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META-ANALYSIS OF
COMMUNICATION APPREHENSION TREATMENT TECHNIQUES

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META-ANALYSIS OF
COMMUNICATION APPREHENSION TREATMENT TECHNIQUES

By

Mike Allen

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ABSTRACT

META-ANALYSIS OF

COMMUNICATION APPREHENSION TREATMENT TECHNIQUES

By

Mike Allen

A quantitative literature review was undertaken to determine which, if any of the treatment techniques for communication apprehension are effective. A search of the literature found 181 experiments that provided data on the effectiveness of treatment in reducing public speaking anxiety. The experiments were examined to determine if the effectiveness of treatment varied depending on the type of treatment used: (1) systematic desensitization, (2) cognitive modification, (3) skills training or (4) some combination of these three treatments. The findings suggest that the effectiveness of the treatments are additive. In addition, differences between measurment techniques and treatment settings were assessed. Generally measurement techniques reach similar conclusions. The exception to this is physiological measurement devices which tend to record smaller reductions in anxiety. The implications that the findings have for the theories and practice for the treatment of public speaking apprehension are discussed.

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Thanks to literally hundreds of reseachers, who over the last 40 years have spend thousands of hours gathering and analyzing information to make this meta-analysis possible.

Last to my wife, Nancy, she stuck by the idea and let me spend $1000 to buy disserations and xerox articles to do the meta-analysis.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

REVIEW OF THE LITERATURE

The ability to communicate publicly has been called one of the skills necessary for democracy (Jeffery and Peterson, 1980). This skill also appears to facilitate success in school (Richmond, 1984) and business (Richmond, 1977; Daly and Leth, 1976). Not surprisingly, situations requiring demonstration of this skill have been labeled one of the most feared aspects of modern living (Neer, 1982). While people may normally suffer some anxiety or tenseness prior to any big event, such as the start of a contest or the beginning of a wedding, this state of physiological arousal should not totally destroy a person's ability to function (Daly and Buss, 1984).

Communication departments in the United States often assume responsibility for teaching public speaking to thousands of students every year. Most of the public speaking classes and texts spend the bulk of their effort on improving the skills of public speaking (organization, research, stategies, and tactics). However, many insititutions to deal with this problem have estabished a special section for apprehensive speakers, created an independent course, have workshops, labs, or special groups, or individual tutoring (Foss, 1982). These methods use classroom time simply trying to calm speakers and instill confidence in their abilities so they can concentrate on improving performance rather than overcoming fear. Most Communication

Departments expect the problem of communication apprehension to be handled in the classroom by the instructor (Hoffman and Sprague, 1982) and do not provide special classes or instruction for those with extremely high anxiety.

Most experienced public speaking instructors can tell antecdotes about anxious students who have refusted to speak when asked, started crying, or run out of the classroom never to return. More commonly, students experience the behavioral signs of fright including a cracked voice, shaking hands, or the scratching of legs and face (Paul, 1966). To reduce these problems public speaking texts often mention the problem of public communication apprehension and offer various methods of minimizing the impact this anxiety has on student performance (Ehninger, Gronbeck, and Monroe, 1984; McCroskey, 1982; Nelson and Pearson, 1981; Verderber, 1976).

My purpose in writing this dissertation is to conduct a meta-analysis of the communication apprehension literature as a means of assessing the effectiveness of the various treatments. This meta-analysis is the first step in a program of research that will test the theoretical assumptions about communication apprehension that differentiate the various therapies.

Previous Summaries of the Research

Researchers have examined numerous types of treatment techniques to find the best method of helping a person overcome their level of communication apprehension. In their seminal reviews of the interventions used to reduce communication apprehension Foss (1982) and Glaser (1981) found that therapies vary widely in terms of the

resources used to reduce communication apprehension and the time needed to implement these programs. For example, some scholars suggest that simply participating in the normal public speaking class improves the student performance (Brooks and Platz, 1968). Others suggest use of biofeedback equipment for treating public communication apprehension (Gatchel, Hatch, Watson, Smith, and Gaas, 1977; Gatchel and Proctor, 1976).

Unfortunately, these lists of treatment methods stand only to explicate the various treatment techniques rather than to evaluate their efficacy. Foss (1982) states explicitly that she seeks only to summarize the available resources for instructors; she devotes no effort assessing the effectiveness of these varied techniques for reducing communication apprehension. Most evaluations generally defend the effectiveness of a given treatment technique but offer no guidance about about the relative effectiveness of the method compared to other methods (Friedrich and Goss, 1984; Kelley, 1984; Fremouw, 1984). For example, Fremouw (1984) summarizes the past research on cognitive modification techniques but does not offer advice about which specific technique of cognitive modification offers the best evidence for reducing communication apprehension. He also does not compare cognitive modification to other techniques like systematic desensitization. Reviews ought to perform more comparisons. Critiques of these techniques should offer practitioners criteria for selecting their own methods of reducing communication apprehension.

Methods of Public Communication Apprehension Treatment

This review will divide the treatment techniques into three types: (1) systematic desensitization, (2) cognitive modification, (3) skills training through education. In addition, the issue of whether treatment types can be combined will be examined. This last issue is not one well established in the literature but a necessary consideration when treatment techniques have been combined to treat the phobia. Each section will examine the assumptions about public communication apprehension that the therapy makes, then a discussion of the general procedure of the therapy will be given.

Systematic Desensitization

Systematic desensitization assumes the problem of anxiety evolves from some association between a stimulus and response. The person learns to associate public speaking with negative emotional reactions (Paul, 1966; Wolpe, 1958; McCroskey, 1972). For example, a person experiences or witnesses a public presentation negatively received by an audience. The speaker involuntary associates public speaking with negative rewards (public speaking leads to embarassment). Systematic dessensitization changes that association by exposing the person to the phobia and causing the patient to involuntary associate more pleasant responses the speaking situation than fear and avoidance. For example, during the public speaking therapy every speech the subject gives would receive applause from the audience. This substitutes a positive feedback for the negative feedback that may be associated with public speaking.

Generally the treatment involves instructing subjects (or

patients) on methods of relaxation (Friedrich and Goss, 1982; Paul and Berstein, 1976). After teching general relaxation techniques, the instructors ask patients to relax while thinking about public speaking and avoid reacting with fear and anxiety to any aspect of the public speaking situation. The subject is asked to relax first about some situation that is rated as only mildly anxious. As the subject learns to successfully relax when thinking about this situation, the subject is asked to then relax when thinking about some more frightening or more involved aspect of public speaking. Often these increasingly anxiety producing statements in systematic desensitization are called "hierarchies" (Paul, 1966; McCroskey, 1972; Goss, Thompson, and Olds, 1978) A subject that can successfully go through the hierarchy of statements about public speaking without becoming anxious is "cured." In practice, when the subjects speak, they can concentrate on the relaxation techniques learned in therapy rather than responding with fear and anxiety. Advocates argue that the training improves significantly the individual's performance.

Some of the various methods of relaxation are: muscular relaxation (Paul and Shannon, 1966), biofeedback (Gatchel, Hatch, Maynard, Turns, and Taunton-Blackwood, 1979; Gatchel, Hatch, Watson, Smith, and Gaas, 1977), and mental (imagery) associational methods (the person thinks of good outcomes rather than embarassing outcomes of the event) (Gurman, 1973; Kirsch and Henry, 1979; Kirsch, Wolpin, and Knutson, 1975). The method of presentation also varies, from automated methods (McManus, 1975; Lohr and McManus, 1975; Marshall, Stoian, and Andrews, 1977), group methods (Rimm and Masters, 1979),

and large classroom techniques (McCroskey, Ralph, and Barrick, 1970). All of these methods share the behavioristic assumption that the phobia is the result of some stimulus-response relationship that the subject has learned. The therapy is intended to substitute more functional responses for other less functional responses when the person is supposed to give a public speech.

Cognitive Modification

Cognitive modification assumes that the person possesses the skills to speak effectively but not the ability to use these skills. Cognitive modification focuses on the beliefs of the speaker about the event and tries to modify those beliefs to permit success (Meichenbaum, Gilmore, and Fedoravicius, 1971; Fremouw and Zitter, 1978).

Cognitive modification therapy assumes that the anxiety results from "irrational" beliefs that people possess about public speaking. For example people incorrectly believe that there is failure, humiliation, or some other undesirable outcome associated with their speaking (Fremouw, 1984; Ellis, 1962). This irrational fear makes a person unable to use the speaking skills they possess. For example, a person may believe that "I never speak well because people laugh at me." This belief creates an irrational overgeneralization that the therapy would correct.

Cognitive modification intends to substitute a set of rational and truthful beliefs for the irrational beliefs about perceived failure to allow the subject to succeed in public speaking. The therapist cognitively changes the patients so that the situation can be used to

gain some advantage. By overcoming these irrational fears patients can rely on their talents and skills to be successful at public speaking. Patients are often taught to use "coping" cognitions while they are speaking such as "so far so good" (much like a mantra).

The therapy sessions begin by encouraging patients to discuss their fears about public speaking. One by one these fears are shown to be the result of some irrational belief held by the patient that needs to be discarded in favor of some more rational belief (a coping statement). For example, a person might believe that people always laugh at me when I speak. The therapist points out that this is false, people only laugh at things that are funny and the audience will take the speaker seriously. By demonstrating the voracity of ths statement (usually through practice speeches), the therapist intends to replace the irrational belief with a rational belief (Glogower, Fremouw, and McCroskey, 1978).

Skills Training

Unlike the other two therapies, this approach does not assume that the innate skill of the speaker is adequate to perform the task of public speaking. Both systematic desensitization and cognitive restructuring assume that the requisite skill level exists but cannot be put into practice because some cognitive or affective feature is blocking the use of the talents of the individual. Skills training assumes that some people have skill deficiencies that must be corrected before they can speak. A person is justified in being anxious if he or she lack the skills necessary to be perceived as competent. Once the skill is learned properly, there need be no

barrier to performance. More than that, the person should be confident in the ability to speak successfully.

This technique assumes that communication apprehension is caused by a person lacking public speaking skills. People experience anxiety because they do not have the training to be successful public speakers (Clevenger and Phifer, 1959). The goal of the therapy is to train the patient in the skills of public speaking. This training gives the patient the confidence to perform well. Raising confidence through training will result in less anxiety as the person speaks with greater certainty of success. People once trained should be confident of their ability to speak successfully.

A large part of this educational process is the giving of practice speeches and constructive criticism (Brooks and Platz, 1968; Borin, 1949; Ertle, 1969). Practice sessions and constructive criticism allow for the person to develop their skills over time and grow in confidence as they are rewarded for demonstrating the lessons they learn from the instructor and each other. The use of positive feedback is emphasized and the use of the skills reinforced with every speech. Skills training is usually done in the form of a public speaking class at an educational institution.

This training in the skill of public speaking has been found to confidence of the speaker (Ewing, 1944; Garrett, 1954; Hayworth, 1940). Once the confidence of the speaker is raised; the speaker will atribute nervousness to excitement, a normal part of the process of giving speeches. The outcome (success) will not be in doubt because of the adequate training the person has received.

Combinatorial Treatments

Several experimenters have used combinations of the three techniques (systematic desensitization, cognitive modification, and skills training). Experiments use one therapy during the one part of the experiment and then another therapy later with the same group of subjects. Theoretically, if public speaking anxiety if the result of multiple causes, then perhaps all causes must be treated simultaneously (Meichenbaum, Gilmore, and Fedoravicius, 1971; Norman, 1975).

