon completion of the voting, the groups were asked to fill out the short questionnaire (mentioned previously) in order to measure quality and satisfaction. When these were completed, the session was adjourned.

VII. Measurement of Variables

As stated previously, the dependent variable chosen for this study was group effectiveness. Group effectiveness was measured as a function of four independent variables: (1) quantity of ideas produced, (2) quantity of unique ideas produced, (3) quality of ideas produced, and (4) satisfaction of the group participants. The following is an explanation of how these independent variables were measured in the study.

A. Quantity

"Quantity, quantity, and more quantity," are the words of Osborn in explaining the need for as many ideas as possible in creative thinking situations. According to Osborn, it only makes sense to assume that the more ideas generated on any problem the higher the quality of solution that can be expected. He points to many examples for the need

---

\(^1\)This method of determining time limitations for the groups was first used by Thomas J. Bouchard, Jr. and Melana Hare in "Size, Performance, and Potential in Brainstorming Groups," Journal of Applied Psychology vol. 54 (1970), p. 54. They refer to this as equal man-hour comparison. Green also used it in "An Empirical Analysis of Nominal and Interacting Groups," p. 68.
for quantity, explaining that scientific discovery is normally not the product of a single revelation; but, instead, it is the culmination of many ideas and experiments and combinations of ideas and experiments.\(^1\)

This same line of thinking can be traced throughout the literature. Almost all empirical tests on group effectiveness have used quantity as a primary measure. Parnes found a significant relationship between quantity and quality of ideas generated.\(^2\)

Quantity in this study was measured by simply counting the number of different ideas produced by each type of group. Since no ideas should have been counted more than once in any one group, a subjective evaluation was made to eliminate duplications. Independent judges were used to make this evaluation.\(^3\) Discrepancies among judges were discussed before any decision was made concerning the possible duplication.

B. Uniqueness

Another commonly used measure of group effectiveness is uniqueness. The common definition of a unique idea is "any response that is mentioned by only one of the groups used in the experiment."\(^4\)

It was measured, therefore, by counting the number of ideas mentioned only once for each type of group. The same panel of judges was


\(^2\)Parnes, "Effects of Extended Effort. . . .", p. 121.

\(^3\)The researcher of this study and two graduate students from the Sociology Department at LSU (Mr. Kevin Smith and Mr. Steven Doeren) acted as the judges. Each was provided with a copy of the ideas generated by the various groups and instructed to eliminate any duplicate ideas in each group.

\(^4\)Green, *An Empirical Analysis of. . . .", p. 68.
employed to determine the number of unique ideas produced in much the same way that they were utilized to eliminate duplications in the measurement of quantity. ¹

In defending the choice of uniqueness as a significant measure of group effectiveness, many experts can be cited. Osborn himself makes such statements as, "scientists seldom fail to pay attention to the preposterous,"² or "the wilder the idea the better; it is easier to tame down than to think up."³ In a previously cited quotation by Richards and Greenlaw concerning the need for creativity in the managerial decision making process, they say that "unique or unusual ideas and alternatives to meet organizational problems may defy development by any other means."⁴ The simple fact that uniqueness is almost uniformly applied as a measure of effectiveness by such people as Taylor et. al., Bouchard, Van de Ven and Delbecq, and Green will attest to its importance.

C. Quality

In measuring the quality of the ideas generated, two measures were employed in this study. First of all, the group participants were

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¹ In measuring uniqueness, the panel of judges used the same idea list used in allowing for duplications. This time they counted the number of ideas that was mentioned only once by each group type. That is, they counted the number of ideas that were mentioned only once in all of the nominal groups and the number of ideas that was mentioned only once in all of the sequenced brainstorming groups.


³ Ibid., p. 84.

⁴ Richards and Greenlaw, Management Decisions . . ., p. 56.
asked to measure the quality of the ideas generated by their respective groups. Secondly, the supervisor of the participants rated the quality of the ideas identified by each group as most important.

1. Quality as Measured by Participants

In the majority of nominal group and brainstorming studies performed thus far in which an attempt was made to evaluate the quality of ideas generated, the experimenter himself, often in conjunction with a panel of judges, attempted to make the evaluation. For many of the studies, this may have been appropriate, assuming that the experimenter was very familiar with the problem area under discussion by the groups. However, in a field setting in which the researcher is not comparable to the participants in terms of expertise in the area, it would seem more logical that the participants themselves would be the ones to rate the quality of ideas generated.

For this reason, each individual participant, immediately after the group session was completed, was asked to rate his group on the overall quality of the ideas produced. In order to accomplish this, the researcher adapted Thomas Bouchard's method of rating quality to the purposes of this study.¹

The following question was a part of the questionnaire that was given to each participant immediately after the voting phase of his particular group: "How practical or important do you consider the ideas generated within your group to be in terms of identifying valid

problems within the area of discussion?" The following five point scale was provided each participant in order to answer the question:

1 = Impractical or unimportant
2 = Not too practical or not too important
3 = Somewhat practical or somewhat important
4 = Practical or important
5 = Highly practical or highly important

A final score was calculated for each group. This was done by averaging together the individual responses of each participant in each group.

2. Quality as measured by the Supervisor

After all the group sessions were completed, the researcher then asked the supervisor of the participants (who is the head of the Social Services Supportive Staff, see the organizational chart in figure 1) to rate the quality of the ideas that were generated by the various groups in the study. In order to accomplish this task, the supervisor was given the complete list of ideas generated by the groups. This list was broken down so that the ideas of each group was listed separately. He was also provided with sixteen copies of the same question that the participants answered when they rated quality, one for each group.

He then rated the quality of the ideas generated by each group in the following manner. First of all, he rated each idea in each group on the same five point scale employed by the participants in rating quality. He then averaged these ratings together and came up with a total quality rating for each group who participated in the study.
D. Satisfaction

The final variable chosen as a measure of group effectiveness was the perceived satisfaction that the participants received from the particular group that they participated in. According to Delbecq and Van de Ven, if a decision maker feels dissatisfied with the process or the decision made through the process, then the decision may fail to be adopted. They go on to say that "the greater the participant's perceived level of satisfaction with a decision making process and outcome, the greater the probability of solution adoption."^1

I have chosen to use the same method of measuring perceived satisfaction that was employed by Delbecq and Van de Ven in their study of nominal, delphi and interacting groups.\(^2\) The following five questions were included on the questionnaire filled out by each participant at the end of the group session:

1. To what extent did you feel free to participate and contribute your ideas?
2. To what extent did you feel your time was well spent in this meeting?
3. How satisfied are you with the quantity (number) of ideas generated by your group?
4. How satisfied are you with the quality of ideas generated by your group?
5. To what extent do you feel that the group meetings are an effective way to deal with the problem?

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\(^{1}\)Van de Ven and Delbecq, "The Effectiveness of. . .," p. 609.

\(^{2}\)Ibid.
Each item was scored on a five point scale. A total was derived for each participant by adding the points from each response and averaging them together to get a total satisfaction score for each participant. The scores for each participant in each group were then averaged together to get an overall group satisfaction score.

VIII. Statistical Evaluation

In almost all of the studies conducted thus far comparing nominal groups with some form of interacting groups, the statistical method employed in analyzing the data was analysis of variance (or ANOVA). For example, the studies of Taylor, Berry and Block;\(^1\) Dunnette, Campbell and Jaastad;\(^2\) Bouchard;\(^3\) Delbecq and Van de Ven;\(^4\) Paskov;\(^5\) and Green\(^6\) all employed ANOVA in analyzing their data. Since this study is quite similar to those mentioned and since in extending this study to a field setting it is necessary to replicate previous studies as closely as possible, ANOVA has been chosen as the statistical tool to be utilized in this study.

Analysis of variance is a statistical technique which is designed to test for any significant difference between two or more

\(^{1}\)Taylor, Berry and Block, "Does Group Participation When Using Brainstorming...", p. 34.

\(^{2}\)Dunnette, Campbell and Jaastad, "The Effect of Group Participation...", p. 33.

\(^{3}\)Bouchard, "Personality, Problem Solving...", p. 59

\(^{4}\)Van de Ven and Delbecq, "The Effectiveness of...", p. 610.

\(^{5}\)Paskov, "Brainstorming in a Naturalistic...", p. 34.

\(^{6}\)Green, "An Empirical Analysis of...", p. 69.
samples which are drawn from the same population. The means of the various samples are used as the test statistic when ANOVA is employed. There are two basic ANOVA models. One is the fixed effects model and the other is the random effects model. The fixed effects model is designed to be used when all of the categories of the various factors are considered in testing the variance. The random effects model should be used when there are many possible categories of the various factors, and only certain ones are selected at random to test the variance.\footnote{Harold L. Pazer and Lloyd A. Swanson, \textit{Modern Methods for Statistical Analysis} (Scranton, Pa.: Intext Educational Publishers, 1972), pp. 210-224.} In the context of this study, the major factor considered in all of the models is group type. There are only two possible categories of group type, nominal and sequenced brainstorming. Since both of these are considered in every test run, the fixed effect model is the proper one to utilize in this study.

ANOVA models are also classified according to the number of factors that are considered at any one time. When only one factor is considered, the model is a one-way ANOVA. When two factors are considered, the model is a two-way ANOVA, etc. For example, assume that a company has sales data on four salesmen in three cities. If they wanted to know if there is any significant difference between the records of the salesmen, they would use a one-way model. But if they wanted to know if there was any significant difference between salesmen and also any significant difference between cities, they could test for these differences simultaneously by employing a two-way ANOVA model.\footnote{Ibid.}
Five basic ANOVA models are employed in this study. These models will be discussed in a great amount of detail in the next chapter. Therefore, in this section only a brief preview of each model will be presented. These models are as follows:

(1) A two-way, fixed factor model designed to test whether or not there is any significant difference between nominal groups and sequenced brainstorming groups in terms of total effectiveness. Total effectiveness is defined as effectiveness which is measured by combining all of the variables employed in the study.

(2) A one-way, fixed factor model designed to test for any significant difference between nominal and sequenced brainstorming groups in terms of the quantity of ideas generated.

(3) A one-way, fixed factor model designed to test for any significant difference between the two group types in terms of the number of unique ideas generated.

(4) A one-way, fixed factor model designed to test for any significant difference between the two group types in terms of the perceived satisfaction of the participants.

(5) A two-way, fixed factor model designed to test for any significant difference between group type in terms of the quality of the ideas generated and also designed to test for any significant difference between the two measures of quality employed in this study.
CHAPTER 4

STATISTICAL ANALYSIS

I. Orientation to Chapter

As was stated in the previous chapter, the statistical tool employed in this study to analyze the results of the data gathered is analysis of variance (ANOVA). Five principal ANOVA models are utilized: (1) a model of total effectiveness; (2) a model of effectiveness based on the quantity of ideas generated; (3) a model of effectiveness based on the quantity of unique ideas generated; (4) a model of effectiveness based on the satisfaction of the group participants; and (5) a model of effectiveness based on the quality of the ideas generated. The models of effectiveness based on quantity, effectiveness based on uniqueness, and effectiveness based on satisfaction are one-way, fixed effects models. The models of total effectiveness and effectiveness based on quality are two-way, fixed effects models. (The explanation of one-way, two-way, fixed effects, etc. was presented in detail in the methodology chapter.)

In this chapter the primary purpose is to discuss in detail each of the models mentioned above. Included in this discussion will be a short explanation of the purpose of each model followed by the specific hypothesis or hypotheses each model is designed to test. Next, the statistical results of each model will be presented. (All of the statistical analysis performed in this study was done via computer
using the Statistical Analysis System (SAS) available at LSU.\(^1\)

In addition to the primary purpose of testing for any statistically significant differences between sequenced brainstorming groups and nominal groups, this chapter also has a secondary purpose. That is, to test whether or not the variables employed in the study (quantity, uniqueness, satisfaction, quality measured by the participants and quality measured by the supervisor of the participants) are independent measures. This will be accomplished by performing a correlation analysis of the variables.

II. Summary of Data

Specifically how the data for this study was gathered and measured was covered in the previous chapter. The purpose of this section is to present a summary view of the data as it was utilized in the various ANOVA models and in the correlation analysis. As may be recalled from the methodology chapter, quantity and uniqueness were measured by counting the absolute number of ideas and the absolute number of unique ideas that were generated by the various groups. A panel of independent judges was utilized to allow for duplications when measuring quantity and to actually count the number of unique ideas. Data on the satisfaction of the participants and the quality of the ideas generated as judged by the participants was gathered via a six-question questionnaire. The responses were measured on a five-point scale. Quality as perceived by the supervisor was measured by having the supervisor of the

participants answer the same quality question as did the participants for the ideas generated by each group. A five point scale was also used for this measure.

Table 1 (below) is a presentation of the data that was gathered for the eight sequenced brainstorming groups. Table 2 represents the data gathered for the eight nominal groups. In these tables (and throughout the remainder of the chapter) sequenced brainstorming groups will be symbolically designated 'I' and nominal groups 'N'. Quantity will be designated 'QU', uniqueness will be designated 'UN', satisfaction will be designated 'SA', quality as measured by the participants will be designated 'Q1', and quality as measured by the participants' supervisor will be designated 'Q2'.