Often, the experimental design unintentionally uses a combinatorial treatment. Many of the studies done by communication scholars draw their subjects from introductory public speaking classes (Ayres and Hopf, 1985; Borin, 1949; Fremouw and Harmatz, 1975). The subjects, in addition to their public speaking class, attend therapy sessions using cognitive modification or systematic desensitization, or additional skills training. This results in the subject receiving two or three types of treatment at the same time. In the communication experiments the comparison to a control group consists of a control group drawn from the same introductory public speaking class. The experiment is therefore testing whether or not the other therapies offer any improvement over and above just attending the public speaking class (one form of skills training).

Selecting subjects from public speaking classes, however is not used in the majority of studies conducted by psychologists. The psychologists generally draw their subjects from introductory psychology classes or by advertisements in the college or local paper

(Gatchel, Hatch, Maynard, Turns, Tauton-Blackwood, 1979; Goldfried and Goldfried, 1977; Grande, 1975; Jarmon, 1972). These subjects are often screened to make sure they have not had training in public speaking and are not taking such classes at the current time. These experiments are testing whether any improvement is taking place as a result of therapy. These subjects do not receive the benefit of a public speaking class (skills training) and therapy but only the specific therapy alone.

This difference in subject selection procedure results in the same labels being applied to different treatments. For example psycholgoical studies investigating the effect of systematic desensitization have subjects only improving as a result of that particular therapy. Communication experiments often take subjects from public speaking classes, the change over time could be the result of either systematic desensitization or skills training or both. In communication experiments however, the label applied to these groups is not skills training and systematic desensitization but is only systematic desensitization. In any literature review the communication and psychology experiment are put into the systematic desensization without recognition of the method of subject selection.

Problems Assessing the Effectiveness of Treatment

Analysis of the treatment techniques is made difficult for a number of reasons related to the nature of the published research. To provide support for a particular treatment technique, scholars reviewing the literature have typically relied on using single studies showing the comparisons between treatment techniques (Page, 1980;

Phillips, 1980, Fremouw, 1984). These experiments take different treatment techniques, usually two or three, and then compare the effects of the treatments within one experiment (Watson and Dodd, 1984; Marshall, Stoian, and Andrews, 1977; Johnson, Tyler, Thompson, and Jones, 1971; Jarmon, 1969; Karst and Trexler, 1970; Goldfried and Goldfried, 1977; Jaremko, Hadfield, and Walker, 1980; Ayres and Hopf, 1985; Sherman, Mulac, and McCann, 1974). Because the sample size used in these experiments is typically ten subjects per treatment technique, a great deal of sampling error exists. There are few experiments making such comparisons. Thus, very little evidence exists regarding the relative effectiveness of the techniques. Comarative conclusions are difficult to draw from these studies. Scholars reviewing that have reviewed these experiments have not been able to set forth firm conclusions about the relative efficasy of the various treatments (Foss, 1982; Glaser, 1981). This is demonstrated in the unwillingness or inability of the reviewers to advocate some treatment techniques over others on the basis of effectiveness.

Problems of Comparisons within a Study

Even if a larger body of studies had existed to compare the various treatment techniques within a study, the result would probably be as inconclusive as it is currently with only a small number of studies. This confusion would come from the reviewers' reliance on the significance test to determine results. With the small sample sizes, the type II (false negative) error rate is extremely large (Hedges and Olkin, 1985). Sampling error in the communication apprehension literature is large because the typical sample size is between 10 and

20; i.e. very small. Thus, the "counting" of significant results could be misleading. The Type II error rate could be as high as 95% and the typical reviewer would ignore this in using vote counting methods when deciding what a majority of the studies conclude. Most studies fail to reject the null and conclude that no difference exists between treatment techniques. This conclusion may be correct but the method used to reach the conclusion is suspect. Without some attempt to take into consideration the effects of sampling error, these summaries of within study comparisons may misrepresent the literature.

Given small sample sizes the difference between treatment groups would have to be extremely large to be significant at the .05 level in every study. This is especially true when the reviewer is looking for a consistent pattern of differences to be found. The number of studies is small and the techniques used are not likely to find any differences that do exist. Thus, the inability of reviewers to make clear recommendations is not surprising.

Problems of Between Study Comparisons

Method effectiveness can be compared across studies. Even if there were no direct within study comparisons of treatment techniques, they could be compared between experiments. This comparison is based on the average amount of change caused by each treatment in those studies where that threatment was used. This method would quantitatively distinguish between treatments that obtain positive effects and those that obtain even greater positive outcomes. Currently, the reviewers do not distinguish between large and small effect sizes; they only distinguish between significant and

insignificant effect sizes. Previous reviewers have compared significance test results (Friedrich and Goss, 1984; Kelley, 1984; Fremouw, 1984) These reviews first look at whether or not a given treatment technique has been consistently effective in reducing anxiety. They then compare treatments in terms of frequency of significance. The conclusion depends on the use of significance tests to determine whether or not a treatment is more effective than other treatments. The underlying assumption is that effective treatment techniques will consistently obtain significant results in studies and ineffective treatments will only get significant results occasionally (because of Type I error). This assumes that the studies are all of equal quality and the chance of a significant finding is equivalent for all studies.

Unfortunately, almost all experiments conclude that a given treatment is effective in reducing anxiety. This means that in terms of frequency of effectiveness all treatments could be classified as equally effective in reducing public communication apprehension. The reviewers make no attempt to quantitatively assess the impact of the treatments in the studies. They do not average or estimate the effects of each treatment. The situation is made complicated because the studies may not be equally likely to obtain significant results. Sample sizes vary from 10 to well over 400. This means that sampling error varies from study to study. The means that there is variance in the probability that a significant finding will be found. Further, some studies use selection procedures that restrict the range in scores. Selction will effect the change scores. Regression to the mean

also occurs in the studies that use a measurement device that has some unreliability for both sample selection and the pretest score. Studies do not correct for attenuation of effect sizes due to measurement error. The result is a whole host of problems that make the significance test inaccurate as a measure of the size of effect.

Almost all experiments conclude that a given treatment works to reduce public communication apprehension. The probability of significant findings is enhanced because most experiments use a selection procedure that selects the top 50, 34, 10 or 5% of the population that is most anxious. Some method of pretesting is done to select only the most apprehensive subjects for treatment out of some larger population. The selection procedure has the effect of restricting the range of scores in the initial population. The effect of the selection procedure for therapy on the pre versus post test measurements is to enhance the change score. Those that are most apprehensive can have larger change scores than those that are least apprehensive. This increases the observed effect size for the treatment, which is almost always significant even given the relatively small sample used. The mathematical effects and solutions to such problems are shown in Hunter, Schmidt, and Jackson (1983). Those studies using small samples can select using a more stringent standard, which will increase the probability futher of a significant finding because the change will be overestimated.

The possibility of significant results is also increased because regression to the mean is caused by unreliability in the measurement devices. One way to avoid the effects of regression to the mean is to

use one scale in the selecting of the sample and a different scale for the pretest. Most texts on experimental design mention regression to the mean as a possible internal reliability problem for an experiment (Babbie, 1979; Cook and Campbell, 1963). These statements about the problem however, only talk about the occurence in general qualitative terms and propose no quantitative means to assess the severity of the effect that regression to the mean has on the effect size obtained. An ability to quantitatively assess this problem exists (Hunter, Schmidt, and Jackson, 1983). This problem is a significant one that can alter results dramatically. For example, the effect this might have on an experiment measuring the effect a given public communication apprehension treatment technique could be quite significant. Suppose the public communication apprehension scale has a test-retest reliability of .90. With a sample chosen from the top 10% of a population (that is, the subjects for the experiment tested in the top 10% during a pretest), the effect of regressing to the mean will show an observed correlation for the change that is .09 larger than the real change due to treatment. (See Appendix A for a more detailed mathematical explanation). This increases the probability greatly that any observed effect will be significant at the .05 level (the standard significance test used does not take this into consideration).

Some experimenters do not preselect their sample. Several experiments have used whole sections of public speaking classes. This use of intact groups avoids the problems of restriction in range and regression to the mean. However small effect sizes are still more likely to be significant because of relatively large sample size (as

large as 840). This large sample size makes these unselected sample experiments appear congruent with the studies that preselect subjects. Both experiments obtain significant results at the .05 level.

All the treatments consistently seem to work to reduce public communication apprehension. However, the results of a significance test is do not measure the magnitude of the effect obtained by the treatment. All the treatments appear to work equally as well (because the experiments all obtain significant findings). This poses a problem for the instructor seeking to find a treatment technique to maximize the potential of the students in the public speaking course. If no argument can be made that a given treatment is more effective than any other treatment technique, the choice is arbitrary with respect to outcome. The instructor cannot use the existing reviews of the published research and literature reviews make a justifiable choice among treament techniques that will maximize the benefits for the students.

Where Should Therapy Take Place

Many of the experiments on communication apprehension treatment have been done in the therapuetic setting conducted on a one to one basis (therapist-patient) rather than as a mass classroom exercise. Miller (1984) has raised the question about whether or not educators should undertake to "treat" communication apprehensives in the context of a classroom. Many professors/graduate assistants are not trained in treating problems of anxiety and could be ineffective in reducing the level of communication apprehension (Barrick, 1971; Miller, 1984). A survey of U.S. colleges and universities reveals that 93.2% of the

respondents do not operate a treatment program, 73.4% said that they thought the problem should be handled in the classroom (Hoffmann and Sprague, 1982). If the results of therapy given by a therapist on an individual basis differ from the results of the same therapy when conducted in the class setting, the mass application of the therapy may not be as beneficial as the instructor hopes. This is a legitimate concern given the inability of an instructor to spend the same amount of time with a student that a therpist can spend with a patient. The reviews of the literature mention the issue but make no attempt to provide a resolution of this issue on the basis of experimental evidence. Advocates of particular types of treatment have suggested that caution, training, and expertise is needed when using public speaking therapies (Barrick, 1971). Only McCroskey (1972) has tested the efficacy of treatment from the lab to the classroom and concluded that for systematic desensitization the mass application remains beneficial.

The issues surrounding the therapist has been examined for psychotherapy in a meta-analytic review of the literature (Glass and Smith, 1981). The findings show that therapists do not differ in effectiveness in treating patients based on their level of education, years of experience, or expensiveness. This provides evidence that many of the concerns about the need for a highly trained and expensive therapist may be misplaced.

Meta-Analysis as a Technique for Comparing Treatments

What is needed is some summary and comparison of treatment techniques for communication apprehension. Meta-analysis provides a

solution to this type of problem. Meta-analysis has been used to asses psychotherapy (Glass, McGaw, and Smith, 1981), coronary artery bypass graft surgery (Wortman and Yeaton, 1983), and patient education (Mazzuca, 1982). The results of a meta-analysis allow for a quantitative comparison of various treatment techniques. The techniques provide a basis for both within and across study comparisons that can take into consideration problems like regression to the mean, restriction in range, and measurement error due to attenuated measurment. The conclusion of a meta-analysis has the effect of reducing the impact of sampling error and allows for comparisons between techniques.