### TABLE 1

<table>
<thead>
<tr>
<th>Group</th>
<th>QU</th>
<th>UN</th>
<th>SA</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1I</td>
<td>34</td>
<td>30</td>
<td>4.200</td>
<td>4.333</td>
<td>4.160</td>
</tr>
<tr>
<td>2I</td>
<td>28</td>
<td>16</td>
<td>3.920</td>
<td>4.400</td>
<td>3.800</td>
</tr>
<tr>
<td>3I</td>
<td>35</td>
<td>14</td>
<td>4.367</td>
<td>4.000</td>
<td>4.300</td>
</tr>
<tr>
<td>4I</td>
<td>25</td>
<td>10</td>
<td>4.467</td>
<td>4.667</td>
<td>3.500</td>
</tr>
<tr>
<td>5I</td>
<td>22</td>
<td>11</td>
<td>4.200</td>
<td>4.500</td>
<td>4.280</td>
</tr>
<tr>
<td>6I</td>
<td>24</td>
<td>10</td>
<td>4.500</td>
<td>4.833</td>
<td>4.600</td>
</tr>
<tr>
<td>7I</td>
<td>22</td>
<td>13</td>
<td>4.167</td>
<td>4.167</td>
<td>4.600</td>
</tr>
<tr>
<td>8I</td>
<td>19</td>
<td>5</td>
<td>4.400</td>
<td>4.333</td>
<td>4.600</td>
</tr>
</tbody>
</table>
TABLE 2
NOMINAL GROUP DATA

<table>
<thead>
<tr>
<th>Group</th>
<th>QU</th>
<th>UN</th>
<th>SA</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1N</td>
<td>20</td>
<td>15</td>
<td>3.857</td>
<td>4.286</td>
<td>5.000</td>
</tr>
<tr>
<td>2N</td>
<td>10</td>
<td>9</td>
<td>4.050</td>
<td>4.500</td>
<td>4.800</td>
</tr>
<tr>
<td>3N</td>
<td>26</td>
<td>19</td>
<td>3.880</td>
<td>4.200</td>
<td>5.000</td>
</tr>
<tr>
<td>4N</td>
<td>17</td>
<td>6</td>
<td>4.467</td>
<td>4.667</td>
<td>4.600</td>
</tr>
<tr>
<td>5N</td>
<td>16</td>
<td>8</td>
<td>4.320</td>
<td>4.200</td>
<td>4.200</td>
</tr>
<tr>
<td>6N</td>
<td>14</td>
<td>6</td>
<td>3.900</td>
<td>4.500</td>
<td>4.600</td>
</tr>
<tr>
<td>7N</td>
<td>35</td>
<td>21</td>
<td>4.029</td>
<td>4.571</td>
<td>4.300</td>
</tr>
<tr>
<td>8N</td>
<td>20</td>
<td>10</td>
<td>3.880</td>
<td>4.200</td>
<td>4.500</td>
</tr>
</tbody>
</table>

III. Model of Total Effectiveness

The model of total effectiveness is designed to test whether or not there is any significant overall difference in effectiveness between the sequenced brainstorming groups and the nominal groups. Total effectiveness is defined in this study as effectiveness when all of the variables measured are taken into consideration. Therefore, 'I' will be compared with 'N' in terms of 'QU', 'UN', 'SA', 'Q1', and 'Q2'.

The basic hypothesis tested in this model may be stated as follows (in the null):

$$H_0: \text{There is no significant difference in overall effectiveness between sequenced brainstorming groups and nominal groups.}$$

Symbolically stated as ($M = \text{mean}$):

$$H_0: M_I = M_N$$

In testing this hypothesis, the following analysis of variance table is presented for the total effectiveness model:
<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F Value</th>
<th>Prob. &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row (R)</td>
<td>1</td>
<td>52.46694</td>
<td>52.46694</td>
<td>2.86732</td>
<td>.0910</td>
</tr>
<tr>
<td>Column (C)</td>
<td>4</td>
<td>4331.72667</td>
<td>1082.93167</td>
<td>59.18234</td>
<td>.0001</td>
</tr>
<tr>
<td>R x C</td>
<td>4</td>
<td>124.99404</td>
<td>31.24851</td>
<td>1.70773</td>
<td>.1570</td>
</tr>
<tr>
<td>Residual</td>
<td>70</td>
<td>1280.87572</td>
<td>18.29822</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>5790.06337</td>
<td>73.29194</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(In the ANOVA table above, several things should be explained before the results of the above hypothesis are discussed. First of all, row variation represents the variation between group types--'I' versus 'N'. This then is the statistical analysis which will be utilized in testing the basic hypothesis of the total effectiveness model. Column variation represents the variation between the variables that were employed in measuring total effectiveness--'QU', 'UN', 'SA', 'Q1', and 'Q2'. Although, in the context of this study, there is no need to test a hypothesis concerning the variation between the specific variables, it is necessary that this variation be included in the model. The reason for this is that if the analysis of the column variation were omitted from the model, it would automatically be added into the value of the residual, or unexplained variation. If this were done, the value of the F statistic would be tremendously distorted since the residual forms the denominator in calculating the F statistic. The same basic rationale applies in including the R x C interaction variation in the model, although--as can be seen from examining the ANOVA table--the R x C interaction variation was not nearly as large as the column variation variation.)
and, therefore, would not have had nearly the impact on the value of the residual. In other words, in order to be as accurate as possible in testing the hypothesis, as much of the variation as possible should be explained so that the value of the residual will truly represent only the unexplained variation.\(^1\)

Now, referring back to the basic hypothesis of this model (testing for the overall difference between the two group types), the sequenced brainstorming groups had a mean score of 10.532; whereas, the nominal groups had a mean score of 8.913. In analyzing the difference between these means, the ANOVA table (Table 3) points out that the probability of the null hypothesis being true is .0910. In other words, it can be stated at a confidence level of 90.9 percent that the sequenced brainstorming groups in this study were superior to the nominal groups in terms of overall effectiveness.

IV. Model of Effectiveness Based on Quantity (QU)

The model of effectiveness based on quantity is designed to test whether or not there is any significant difference in the effectiveness of the two group types when only quantity is considered. In other words 'I' will be compared with 'N' in terms of 'QU'. (Keep in mind that the quantity of ideas generated was adjusted for duplications prior to the statistical analysis).

The hypothesis for this model (stated in the null) is:

---

\(^1\) The information for the above explanation was made available to this researcher through the kind, considerate and patient assistance of Dr. Barton R. Farthing, Professor of Experimental Statistics and Head of the Department of Experimental Statistics, College of Agriculture, Louisiana State University, Baton Rouge, Louisiana.
H₀: There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the quantity of ideas generated.

Symbolically stated as:

H₀: M_qui = M_qun

Statistical analysis shows a mean 'QU' for the sequenced brainstorming groups of 26.175 and a mean 'QU' for the nominal groups of 19.75. ANOVA results comparing the difference in these means appear in the following table.

**TABLE 4**

ANOVA TABLE FOR MODEL OF EFFECTIVENESS BASED ON QUANTITY

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F Value</th>
<th>Prob. &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>1</td>
<td>162.5625</td>
<td>162.5625</td>
<td>3.46734</td>
<td>.0808</td>
</tr>
<tr>
<td>Residual</td>
<td>14</td>
<td>656.3750</td>
<td>46.8839</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>818.9375</td>
<td>54.5958</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above table, it can be seen that there is only a .0808 probability that the null hypothesis for the model of effectiveness based on quantity is supported. Therefore, it can be stated at a confidence level of 91.92 percent that the effectiveness of sequenced brainstorming groups is superior to that of nominal groups in terms of the quantity of ideas generated by each.

V. Model of Effectiveness Based on Uniqueness (UN)

As mentioned in previous chapters, uniqueness is a very traditional measure in studies testing various creative idea generation
techniques. A unique idea is defined as one which is mentioned only once by a particular group type. This model is designed to test whether or not there is any significant difference in effectiveness between 'I' and 'N' when the generation of the number of unique ideas is considered.

The null hypothesis for this model is:

\[ H_0: \text{There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the quantity of unique ideas generated.} \]

Symbolically stated as:

\[ H_0: \mu_{uni} = \mu_{unn} \]

The mean number of unique ideas generated by the sequenced brainstorming groups was 13.625, whereas the mean number of unique ideas generated by the nominal groups was 11.75. The ANOVA table analyzing the variation between these means is presented below.

**TABLE 5**

**ANOVA TABLE FOR MODEL OF EFFECTIVENESS BASED ON UNIQUENESS**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F Value</th>
<th>Prob. &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>1</td>
<td>14.0625</td>
<td>14.0625</td>
<td>.31684</td>
<td>.5882</td>
</tr>
<tr>
<td>Residual</td>
<td>14</td>
<td>621.3750</td>
<td>44.3839</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>635.4375</td>
<td>42.3625</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples of previously cited studies employing uniqueness as a measure are: Taylor, Berry and Block, "Does Group Participation When Using Brainstorming Facilitate or Inhibit Creative Thinking," p. 23; Campbell, "Individual vs. Group Problem Solving in an Industrial Sample," p. 206; Van de Ven and Delbecq, "The Effectiveness of Nominal, Delphi, and Interacting Group Decision Making Processes," p. 609; and Green, "An Empirical Analysis of Nominal and Interacting Groups," p. 68.
As can be seen from the above table, the probability that the null hypothesis is supported is .5882. Therefore, it can be concluded that there is no significant difference between the effectiveness of sequenced brainstorming groups and nominal groups in terms of the number of unique ideas generated.

VI. Model of Effectiveness Based on Satisfaction (SA)

It would seem very important in any group process for the participants to feel a certain sense of satisfaction with the process and its results. This model is designed to test the effectiveness of the two group types, 'I' and 'N', in terms of the perceived satisfaction (SA) of the group participants.

The null hypothesis for this model is:

\[ H_0: \text{There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the satisfaction of the group participants.} \]

Which may be stated symbolically as:

\[ H_0: \mu_{sai} = \mu_{san} \]

The sequenced brainstorming groups achieved a mean 'SA' score of 4.2776. The mean score of the nominal groups was 4.0479. As can be seen from the ANOVA table below, the probability that there is no significant difference between these means is only .0452. Therefore, it can be said with a 95.48 percent level of confidence that the sequenced brainstorming groups are more effective in terms of the satisfaction of the participants than are the nominal groups.
TABLE 6

ANOVA TABLE FOR MODEL OF EFFECTIVENESS
BASED ON SATISFACTION

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F Value</th>
<th>Prob. &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>1</td>
<td>.21114025</td>
<td>.21114025</td>
<td>4.72799</td>
<td>.0452</td>
</tr>
<tr>
<td>Residual</td>
<td>14</td>
<td>.62520475</td>
<td>.04465748</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>.83634500</td>
<td>.05575633</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VII. Model of Effectiveness Based on Quality (Q1 and Q2)

The basic purpose of the model of effectiveness based on quality is to test for any significant difference in effectiveness between sequenced brainstorming groups and nominal groups in terms of the quality of the ideas generated. The model also has two other purposes. It will test for any significant difference between the two measures of quality—quality as rated by the participants, 'Q1', and quality measured by the participants' supervisor, 'Q2'. It will also test for any significant interactions between group type ('I' and 'N') and quality rating ('Q1' and 'Q2').

Therefore, the basic hypothesis of this model may be stated (in the null):

\[ H_0: \text{There is no significant difference between the effectiveness of sequenced brainstorming groups and the effectiveness of nominal groups in terms of the quality of ideas generated.} \]

Stated symbolically as:

\[ H_0: M_{q1/q2} = M_{q1/q2n} \]

The hypothesis testing for the difference in the measures is stated as follows (in the null):
H\textsubscript{0}: There is no significant difference between the measure of quality as rated by the group participants and the measure of quality as rated by the supervisor of the group participants.

Stated symbolically as:

\begin{align*}
H\textsubscript{0}: & \quad M_{q1} = M_{q2} \\
\text{The final hypothesis for this model, testing for the interactions, is stated as follows (in the null):} \\
H\textsubscript{0}: & \quad \text{There is no significant interaction between the group types and the measures of quality.} \\
\text{Which may be stated symbolically as:} \\
H\textsubscript{0}: & \quad M_{i/n} \times M_{q1/q2} = 0
\end{align*}

The following ANOVA table summarizes the results of the statistical analyses performed to test the preceding hypotheses.

\textbf{TABLE 7}

\textbf{ANOVA TABLE FOR MODEL OF EFFECTIVENESS BASED ON QUALITY}

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>DF</th>
<th>SS</th>
<th>MS</th>
<th>F Value</th>
<th>Prob. &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row(R)</td>
<td>1</td>
<td>0.29089378</td>
<td>0.29089378</td>
<td>3.25734</td>
<td>0.0785</td>
</tr>
<tr>
<td>Column(C)</td>
<td>1</td>
<td>0.00729028</td>
<td>0.00729028</td>
<td>0.08613</td>
<td>0.7739</td>
</tr>
<tr>
<td>R x C</td>
<td>1</td>
<td>0.33394878</td>
<td>0.33394878</td>
<td>3.73946</td>
<td>0.0603</td>
</tr>
<tr>
<td>Residual</td>
<td>28</td>
<td>2.50051287</td>
<td>0.08930403</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>3.13264572</td>
<td>0.10105308</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the context of the first hypothesis, testing for the difference in quality between groups types, the 'I' groups had a mean quality score of 4.3171, and the 'N' groups had a mean quality score of 4.5078. As can be seen from the above ANOVA results, there is only a .0785 probability that the null hypothesis is supported. Therefore, it can
be stated with a 92.15 percent level of confidence that nominal groups are more effective than sequenced brainstorming groups in terms of the quality of ideas generated.