Rosenthal (1984) points out that the issue in conducting a treatment techniques meta-analysis is not simply whether or not any particular treatment is effective. Certainly that is an issue, but as important is the issue of relative efficacy. If all treatments work to apprehensive speakers; which treatment type should be preferred over another because of its effectiveness? This dissertation will make no attempt to assess the administrative questions of resource allocation (how much additional resources should be expended per student to gain the optimal amount of treatment), but this dissertation will address the question of the relative effectiveness of existing techniques.

Theoretical Implications of the Meta-analysis

Even if one therapy type should emerge as superior to the other therapy types, this does not prove that the theory underlying the therapy is necessarily correct. However, if one therapy does prove superior, special attention should be given that particular

explanation of the phobia. At the current time the competing explanations offer evidence that each is a correct interpretation of the phobia. Until the evidence can be compared quantitatively, cumulatively, and systematically, theoretical development will be stunted. It is only with the accumulation of information and the formation of facts that better explanations can be sought and then tested.

This meta-analysis will also compare the self-report measures of a phobia to observer ratings of performance. This is an important question for any therapy that claims to reduce an anxiety that inhibits performance of a task. Does the therapy really improve performance (as measured by observers) or does it only raise the confidence (as measured by self-reports). Meta-analysis allows a partial answering to these kinds of questions that will allow for futher theoretical development.

CHAPTER II

METHODS

This meta-analysis gathers the existing quantitative literature on the treatment of communication apprehension. After gathering the literature, the studies were coded by design features that could be possible moderator variables. Once the manuscripts had been coded, the results of every study were converted to a common metric (in this case the correlation). When the results are in a common form they can be averaged to estimate the effect size for the population. Groups of correlations were compared on the basis of the observed variance in effect sizes to determine if that variance is greater than would be expected due to sampling error. This is useful in determining if moderator variables exist.

Literature Search

A search of the literature was conducted to gather all relevant materials. A manual search of the relevant subject listings for articles on treatment of communication apprehension was made of the Psychological Abstracts and the Education Index. A manual search of the table of contents of all Communication Education issues was made to obtain articles on the topic. All materials obtained were examined for references to additional materials. The Social Science Citation Index was also searched.

To be included in the analysis a manuscript had to meet the

following criteria:

(1) the manuscript had to contain a quantitative analysis of the effect that one or more communication apprehension treatments had on one or more dependent measures of anxiety (case studies were excluded);

(2) the manuscript had to have measured the level of apprehension prior to treatment (pretest) and measured the level of apprehension after treatment (posttest);

(3) the manuscript had to be accessible to the author (Appendix B contains those articles that were inaccessible);

(4) the manuscript had to contain enough information permit conversion of results to the common metric (Appendix C lists those articles with insufficient information).

There were 115 manuscripts that met the criteria containing the results of 181 separate experiments.

Coding Scheme

Initially each study was coded for the following three characteristics: (1) type of treatment(s) used, (2) type of measurement device(s) used, and (3) setting(s) used to adminster the treatment.

Type of Treatment

The study was coded as using one of the following treatment types: (1) systematic desensitization, (2) cognitive modification, (3) skills training, or (4) combinatorial treatment. The decision for coding was not based on necessarily the term used by the experimenter but rather by the description of the therapy given in the manuscript.

Studies were coded as using systematic desensitization therapy if the person went through a process that exposed the person to the anxeity provoking stimulus with the expectation that over time the person would become less sensitive to the problem. The "classic" approach seats the subject in a comfortable chair and then instructs the person to think about the first sentence in a provided hierarchy of statements relating to public speaking. When the subject learns to relax when thinking about the first statement, they are then told to think about the second statement in the hierarchy which is one that is slightly more threatening (phobic inducing) than the first statement. The subject then relaxes while thinking about that statement. This process continues until the subject exhausts all items in the hierarchy. Other systematic desensitization procedures have the subject speaking while relaxing the muscles in their body and regulating their breathing. Some methods use group discussion, self-pacing, biofeedback techniques, or other techniques to desensitize the person to public speaking. The common feature in this type of therapy is instructing the person to relax in a situation that is normally anxiety producing. The person learns to relax and control their fear by becoming less sensitive to the fear invoking aspects of the situation through repeated exposure to the situation.

Studies were coded as using cognitive modification if the therapy was designed to change the cognitive beliefs of the person about public speaking. This therapy changes the beliefs about public speaking that cause fear. This therapy is also called, "cognitive restructuring", or "insight" (by "insight" the authors mean an insight

into the unreasonableness of the beliefs). This therapy usually involves either eliciting from subjects the reasons they fear public speaking or providing the "common" reasons people fear public speaking. The therapy sessions then expose the falseness of these beliefs. Substitute beliefs are provided that allow a person to cope with the situation (coping statements) or show the positive effects of speaking (rewarding statements). These beliefs are reinforced by practice speeches incorporating the statements provided by the therapy.

Studies were coded as using skills training if the focus of the therapy was on providing information/practice on public speaking as an art. The skills training approach emphasizes doing research on the speech topic, outlining and organizing the speech, selecting appropriate language to use in the speech, and practicing the speech to improve performance. The subject learns the proper techniques of public speaking which will lead to success and build confidence. The theory behind the teaching of skills to diminish apprehension is that people trained in the skills of the technique will automatically acquire confidence because they know they have the skills rquired for success.

Studies were coded as combinatorial if they used more than one technique to reduce communication apprehension. The specific combination used was recognized as a separate treatment type. For example, a study using systematic desensitization and skills training was coded differently than a study using rational emotive therapy and systematic desensitization.

Type of Measurement Device

A separate coding was made for each type of measurement device used to assess the treatment technique. The types of assessment fall into three categories: (1) self-evaluations, (2) observer ratings of behavior, and (3) physiological assessments.

Self-evaluations are paper and pencil tests that ask the person to answer questions about their own level of apprehension before and after treatment. These tests take a variety of forms and each form was coded separately. For example, the Personal Report of Confidence in Speaking is a 30 item true/false questionairre about various aspects of the phobia. The Fear Thermometer is a single item asking the individual to rate their level of apprehension on a scale from 1 to 100. Both instruments are self-reports but operate at different levels of specificity. The PRCS focuses in on specific features and combines the answers to form a score that represents the level of anxiety. The Fear Thermometer asks the individual to make one overall assessment. Each form of self report was tested against the other forms of self report measures to determine if particular forms obtain different effect size estimates.

Observer ratings of behavior is the technique of using some trained person to make assessments about an individual speaker's performance. The assumption of this measurement technique is that the anixiety felt by the speaker will produce nervous behaviors. The individual is rated both before and after treatment on those behaviors. Theoretically, a person's performance should improve as the behaviors associated with good public speaking increase. This means in

practice that those behaviors associated with poor public speaking (grooming behaviors, scratching of the arms or legs, appearing "nervous") should be reduced as a result of the therapy. These rating systems vary from a single overall assessment of the performance to scales that rate the individual on an entire range of behaviors individually, summing the scores to determine the level of anxiety. Each separate assessment tool will be coded and compared to other observer rating methods to determine if the different methods obtain similar or dissimilar effect sizes.

Physiological measurement techniques use machines to record some physiological reaction while giving a speech. The comparison is between the reactions while giving a public speech prior to and after therapy. The theory is that certain processes result from nervousness (high pulse, increased palmar sweat, or high skin tension). The therapy should work to change the level of anxiety which will result in a reduced level of these reactions. Each type of different physiological measurement will be coded separately. A comparison will be made among these different techniques to determine with if type of bodily function measured reacts similarly or dissimilarly to other physiological reactions produced by public speaking anxiety.

Setting of Therapy

The setting of the therapy will be coded as either clinical or in the classroom. In some studies using combinatorial treatment techniques both the clinical and classroom settings were used for therapy. In these cases each therapy was coded for the appropriate setting type. The classroom setting was defined as having the subject

experience the therapy as part of the normal coursework for which the student received academic credit. The clinical setting was defined as having trained individuals administer the therapy individually or to small groups at times outside of registered coursework.

Statistical Analysis

For each mansucript that contained adequate information, an effect size was estimated in the form of a correlation. The correlation was corrected for restriction in range (Hunter, Schmidt, and Jackson, 1983), regression to the mean (See Appendix A), and attentuation of measurement (Hunter, Schmidt, and Jackson, 1983). These corrections required an estimate of the reliability of the measurement device used. When such information was not provided within that particular manuscript, the estimates from other studies for that particular device were averaged to provide the estimate that was used to correct for selection artifacts (restriction in range and regression to the mean) and attenuation of measurement. When no reliability estimates were available for the particular device in any of the literature, the reliabilities of other measurement devices most similar to that device were averaged and that estimate was used for correcting for selection artifacts and attenuation of measurment. Estimates of the test-retest correlation for all devices used in this body of literature is contained in Appendix D.

Many studies selected a sample by asking for subjects to volunteer for treatment if the person experienced public speaking anxiety. This selelection method is known to introduce a "volunteer bias" in evaluating behavior therapy research (Cash and Janda, 1977). The

research shows that the self-selected sample will have more anxiety than the general population. Examination of the means of these volunteer samples shows that they have the same mean and standard deviation as a group that would be chosen on the basis of a score on a measure greater than the population mean. Studies using volunteer samples were treated as having a restriction in range equivalent to selecting a sample having a score greater than the mean.

The correlations were first tested to determine if the variation in the population was more or less than that expected due to sampling error (Hunter, Schmidt, and Jackson, 1983). After the total set of studies was tested, each moderator and possible combination of moderators was tested to determine if any treatment type, treatment setting, or measurement device obtained discrepant results.

The results of the meta-analysis should allow for a comparative evaluation of the treatment types. This evaluation should provide a means to evaluate the theories about treatment and the application of those theories. The results should also provide some evidence on measurement issues and the issue of treatment setting.

CHAPTER III

Results

This chapter contains the results for each method of subgrouping the data (by treatment, by measurement technique, by particular type of scale, and by treatment setting). A final section of this chapter demonstrates potential explanation (additivity of the treatment types) for the results in the treatment subgroupings of the data. A complete listing of all the effect sizes (correlations) for all studies and all subgroups is given in Appendix E.

Data Analyzed by Treatment Type

There were seven possible treatment types (cognitive modification/CM, systematic desensitization/SD, skills/SK, CM+SD, CM+SK, SD+SK, CM+SD+SK) and all were represented in the data. When studies used multiple methods of measurement the effect sizes (correlations) used in this section were averaged across measurement methods. For each treatment type, observed variance of effect sizes was less than the variance expected by random sampling error. See Table 1 for a summary of the results. Significance tests show that a combination of all three primary treatment techniques (SD+CM+/SK) was significantly more effective in reducing public communication apprehension than any other treatment method with the exception of cognitive modification. The trend for cognitive modification

comparison was in the right direction but the t value failed to reach significance). All six non skill treatment types (CM, SD, CM+SD, CM+SK, SD+SK, CM+SD+SK) had a correlation larger than that of the skills (SK) treatment group. Finally a significant difference was observed between the CM+SD and SD+SK treatment groups. See Table 2 for a summary of the t tests.

A caveat exists, however, regarding the low power of the significance tests. For example, a t test with 9 degrees of freedom is based on an N of 11. The probability of a significant findings is based on two factors: (a) the size of the difference and (b) the size of the sample. A difference between groups is less likely to be significant with a smaller sample size. This means that real differences between groups may not be reflected in the results of the t test when the sample size is small.