In testing the second hypothesis, the table above notes that there is a .7739 probability that there is no significant difference between 'Q1' and 'Q2'. Therefore, the null hypothesis in this case is strongly supported.

In testing for the interactions between group type and quality rating, the ANOVA table points out that there is only a .0603 probability that there are no significant interactions. Therefore, it can be stated at a 93.97 percent level of confidence that group type and quality rating significantly interact with each other.

VIII. Test for Independence of Variables

As was stated in the orientation section, there is a secondary purpose of this chapter to test whether or not the variables employed in this study are independent of one another. Correlation analysis is the statistical tool used here to test for independence.⁴

The hypothesis employed in testing for independence may be stated as follows (in the null):

\[ H_0: \text{There is no significant correlation between the variables of quantity, uniqueness, satisfaction, quality as measured by the group participants and quality as measured by the supervisor of the group participants.} \]

This may be stated symbolically as:

\[ H_0: R_{i,j=1,5;i\neq j} = 0 \]

⁴According to Pazer and Swanson, Modern Methods for Statistical Analysis, p. 313, correlation analysis is a valid method for determining whether or not variables are independent of one another.
where 'R' represents the coefficient of correlation, 'i' represents the values in the rows of the correlation matrix and 'j' represents the columns in the correlation matrix.

Table 8, which follows, is the computer generated correlation matrix for the variables employed in this study. The top number for each matrix value represents the actual value of the correlation coefficient ('R'). (A minus sign in front of the 'R' indicates negative correlation.) The bottom number for each matrix value represents the probability that there is no significant correlation between the two variables.

**TABLE 8**

CORRELATION MATRIX FOR 'QU', 'UN', 'SA', 'Q1', 'Q2'

<table>
<thead>
<tr>
<th></th>
<th>QU</th>
<th>UN</th>
<th>SA</th>
<th>Q1</th>
<th>Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>QU</td>
<td>1.0000</td>
<td>.7592</td>
<td>.0695</td>
<td>-.1692</td>
<td>-.3985</td>
</tr>
<tr>
<td></td>
<td>.0000</td>
<td>.0009</td>
<td>.7934</td>
<td>.5373</td>
<td>.1233</td>
</tr>
<tr>
<td>UN</td>
<td>.7592</td>
<td>1.0000</td>
<td>-.3012</td>
<td>-.2180</td>
<td>-.1235</td>
</tr>
<tr>
<td></td>
<td>.0009</td>
<td>.0009</td>
<td>.2561</td>
<td>.5780</td>
<td>.6525</td>
</tr>
<tr>
<td>SA</td>
<td>.6950</td>
<td>-.3012</td>
<td>1.0000</td>
<td>.3384</td>
<td>-.3420</td>
</tr>
<tr>
<td></td>
<td>.7934</td>
<td>.2561</td>
<td>.0000</td>
<td>.1976</td>
<td>.1925</td>
</tr>
<tr>
<td>Q1</td>
<td>-.1692</td>
<td>-.2180</td>
<td>.3384</td>
<td>1.0000</td>
<td>-.1806</td>
</tr>
<tr>
<td></td>
<td>.3373</td>
<td>.5780</td>
<td>.1976</td>
<td>.0000</td>
<td>.5095</td>
</tr>
<tr>
<td>Q2</td>
<td>-.3985</td>
<td>-.1235</td>
<td>-.3420</td>
<td>-.1806</td>
<td>1.0000</td>
</tr>
<tr>
<td></td>
<td>.1233</td>
<td>.6525</td>
<td>.1925</td>
<td>.5095</td>
<td>.0000</td>
</tr>
</tbody>
</table>

As can be seen from the table above, the only two variables which are highly correlated are 'QU' and 'UN' (there is only a .0009 probability that these are not significantly correlated). Therefore, it can be stated that, with the exception of quantity and uniqueness,
the variables employed in this study are independent of each other.

Two more points of interest to this study have been brought to light by the correlation analysis performed. First of all, as can be seen from table 8, there is no significant correlation between 'Q1' and 'Q2'. In other words, there is no relationship between quality as rated by the participants and quality as rated by the participants' supervisor. Secondly, there is a strong (although not significant) negative correlation between 'QU' and 'Q2'. In other words, there is a possibility that as the quantity of ideas increases the quality of the ideas decreases. (The significance of these results will be discussed in more detail in the next chapter.)

IX. Summary of Statistical Results

The following is a summary of the results that were obtained through statistical analysis in this study:

(1) In terms of overall effectiveness, that is when all of the variables employed in the study were considered collectively, the sequenced brainstorming groups were superior to the nominal groups.

(2) The sequenced brainstorming groups were also superior in effectiveness to the nominal groups in terms of the quantity of ideas generated.

(3) There was no significant difference in the effectiveness of the two group types in terms of the quantity of unique ideas generated.

(4) The sequenced brainstorming groups were significantly more effective than the nominal groups in terms of the perceived satisfaction of the group participants.
(5) When effectiveness was defined in terms of the quality of ideas generated, the nominal groups were superior to the sequenced brainstorming groups.

(6) There was no significant difference between the measure of quality as rated by the participants and quality as rated by the participants' supervisor. However, there was significant interactions between group type and quality rating.

(7) Quantity and uniqueness were highly correlated. The remaining variables were not significantly correlated and, therefore, can be considered independent measures.

(8) There was no significant relationship between 'Q1' and 'Q2'. Also, there was a strong, but not significant, negative relationship between 'QU' and 'Q2'.

The practical and theoretical implications of these statistical results will be discussed in the next chapter.
CHAPTER 5

SUMMARY AND CONCLUSIONS

I. Orientation to Chapter

As was stated in the introductory chapter, the purpose of this study is to compare the nominal grouping and sequenced brainstorming methods of creative idea generation. Thus far in the dissertation (1) the topic has been introduced, (2) the related literature has been reviewed, (3) the methodology for comparing the two techniques has been presented, and (4) the statistical analysis has been performed.

The major purpose of this chapter is to draw the overall conclusions of this study based on the pertinent facts that have been gathered and analyzed in the previous chapters. The initial section of this chapter will give a general summary of how the study was conducted. This will include a re-statement of the basic hypothesis, a short explanation of what the two group techniques are, and a review of what took place in the experiment. The next four sections will be dedicated to drawing the conclusions of the study. These sections include: (1) conclusions concerning the conflicts in the literature, (2) conclusions concerning the shortcomings in the literature, (3) conclusions dealing with certain conceptual considerations that were alluded to in the previous chapters, and (4) conclusions concerning the secondary hypotheses tested in the study.
The next two sections of the chapter will include a discussion of the limitations which arose as the study proceeded, and a presentation of some areas of future research which may be explored. The final section of the chapter will summarize the conclusions of this dissertation.

II. Summary of How the Study Was Conducted

The basic hypothesis of this study was stated as follows:

In a field setting employing a problem of true concern and significance to the group participants, there is no significant difference between the effectiveness of nominal groups and sequenced brainstorming groups as measured in terms of quantity, uniqueness, and quality of the ideas generated and satisfaction of the group participants.

In this section, the method utilized to test this hypothesis will be summarized.

As may be recalled from the definitional section of Chapter One, nominal groups may be defined in two ways. First of all, there is the technical definition--groups in name only--which dominated the early nominal group research. Secondly, there is the Van de Ven/Delbecq definition--groups in which the participants generate ideas individually (in writing) while in the presence of the other group members. The definition employed in this study is the Van de Ven/Delbecq version.

The sequenced brainstorming procedure was developed by Thomas J. Bouchard, Jr. as an improvement over the more random method of brainstorming espoused by Alex Osborn (see pages 10 and 18-23 above). It involves the verbal generation of ideas by the participants in a sequenced (or round-robin) fashion.

Both the nominal grouping technique and the sequenced brainstorming technique have as their basis organized creative thinking.
That is, both methods were designed to generate as many creative ideas as possible concerning the problem area under consideration. The most appropriate places in the decision making process where these techniques can best be utilized are in the problem identification and alternative identification stages (see pages 7-15).

There were a total of sixteen groups employed in the study—eight nominal and eight sequenced brainstorming—drawn from the Division of Family Services, Louisiana Health and Human Resource Administration. Each group was asked to contemplate the question, "How can communication be improved between State Staff, Parish Directors and Area Consultants?" The selection of the sample and the focus problem satisfied two pertinent requirements of this study. First of all, it placed the study in a field setting; and, secondly, it provided a problem of true concern and significance to the group participants (see pages 51-54, 55-56, and 59-60).

The participants in the nominal groups were asked to list as many ideas as possible about the focus problem on a piece of paper. They were given ten minutes to complete this task. After the listing phase was completed, the group leader recorded the ideas generated by the group members. Recording was accomplished in a round-robin fashion by asking each participant to provide one idea from his or her list each time it was his or her turn. Ideas were also generated in a round-robin fashion in the sequenced brainstorming groups, but there was no individual listing of ideas. Instead, the ideas in the sequenced brainstorming groups were generated verbally and with the benefit of interaction between the group participants. Both group types involved
a voting procedure at the end of the meeting in which the participants voted on what they considered to be the five best ideas generated by their respective group. (See pages 61-68 for a more detailed discussion of how the groups were conducted.)

The two group types were compared according to the effectiveness of each. Effectiveness was measured as a function of four independent variables—quantity of ideas generated, quantity of unique ideas generated, quality of ideas generated, and satisfaction of the group participants. (For further discussion of how these variables were defined and measured, see pages 68-74.)

III. Conclusions Concerning the Relationships of the Conflicts in the Literature to the Primary Hypotheses

As may be recalled, one of the primary purposes of this dissertation was to explore via the five primary hypotheses certain conflicts which were apparent throughout the literature (see pages 51-54). The statistical results of this study showed no clear-cut superiority of one technique over the other. For example, although the sequenced brainstorming groups were statistically more effective when all of the variables were collectively considered, the nominal groups provided higher quality ideas. The purpose of this section is to determine what support the statistical findings of this study can provide for previously conducted studies.

A. Overall Effectiveness

Statistical testing of the first primary hypothesis—which stated that there is no significant difference in overall effectiveness between
nominal and sequenced brainstorming groups—provided a 90.9 percent probability that the sequenced brainstorming groups were superior in this study. This result tends to support the conclusions of Paskov and Green and contradicts the studies of Taylor et. al., Dunnett et. al., Bouchard, Van de Ven and Delbecq, etc. Therefore, it is the conclusion of this study that sequenced brainstorming groups are as effective or more effective than nominal groups when all of the variables are collectively considered.

(However, this statement should not be construed to mean that sequenced brainstorming groups proved to be superior to nominal groups in the context of every variable employed in the study. As may be recalled from Chapter Four, this hypothesis was tested by comparing the collective means of all of the variables employed in the study. It did not consider each variable separately. The discussion below of the remaining primary hypotheses deals directly with the separate comparison of each variable.)

B. Effectiveness Based on Quantity

In comparing the two group types in terms of the quantity of ideas generated, again the results of the pro-group studies tend to be supported (at the 91.92 percent confidence level). Paskov found that the quantity of ideas generated by the brainstorming groups was significantly higher than the quantity of ideas generated by the nominal groups. Green found no significant difference between the two group types.

On the other hand, the major point made in most of the pro-individual studies was that nominal groups are far superior to
interacting groups in terms of the quantity of ideas generated. For example, Van de Ven and Delbecq stated that "on the average, the nominal groups generated nearly twice as many ideas as did the interacting groups." This ratio was quite different in this study. The average number of ideas generated by the sequenced brainstorming groups was 26.175, while the average number of ideas generated by the nominal groups was 19.75. This means that, on the average, the sequenced brainstorming groups generated approximately 33 percent more ideas than did the nominal groups. Therefore, it is the conclusion of this study that the sequenced brainstorming groups generate as many or more ideas than do the nominal groups.

C. Effectiveness Based on the Quantity of Unique Ideas

The results of the third primary hypothesis were inconclusive. There was no significant difference between the effectiveness of the two group types in terms of the number of unique ideas generated. This supports neither the pro-individual conclusion that nominal groups generate a greater quantity of unique ideas nor the pro-group conclusion that interacting groups produce more unique ideas. Therefore, the conclusion of this study is that effectiveness of nominal and sequenced brainstorming groups is relatively equal in terms of the number of unique ideas generated.