Data Analyzed by Measurement Technique

There were three types of measurement techniques: (a) self report questionnaires; (b) observer ratings of behavior, and (c) mechanical measurements of physiological reactions. When studies used multiple types of the same measurement technique the effect sizes (correlations) used in this section represent averages. See Table 3 for a summary of the results for this section. For each measurement technique, the observed variance of the effect size was less than that expected due to sampling error alone. A comparision of the self report correlation ($\underline{r}$ = .261) to the observer correlation ($\underline{r}$ = .212) and the physiological correlation ($\underline{r}$ = .172) showed that significant differences existed between the self report measures and observer

ratings (t = 2.58, df=290, p<.05) and self report measures and physiological measurement techniques (t = 4.05, df=222,p<.05). The difference between the observer and physiological techniques of measurement was not significant (t = 1.67, df = 176, p>.05).

Data Analyzed by Type of Device

Self Report Scales

The self report scales were compared to each other to determine if differences existed between scales regarding the observed effect sizes. Six scales were used in minimally least ten studies and subsequently were used for this analysis. The six scales included: (a) Personal Report of Confidence in Speaking/PRCS (b) Fear Thermometer/FT, (c) Anxiety Differential/AD, (d) Personal Report of Communication Apprehenion/PRCA, (e) Stimulus-Response Inventory of Anxiousness (Speech)/SRIA (S), and (f) Affect Adjective Checklist/AACL. The PRCS is a scale that has 30 statements about attitudes towards public speaking that the person either marks as true (the statement reflects the subject's attitude) or false (the statement does not reflect the subject's attitude). A score is computed between 0 and 30 by counting true responses as one and false responses as zero. The FT is a one item scale (rated 1 to 10) on which a subject marks the level of fear cuased by public speaking. The AD is a semantic differential that has public speaking as a stimulus and 31 five point scales anchored by bipolar adjectival pairs. A score is computed by summing the scores of the pairs. The PRCA has a subject rate 20 items using a scale of one to five how much they agree with a particular statement concerning communication anxiety. A score is

computed by summing the responses to the 20 statements. The SRIA (S) has the subject rate on 13 one to five scale how likely they are to experience certain reactions (faster heart beat, loose bowels, exhilaration) to giving a speech before a large group. The subject is scored by summing the responses to these 13 items. The AACL is list of adjectives (minimally 100) that the subject is asked to read and mark the descriptors that apply to the subject's attitude regarding public speaking. The subject receives a score based on the number and content of the adjectives marked.

For each scale, the observed variance of the effect size was less than that expected by sampling error. This indicates that the observed mean correlations are not based on a heterogenous sample of correlations. See Table 4 for a summary of the data on the correlations for the scales. However, the scales seem to break down into two clusters, one cluster with the PRCS, PRCA, and AD, and another cluster with the FT, SRIA (S), and AACL. This apparent difference between scalse may have been the result of scales being confounded with treatment type. If the PRCS, PRCS, and AD occur most often in skills studies, then the correlation will be smaller <u>not</u> because of some aspect of the scale but rather because of the scale's use in studies using treatments with a smaller effect size. This confounding effect was demonstrated by breaking down the scales by type of treatment the subject received.

The breakdown by type of treatment indicates shows that the scales with small effect sizes (PRCS, PRCA, AD) have a higher percentage of subjects in the skills treatment than the other scales with larger

effect sizes (FT, SRIA (S), AACL). See Table 5. The higher percentage demonstrates that the observed difference between scales can be explained on the basis of a confounding variable (treatment type).

Observer Rating Techniques

Two types of observer rating techniques had been used at least ten times and were compared to each other. The two techniques of observer ratings were: (a) the Behavioral Checklist/BC, and (b) the Anxiety Scale/AS. The BC is a checklist used by observers to rate the presence or absence on a one to five point scale of certain behaviors associated with nervousness in public speaking (e.g., scratching, rubbing, etc.). The subject is scored for each behavior and a total score is computed by summing the scores for the individual behaviors. The AS is simply a single rating made by the observer on a one to seven point scale of the nervousness of the speaker.

For the two scales separately, the observed variance of the effect sizes was less than that predicted by sampling error. See Table 6 for a summary of the results. The BC correlation (r = .255) and the AS correlation (.262) did not differ from each other significantly (t = .16, df=24, p>.05). These results indicate that the type of observer rating method used did not influence the estimation of the effect size.

Physiological Measurement Techniques

Two types of physiological measurement techniques (Heart Rate/HR and Palmar Sweat/PS) were sued minimally ten times and were compared to each other. Heart Rate is simply measuring the pulse of the subject both pre and post treatment and observing the difference between the

pulse rates. Palmar Sweat measures the change in the amount of sweating in the palms from pretreatment to posttreatment.

For both techniques separately, the observed variance of the effect sizes was less than that predicted by sampling error. For a full summary of the data see Table 7. A comparison of the Heart Rate effect size ($r = .143$) to the Palmar Sweat effect size ($r = .218$) showed significant differences between the two techniques ($t = 1.88$, $df=61$, $p>.05$).

More research is needed examining the connection between physiological and psychological responses. Physiological measures may be ambiguous because they might measure both postive excitement as well as fear. The problem is that two types of people could exhibit high levels of physiological arousal: (a) those people who love excitement and (b) those who are anxious and afraid. One solution would be to get two different groups meeting these criteria (e.g., the thrillseekers and the afraid) and investigate what effect a communication apprehension treatment would have on the level of should show little if any decline in physiological arousal after treatment. The anxious group should decline in their level of arousal (unless they decide public speaking is a form of thrillseeking).

Setting of Treatment

A comparison was made between the three types of treatment setting: (a) Therapy, (b) Classroom, and (c) Combination of Therapy and Classroom. All studies were coded by the type of setting and effect sizes estimated for each setting. A full summary of the results is found in Table 8. Each setting had an effect size with less

observed variance in the individual correlations than that expected by sampling error. The three settings were compared using t tests. The results of the t tests indicate that the therapy/classroom combination have significantly higher ($p>.05$) correlations than the classroom setting alone. No significant difference was found between therapy and the therapy/classroom combination.

Unfortunately, the setting of a particular treatment is almost perfectly confounded with the type of treatment. The classroom setting was almost exclusively used for skills training. The therapy setting was used for systematic desensitization, cognitive modification, and SD+CM. The combination of therapy and classroom setting was used for SK+SD, SK+CM, SK+CM+SD. The important feature to note is that for no setting was the effect size negative, all settings had positive effect sizes.

Testing Therapy Additivity

One explanation for the differences in effect sizes among the treatment subgrouping is that the effects of each therapy is additive. That is, the positive benefits of one therapy can be added to the positive benefits of another therapy. To test this explanation the following provisions were made. First, a common measurement technique was needed since differences had been observed among the various measurement techniques. Self report measures were chosen because of their extensive use. Second, the model assumes that the effects of systematic desensitization and cognitive modification will only be 50% as effective in combinatorial treatments than when used singly. The reason for this reduced effectiveness is that experiments using the

combinatorial therapies used the same amount of time for a combinatorial therapy as was used for a single therapy. This means that the subject in a combinatorial treatment only received one-half of the time in any given therapy that a person in a single therapy received. For example, in experiments using 8 hours of therapy, the systematic desensitization and the cognitive modification therapies when used alone devoted all 8 hours to the single therapy. The systematic desensitization/cognitive modification combinatorial therapy was 8 hours long with 4 hours devoted to each therapy. The effects of any therapy are probably a nonlinear function of time across a long time interval; after a certain number of hours diminishing returns become apparent. However, given the relatively short time involved in these studies, linearity was assumed. Skill treatment is almost always done is the classroom and when used in combination with the other therapies is used in addition to them. Thus the amount of time spent in skills training is not reduced when used in combination.

The effect size for each method was estimated from the data on studies using single therapies. These are the treatment groups with the largest number of studies. The treatment effect correlations were recomputed for studies using only self report measures. Table 9 presents the meta-analysis for each single and combinatorial treatment. For each treatment type separately, the observed variance of the effect size was less than the expected variance due to sampling error.

The correlations for the single treatments (CM, SD, SK) were used

to predict expected correlations for the combinatorial treatments. The expected correlations for the SD+SK and CM+SK treatments represent simple addition. The expected correlation for the SD+CM treatment represents one-half the SD treatment correlation added to one-half the CM correlation. This division is justified because the studies using this treatment divided time equally between the techniques where other single therapies alloted all the time to one therapy. The CM+SD+SK combinatorial therapy represents addition of the CM+SD therapy to the SK therapy. See Table 10 for information regarding the test of the additivity model. The observed and expected correlations for the combinatorial treatments were compared using t tests. All four t values were insignificant ($p>.05$). Thus, the additivity model fits the data on treatment combinations.

The additivity model assumes linearity of treatment effectiveness for communication apprehension. An equal division of time between two therapies (CM and SD) would result in each therapy being only one-half as effective than if the entire time were devoted to the single therapy. The data confirmed this assumption.

The next Chapter will discuss the results and provide directions for future research and practice. Specifically, the theoretical implications for the treatment types will be discussed as well as the need for more specific research.

Table 1

Results of Analysis by Treatment Groups

Treatment Type	CM	SD	SK	SD+CM
Correlation	.293	.270	.158	.243
N	382	1499	3516	142
# of Studies	20	64	47	9
Observed Variance	.026	.013	.010	.011
Expected Variance	.044	.037	.012	.051
Var. due Sampling Error	100%	100%	100%	100%

	SD+SK	CM+SK	CM+SD+SK
Correlation	.334	.291	.505
N	1299	246	20
# of Studies	30	9	2
Observed Variance	.018	.006	.041
Expected Variance	.018	.029	.058
Var. due Sampling Error	100%	100%	100%

CM = Cognitive Modification
SD = Systematic Desensitization
SK = Skills

Table 2

Comparing Treatment Group Correlations

Treatment Groups	1	2	3	4	5	6
1. CM						
2. SD	.70 (82)					
3. SK	6.52* (65)	3.73* (109)				
4. CM+SD	.82 (27)	.56 (71)	2.30* (54)			
5. CM+SK	.04 (27)	.54 (71)	3.80* (54)	1.12 (16)		
6. SD+SK	1.00 (48)	1.78 (92)	6.52* (75)	2.39* (37)	.91 (37)	
7. CM+SD+SK	1.71 (20)	2.83* (64)	4.63* (47)	2.79* (9)	2.77* (9)	2.07* (30)

Number in brackets is the degrees of freedom.

*Indicates that t value is significant at $p<.05$.

Table 3

Comparing Measurement Techniques

Type of technique	Self Report	Observer	Physiological
Correlation	.261	.212	.172
N	5857	3251	1197
# of Studies	169	123	55
Observed Variance	.025	.027	.008
Expected Variance	.024	.035	.037
Var. Due Sampling Error	96%	100%	100%

t-tests between techniques

Self Report v. Observer	t = 2.58* (df=290)
Self Report v. Physiological	t = 4.05* (df=222)
Observer v. Physiological	t = 1.67 (df=176)

*Indicates that t value is significant at $p<.05$.

Table 4

Results for Self Report Scales

Name of Scale	PRCS	FT	AD
Correlation	.266	.346	.262
N	2810	683	806
# of Studies	104	38	42
Observed Variance	.036	.031	.021
Expected Variance	.034	.030	.043
Var. due to Sampling Error	95%	97%	100%

Name of Scale	PRCA	SRIA (S)	AACL
Correlation	.277	.364	.350
N	1519	548	539
# of Studies	34	26	30
Observed Variance	.020	.032	.043
Expected Variance	.021	.044	.046
Var. due to Sampling Error	100%	100%	100%

PRCS = Personal Report of Confidence in Speaking
FT = Fear Thermometer
AD = Anxiety Differential
PRCA = Personal Report of Communication Apprehension
SRIA (S) = Stimulus-Response Inventory of Anxiousness (Speech)
AACL = Affect Adjective Checklist

Table 5

Self Report Scales Broken Down by Treatment Type

Treatment Type	SK	SD	CM	SK+CM	SK+SD	SD+CM	SD+SK+CM
1. PRCS	1172 (42%)	900 (32%)	248 (9%)	143 (5%)	321 (11%)	26 (1%)	0 (0%)
2. PRCA	663 (44%)	324 (21%)	48 (3%)	75 (5%)	364 (24%)	31 (2%)	14 (0%)
3. SRIA (S)	56 (10%)	202 (37%)	142 (26%)	0 (0%)	116 (21%)	32 (6%)	0 (0%)
4. AD	198 (25%)	317 (39%)	67 (8%)	25 (3%)	168 (21%)	31 (4%)	0 (0%)
5. AACL	119 (22%)	179 (33%)	105 (19%)	19 (4%)	93 (17%)	18 (3%)	6 (1%)
6. FT	130 (19%)	231 (34%)	94 (14%)	113 (17%)	81 (12%)	14 (2%)	20 (3%)

Table 6

Comparison of Observer Measurement Techniques

Measurement Type	BC	AS
Correlation	.255	.262
N	2052	516
# of Studies	104	22
Observed Variance	.037	.029
Expected Variance	.048	.039
Var. due to Sampling Error	100%	100%

t test between techniques

BC v. AS t = .16 (df=124)

BC = Behavioral Checklist

AS = Anxiety Scale

Table 7

Comparison of Physiological Measurement Techniques

Type of Measurement	Heart Rate	Palmar Sweat
Correlation	.143	.218
N	850	553
# of Studies	39	24
Observed Variance	.012	.041
Expected Variance	.040	.045
Var. due to Sampling Error	100%	100%

t test between techniques

Heart Rate v. Palmar Sweat	t = 1.88 (df=61)

Table 8

Comparison of Treatment Setting

Setting of Treatment	Therapy	Classroom	Therapy+Classroom
Correlation	.289	.163	.332
N	2369	3763	972
# of Studies	113	32	36
Observed Variance	.022	.007	.020
Expected Variance	.040	.009	.029
Var. due to Sampling Error	100%	100%	100%

t test between settings

Therapy v. Classroom	t = 4.50* (df=143)
Therapy v. Therapy+Classroom	t = 1.54 (df=147)
Classroom v. Therapy+Classroom	t = 5.83* (df= 66)

*Indicates that the t value is significant at $p<.05$.

Table 9

Reanalysis of data by Treatment Groups

Treatment Type	CM	SD	SK	SD+CM
Correlation	.327	.301	.142	.332
N	363	1259	2858	112
# of Studies	19	54	33	7
Observed Variance	.038	.022	.010	.015
Expected Variance	.041	.034	.012	.050
Var. due Sampling Error	100%	100%	100%	100%

	SD+SK	CM+SK	CM+SD+SK
Correlation	.367	.412	.505
N	561	185	20
# of Studies	23	8	2
Observed Variance	.021	.007	.041
Expected Variance	.032	.045	.044
Var. due Sampling Error	100%	100%	100%

Table 10

Test of Additivity Model

Individual Therapies		CM	SK	SD	
Correlations		.327	.142	.301	
Combinatorial Therapies	**CM+SK**	**SD+SK**	**SD+CM**	**CM+SD+SK**	
Expected Correlations	.469	.443	.314	.456	
Expected Variances	.030	.029	.054	.061	
Observed Correlations	.412	.367	.332	.505	
Observed Variances	.007	.021	.015	.041	
t test value comparing expected and observed correlations	.84	1.65	.18	.23	
df for t	(14)	(44)	(12)	(2)	

CHAPTER IV

DISCUSSION

The purpose of this synthesis of the literature was to quantitatively summarize the public communication apprehension literature. This chapter discusses the results of each type of subgrouping and points out possible explanations for the findings as well as methodological limitations. A final section presents recommendations for both future research and future practice.

Treatment Effects

The first conclusion is that all forms of treatment (cognitive modification, systematic desensitization, and skills training) were effective in reducing public communication apprehension. Consequently no discussion of whether or not a given treatment works is unnecessary. All treatments successfully reduced communication apprehension.

The second conclusion is that the effect of the treatments is additive. That is, the effect of one primary method of treatment (cognitive modification, systematic desensitization, skills) can be added to the effectiveness of another treatment method. This means that combinations of the treatments are more effective than single treatments. This additive effectiveness assumes that the amount of time devoted to combinatorial therapies is also additive. For example if a systematic desensitization therapy is six hours long and the

cogntive modification therapy is 6 hours long, then the combinatorial therapy should be twelve hours long to gain the additional reduction in anxiety.

This quantitative review of the literature has several limitations. First, not all possible combinations of therapies have sufficient sample size for the drawing of firm conclusions. For example, this is particularly true of the combinatorial treatment combining all three primary treatments (SD+CM+SK). This combinatorial threatment had two studies with a total of 20 subjects. Furthermore, most of the other treatments had less than 1000 subjects represented. This is an important consideration because small sample size makes any test of the additive model one with low power. Deviations from the additive model would be detected only if they are extremely large.

Second, the test of the model was only conducted on self report measures. The set of data for observer ratings and physiological data was not large or complete enough for a reanalysis of the data to test the additive model as was the case for the self report data. A construct validation study is needed to assess the difference between measures. Perhaps the assessment between measures could be done using meta-analysis with existing data sets. Another meta-analysis should also be conducted to test the additivity model when data becomes available for the other measurement techniques and from construct validation studies.

Assessment of the Theories about Treatment

The three primary treatment types (cognitive modification, systematic desensitization, and skills training) all posit

explanations about why the therapy works to reduce the phobia. This section will explore whether the theory for any single treatment can explain why all treatments would work to reduce the anxiety. As practiced, the operationalizations of the theories underlying the treatments may overlap or may include features of another treatment.

The following sections take the perspective of one theory of treatment while examining the other treatments as practiced. This application assesses whether or not a theory of treatment can explain the results of other treatment types. For example, the first section will take the perspective of the systematic desensitization therapist and examine the practices of the other two treatments (skills and cognitive modification). The practices of the other two treatments are examined to see if the treatment processes involve elements of systematic desensitization. Following sections then examine other treatments from the perspective of cognitive modification and skills training.

Systematic Desensitization

Sytematic desensitization explains the problem of communication apprehension as resulting from a reinforcement history with an involuntary pairing of a stimulus (public speaking situations) with a reponse (anxiety). The therapy creates a different response to the stimulus by substituting confidence and calmness for anxiety as the affective reponse. This form of treatment was successful in the experiments reviewed. However, the cognitive modification and skills training therapies also worked to reduce public communication apprehension. This section will explore SD and/or CM treatments as

practiced to see if elements of systematic desensitization are present.

Cognitive modification therapy takes false/irrational beliefs about public speaking and substitutes true/rational beliefs about public speaking. These cognitive changes are what should help the speaker overcome the phobia. An examination of the cognitive statements used in the therapy involve a great deal of emotional content that is repeated over and over. For example, a person might be told that when confronted with a speech situation he or she should think that, "...the event is no big deal. There won't be any serious consequences and therefore, there is no reason for me to get so nervous about it." (Trier, 1974, p107).

This type of approach when repeated in session after session using the previously mentioned statement and other similar statements begin to resemble closely the typical systematic desensitization treatment where people think about public speaking and then try to relax. The focus of both treatments is to create a different affective response to a stimulus. One treatment (SD) involves using physiological relaxation while the other treatment (CM) uses psychological relaxation. The cognitive modification technique could be considered a variation of the traditional systematic desensitization treatment.

The results of skills training can also be explained in terms of systematic desensitization theory. Almost all skills training has occurred in the classroom setting during a public speaking class. One of the pedagogical devices used in public speaking class to help the communicative apprehensive is the use of small classes that share

information and mutual support. For example, students are often required to know each other's names and talk to one another. Knowing the other classmates names is encouraged done to make the setting in the classroom seem more friendly and less threatening. After all speeches there is applause by the class led by the instructor. All criticism and comments are supposed to be made in the spirit of constructive, nonthreatening criticism that will encourage the student to improve.

This comparison of skills training to systematic desensitization reveals numerous shared features. The goal of the public speaking class is to instill confidence and good speaking habits by associating success with public speaking rather than failure. The student by experiencing success with speaking rather than failure, becomes desensitized to the event.

While the processes in all the experiments in treatment of public communication apprehension can be explained by the assumptions of systematic desensitization, the results of the experiments cannot. If the results could be explained only by the elements of systematic desensitization present in the treatments than the additivity model would not work. For example, if the elements of systematic desensitization were responsible for the reduction of anxiety in skills treatment, then the SK+SD would be no larger than the SD. The additivity model shows this is not the case and casts doubt on the explanation. Alternatively, SD could explain the results if the effect of treatment is linear and substitutable, then the results would be consistent with all three treatment types and the combinations.

Cognitive Modification

Cognitive modification explains the phobia as a belief in irrational fears that can be changed by replacing the irrational beliefs about the situation with rational beliefs about the situation. This section examines systematic desensitization and skills training to determine if the explanation for the phobia given by cognitive modification can account for the effectiveness of the other treatments.

On the surface, systematic desensitization treatment does not appear to contain any significant aspect of cognitive modification. The systematic desensitization treatment has subjects practice relaxation in response to a threatening stimulus. This treatment does not address the beliefs regarding the phobia. Systematic desensitization (SD) does have the therapist mentioning any rational or irrational beliefs. The SD treatment is intended to control emotive reponses (usually physiological responses to the stimulus) and not cognitive beliefs. For example, a subject when experiencing anxiety is told to breathe deeply and relax the arm and leg muscles.

Systematic desensitization therapists think of their technique as purely affective and not cognitive. That is, the therapists interpret positive findings as confirming that theory. For example, however, none of these studies actually assessed the cognitive processes in the treatment. That is, therapists gathered no data on cognitive processes and hence there is no basis for excluding a cognitive modification explanation for the results.

Consider the following scenario scenario. Subjects are instructed

to relax. In order to relax, they find that they must deal with intrusive irrational beliefs. That is, in order to relax subjects may self administer cognitive modification regarding public speaking to allow themselves to relax. Thus, the systematic desensitization treatment may contain a great deal of self administered cognitive modification.

Skills training may be interpretable in terms of CM theory. Many of the public speaking texts discuss the irrational reasons people fear public speaking and suggest alternative beliefs (Ehninger, Gronbeck, and Monroe, 1984; Jefferey and Peterson, 1980, Verderber, 1985). Instructors in the classroom often talk about public communication apprehension and give reasons why those fears should not exist in this setting. This type of information contained in lectures and textbooks suggests that CM may be able to explain the results of skills training because actual classroom practices may work to change the cognitions that persons have about public speaking.