D. Effectiveness Based on Satisfaction

In comparing the effectiveness of the two group types in terms

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1Van de Ven and Delbecq, "The Effectiveness of...", p. 615.
of the satisfaction of the participants, it is concluded that the sequenced brainstorming groups provided more satisfaction for their members than did the nominal groups. This conclusion was statistically supported at the 95.48 percent confidence level. This is completely contradictory to the results of the only other study to employ satisfaction as a measure of effectiveness, the Van de Ven and Delbecq study.\textsuperscript{1}

At the February, 1976, meeting of the Southeastern section of the American Institute of the Decision Sciences, a study was reported which may help in explaining the conflicting results concerning satisfaction. The study, performed by Gene E. Burton and Dev S. Pathak, concluded that the satisfaction a group member receives from a particular group process is dependent on that individual's social character. They found that inner-directed people—those whose behavior is guided by their own values and standards—are more satisfied when participating in the nominal group process. On the other hand, other-directed people—those whose behavioral direction is guided more by persons around them—tend to be more satisfied with interacting group processes.\textsuperscript{2} The need to identify this as well as other contingencies of effectiveness will be discussed in the future research section of this chapter.

\textsuperscript{1}Ibid.

E. Effectiveness Based on Quality

In the context of the final primary hypothesis—comparing the quality of ideas generated by the group types—it is the conclusion of this study (at the 92.15 percent confidence level) that nominal groups generate as high or higher quality ideas than do sequenced brainstorming groups. This conclusion tends to support the pro-individual studies of such people as Taylor et. al., Bouchard, etc. However, as will be discussed in a great deal more detail in the conceptual conclusions section, this conclusion coupled with the conclusion that sequenced brainstorming groups generated a greater quantity of ideas refutes one of the basic assumptions made by Osborn and the majority of other authors cited in this study. That is, quantity leads to quality.

To summarize the results of this study in light of the conflicts found in the previous literature, the overall conclusion is that there is more support for the pro-group studies than for the pro-individual studies. In comparing overall effectiveness, effectiveness based on quantity and effectiveness based on satisfaction, the sequenced brainstorming groups seemed to be superior. However, a very critical question is raised because of the fact that the nominal groups in this study generated ideas of greater quality than sequenced brainstorming groups. It is the opinion of this researcher that a manager would be more interested in the quality of the ideas generated by a particular group process than in any of the other variables utilized in this study. Therefore, if future research (to be discussed later in the chapter) upholds the conclusion of this study concerning quality, then nominal groups should be considered superior.
IV. Conclusions Concerning the Shortcomings in the Literature

As was pointed out previously (pages 51-54), there were two basic shortcomings that stood out in the studies that have been performed thus far. These shortcomings are (1) very little empirical testing of the two methods has been performed outside of an academic environment, and (2) most of the researchers have employed focus problems of a nonsensical nature which had very little concern or significance to the group participants. No study has ever employed both a field sample and a problem of true significance and concern. This section will discuss various impacts that dealing with these two shortcomings in this study have had.

A. Employing a Field Setting

In drawing a conclusion concerning the extension of this study into a field setting, it is the strong opinion of this researcher that both sequenced brainstorming and nominal grouping provide the manager with excellent techniques for obtaining a significant number of high quality creative ideas concerning the identification of problems or alternatives. Regardless of the statistical superiority of one technique over the other in any of the categories tested, both group processes produced a very acceptable number of high quality ideas in a relatively short period of time. This was accomplished in an atmosphere which proved quite satisfying to the participants involved.

In supporting this conclusion, it should be pointed out that the nominal groups produced an average of over 19 ideas per group,
and the sequenced brainstorming groups produced over 26 ideas per group. Since the nominal groups had an average quality rating of about 4.51 and the sequenced brainstorming groups 4.32 (with 5.00 being the highest quality rating possible), it can be concluded that a significant number of the ideas generated were indeed of very high quality for both types of groups. This point was supported by Mr. Don Fuller, Director of Social Services, Louisiana Health and Human Resource Administration, and the supervisor of the participants in this experiment in a conversation with this researcher. After Mr. Fuller had had the opportunity to examine the ideas and rate their quality, he expressed extreme pleasure with the number of high quality ideas that were produced and indicated that he had already set in motion the procedures necessary for implementation of many of them. Incidentally, Mr. Fuller rated the quality of the nominal groups at 4.625 and the sequenced brainstorming groups at 4.230.

As previously mentioned, these significant numbers of high quality ideas were produced in a relatively short period of time in an atmosphere which seemed relatively satisfying to the group members. Although a maximum of 50 minutes was allotted to each group, observation by this researcher and by those who served as group leaders indicated that most of the groups required only 30 to 40 minutes to generate all of their ideas. Only two groups used all of the time allotted--11 and 7N--and they generated 34 and 35 ideas respectively (far above the average). The time requirements could be cut down even further if sophisticated recording equipment were utilized instead of recording by hand. The high satisfaction ratings--4.28 for the sequenced
brainstorming groups and 4.05 for the nominal groups—indicate that both methods proved relatively satisfying to most of the group members. This point is also supported by the fact that the answers to all of the questions dealing with satisfaction of the group participants were heavily skewed toward the higher ratings of 4.00 and 5.00 (see Appendix C).

B. Employing a Problem of True Concern and Significance

In dealing with the second shortcoming—utilizing a problem of true concern and significance to the group participants—it is the conclusion of this researcher that this was the major factor which influenced the statistical results of this study. In all of the studies cited in this paper, those which utilized nonsensical problems or problems which were of very little concern to the participants involved (i.e., Taylor et. al., Dunnett et. al., Bouchard, Delbecq and Van de Ven, etc.) proved overall that nominal groups were superior to interacting groups. On the other hand, those studies which proved interacting groups superior or found no significant difference between the two—the Paskov and Green studies—employed problems of true concern and significance to the group members. Since the statistical results of this study seem to provide a great deal more support for the results of the Paskov and Green studies than for the other studies cited above, it seems logical to conclude that the selection of a problem of true concern and significance to the group members was the major deciding factor in the statistical results obtained.

Regardless of the statistical results however, it seems simply a matter of sound reasoning to this researcher that a problem of true
concern and significance to the participants should be employed any time research is conducted on any type of creative idea generation technique (whether it be the two techniques employed in this study or some other method). When organizations employ a creative idea generation technique, they are searching for real problems or real alternatives which may help to solve their problems. Therefore, when research is conducted on such methods, the conditions for the experiment should be as realistic as possible. Choosing a problem of true concern and significance to the group participants should provide the researcher with at least some of the realism he needs to conduct a more reliable experiment.

To summarize the results of this study in light of the shortcomings in the previous research which were dealt with here, it is concluded that both nominal grouping and sequenced brainstorming are excellent techniques for generating creative ideas. Both techniques can provide management with a significant number of high quality ideas. Each can accomplish this task in a relatively short time and in an atmosphere which can prove satisfying to the participants involved. It is also concluded that the major factor influencing the statistical results of this study was the selection of a realistic focus problem which was of true concern or significance to the group participants. The selection of such a problem is considered of extreme methodological importance to this researcher.

V. Conceptual Conclusions

A great deal of the conceptual base for this study was provided
by Alex Osborn (see pages 10-11 and 18-20) and Norman R. F. Maier (see pages 37-41). The purpose of this section is to discuss the concepts of Osborn and Maier as they relate to the results of this study.

A. Conclusions Concerning Osborn's Concepts

The discussion of the relationship of the results of this study to the concepts espoused by Osborn will center primarily on his assumption that quantity leads to quality. For some reason, it seems that research studies in the past have made the assumption (either implicitly or explicitly) that this theory was correct although there is very little empirical evidence to support such an assumption. For example, Bouchard et al., in 1974, make the following statement concerning the measurement of their variables:

The dependent variable analyzed was the number of different ideas generated. Previous work (Bouchard, 1969, 1972b) has shown that the total number of ideas is the most sensitive indicator of treatment effects and correlates highly with quality scores.\(^1\)

And yet, a very close examination of both of the studies cited by Bouchard et al., above as proof that there is a high correlation between quantity and quality shows that Bouchard never even ran a correlation analysis between quantity and quality of ideas (or if he

\(^1\)Bouchard, Barsaloux, and Drauden, "Brainstorming Procedure, Group size, and Sex...," p. 137.
did, he never considered it significant enough to mention in the articles.¹

In their study comparing nominal, interacting and delphi groups, Van de Ven and Delbecq did not even use quality of ideas generated as a measure of group effectiveness (see pages 42-45 above). The only variables they used to measure effectiveness were quantity of unique ideas generated and satisfaction of the group participants. This indicates that they made the implicit assumption that quantity leads to quality.

The only two studies to actually perform a correlation analysis between quantity and quality produced conflicting and inconclusive results. Parnes and Meadow found a significant correlation between quantity and quality.² Yet, as reported in Chapter Four and again in this chapter, this researcher has found little evidence to support such a conclusion. As can be seen from the correlation matrix (table 8, page 89), there was no significant correlation between quantity and quality as measured by the group participants. Also, as mentioned earlier, there proved to be a strong but not significant negative correlation ($r = -.3985$) between quantity and quality as measured by

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¹ Close examination of both of these studies (Bouchard, "Personality, Problem-Solving Procedure...," and Bouchard, "Training, Motivation, and Personality As Determinants...") seems to indicate strongly that since the results of both were generally that nominal groups were superior to brainstorming groups in terms of both quantity and quality, Bouchard concluded that there was a high correlation. Yet, the statistical method utilized to determine this correlation was ANOVA, not correlation analysis.

² Parnes and Meadow, "Effects of Brainstorming Instructions on Creative Problem Solving...," p. 175.
the supervisor of the participants. And finally, as reported in section III-A of this chapter, the sequenced brainstorming groups seemed superior in the generation of more ideas, and yet the nominal groups seemed superior in the generation of higher quality ideas.

The point of this discussion is not to attempt to conclude that the greater the quantity of ideas generated the lower the quality of the ideas will be. On the contrary, a reasonable conclusion would be that the more ideas available the greater the chance of having more high quality ideas. The conclusion of this study is that quality is an extremely complex variable which cannot be measured simply by counting the number of ideas produced. It is strongly recommended to those who conduct research in this area in the future that they not make the extremely over-simplified assumption that because they have more ideas they have better ideas.

None of the remainder of Osborn's concepts were dealt with in this study as directly as the one discussed above. There is moderate support for his concept that groups are more productive than individuals in terms of the number of ideas generated. Osborn says that brainstorming groups can generate twice as many ideas as individuals working alone (although he never supports this bold statement with empirical evidence). This study found that the sequenced brainstorming groups generated 33 percent more ideas than did the nominal groups. However, one must be careful in generalizing from the results of this study that Osborn's concept is completely supported. It is important to remember that the nominal groups employed in this study actually met in a group setting and generated ideas in the presence of one another with the knowledge that the other group members would eventually have
the opportunity to evaluate the ideas. The nominal group members in this experiment then could hardly be considered as individuals working alone. Therefore, this study may provide some support for this concept, but by no means does it prove it to be true.

B. Conclusions Concerning Maier's Concepts

In relating nominal grouping and sequenced brainstorming to the assets and liabilities of group problem solving espoused by Norman R. F. Maier, it is the conclusion of this study that both techniques are very effective in dealing with the liabilities of group problem solving.

In the context of the first liability, which states that social pressure in the form of criticism and disagreement tends to silence minority opinions, it is concluded that both techniques by design are very effective in avoiding this problem. Neither technique allows criticism of ideas during the group sessions. As may be recalled, one of the basic brainstorming instructions is that criticism is ruled out. In the nominal groups, the ideas are generated individually. Therefore, nominal group members have no opportunity to criticize the ideas of others during generation because they have no indication of what the ideas of the other group members may be. Therefore, under such structured formats in which criticism and disagreement are virtually silenced, the possibility that social pressure will damage the effectiveness of the group is minimal.

In the opinion of this researcher, both techniques are also designed to deal very effectively with the problem of the valence index. As may be recalled, the valence index is calculated by algebraically
summing the number of positive and negative comments made about an idea. Since the participants in both the sequenced brainstorming groups and the nominal groups are not allowed to make any comments—positive or negative—concerning the ideas of others, the possibility that a valence index greater than zero could be achieved in either group type is remote. Since, according to Maier, it takes a valence index of approximately 15 to have any effect on the group's evaluation, it can be concluded that the valence index poses no problem to the effectiveness of either of the group techniques employed in this study.

In dealing with the third group problem solving liability (that is, that groups often tend to be monopolized by individuals with dominant personalities), it should be very clear that both techniques were explicitly designed to balance member participation as much as possible. Both techniques employ a sequencing procedure which gives each member an opportunity to express his or her ideas. No individual is ever given complete control to monopolize the group. These techniques also deal with this problem in another way. Osborn conceptualized that timidity often has a detrimental effect on creativity. Basically, this means that often a shy or timid group member will keep his ideas to himself although these ideas may be of a great deal of value. In the opinion of this researcher, the sequencing procedure tends to reduce the impact of this problem. By calling on each group member every time it is his turn, a certain amount of pressure is being exerted on the member to generate ideas. As may be recalled, when a participant has no ideas, he must express this to the group. He is not allowed to simply sit back and keep quiet. This point was supported during the course of the experiment by the personal observation of this researcher.
In all of the groups in which this researcher served as group leader (seven out of sixteen), only one individual participant contributed no ideas to the group. Therefore, it can be concluded that both nominal and sequenced brainstorming groups are structured to effectively reduce individual domination and increase the balance in member participation.

The final group liability mentioned by Maier (concentration of the participants on the secondary goal of winning the argument) is also dealt with very simply and effectively by both the nominal and sequenced brainstorming group processes. As can easily be deduced from the preceding discussion, argument is simply not allowed in either group type. Therefore, it seems logical that this would pose no problem to effectiveness of either group process.

The only asset of group decision making processes espoused by Maier which was dealt with directly in this study was the one which states that groups have the possibility of a greater divergence of ideas, whereas individuals tend to fall into a rut in their thinking. As may be recalled, one of the major arguments against interacting groups is that they tend to channelize thought in one direction, which completely contradicts Maier's point. The results of this study tend to support the conclusion that interaction tends to channelize thought. Although the sequenced brainstorming groups generated a significantly higher quantity of ideas, there was no significant difference in the quantity of unique ideas generated. This may tend to suggest that, idea for idea, the nominal groups generated more different ideas than the sequenced brainstorming groups.
In summarizing the conceptual conclusions of this study, two major points should be remembered. First of all, quality is an extremely complex variable which cannot be measured by simply counting the number of ideas produced by a group. Although in a general sense it would probably be correct to assume that the more ideas available the greater the chance of having more high quality ideas, this in no way says that quantity will always lead to quality. In the opinion of this researcher, to make such a simplistic assumption about a variable as complex as quality represents a critical methodological error which should be avoided in the future.

The second major point which should be remembered from the conceptual conclusions section is that both nominal grouping and sequenced brainstorming deal very effectively with the liabilities of group problem solving as espoused by Maier. Both techniques are structured in such a way that social pressure from criticism and disagreement should be significantly reduced, the valence index should be virtually non-existant, member participation should be relatively balanced, and argument should not occur.

Two other conclusions were also drawn in the conceptual conclusions sections. First, there was some support in this study for Osborn's contention that groups can generate more ideas than individuals working alone. Secondly, this study somewhat supports the contention of nominal group proponents that group interaction tends to channelize thought.
VI. Secondary Conclusions

In addition to the five primary hypotheses, there were three secondary hypotheses tested in Chapter Four. The first tested for any significant difference between the two measures of quality—'Q1' and 'Q2'. Statistically, there was no significant difference between the two. The second secondary hypothesis found at the 93.97 percent confidence level that there were significant interactions between the group types and the quality measures. The final secondary hypothesis indicated that, with the exception of 'QU' and 'UN' which were positively correlated to the .0009 significance level, the variables employed in the study were independent of one another. In the context of this final hypothesis, it should also be noted that the two measures of quality were independent of each other and that there was a strong but not significant negative correlation between 'QU' and 'Q2' \( r = -.3985 \).

This section will provide conclusions in two areas as they relate to these secondary hypotheses: (1) the relationship between the two measures of quality, and (2) the independence of the variables employed in the study.

A. Relationship Between 'Q1' and 'Q2'

In dealing with the relationship between the two measures of quality, the fact that there was no significant difference between the mean values of 'Q1' and 'Q2' would indicate on the surface that both the participants and their supervisor viewed the quality of the ideas generated in relatively the same terms. However, the results of the other two statistical tests concerning quality spurn such a conclusion. In analyzing the interactions, it should be noted that the group
participants rated the quality of the ideas generated by the sequenced brainstorming groups slightly higher than the quality of the nominal group ideas (4.404 for sequenced brainstorming groups and 4.391 for nominal groups). On the other hand, the supervisor of the participants rated the nominal group ideas much higher than the sequenced brainstorming group (4.625 to 4.230). These facts coupled with the fact that there was no correlation between quality as rated by the participants and quality as rated by the participants' supervisor lead to the conclusion that the rating of the quality of the ideas generated was tremendously effected by who was doing the rating. In other words, it is concluded that the participants' perception of the quality of the ideas generated in this study was significantly different from their supervisor's perception of the quality of the same ideas.

B. Independence of the Variables

As may be recalled, the results of the correlation analysis showed that only two variables—quantity and uniqueness—were significantly correlated. Since the value of the correlation coefficient between these two variables was positive ($r = .7592$) and significant at the .0009 level, it can be concluded that the more ideas that are generated by a particular group, the more unique ideas that the group is likely to produce. No other significant correlations between variables was found indicating that they are independent of each other. Two of these independent relationships were of particular interest to this researcher. The first was the independence between 'Q1' and 'Q2' discussed above. The second was the independence between quality as rated by the participants and the satisfaction of the participants ('Q1' and 'SA'). Since both of these variables were measured via the
same questionnaire, it was suspected that the rating of one might effect the rating of the other. The fact that 'Q1' and 'SA' proved to be independent of one another indicates that this suspicion was unfounded.

In summary, the statistical results of the secondary hypotheses led to three basic conclusions: (1) The way in which the participants in the study perceived the quality of these ideas generated was different than the way their supervisor perceived the quality of the same ideas. (2) The more ideas a group produces, the more unique ideas it is likely to produce. (3) Except for quantity and uniqueness, the measurement of any of the variables employed in this study had no significant effect on the measurement of any of the other variables (including 'Q1' and 'SA').

VII. Limitations Which Arose as the Study Progressed

It may be recalled that in Chapter One some of the limitations of this study were discussed. First of all it was pointed out that the questionnaire measuring satisfaction and quality had not been scientifically validated. Secondly, the fact that the measure of quality was highly subjective and thus highly suspect was discussed. Finally it was mentioned that exact regulation of group size in this experiment was impossible because of the field conditions under which the study was conducted. In this section, two specific limitations will be discussed. The first will actually be an expanded discussion of the measure of quality in light of the results obtained through statistical analysis in this study. The next limitation to be discussed here concerns the measure of uniqueness.
A. The Limitation of Quality

In light of the fact that the statistical results of this study led to the conclusion that the participants perceived the quality of ideas in a different manner than did their supervisor, it can be concluded that securing these two measures of quality did little to reduce the judgmental subjectivity of this variable. Therefore, quality in this study remains a highly subjective measure. However, this should not be construed to mean that the measures of quality employed in this study were poor or invalid. On the contrary, this researcher still believes that having those persons potentially affected by the ideas generated rate the quality of the ideas is a much more valid method of measuring this variable than if the researcher himself had rated the quality of the ideas--especially in a field setting where the participants are superior in knowledge to the researcher concerning the subject matter being discussed in the groups.

In light of this limitation, it is recommended that future researchers in the field take more pains to insure a more objective measure of quality. In this study only two dimensions of quality were measured--practicality and importance of the ideas, and these dimensions were measured simultaneously via the same question. It is recommended that future researchers measure each of these dimensions in separate questions since a practical idea may not be particularly important and visa versa. It is also recommended that other dimensions of quality (such as pervasiveness, frequency, and severity which were employed in the study by Green--see Chapter Two, section IV-A) be considered in future research studies.
B. The Limitation of Uniqueness

The limitation of this study which became most apparent as the study progressed concerned the measure of the quantity of unique ideas. As may be recalled, a unique idea was defined as any idea which was mentioned only once by any group type. The number of unique ideas was measured by having a panel of independent judges, each working separately from the others, physically count the number of ideas that were mentioned only once by all of the sequenced brainstorming groups and all of the nominal groups.

Although this process sounds simple enough, the actual task of measurement turned out to be almost impossible. When the evaluation of each of the judges was received by this researcher (who acted as a judge himself), it was noted that very few of the unique ideas identified by any one judge corresponded to the unique ideas identified by any of the other judges. Therefore, this researcher took on the task of attempting to synthesize the evaluations of the judges into a valid list of unique ideas. After many hours of scanning and re-scanning and evaluating and re-evaluating the ideas list, the number of unique ideas generated was finally settled upon. However, the validity of this list is still quite suspect in the mind of this researcher.

Three almost insurmountable problems were encountered in measuring uniqueness. The first problem is one which this researcher suspects has been encountered by other researchers in the field (although it was never actually mentioned). This involves the mental ability of anyone to evaluate a list of hundreds of ideas, each expressed in different terms, and be able to remember from idea to idea and from group to group exactly what each of these ideas means and exactly which ones have
and have not been mentioned previously. However, if this were the only problem encountered in measuring uniqueness in this study, it could have been effectively dealt with through the slow process of scanning and re-scanning, evaluating and re-evaluating that was utilized here.

The other two problems encountered were much more difficult to deal with. First, the participants in the experiment were quite heterogeneous in terms of their residence and position. The participants came from virtually every parish in Louisiana. There were Parish Directors, Area Consultants, and Supportive Staff with various responsibilities and problems. This heterogeneity led to the generation of ideas from many perspectives. It was quite difficult (maybe impossible) to determine on many occasions whether the idea being evaluated was a unique idea or one which had been stated from a different perspective previously. Further, it was difficult to determine whether an idea approached from two different perspectives constituted two unique ideas or no unique ideas.

Secondly, as mentioned earlier when discussing quality, when conducting research in the field, the researcher is not going to be comparable to the participants in terms of expertise in the area being discussed. This often led to the researcher having to interpret the meaning of an idea before its uniqueness could be determined. The accuracy of such interpretations was limited by researcher expertise, and yet the identification of unique ideas often rested on such interpretations. Therefore, it is concluded that the weakest link in this research study involved the measurement of the quantity of unique ideas generated.

Two basic conclusions can be summarized from the above discussions of limitations which have been encountered in this study. First
of all, the measures of quality employed in this study required too much subjective evaluation on the part of the participants. The dimensions of quality should have been better defined and more specifically measured. Secondly, the measure of uniqueness is quite suspect and is considered by this researcher to be the weak link in the experiment.

VIII. Areas of Future Research

In terms of conducting future research, several directions could be taken. For example, it seems that very little, if any, follow-up research has been conducted to attempt to determine what the long run effect of various group creative idea generation techniques may be. An area in need of a great deal more research, as can be seen from previous discussion, concerns the relationship of quantity and quality and the measurement of quality itself. Burton and Pathak, in testing why some people are more satisfied with interacting groups while others seem more satisfied with nominal groups (see section III-A of this chapter), have implied the need for future research concerning the identification of conditions under which the various group techniques will be most successful and thus most useful. Also, there is a need for a scientifically validated questionnaire which can be employed in measuring the specific variables utilized to determine the effectiveness of any of the group processes. These possible areas of future research will be discussed in this section.

A. A Follow-up Study

Two of the major drawbacks to previous studies, as has been discussed at great length in this paper, is the fact that, for the most part, the studies have employed either an academic setting or a
nonsensical discussion problem or both. In addition to the research shortcomings already discussed concerning these unrealistic conditions, they also create another problem. Under the conditions of an academic environment and/or a nonsensical discussion problem, the possibility of follow-up studies is all but eliminated.

A follow-up study would have as its purpose to investigate the long range effects that these group processes may have on the organizations that utilize them. Many questions which could not be answered immediately following the gathering of the ideas could be answered via a follow-up study. For example: Have any of the ideas actually been implemented? Have those ideas that were implemented been successful in improving the organization? Were the quantity and quality of the ideas generated sufficient to justify the time and money invested by the organization in having the groups conducted? These and other questions must be answered before the true effectiveness of these techniques can be determined.

By conducting field research and by utilizing a discussion problem of true concern and significance to the organization, the possibility of gathering follow-up data concerning the effectiveness of the group methods is opened up. It is the plan of this author to perform such follow-up research in conjunction with the ideas generated in this study.

B. Relationship of Quantity to Quality

An area of future research that has already been covered at some length in this study concerns the relationship of quantity to quality. Common sense says that, more than likely, the more ideas an organization has to choose from, the better the chances that they will
have a greater number of high quality ideas. However, to say that quality can be measured simply by its relationship to quantity is a critical over-simplification. Quality is a complex variable with many dimensions (of which quantity may be one). These dimensions should be identified and specifically measured by future researchers. If this is done, then two things should be accomplished. First of all, quality should become a much more precise and accurate measure, thus making it more useful. Secondly, the true nature of the relationship between quantity and quality should be better understood.

C. Contingencies of Effectiveness

Burton and Pathak found that the satisfaction of the group participants in either nominal or interacting groups was dependent on whether the participants had inner-directed or other-directed personalities. Yet this is only one of many possible contingencies which may have an effect on the process employed. What other contingencies affect the effectiveness of creative idea generating group processes? The more contingencies that can be identified, the easier it will be to predict the success of any process in a given situation. If this can be accomplished, then recommendations to organizations concerning which technique they should employ (or whether or not they should employ one at all) can be made with a great deal more confidence and accuracy. Also, future researchers will have more information available to aid them in designing experiments employing group creative thinking techniques and also to aid them in explaining any conflicting results which may be achieved in future experiments.
D. Validation of Instruments

Finally, as was mentioned in the limitations section of the introduction to this study, none of the questionnaires or methods of measuring the variables in any of the research conducted thus far has been scientifically validated. Hypothetically, many of the conflicting results which have been found may be explained by the fact that the methods and instruments utilized produced neither consistent nor reliable results. Although this is simply conjecture by this researcher which may or may not be true, a validated methodology would eliminate the need for such doubt in future experiments.