Cognitive modification provides an explanation for the effectiveness of skills training and systematic desensitization. However, these explanations would still not account for the additivity model if there were nonlinearity in the data. If the other treatments were effective only because of the CM elements and if any given treatment used up the potential effect of that element, then they would not "add" to CM in a combinatorial treatment (unless the skills therapy is still linear). Alternatively, CM could explain the additivity model if the effect of treatment was linear and substitutable. Then the effect of each treatment is the result of the

the elements of CM present and the combinatorial treatments would be the result of adding the effect of each treatment.

Skills Training

Skill training assumes that the anxiety people feel about public speaking is the result of lack of confidence caused by a lack of communicative ability. The goal of the skills treatment is to train persons in the techniques of successful speaking and thus give them the confidence they need to succeed. This section will examine the other two treatments (SD and CM) to see if they contain important element of skills training.

Systematic desensitization involves no skills training whatsoever. The relaxation techniques are unrelated to the level of skills possessed by the subject. The results of SD cannot be interpreted in terms of skills training assumptions. The only possible explanation could be that SD may result in self administered skills training. The person in a relaxed state may choose to spend more time in research and preparation for public speaking. The result of SD therapy may then allow for the subject to self administer skills training. At this time no evidence exists for such a claim.

Cogitive modification offers no skills training as part of the treatment. The irrational beliefs affected by the therapy are irrational beliefs regarding the reasons for failure. These reasons however, are unrelated to the level of skill possessed by the people undergoing treatment. The rational beliefs used to replace the irrational beliefs involve no issues of public speaking skills. The cognitions affected by CM are attitudes held towards the action of

speaking in public not the cognitions regarding how a proper public speech ought to be given. CM does not involve skills training as part of the treatment. Unless the CM training results in self administered skills training. If CM were to result in a subject self administered skills training then CM may be effective not because of changing beliefs but because the changed beliefs result in some other process taking place. At this time no evidence exists for such a claim.

Skills training probably is unable to explain the positive findings of SD or CM treatment. The SD and CM treatments involve no instruction in the "skills" of public communcation. Skills training may contain elements of SD and CM but CM and SD do not contain elements of skills training.

Alternative Explanations for the Effectiveness of Treatments That Anxiety has Multiple Causes

One alternate explanation to the three perspectives (SD, CM, Skills) is that the three treatments address three different types of motivations that a person can have for anxiety regarding public speaking. Individuals could fear public speaking because: (a) they have an anxiety response to the public speaking situation, (b) they have irrational beliefs about public speaking, or (c) they lack the skills necessary to be a successful public speaker.

Support for this position is found in the additive model. The reasoning is that if the entire anxiety can be explained by only one cause than the combinatorial treatments should not observe larger effect sizes. This is because the additional treatment cannot reduce an anxiety that no longer exists. Combinatorial treatments involving

skills training should have no additional reduction if there is only one cause for the anxiety.

Skills training is typically a 3 or 4 hour semester public speaking course. The addition of a 5 to 8 hour SD or CM treatment should not be able to reduce the anxiety much more. This could be explained alternatively in terms of skills training having little time spent on the task. While the amount of class time is great, the actual time spent on the task of public speaking may be small. If the time spent in the public speaking class is nominal time rather than therapy time, then the skills training may not be less effective. The SD and CM treatments may potentially be more effective because at the current treatment has so few hours devoted to treatment (typically less than 8).

The content of the treatments may not overlap entirely and the problem may involve different types of individuals that require separate solutions. More research is needed on identifying these types of people, involving these personality types in treatments targeted at the source of the anxiety and observing what features change over time. Theoretically only those persons with irrational beliefs about public speaking should be helped by cognitive modification. Only those persons that lack skills should be helped by skills training. And finally, only those individuals that involuntarily associate anxiety with public speaking should be aided by systematic desensitization.

A Distraction Hypothesis

Another explanation for additivity model is the nature of anxiety. For example, suppose that communication apprehension is the result of

an internal feedback loop that has the speaker concentrating on the fear. As the speaker becomes more fearful the more the speaker thinks about the fear. That is, individuals may also be afraid to be afraid and this could contribute to the level of anxiety that a person feels about the situation. A solution would be to break this internal feedback loop with some type of distraction.

Support for this idea can be found in common folklore regarding tense situations. Athletic teams often have pranksters that help players loosen up before a game by distracting them from thinking about the contest. Soldiers will write letters or pray before battle which comforts and distracts them from the upcoming event. The three treatments (cognitive modification, systematic desensitization, and skills training) all provide forms of distraction to divert the speaker's thoughts away from fear and into some more productive pattern.

Skills training has the speaker practicing the speech, going over the outline and, in general, preparing for the presentation rather than thinking about fearing the presentation. Cognitive modification distracts the speaker into thinking about the rational rewards of a good speech and can almost create a mantra to focus concentration. Systematic desensitization has the speaker concentrating on relaxing muscles and breathing deeply rather than thinking about the speech. All three treatments could be described as providing different distractors to break the internal feedback loop.

The additivity of treatments could be accounted by the susceptability of individuals to different types of distractors. Some

individuals distract themselves by thinking of rewards, some by using a mantra, some by concentrating on breathing excercises, and some persons will distract themselves by practicing the speech.

Impact of Measurement Type

Comparing measurement types, self report measures show the greatest reduction in anxiety. All measurement types (self report, observer, physiological) show reduction in anxiety due to treatment. Self report measures, however, are more concerned directly with emotional states versus observer ratings which may or may not be connected with emotional states. Self report measures ask how nervous, or afraid the person feels about the situation. Observer ratings of behaviors involve observer counting of behaviors that are thought to indicate anxiety felt by the speaker. The observer may count the number of times the person crosses his or her legs or arms. Such systems of observer ratings depend on how well the coded behaviors match the anxiety felt by the speaker. This match may not always be good. For example, shifty eyes may be an individual phenomenon and not the result of fear. A cracked voice may be the natural voice of a speaker and not the result of anxiety.

Physiological measures are proabably just an unreliable indicator of an emotional state. However, even the physiological measures show that treatment will reduce anxiety. The only differences observed at the level of individual scales was observed among the self report measures. This difference, however, was the result of a confounding with treatment type. The scales with the largest effect sizes were used most often in the combinatorial treatments, therefore the effect

sizes should be larger.

Effect of Treatment Setting

All settings were effective in treating communication apprehension. This provides evidence to lay to rest Miller's (1984) concern that classroom settings are ineffective or even counterproductive in treating communication apprehension. The superiority of therapy and therapy/classroom can be explained due to the additivity of treatments and the superiority of systematic desensitization/cognitive modification.

Skills training is conducted almost exclusively in the classroom and has a smaller effect than systematic desensitization and cognitive modification. Both of those therapies are usually set in the laboratory or clinical setting. The therapy/classroom combination by definition has combinatorial treatments and is therefore more effective because more treatment is offered.

Recommendations

Directions for Future Research

First, this study dictates a need for a construct validity study to assess the relations among the various measures of communication apprehension. This is important because better and more standard measurement would make the assessment of treatent effectiveness more accurate.

Second, more studies are needed that involve the use of combinatorial treatments, especially the cognitive modification, systematic desensitization, and skills training combinatorial treatment. At the current time, the estimates regarding those

particular types of treatment do not rely on a large number of studies. More data would make testing competing models possible and contribute to more power when analyzing the additivity model proposed here.

Third, an examination is needed to uncover what treatment actually changes. Paul (1966) concluded that systematic desensitization works to reduce public speaking anxiety but claimed that explanations about why the treatment works have little data. More then twenty years later there still has been little, if any work providing evidence for an explanation. The conclusion of this synthesis of the literature is that treatment works but there is little data to test why the treatments work. Thus, this report advances the state of knowledge regarding the effectiveness of treatment but unfortunately is not able to address the issue of why the treatments work.

Fourth, experiments examining the various lengths of time for treatments and combinations of treatments to test the assumption of linearity should be undertaken. This information is of practical value since minimum lengths of time could be established for treatments. Of particular concern is at what point the diminishing return for additional time is outweighed by the cost in resources of continuing treatment. If the effectiveness diminishes over time, then public speaking courses could more profitably use time in systematic desensitization or cognitive modification than in skills training.

Advice for Treatment of Public Communication Apprehension

If possible, treatment for communication apprehension should use the widest possible combination of methods. Public speaking classes

should probably include an in-class form of systematic desensitization and/or cognitive modification, especially for the highly apprehensive. The issue will depend upon resource availability and other pedagogical concerns of the instructor. This synthesis of the literature does provide strong evidence that the current treatment methods are beneficial and great confidence should be placed in the ability of the practioner to reduce public communication apprehension using any of the methods currently available.

This is not to say that all issues have been answered. This report does not recommend the length of treatment necessary or whether some characteristic of the practioner (like training) can improve the results of treatment. This report does not provide evidence why any of the treatments work, only that the seven treatment types all successfully reduce anxiety. The results, therefore, should be taken as a starting place for improvement in both theory and practice. Current practices are successful and should obviously be continued. Future research can uncover the reasons that treatments work and seek to improve treatment. The advice for the practioner is to practice confidently knowing that the efforts to decrease public communication apprehension are not in vain. Future research can only improve what is already a healthy start.

APPENDICES

APPENDIX A

APPENDIX A

CORRECTING FOR REGRESSION TO THE MEAN

Many methodologists have commented on the problem of regression to the mean in experimental design. The comments have generally involved qualitative assessments of the phenomena's occurence with no recommendations about how to quantitatively assess or correct for the problem. The term regression to the mean refers to the problem of using a measurement instrument to select a sample and then assess a change at some future point with the same instrument. The sample that is selected based on some minimum score will at a later date have scores (as measured by the selection instrument) that regress to the population mean. This change in scores will occur in groups that have been exposed to no treatment or other typical experimental effects (history, maturation, contamination, etc.,) that would explain such a change.

For example, suppose an experimenter wants a group of individuals that are afraid of snakes. The experimenter gives a group of individuals a self-report measure to select the 10% of the sample most afraid of snakes. If the experimenter were to select these individuals and do nothing for three weeks and then give them the self-report questionnaire the group would have appeared to become less afraid of snakes. Assuming there was no exposure to therapy explain the

difference or any other history, maturation, or event that should change the score, the explanation would be traced to regression to the mean. This is the tendency of a samples initial mean score over time to become less distant from the population mean. This appendix will explain the effect that regression to the mean has in overestimating the effect size in an experiment will be explained and a correction suggested for this effect. Two different conditions will be explored, a situation with no real change in the group mean and a situation with real change in the group mean.

A number of assumptions will be made about the data that is being analyzed. First, the data will be assumed to be normally distributed so that x is N(0,1). Second, when a cutoff score for selection (c) is chosen, like choosing the highest 10% of the sample scores, the sample mean for the scores greater or equal to the cutoff score can be expressed as $E(x/x \geq c)$. The value of the mean of the sample, $E(x/x \geq c)$ chosen on the basis of a cutoff score (c) is equal to oc/p where p is equal to $p(x \geq c)$ and o(x) assumes the normal density function. These assumptions are standard for most selection methods and measurement techniques as well as robust to violations of these assumptions.

Assume No Real Change in Sample Mean

This situation will be examined under two different conditions, perfect test-retest reliability and less than perfect test-retest reliability. The score for the mean of the sample at time one is:

$$\overline{X}_1 = \text{sigma}_X \ (\phi c/p) + \overline{X}$$

This score is the standard deviation for the population (sigma_X) multiplied by the sample mean (as expressed in standard units) added

to the population mean.

Suppose the measurement device had a test-retest reliability of 1.0, then the first and second scores would show no regression towards the mean. This is because the score for the mean of the sample at time two is:

$$\overline{X}_2 = r\ (\text{sigma}_X)\ (\not{\text{c}}/p) + \overline{X}$$

When the reliability (r) is 1.0 the difference between the score at time two ($\overline{X}_2$) and the total population mean ($\overline{X}$) is equal to the difference between the score at time one ($\overline{X}_1$) and the total population mean ($\overline{X}$) multiplied by the reliability. When the reliability is 1.0, the difference between the sample mean and the population mean at time two will the same as the difference between the sample mean and the population mean at time one. Any change that is observed in individual scores is random and the sum of the random errors should be zero which means no change will be observed at the group level (the sample mean).

Suppose now that the test-retest correlation is less than 1.0. The score for the individual at time one remains the same. But the score at time two, however, will not be the same. The value of the test-retest correlation if not 1.0, will always be less than 1.0. This mandates that the distance between the population mean and the sample mean at time one ($\overline{X}_1$) will be smaller than the distance between the population mean and the sample mean at time two. The distance between the sample mean at time two and the population mean if multiplied by a number less than 1.0 will reduce the distance between the sample mean at time two ($\overline{X}_2$) and the population mean ($\overline{X}$).

This explanation shows that regression to the mean is a function

of two values, the test-retest correlation and the distance between the sample mean and the population mean. The smaller the test-retest correlation the smaller the portion of distance between the population and sample mean that is retained at time two ($\bar{X}_2$). The larger the distance between the sample mean and the population mean ($\bar{X}$) at time one ($\bar{X}_1$) the larger the regression that will occur (assuming the test-retest correlation is not equal to 1.0).

Assume Change in Sample Mean

The score at time one will be the same as mentioned above:

$$\bar{X}_1 = \text{sigma}_X \; (\not{\text{c}}/p) + \bar{X}$$

The difference in this section will be that the mean at time two ($\bar{X}_2$) will be different than the mean at time one ($\bar{X}_1$). Within the context of therapy this means that the sample mean is moving towards the population mean. Such a change indicates that the therapy is reducing the difference that exists between the sample and the population. Unfortunately this reduction can be overestimated if the reduction includes regression to the mean. As demonstrated in the case where no change occurs, the sample mean will regress to the population mean. The standard score at time two is:

$$\bar{X}_2 = r \; (\text{sigma}_X) \; (\not{\text{c}}/p) + \bar{X} + d$$

This is true where d is equal to the amount of change.

Regression to the mean does not occur when the test-retest correlation is 1.0. The score at time at time two ($\bar{X}_2$) if the test-retest correlation is equal to 1.0, the score at time two will only show change equal to the value of the change score (d). However, when the value of the test-retest correlation is not 1.0 than the

score will change by the value of d plus the value of the regression to the mean. This means that the observed change score, unless corrected for regression to the mean, will be larger than the real change score. The implication is that failure to correct for this problem can lead to conclusions about the magnitude of change that systematically overestimate the effectiveness of treatments.

Example of Regression to the Mean

Suppose the therapist has gathered a sample that tests in the top 10% of the population ($\phi c/p = 1.76$ under these conditions) with regards to fearing snakes. The therapist takes the sample and uses systematic desensitization to reduce the level of fear the patients feel about being near snakes. The scale used has a population mean of 50 and a standard deviation of 10. The scale had a test-retest reliability of .90. Substituting these values produces the following for the mean value of the sample at time one:

$$\overline{X}_1 = 10\ (1.76) + 50 = 67.6$$

At time two the observed value for the sample was 57.6. This shows an observed difference between time one and time two of ten points on the scale or one standard deviation. Substitution for the values at time two produces the following:

$$57.6 = .90\ (10)\ (1.76) + 50 + d$$

This equation reduces to:

$$-8.24 = d$$

This value shows that the change score was inflated by 21% because of regression to the mean. Had the test-retest reliability been perfect the real change score would have been equal to the observed

change score. In most experiments the significance tests are conducted on the observed change score rather than the real change score. This increases the probability of Type I error, concluding a significant change has occurred when no significant change has occurred. Not enough is known about the distribution of the corrected change score to suggest corrections to the significance test. The confidence interval could be corrected by correcting both end points of the interval for regression to the mean.

Conclusion

Regression to the mean can is a problem whenever a selection score is used to divide or choose a sample and the measurement device has a test-retest correlation less than 1.0. This essay suggests a possible correction for the effects of regression to the mean. The best method for correction however, is prevention. If a different scale is used for sample selection than is used for measurement at time one the whole problem can be avoided. This solution is preferable because it avoids the effect of increasing sampling error inherent in the correction formula.

When the effect cannot be prevented than the systematic effect of regression to the mean can be corrected. The correction will provides greater accuracy in estimating the effect size in any experiment.

APPENDIX B

APPENDIX B

INACCESSIBLE MANUSCRIPTS

The following manuscripts were not included in the analysis. The manuscripts were not contained in the Michigan State University or the Northwestern University library. The material was not available for interlibrary loan. The University Microforms International did not have the manuscripts available for sale. The universities granting the degrees when contacted could not provide access to the manuscript.

Algirdas, F. (1972). Self-instructional and relaxation variable in the systematic desensitization treatment of speech anxiety. Unpublished doctoral dissertation, Waterloo University, Canada.

Garrison, K. (1978). The effect of cognitive modification on communication apprehension in children. Unpublished master's thesis. University of Nebraska, Lincoln, Nebraska.

Reid, J. (1978). An investigation of heirarchy properties in systematic desensitization. Unpublished doctoral dissertation, University of Victoria, Canada.

APPENDIX C

APPENDIX C

STUDIES LACKING STATISTICAL INFORMATION

The following manuscripts were not used in the analysis because the published manuscripts lacked sufficient information to estimate an effect size.

Hekmat, H., Lubitz, R., and Deal, R. (1984). Semantic desensitization: A paradigmatic intervention approach to anxiety disorders. Journal of Clinical Psychology, 40, 463-466.

Lent, R., Russell, R., and Zomostny, K. (1981). Comparison of cue-controlled desensitization: Rational restructuring, and a credible placebo in the treatment of speech anxiety. Journal of Consulting and Clinical Psychology, 49, 608-610.

Zettle, R. and Hayes, S. (1983). Effect of social context on the impact of coping self-statements. Psychological Reports, 52, 391-401.

APPENDIX D

APPENDIX D

TEST-RETEST CORRELATIONS FOR MEASUREMENT TECHNIQUES

Technique	Test-Retest Correlation
Personal Report of Confidence in Speaking	.92
Personal Report of Communication Apprehension	.81
Stimulus-Response Inventory of Anxiety (Speech)	.60
Affective Adjective Checklist	.68
Behavioral Checklist	.80
Anxiety Scale	.72
Anxiety Differential	.64
Heart Rate	.86
Q-Sort	.90
Palmar Sweat Print	.63
Overall Anxiety Rating (observer)	.79
Subjective Units of Disturbance	.93
Speech Anxiety Inventory-Trait	.79
Speech Anxiety Inventory-State	.76
Speech Attitude Survey	.68
Duration of Silence	.96
Speech Appraisal Survey	.89
Interaction Behavior Measure	.84
Propensity for Verbal Behavior	.84
Behavioral Assessment of Speech Anxiety	.80
Fear Survey Schedule-Speech Anxiety	.80
Measure of Elementary Communication Apprehension	.85
Fear Thermometer	.72
Checklist of Appropriate Speaking Behaviors	.80
Time of Speech	.78
Self Efficacy Measure	.62
Speech Disruption Checklist	.81
Personal Report of Public Speaking Aprrehension	.84
Word Count of Speech	.70
Public Speaking Fear Survey	.90
Social Fear Scale	.96
Lomas Verbal Report Form	.73
Combination Public Speaking Inventory and PRCS	.97
Rating Scales	.76
Compilation of Behavioral Ratings	.81
Number of "ah" statement	.85
Speech Performance Survey	.84
Public Speaking Anxiety Inventory	.77
Speech Composite Index	.94
Unwillingness to Communicate	.83
Reticence Scale	.66

APPENDIX E

APPENDIX E

COMPLETE SUMMARY OF DATA

Manuscripts are listed by first author and year of publication.

The following abbreviations are used:

Treatment Type

Systematic Desensitization	(SD)
Cognitive Modification	(CM)
Skills training	(SK)

Setting of Experiment

Therapy	(T)
Classroom	(C)

Measurement Type

Overall Average	(OA)
Average for Self Reports	(ASR)
Average for Observer Ratings	(ABR)
Average for Physiological Reactions	(APR)
Self Report	(SR)
Behavioral Rating	(BR)
Physiological Reaction	(PR)

Particular Measurement Device

Personal Report of Confidence in Speaking	(PRCS)
Behavioral Checklist	(BC)
Personal Report of Communication Apprehension	(PRCA)
Stimulus-Response Inventory of Anxiousness-Speech	(SRIA-S)
Affective Adjective Checklist	(AACL)
Anxiety Scale (observer)	(AS)
Lomas Verbal Report Form	(LVRF)
Anxiety Differential	(AD)
Heart Rate	(HR)
Q-Sort	(QS)
Palmar Sweat	(PS)
Combination Public Speaking Inventory and PRCS	(PSI/PRCS)
Speech Attitude Scale	(SAS)
Silence Duration	(SD)
Speech Appraisal Survey	(SAPS)
Rating Scales	(RS)
Speech Anxiety Inventory--State Scale	(SAI-S)
Speech Anxiety Inventory--Trait Scale	(SAI-T)
Interaction Behavior Measure	(IBM)
Propensity for Verbal Behavior	(PVB)
Behavioral Assessment of Speaking Anxiety	(BASA)
Fear Thermometer	(FT)
Fear Survey Schedule--Speech	(FSS-S)
Measure of Elementary Communication Apprehension	(MECA)
Subjective Units of Distrubance Scale	(SUDS)
Checklist of Appropriate Speaking Behaviors	(CASB)
Compilation of Behavioral Ratings	(CBR)
Number of Seconds in Speech	(SS)
Self Efficasy Measure	(SEM)
Public Speaking Fear Survey	(PSFS)
Speech Disruption Checklist	(SDC)
Speech Experience Inventory	(SEI)
Personal Report of Public Speaking Apprehension	(PRSPA)
Count of Words in Speech	(WC)
Number of "ah" Statements in Speech	(NA)
Speech Performance Scale	(SPS)
Public Speaking Anxiety Inventory	(PSAI)
Speech Composite Index	(SCI)
Unwillingness to Communicate Scale	(UCS)
Reticence Scale	(RES)