In summary, four basic future research possibilities have been identified: (1) A follow-up study should be performed to test the long range effectiveness of the various group techniques. By conducting research in the field and by using a problem of true concern and significance to the organization, such a follow-study has been made possible for the first time. (2) The true relationship between quantity and quality as well as the identification of other dimensions of quality must be investigated more thoroughly. (3) The contingencies or conditions under which the various group processes will be most successful and, therefore, most useful need to be identified. (4) The methodologies employed in future research should be scientifically validated in order to insure reliable and consistent results.

IX. Summary of Conclusions

Many conclusions have been drawn in this study in a wide variety of areas. The purpose of this section is to provide the reader with a summary of the conclusions of this experiment. These conclusions
are as follows:

(1) In testing the five primary hypotheses, it was concluded that this study provided more support for the pro-group studies than for the pro-individual studies. In comparing overall effectiveness, effectiveness based on quantity, and effectiveness based on satisfaction, the sequenced brainstorming groups proved superior to the nominal groups. However, since the nominal groups proved superior to terms of the quality of ideas generated, and since the quality of the ideas would seem of paramount importance to any organization employing such a technique, this study cannot espouse completely the superiority of sequenced brainstorming over nominal grouping.

(2) In relationship to the shortcomings dealt with in this study, it was concluded that both sequenced brainstorming and nominal grouping provide management with excellent techniques for generating a significant number of high quality ideas in a relatively short period of time. It was also concluded that the major factor which influenced the statistical results of this experiment was the selection of a focus problem of true concern and significance to the group participants.

(3) Two major conceptual conclusions were drawn. First, it was concluded that quality is an extremely complex variable which cannot be accurately measured by simply counting the number of ideas that a group generates. In the opinion of this researcher, such an assumption represents a major methodological error in previous research. Secondly, it was concluded that both nominal grouping and sequenced brainstorming deal very effectively with the liabilities of group problem solving as espoused by Norman R. F. Maier. In addition to these two major conceptual conclusions, two other conclusions were also drawn from the
concepts reviewed in this study. First of all, there was some support for Osborn's concept that groups can generate more ideas than individuals working alone. Secondly, there was some support that group interaction tends to channelize participant thought.

(4) Three basic conclusions were derived from the statistical results of the secondary hypotheses tested. First, participant perception of the quality of the ideas generated was different from the manner in which their supervisor perceived quality. Second, the more ideas a group produces, the more unique ideas it is likely to produce. Third, except for quantity and uniqueness, the measurement of any of the variables in this study had no effect on the measurement of any of the other variables.

(5) In the context of the limitations which arose as this study progressed, two conclusions were presented. First of all, the measures of quality in this study required too much subjective evaluation on the part of the participants and their superior. Secondly, in the opinion of this researcher, the measure of uniqueness proved to be the weakest link in this experiment.

(6) Four areas of future research were also identified. These included the recommendation that follow-up studies be conducted to determine the long run effectiveness of these group processes, the need to investigate the true relationship between quantity and quality and to identify specifically the dimensions of quality, the necessity of identifying conditions or contingencies under which the various group processes will be the most effective, and the need for scientifically validated methodologies which will help to insure reliable and
consistent results in future research studies in the area.

It should also be noted that the single population limitation also applies to this study. It would seem desirable to have replications of this study performed utilizing samples from other segments of the economy. This would aid in generalizing the results and making them more practitioner oriented.
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APPENDIX A

IDEAS GENERATED BY VARIOUS GROUPS
I. Ideas Generated by Sequested Brainstorming Groups

A. 1st Sequested Group (II)

1. State Staff should provide form letter to Area Office when a contract is signed explaining what it is and when to expect it.

2. State should set guidelines for record keeping by Provider.

3. State should set guidelines for what the Provider can expect to provide the State with.

4. On initial contact with Provider, the State should provide verbal and written information on unit responsibilities and establish lines of communication.

5. In regards to filling out forms on billing, etc., state should have very explicit directions—not just a copy of DSF instructions.

6. State should emphasize the importance of determining eligibility in keeping within guidelines.

7. Providers should be evaluated following the initial six month period.

8. A follow-up procedure should be established after evaluations.

9. State should schedule quarterly meetings between Providers who give similar services and representatives of RDU and MEU.

10. State should provide more assistance to Providers in writing contracts so that contracts are more specific.

11. Ideally, a monitoring person should visit Providers for evaluation at the Provider's request.

12. Presentation of the monitor's report should be made at the Provider's board meeting in order that questions may be answered.

13. Providers should be offered the opportunity to participate in social service planning at the State level either as committee members or through written mail-outs.

14. There should be closer supervision of a Provider's adherence to contract specifications in technical areas.

15. It should be emphasized that the State Staff is there to help rather than harass.

16. State should provide Providers with a quarterly computer report on the services that they have provided.
17. There is a need for uniformity in the monitoring of reports.

18. There needs to be better understanding of programs now in existence between AAA and DFA.

19. Provide a quarterly report giving suggestions for improvement.

20. In conjunction with the advent of Title 20, there should be a defined job description and specified duties that the monitors are to perform.

21. Attendance of State Office Staff should be required at public meetings which are attended by Providers because of service they provide.

22. There needs to be a system of feedback from Providers that will allow State Staff to set priorities of monitoring needs.

23. When Providers begin services, monitor should make an initial visit.

24. State Office Staff should be offered as ex-officio board members.

25. State should set up negative sanctions for non-compliance and a system of enforcement.

26. When RDU is talking to Providers, they should suggest that Providers contact local DSF Office in learning about possible people eligible for a program and for advertisement of their program.

27. Providers should be offered free public relations consultation.

28. State should have an initial training session for the Provider's staff concerning Title 20 regulations.

29. There should be monthly meetings between Providers of similar services in the area with RDU personnel.

30. The State Staff should provide a step by step manual on policies and procedures.

31. The State should provide video-tape coverage of meetings of State Office Staff and the Social Service Advisory Committee.

32. There should be free hotline service for Providers into each office through which contracts pass.

33. There needs to be a reduction of time between when contracts are submitted and when they are signed.

34. There should be an annual Christmas party between State Staff and Providers.
B. 2nd Sequenced Group (21)

1. State Staff should stay at desk or at telephone occasionally.

2. There is a need for better telephone system in the area.

3. There should be qualified back-up personnel to answer inquiries when State Staff is not available.

4. State Staff should answer correspondence promptly.

5. Communication from State Staff to Area Consultants should be channeled through one person rather than several people.

6. Consultants should be given background information on new programs and program changes as well as reasons for changes.

7. Consultants should be informed as to what is going on with the Federal and State Governments affecting programs.

8. Consultants should not be considered as a relay station between State staff and Parish Directors, Administrators, etc.

9. There should be regular field staff meetings where consultants can present their ideas.

10. Memos should be clear, concise, and complete.

11. Consultants should receive support from supervisors concerning administrative problems.

12. Consultants need people to talk to in State Staff who will give them an answer.

13. Consultants need to have time available with their supervisors to discuss problems.

14. Consultants need a directory of who is responsible for what so that they will know who to contact.

15. Requests to fill personnel vacancies need to be simplified and more efficient.

16. Consultants should be more a part of the planning and coordination process.

17. Supervisors should make a planned, regular visit which is well announced and coordinated along with an agenda of what needs to be discussed.

18. Supervisory staff should be informed and knowledgable of the conditions in the specific areas since problems differ from locality to locality.
19. Programs have changed totally since 1970, yet the manual has not changed. A new manual would solve many communication problems.

20. Any policy changes indicated by memo or executive bulletin should be incorporated into the manual within 30 days.

21. Meetings requiring the presence of Consultants should be planned, and the Consultants notified in advance so that they can plan to attend without disrupting their own schedule.

22. If Consultants are to be responsible for the end result of contacts with others in their area, they should at least be provided with a carbon copy of what is happening.

23. Consultants should be better informed of additions to support staff and these peoples' responsibility as it affects operations in the area.

24. People in State Staff should have ample experience in program delivery.

25. Research should be done on new and changed policies in order to indicate what part(s) of the manual these affect.

26. Consultants want to be informed as to whether or not their communications are reaching the top and being acted upon--more feedback.

27. Pertinent information, i.e., salary changes or important meetings, should be transmitted better to the Consultants.

28. Communication could be improved if supervision of Consultants rated a high priority in the supervisor's time and responsibility.

C. 3rd Sequenced Group (3I)

1. Need more feedback--need to know whether or not you have done a good job.

2. Need to know with whom to communicate.

3. Need to establish WATTS line between Parish Directors and State Office Staff.

4. State Office needs to follow procedure of responding to communications in 10 days.

5. Need quicker responses to memos, phone calls, etc.

6. Need more prior planning in giving instructions of new procedures.

7. Need more involving of field personnel in previewing new procedures.
8. Need more mutual goal setting.

9. Information received should be coordinated to make sure that it is compatible.

10. All policies should be incorporated in the manual within 30 days after the bulletin comes out.

11. Need instructions on what the TP is to be used for.

12. The same policy clarifications and interpretations should be given to the Parishes at the same time.

13. Need to know who to send carbon copies to.

14. Area staff needs to be more coordinated on the State level so that feedback will be consistent.

15. Need more frequent meetings with State Office.

16. There should be more coordination with State Office in planning implementation of new programs and program changes.

17. Need an evaluation process which will tell Parish Directors what areas they need to concentrate on or improve in.

18. Need new or revised job descriptions for Parish Administrators and Staff.

19. Need more direction for new Directors.

20. Need valid statistical reports from State Office.

21. Need to use Executive Bulletins only for agreements with other agencies and use memos only for administrative procedures.

22. All policy should be put directly into manuals.

23. State Office should share wealth of information with administrators so that they can properly inform their staff.

24. Need to know why you do things.

25. Need to have meetings between workers in one Parish with workers in another Parish to exchange ideas.

26. Need to confirm telephone calls as a regular procedure.

27. Each Parish Office should have a budget so that they would know what would be available for supplies and equipment.

28. Dispense with program memorandum from Consultants and get the word directly from State Staff.
29. State Office should consult Local Office before establishing a Local Office procedure.

30. Need to eliminate certain communication that is necessary now—such as having to get necessary auto repairs approved.

31. Evaluation team on State level should be established to evaluate needs for new office space.

32. When a State Office person requests a report on a special case, he should provide instructions on where the reports are to go.

33. Need more efficient operations in the mail room at State Office.

34. Have too much unorganized communication between State Office and Parish Administrators.

35. Need people to identify themselves completely in various meetings with State Office Staff.

36. Need an organizational chart or directory of State Staff.

37. Need State Office Staff to make more field visits.

   D. 4th Sequenced Group (4I)

1. Policy changes should be added to manual promptly.

2. Need a complete directory of personnel by title and function.

3. Need enough lead time on policies and directives to permit implementation.

4. Would like more information on why policies and directives are made.

5. More thought and planning should be put into Executive Bulletins on the first publication.

6. Make policy changes by use of the manual only.

7. Would like Parish Office participation in formation of Executive Bulletins on policy changes.

8. Would like to have a list of required reports and due dates.

9. Would like information transmitted to local offices at least by the same time that it is given to the agency with whom the office must work.

10. Would like uniformity in distributing information to Parish Offices on policy interpretations.
11. Answer correspondence within a reasonable time period.

12. Would like method developed so that Parish Offices get the same information as is given to cooperating agencies.

13. Would like memos from State Office to be signed by author to insure better coordination.

14. Would like someone on the area level to talk to about administrative matters.

15. Would like State Office to check with local office to determine if additional responsibilities can be assumed with existing staff.

16. On telephone communication the case name and number should be given to the person receiving the call so that the caller can be referred to the proper person.

17. State Office should confirm telephone information on calls they initiate.

18. Each Parish Office should have a CENTREX system for ease in telephone communication.

19. Would like training session for local administrators, clerical supervisors and appropriate State Office personnel regarding communications.

20. Would like quarterly brainstorming session between State Office personnel and Parish Directors.

21. Would prefer that the old method of stating that "change from" to "change to" be used in communication of policy changes.

22. On Food Stamp communication, there should be identifying headings on the top of policy interpretations for filing purposes.

23. Separate memos for each different policy interpretation.

24. Would like SSI interpretations directly from State Office rather than from the Social Security District Office.

25. Would like positive statements from State Office on jobs well done.

E. 5th Sequenced Group (51)

1. Delay communications until policies are fixed.

2. Policies should be tested before implementation to eliminate later revisions.

3. Communication would be improved if an explanation is given as to why the policy is necessary.
4. There should be more time to study policy changes before implementing.

5. Need more detailed explanation as to how to carry out directives.

6. Should eliminate transmitting policy by bulletins—should be put directly into manual instead.

7. Consideration should be given to all of the activities and responsibilities in the Parish Office when changes are being made and programs are beginning.

8. All Parishes should have CENTREX line.

9. There should be coordination between the three groups that the Parish Offices deal with to prevent overloading at any one time.

10. Need a better and more consistent system of feedback from the Parish staff, not just the administrators.

11. Communications from the State Office should be timed so that they reach the Parish Office at least as soon as they reach the agency.

12. When changes occur that directly affect the operations of the Parish Office, the State Office should advise immediately.

13. Parish Administrators should have more say so on how new communication equipment is used (TP system).

14. State Office should answer or at least acknowledge written correspondence.

15. State Office should provide reasons why requests are denied.

16. Policy directives should contain more background information—more explanation.

17. State Office should keep policy manuals up to date to insure that they are usable.

18. Need an updated directory of persons with whom we must communicate to resolve different problems (name, title, phone).

19. Personnel changes (new administrators) should go through a program of phasing in, orientation, etc. State Office should communicate job responsibilities and give assistance during early period.

20. State Office should understand the importance of the tasks performed at the Parish level and should be more tolerant in demanding answers to questions.

21. State should inform the Parish Office when changing computer forms and/or programs—instructions are not up to date.
22. State Office should eliminate sending special interpretation on particular case situations to all Parishes when they are only needed by the Parish involved.

23. There should be communications training for Parish Staff so that they can better communicate problems.

24. State Office should spend more time analyzing policies before handing down interpretations—communicate accurate information.

F. 6th Sequenced Group (6I)

1. Need a current directory of personnel.

2. Need prompt response to memos.

3. Need frequent communication on matters under consideration.

4. Memos should be better thought out.

5. Manuals need to be updated.

6. Keep Parish Office better informed on proposed changes.

7. Need training in the use of the TP.

8. Changes should occur at regularly scheduled intervals.

9. Eliminate question/answer clarification—instead have this information incorporated into policy.

10. Use subordinates at local office level for policy planning.

11. All memos should be signed.

12. Do away with Consultants—instead have field representatives.

13. Clarify and assign our responsibilities so that we can plan.

14. All agencies should receive information at the same time.

15. Eliminate requests for reports that have already been submitted.

16. Policy changes should be incorporated into the manual within one month.

17. Eliminate the need for "begging" for staff and/or equipment.

18. Give the same interpretation to Providers as you do to administrators.

19. Reduce the number of statistical reports.
20. Require callers to identify themselves.
22. Clear up confidential items.
23. Clear up the "why" of reports.
24. Would like to know the intent of policy.
25. Need a straight line phone.

G. 7th Sequenced Group (7I)

1. Administrators need to meet with state staff more often in a central location.
2. State Office should furnish Directors with a personnel directory.
3. Need to know things from State Office before being informed from outside sources.
4. State Office should give you authority to make routine purchases.
5. State Office should have more control over mail from directors.
6. Bulletins and memos should come out numbered by program and cross referenced between programs when appropriate.
7. Bulletins and memos should come out once a month.
8. State Office Staff should make periodic visits in which they stay longer than a couple of hours (possibly a week).
9. State Office Bulletins and memos should be incorporated in manual as soon as possible.
10. State Office should put in writing how operations should be handled in adverse situations.
11. Need a new, up to date personnel manual.
12. State Staff should coordinate deadlines so that they are manageable in Parish offices in terms of time requirements, personnel, etc.
13. Staffing memos should be answered regardless of whether the answer is yes or no.
14. Use of the computer terminal should be determined by the local office.
15. Local staff should review major bulletins so that supplementary bulletins answering local questions might be avoided.
16. Should be more information shared between divisions of LAHHA--particularly Parish health units on EPSDT program.

17. Staff of divisions should have a training session together.

18. A committee at the Parish level should be appointed to review major bulletins before final draft is presented in order to answer any questions at the Parish level.

19. Training should be provided for the computer terminal and its use.

20. There should be coordination in training of staff for programs.

21. Every job should be specifically defined statewide and there should be quantification of jobs (volume of work expected for each job).

22. There should be a current desk audit by Civil Service of Parish jobs.

23. Every Director should be trained in the techniques of how to get jobs reclassified.

24. Computers should be programmed to fit the needs of the Parish Directors including anticipation of future information needs.

H. 8th Sequenced Group (81)

1. Parish should review policy before implementation.

2. There should be middle field contact.

3. There should be flexibility on the Parish level for the management of equipment and supplies.

4. Send out policies at the same time.

5. There should be quarterly manual revision.

6. Procedures should be better thought out.

7. There needs to be a crisis contact person.

8. A personnel directory is needed.

9. Need more sharing of policy interpretation.

10. Persons in authority need support.

11. Need a statewide CENTREX system.

12. Need more personal visits from State Office Staff.
13. Should have feedback on all written communication.

14. Need definite allocation of the number of staff.

15. Need a more direct communication line.

16. More answers should be to the point.

17. Need more face-to-face contact with supervisors.

18. Need a better system of evaluation of Parish Administrators.

19. Need better communication between Department heads at the State Office level.

20. Need better communication all up and down the line.

II. Ideas Generated by Nominal Groups

A. 1st Nominal Group (IN)

1. Weekly memo to all Consultants and State Office Staff.

2. Role definition as a consultant regarding resource development.

3. Concurrent release of information in all divisions of LAHHRA.

4. Increased awareness at state levels of Consultant responsibility.

5. Explanation of exactly what we are looking for in monitoring a particular agency.

6. Have quarterly meetings of Consultants and State Staff.

7. Informing Consultants of my job as a Monitor.

8. Channel Consultant's policy questions through one clerical person to record and send answers to all Consultants and State Office Staff.

9. More routine correspondence to all areas regarding clearances and interpretations.


11. Familiarize consultants with the purpose and operation of programs.

12. Need information on why an instrument is chosen.

13. Should send carbon copies to Consultants from program chiefs of significant information.
14. Personal contact with Consultants on a planned basis for transmittal or exchange of information at area level.

15. More extensive training of Consultants in all areas.

16. More accessibility of State Staff in person with Consultants on specific programs.

17. Establish lines of responsibility at State Office level for keeping Consultants informed on program changes.

18. Require that state policy questions and answers from Consultants be in writing and distributed to State Office Staff.

19. Circulation of Consultant's schedules on a quarterly basis.

20. Copy of correspondence to Consultants regarding potential service Providers or unusual situations.

B. 2nd Nominal Group (2N)

1. Answers to why a registry cannot be sent or when they will arrive.

2. Make available at least one person at the state level in services to answer questions and clear up matters that need immediate attention.

3. Decisions on structure and reorganization need to be completed and implemented.

4. If a problem is handled by one Consultant and the problem is of a general nature, either the State of the Consultant should inform other Consultants about the problem.

5. Need more direct supervision.

6. Put all policy and procedure into manual in six months or consider it obsolete.

7. We are asked to be experts in too many areas--set limitations.

8. Clarifying and agreeing on priorities with Consultants in their areas.

9. Clarify policy and procedure before sending out Executive Bulletins.

10. Stop trying to apply policy alike in largest and smallest Parishes.

C. 3rd Nominal Group (3N)

1. Define the Consultant's role.
2. Consultants should understand the Administration of the Child Protection Center responsibilities.

3. More clearly identify who is the final authority on what in this agency.

4. Have area Consultant spend time in local offices to obtain more than formal statements of practices.

5. As the proposed job requirements of the Social Service Consultants now stand, they are overwhelming, unrealistic and demoralizing to Lafayette Social Service Consultant.

6. Distribute role definition and ascertain understanding of said definition by Consultants and State Staff.

7. Consultants should take more leadership in agency and community needs.

8. State Staff should be more free in distributing documents (such as laws and HEW regulations) rather than some interpretation of those documents prepared by State Staff.

9. State Staff and Area Consultants should work together on plans of service delivery.

10. Social Service Consultants should be given line authority.

11. Provide Consultants and State Staff training in communications skills within an organization.

12. Consultants should show interest, not control, in our work. For example, they should attend board meetings, etc.

13. Both ends should improve responsiveness to requests for input from other.

14. Have mutual training sessions in which one can share in and appreciate the role of the other.

15. Consultants should not be engaged in dual roles currently existing--acting as program administrators on the one hand and monitors on the other.

16. Ascertain the willingness and ability of Consultants and State Staff to follow improved communication methods.

17. Consultants should act as liaison to Foster Care Services and Child Protection Centers.

18. State Office leadership should avoid verbal dialogue only regarding policies, practices, etc. with Social Service Consultants and put these in writing--making them available to field and State Staff.
19. Make a decision (based on item 16) whether or not particular Consultants or State Staff can have a meaningful consulting relationship.

20. If item 19 is "no," provide alternatives--don't just ignore the problem.

21. Consultants see self as public relations persons for the agency.

22. The final decision is due now on role definition. As things stand now, net result has been splintering of service program units and lack of leadership available to local service administrators.

23. Superiors should meet periodically with Consultants for feedback.

24. State Staff needs to be made aware of the strengths (positive factors) of the Consultants that they deal with.

25. Staff should invite Consultants to see their operation.

26. Staff and Consultants should carbon copy all pertinent written communication to each other.

27. Should have regular meetings of local administrators and CPC personnel.

28. Consultant and staff should go over their job relationship with each other.

D. 4th Nominal Group (4N)

1. Correctness of memos and bulletins should be assured before leaving State Office.

2. State Office should send a directory with names and numbers of persons to consult about various items.

3. Need only one person to give interpretations--not two or three.

4. Should allow communications and decisions about personnel to be handled by division management alone.

5. Don't notify us tomorrow that the change and procedure became effective yesterday.

6. Revamp our supervisory system.

7. Communication between State and Parish should be prompt.

8. State Office should periodically review with us our problems and assist in arriving at solutions.

9. Confirmations of agreements and interpretations should be confirmed in writing.
10. Receipt of correspondence should be acknowledged quickly, and, if question cannot be answered, information should be given as to when and from whom the answer can be expected.

11. Eliminate middleman--have one channel of communication.

12. More meetings between State Staff and Parish Directors to cover issues of a general nature.

13. State Office should give background on changes so that we can understand why the changes are being made.

14. State Staff should be available.

15. Either eliminate the position of Area consultants or strengthen their position as policy interpreters through greater use.

16. Uniformity should be stressed.

17. Requests should be clear.

18. If an interpretation is given but later changed, administrators should be notified.

19. Changes that often occur should be passed on to administrators as they happen rather than having them find out from unofficial sources.

20. Each division director or section chief should designate a staff member to handle decisions and correspondence in his absence.

E. 5th Nominal Group (5N)

1. WATTS or CENTREX in each office.

2. Assurance of reply to written communication in a timely fashion.

3. Give information to Parishes sooner than is being done now.

4. Policy should be written in a clearer manner.

5. Answer correspondence within ten days or state why a reply cannot be formulated.

6. Need names of key personnel in various sections in State Office other than division heads.

7. Have a standby available for help with programs when the usual person is not available.

8. Explain why Directors have to get clerical approval to get cars repaired when Property Control Officer is out.
9. Need a directory of all units and chiefs including their duties and responsibilities.

10. Explain why not when a request cannot be approved.

11. Need clearer definition of the various divisions under LAHHRA and their functions.

12. Increase the action that a local administrator can perform without approval from above.

13. Need to know why you have to take bids to get supplies when suppliers have State contracts.

14. More field visits by State Staff to Parish Officer.

15. Introduce all policy directives with a statement of what they hope to accomplish and why.

16. Acceptance of local responsibility for documented feed-in of problems to Parish Director's supervisor.

17. Advise of availability of resources in the way of supplies and furniture for Parish Offices.

18. Incorporate all policy statements in appropriate manuals rather than issuing Executive Bulletins and memos which supercede manual policies per prior commitment.

F. 6th Nominal Group (6N)

1. Keep local staff better informed as to what is going on.

2. Curtail the flow of new programs down through the organization--give time to test new programs.

3. Between State meetings, keep staff informed of pending or tentative changes.

4. Better define who in State Office is responsible for certain aspects of each program that is administered.

5. Cut down on over-organization.

6. Go back to smaller units at the State level. LAHHRA is too large to handle at one level.

7. Let us know when certain problems (as in computer changes) have been corrected even to consultant level.

8. Consolidation quarterly of all Executive Bulletins and memos into manual policy.
9. Keep manual up to date on policy changes.

10. Keep State Office informed of all problems at local levels and expect answers from State.

11. Develop a more sophisticated system of feedback from the local level to the State level regarding the implementing of new programs and existing ones.

12. Prompt answer of inquiries from State Office.

13. More efficient use of expensive equipment at all levels.

14. Share knowledge of how Federal Regulations affect State policy so that our understanding of why policies must be changed can be shared with the staff.

15. Requiring State Office Staff to visit Parish Offices to get a first hand view of local problems and the implementing of new and existing programs.

16. Repeated changes in policy lead to a credibility gap.

17. Quarterly staff meeting of State Staff and Parish personnel.

G. 7th Nominal Group (7N)

1. Directory of State Office Personnel telling duties and how to reach.

2. Incorporate State Office memos and bulletins into manual.

3. Hotline to policy interpretation center.

4. Bulletins and memos should only be issued on a quarterly basis.

5. Simultaneous notification of all agencies involved.

6. Periodic conferences with super Parish Administrator.

7. Follow up all verbal communication with written confirmation.

8. State Office should request input from Parishes prior to major program changes.

9. Stop program memo release or use State Office memo.

10. Avoid, when possible, working on crisis situations.

11. Better selection of memos that go to the Parish and State Staff.

12. Prompt replies to correspondence.
13. Clearer written instructions.
14. All written communication should be signed by initiating party.
15. Integrate Area Parish and State programs.
16. Give more complete information about programs and procedures.
17. Occasional visits by State Officers to Parishes.
18. Need interpretation of computer data received.
19. Keep Administrators informed during planning as well as implementation stage.
20. State Office should advise of new undertakings instead of learning through other tentacles of LAHHRA.
21. More information on the changing procedures in the umbrella such as ordering equipment.
22. Let the Parish Offices know the "why" of directives.
23. Fewer revisions of forms.
24. Quit keeping unpopular plans secret until implementation.
25. Update all manuals.
26. More assistance for local staffing problems or alternatives agreed upon.
27. Do not give conflicting instructions.
28. Set definite staff allocations and let us hire.
29. Have training workshops based more on everyday Parish administrative problems.
30. Plan so that the number of changes is minimized.
31. More frequent State Office/Administrator meetings.
32. Give more feedback.
33. Pay expenses to roundtable.
34. Follow official lines of communication.
35. State Office personnel DW work at least two weeks a year.
36. All FSB eligibility determination in one program.
H. 8th Nominal Group (8N)

1. Prompt, clear, concise and accurate bulletins and memos.

2. State Office should furnish local offices with directory of personnel in State Office as to whom directors should call for answers to specific problems.

3. Creation of a single State Office position to keep administrators informed of changes and to provide information on administrative matters and to help in getting things done.

4. Parish Administrator should have a conference with State Office (personal visit) every three months.

5. Administrators should be more involved in program planning.

6. Orientation for new Administrators giving training concerning ordering of forms, personnel, training of new supervisors and a current, accurate job description.

7. Give prompt attention to local office memos concerning information desired by local Administrators.

8. Create procedure whereby manuals are current.

9. Policy interpretations need to be made promptly.

10. Administrator should have more authority in dealing with landlords.

11. State Office Staff should make periodic visits to Parish Offices for oversight inspection of operations.

12. State Office should visit Parish Offices to establish rapport.

13. In addition to the obsolete list now offered, State Staff should provide a current list of memos and bulletins in effect.

14. Need clear procedure for expressing opinions to State Office.

15. Need an index of manuals and bulletins so that they can be easily located.


17. Division of Family Service has become so large that with so many employees the local office gets lost in the shuffle, thus breaking down communications.

18. When State Office procedures are changed, local office needs to be informed immediately.
19. Need evaluatory conferences.

20. When Administrators express their office needs, they need to be paid attention to.

21. Periodic group sessions with State Office personnel.

22. A procedure manual for Administrators and State Office personnel is needed.

23. When changes, such as the delay of an anticipated manual, are made, Directors should be notified.
APPENDIX B

IDEAS IDENTIFIED BY THE VARIOUS GROUPS

AS MOST IMPORTANT
I. Ideas Identified as Most Important by

Sequenced Brainstorming Groups

A. 1st Sequenced Group (1I)

1. The State Staff should provide a step by step manual on policies and procedures.

2. On initial contact with Provider, the State should provide verbal and written information on unit responsibilities and establish lines of communication.

3. State Staff should provide form letter to Area Office when a contract is signed explaining what it is and when to expect it.

4. A follow-up procedure should be established after evaluations.

5. Providers should be offered the opportunity to participate in social service planning at the state level either as committee members or through written mail-outs.

6. There needs to be a system of feedback from Providers that will allow State Staff to set priorities in monitoring needs.

B. 2nd Sequenced Group (2I)

1. Consultants need people to talk to in State Staff who will give them an answer.

2. There is a need for better telephone systems in the areas.

3. Communication from State Staff to Area Consultants should be channeled through one person rather than several people.

4. Consultants should receive support from supervisors concerning administrative problems.

5. Programs have changed totally since 1970, yet the manual has not changed. A new manual would solve many communication problems.

6. There should be qualified back-up personnel to answer inquiries when State Staff is not available.

C. 3rd Sequenced Group (3I)

1. Need more feedback--need to know whether or not you have done a good job.
2. All policies should be incorporated in the manual within 30 days after the bulletin comes out.

3. Need to know with whom to communicate.

4. The same policy clarifications and interpretations should be given to the Parishes at the same time.

5. Information received should be coordinated to make sure that it is compatible.

6. Need quicker responses to memos, phone calls, etc.

D. 4th Sequenced Group (41)

1. Policy changes should be added to the manual promptly.

2. Need a complete directory of personnel by title and function.

3. Need enough lead time on policies and directions to permit implementation.

4. Make policy changes by use of the manual only.

5. More thought and planning should be put into Executive Bulletins on the first publication.

6. Would like someone on the area level to talk to about administrative matters.

E. 5th Sequenced Group (51)

1. Policies should be tested before implementation to eliminate later revisions.

2. All parishes should have a CENTREX line.

3. Need a better and more consistent system of feedback from the Parish staff, not just the administrators.

4. Should eliminate transmitting policy by bulletins--should be put directly into manuals.

5. There should be coordination between the three groups that the Parish Offices deal with to prevent overloading at any one time.

6. Communication from the State Office should be timed so that they reach the Parish Office at least as soon as they reach the agency.

7. State Office should spend more time analyzing policies before handing down interpretations--communicate accurate information.
F. 6th Sequenced Group (6I)

1. Eliminate the need for "begging" for staff and/or equipment.
2. Manuals need to be updated.
3. Use subordinates at local office level for policy planning.
4. Need a current directory of personnel.
5. Policy changes should be incorporated into the manual within one month.

G. 7th Sequenced Group (7I)

1. State Office bulletins and memos should be incorporated in manual as soon as possible.
2. Bulletins and memos should come out numbered by program and cross referenced between programs when appropriate.
3. Staff of the divisions should have training sessions together.
4. Administrators need to meet with State Staff more often at a central location.
5. State Office Staff should make periodic visits in which they stay longer than a couple of hours (possibly a week).
6. Every Director should be trained in the techniques of how to get jobs re-classified.

H. 8th Sequenced Group (8I)

1. Need better communication all up and down the line.
2. Parish should review policy before implementation.
3. There should be middle field contact.
4. There needs to be a crisis contact person.
5. Procedures should be better thought out.
II. Ideas Identified as Most Important by Nominal Groups

A. 1st Nominal Group (IN)
1. Have quarterly meetings of Consultants and State Staff.
2. More extensive training for Consultants in all areas.
3. Concurrent release of information in all divisions of LAHHRA.
4. Role definition as a Consultant regarding resource development.
5. Require that State policy questions and answers from Consultants be in writing and distributed to State Office Staff.

B. 2nd Nominal Group (2N)
1. Answers to why a registry cannot be sent or when they will arrive.
2. Need more direct supervision.
3. Make available at least one person at the state level in services to answer questions and clear up matters that need immediate attention.
4. We are asked to be experts in too many areas—set limitations.
5. Put all policy and procedure into manual in six months or consider it obsolete.
6. Clarifying and agreeing on priorities with Consultants in their areas.

C. 3rd Nominal Group (3N)
1. Define the Consultant's role.
2. Distribute role definition and ascertain understanding of said definition by Consultants and State Staff.
3. Ascertain the willingness and ability of Consultants and State Staff to follow improved communication methods.
4. State Office leadership should avoid verbal dialogue only regarding policies, practices, etc. with Social Service Consultants and put these in writing—making them available to field and State Staff.
5. More clearly identify who is the final authority on what in the agency.

D. 4th Nominal Group (4N)
1. Changes that often occur should be passed on to administrators as they happen rather than having them find out from unofficial sources.
2. Communication between State and Parish should be prompt.
3. Don't notify us tomorrow that the change in procedure became effective yesterday.
4. Revamp our supervisory system.
5. Need only one person to give interpretations—not two or three.
6. State Office should send a directory with names and numbers of persons to consult about various items.

E. 5th Nominal Group (5N)
1. Incorporate all policy statements in appropriate manuals rather than issuing executive bulletins and memos which supercede manual policies per prior commitment.
2. Introduce all policy directives with a statement of what they hope to accomplish and why.
3. Need names of key personnel in various sections in State Office other than division heads.
4. Policy should be written in a clearer manner.
5. Increase the action that a local administrator can perform without approval from above.

F. 6th Nominal Group (6N)
1. Keep local staff informed as to what is going on.
2. Keep manual up to date on policy changes.
3. Cut down on over-organization.
4. Curtail the flow of new programs down through the organization--give time to test new programs.
5. Develop a more sophisticated system of feedback from the local level to the State level regarding the implementing of new programs and existing ones.
6. Consolidation quarterly of all executive bulletins and memos into manual policy.

G. 7th Nominal Group (7N)

1. Incorporate State Office bulletins and memos into manual.

2. Update all manuals.

3. Need directory of State Office Personnel telling duties and how to reach them.

4. Need a hotline to policy interpretation center.

5. State Office should request input from Parishes prior to major program changes.

6. Periodic conferences with super Parish Administrator.

H. 8th Nominal Group (8N)

1. Prompt, clear, concise and accurate bulletins and memos.

2. Give prompt attention to local office memos concerning information desired by local administrators.

3. State Office should furnish local offices with directory of personnel in State Office as to whom directors should call for answers to specific problems.

4. Parish Administrator should have a conference with State Office (personal visit) every three months.

5. Need evaluatory conferences.

6. Creation of a single State Office position to keep administrators informed of changes and to provide information on administrative matters and to help in getting things done.
APPENDIX C

OVERALL QUESTIONNAIRE RESULTS
I. Questionnaire Results for Sequenced

Brainstorming Groups

How practical or important do you consider the ideas generated within your group to be in terms of identifying ways in which communication between State staff and area consultants can be improved? (Please check one of the responses below.)

0 Impractical or Unimportant
1 Not too Practical or Not too Important
3 Somewhat practical or Somewhat important
18 Practical or Important
23 Highly practical or Very important

To what extent did you feel free to participate and contribute your ideas?

0 Not free at all
0 Not too free
0 Somewhat free
12 Free
33 Very free

To what extent did you feel your time was well spent in this meeting?

1 The time was wasted
2 The time was not too well spent
6 The time was somewhat well spent
21 The time was well spent
15 The time was very well spent
How satisfied are you with the quantity (number) of ideas generated by your group?

- 0 Not at all satisfied
- 0 Not very satisfied
- 1 Somewhat satisfied
- 31 Satisfied
- 13 Very satisfied

How satisfied are you with the quality of ideas generated by your group?

- 0 Not at all satisfied
- 1 Not very satisfied
- 2 Somewhat satisfied
- 28 Satisfied
- 14 Very satisfied

To what extent do you feel the group meetings are an effective way to deal with the problem discussed?

- 0 Ineffective
- 2 Not very effective
- 7 Somewhat effective
- 19 Effective
- 17 Very effective
II. Questionnaire Results for Nominal Groups

How practical or important do you consider the ideas generated within your group to be in terms of identifying ways in which communication between State staff and area consultants can be improved? (Please check one of the responses below.)

- 0  Impractical or Unimportant
- 1  Not too Practical or Not too Important
- 3  Somewhat practical or Somewhat important
- 17 Practical or Important
- 22 Highly practical or very important

To what extent did you feel free to participate and contribute your ideas?

- 0  Not free at all
- 1  Not too free
- 1  Somewhat free
- 11 Free
- 30 Very free

To what extent did you feel your time was well spent in this meeting?

- 0  The time was wasted
- 2  The time was not too well spent
- 15 The time was somewhat well spent
- 21 The time was well spent
- 5  The time was very well spent
How satisfied are you with the quantity (number) of ideas generated by your group?

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<td></td>
</tr>
</tbody>
</table>

How satisfied are you with the quality of ideas generated by your group?

<table>
<thead>
<tr>
<th></th>
<th>Not at all satisfied</th>
<th>Not very satisfied</th>
<th>Somewhat satisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
<td>23</td>
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<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

To what extent do you feel the group meetings are an effective way to deal with the problem discussed?

<table>
<thead>
<tr>
<th></th>
<th>Ineffective</th>
<th>Not very effective</th>
<th>Somewhat effective</th>
<th>Effective</th>
<th>Very effective</th>
</tr>
</thead>
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</tbody>
</table>
VITA

W. Edward Stead was born in Birmingham, Alabama on June 27, 1946. He attended both primary and secondary schools in the Birmingham area until his graduation from Shades Valley High School in 1964. He then attended Auburn University in Auburn, Alabama where he received his Bachelor of Science in Business Administration in 1968. In 1970, after completion of two years as an officer in the United States Army, he enrolled in the Masters of Business Administration program at Auburn University from which he was graduated in 1972. While a graduate student at Auburn he had a graduate teaching assistantship in the Department of Management. Upon graduation he worked for one year as a management trainee for Exchange Security Bank of Birmingham.

In 1973 he enrolled in the Doctor of Philosophy program in Management at Louisiana State University, Baton Rouge, Louisiana. He was awarded a graduate teaching assistantship in the Management Department and served in that capacity for the 1973-74 and 1974-75 academic years. During the 1975-76 academic year, he served as Instructor in the Management Department. Beginning in September, 1976, he will be Assistant Professor of Management, Western Illinois University, Macomb, Illinois.
EXAMINATION AND THESIS REPORT

Candidate: Walter Edward Stead

Major Field: Management

Title of Thesis: Comparison of the Nominal Grouping and Sequenced Brainstorming Techniques of Creative Idea Generation: A Field Study

Approved:

[Signatures]

Date of Examination:

July 19, 1976