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Akin	1974	84	SD/T	SR	PRCS	.198
Altmaier	1982	16	CM/T	BR	BC	.196
		16	SD/T	BR	BC	.259
		16	SD+CM/T	BR	BC	.291
Ayres	1985	212	SK/C	SR	PRCA	.147
		218	SK+SD/C	SR	PRCA	.260
Benton	1974	30	CM/T	OA		.200
				ASR		.175
				ABR		.237
				SR	PRCS	.135
				SR	SRIA (S)	.133
				SR	AACL	.257
				BR	BC	.260
				BR	AS	.214
Biggers	1987	100	SK/C	SR	PRCA	.141
Borin	1949	7	SK/C	SR	LVRF	.319
		8	SK+SD/C+T	SR	LVRF	.668
Borkovec	1979	42	SD/T	OA		.167
				SR	AD	.191
				PR	HR	.143
Brooks	1968	37	SK/C	SR	QS	.244
Calef	1970	40	SD/T	SR	PRCS	.129
Casas	1975	14	CM/T	OA		.217
				ABR		.245
				APR		.165
				SR	PRCS	.245
				BR	BC	.105
				PR	HR	.038
				PR	PS	.291
				BR	AS	.404
		14	SD/T	OA		.178
				ABR		.124
				APR		.183
				SR	PRCS	.279
				BR	BC	.065
				PR	HR	-.047
				PR	PS	.412
				BR	AS	.183
Chaplin	1981	48	SD/T	SR	PRCS	.363
Connell	1987	42	CM+SK/C+C	SR	PRCA	.207
		30	SK/C	SR	PRCA	.247
Cradock	1977	10	SD/T	SR	PRCS	.629
		10	CM/T	SR	PRCS	.873
Deffenbacher	1980	25	SD/T	SR	PRCS	.188
Deffenbacher	1977	25	SD/T	SR	PRCA	.268

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Devine	1974	33	CM/T	OA		.472
				SR	PSI/PRCS	.477
				BR	BC	.467
Ertle	1969	32	SD+SK/T+C	SR	PRCA	.734
		16	SK/C	SR	PRCA	.144
Ewing	1944	200	SK/C	SR	SAS	.223
Fremouw	1975	10	SK/C	OA		.076
				ASR		-.063
				ABR		.215
				SR	PRCS	-.012
				SR	AD	-.113
				BR	BC	.237
				BR	AS	.192
		31	SD+SK/T+C	OA		.551
				ASR		.492
				ABR		.610
				SR	PRCS	.529
				SR	AD	.454
				BR	BC	.546
				BR	AS	.674
Fremouw	1978	12	SK/T+C	OA		.361
				ASR		.416
				ABR		.425
				SR	PRCS	.584
				SR	PRCA	.617
				BR	BC	.424
				BR	AS	.425
				PR	SD	.066
				SR	AD	.048
		12	SD+SK/T+C	OA		.197
				ASR		.197
				ABR		.255
				SR	PRCS	.177
				SR	PRCA	.234
				BR	BC	.258
				BR	AS	.253
				PR	SD	.081
				SR	AD	.179
		12	SK/C	OA		.085
				ASR		.016
				ABR		.166
				SR	PRCS	.012
				SR	PRCA	.011
				BR	BC	.162
				BR	AS	.169
				PR	SD	.131
				SR	AD	.025

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Garrett	1954	46	SK/C	ASR		.128
				SR	PRCS	.062
				SR	SAPS	.193
Gatchel	1979	27	SD/T	OA		.184
				SR	PRCS	.282
				BR	BC	.086
Gatchel	1977	40	SD/T	OA		.256
				APR		.311
				SR	RS	.140
				BR	BC	.254
				PR	HR	.391
				PR	PS	.231
Gatchel	1976	36	SD/T	ABR		.200
				BR	BC	.140
				BR	AS	.261
Germer	1975	8	SD/T	OA		.177
				ASR		.239
				BR	BC	-.031
				PR	HR	.010
				SR	SAI-S	.201
				SR	SAI-T	.130
				SR	PRCS	.330
				SR	PRPSA	.268
				SR	PRCA	.316
				SR	AD	.188
		8	CM/T	OA		.235
				ASR		.253
				BR	BC	.118
				PR	HR	.246
				SR	SAI-S	.226
				SR	SAI-T	.149
				SR	PRCS	.183
				SR	PRPSA	.122
				SR	PRCA	.666
				SR	AD	.171
		8	SD+CM/T+T	OA		.398
				ASR		.467
				BR	BC	.091
				PR	HR	.290
				SR	SAI-S	.452
				SR	SAI-T	.347
				SR	PRCS	.680
				SR	PRPSA	.345
				SR	PRCA	.655
				SR	AD	.322
Giffin	1969	177	SK/C	SR	PRCS	.250

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Glogower	1978	12	SD+SK/T+C	ASR		.284
				SR	PRCA	.446
				SR	IBM	.121
		35	CM+SK/T+C	ASR		.445
				SR	PRCA	.561
				SR	IBM	.339
Goldfried	1977	28	SD/T	OA		.309
				ASR		.356
				APR		.301
				BR	BC	.185
				PR	SD	.240
				PR	HR	.361
				SR	AD	.396
				SR	PRCS	.199
				SR	SRIA-S	.474
Goldfried	1974	27	SD/T	OA		.206
				ASR		.256
				BR	BC	.165
				PR	SD	.100
				SR	AD	.366
				SR	PRCS	.153
				SR	SRIA-S	.248
Goss	1978	17	SD+SK/T+C	SR	PRCA	.338
		16	SD+SK/T+C	OA		.242
				ASR		.309
				SR	PVB	.260
				SR	PRCS	.357
				SR	BASA	.108
Grande	1975	20	SD/T	OA		.260
				ASR		.313
				ABR		.308
				APR		.194
				SR	FT	.327
				SR	FSS-S	.298
				BR	BC	.380
				BR	AS	.236
				PR	HR	.168
				PR	PS	.206
Grayson	1978	49	SD/T	PR	HR	.172
Gross	1982	26	SD/T	OA		.171
				ABR		.100
				APR		.184
				PR	HR	.188
				PR	PS	.180
				BR	BC	.118
				BR	AS	.083
				SR	PRCS	.287

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Gross	1982	23	CM/T	OA		.176
				ABR		.108
				APR		.068
				PR	HR	.093
				PR	PS	.043
				BR	BC	.121
				BR	AS	.094
				SR	PRCS	.528
Harris	1981/1982	33	SD+CM/T+T	SR	MECA	.271
Hayes	1984	14	CM/T	OA		.221
				ASR		.403
				ABR		-.051
				SR	SUDS	.380
				SR	FT	.482
				SR	PRCA	.346
				BR	BC	-.151
				BR	CASB	.050
		14	SD+CM/T+T	OA		.414
				ASR		.456
				ABR		.353
				SR	SUDS	.361
				SR	FT	.625
				SR	PRCA	.381
				BR	BC	.327
				BR	CASB	.378
		14	CM+SK+SD/T+T+T	OA		.689
				ASR		.616
				ABR		.798
				SR	SUDS	.540
				SR	FT	.716
				SR	PRCA	.591
				BR	BC	.620
				BR	CASB	.926
		14	SK/T	OA		.629
				ASR		.590
				ABR		.689
				SR	SUDS	.617
				SR	FT	.571
				SR	PRCA	.581
				BR	BC	.606
				BR	CASB	.771

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Hayes	1984	14	SD/T	OA		.425
				ASR		.420
				ABR		.434
				SR	SUDS	.394
				SR	FT	.424
				SR	PRCA	.441
				BR	BC	.151
				BR	CASB	.717
		14	SK+SD/T+T	OA		.381
				ASR		.380
				ABR		.384
				SR	SUDS	.328
				SR	FT	.370
				SR	PRCA	.442
				BR	BC	.450
				BR	CASB	.317
		14	SK/T	OA		.642
				ASR		.374
				ABR		.855
				SR	SUDS	.356
				SR	FT	.392
				BR	BC	.890
				BR	CASB	.820
Hayworth	1970	840	SK/C	BR	CBR	.138
Hekmat	1985	10	SD/T	OA		.183
				ASR		.185
				SR	PRCS	.092
				SR	AACL	.143
				SR	SRIA-S	.321
				BR	BC	.176
Hemme	1976	18	SD/T	OA		.162
				APR		.119
				SR	PRCS	.154
				BR	BC	.255
				PR	FS	.141
				PR	SS	.096
Henrikson	1943	205	SK/C	SR	RS	.339
Horne	1974	13	SD+SK/T+C	OA		.287
				SR	PRCS	.581
				PR	HR	.020
				BR	BC	.260
		5	SK/T+C	OA		.315
				SR	PRCS	.700
				PR	HR	.219
				BR	BC	.026

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Horne	1974	7	SK/C	OA		.162
				SR	PRCS	.446
				PR	HR	-.032
				BR	BC	.071
		22	CM+SK	OA		.300
				SR	PRCS	.591
				PR	HR	.145
				BR	BC	.163
Jaremko	1980	37	SD+E/T+C	OA		.250
				ASR		.278
				SR	AACL	.343
				SR	SEM	.213
				BR	BASA	.194
		25	E/C	OA		.083
				ASR		.004
				SR	AACL	.029
				SR	SEM	-.022
				BR	BASA	.242
Jaremko & Hadfield	1980	6	SD+SK/T+C	OA		.185
				ASR		.110
				SR	AACL	.179
				SR	FT	.041
				BR	BASA	.334
		9	CM+SK/T+C	OA		.422
				ASR		.407
				SR	AACL	.547
				SR	FT	.266
				BR	BASA	.453
		6	CM+SK+SD/T+C+T	OA		.245
				ASR		.246
				SR	AACL	.393
				SR	FT	.099
				BR	BASA	.242
		10	SK/T	OA		.161
				ASR		.039
				SR	AACL	.105
				SR	FT	-.027
				BR	BASA	.405
Jaremko	1973	10	SD/T	SR	PSFS	.283
Jarmon	1972	16	CM/T	OA		.101
				ASR		.138
				ABR		-.012
				SR	PRCS	.008
				SR	FT	.419
				BR	AS	-.011
				BR	SDC	-.012

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Jarmon	1972	13	SD/T	OA		.126
				ASR		.090
				ABR		.147
				SR	PRCS	.182
				SR	FT	.028
				BR	AS	.234
				BR	SDC	.059
Johnson	1971	8	SD/T	SR	PRCS	.066
		8	SK/T	SR	PRCS	.077
Kanter	1979	17	CM/T	OA		.284
				ASR		.387
				SR	SRIA-S	.369
				BR	BC	.137
				PR	HR	.225
				SR	AD	.404
		16	SD/T	OA		.265
				ASR		.400
				SR	SRIA-S	.418
				BR	BC	.110
				PR	HR	.151
				SR	AD	.384
		19	SD+CM/T+T	OA		.305
				ASR		.475
				SR	SRIA-S	.527
				BR	BC	.194
				PR	HR	.077
				SR	AD	.423
Karst	1970	16	CM/T	OA		.269
				ASR		.425
				SR	PRCS	.302
				SR	FT	.549
				BR	SDC	-.044
Katz	1976	94	SK/C	SR	PRCS	.056
Kirsch	1977	33	SD/T	OA		.239
				ASR		.190
				BR	BC	.338
				SR	PRCS	.106
				SR	AD	.274
Kirsch	1975	47	SD+E/T+C	OA		.379
				SR	PRCS	.315
				BR	BC	.442
Kleinsasser	1968	30	SD+SK/T+C	OA		.284
				ASR		.363
				SR	AD	.344
				BR	BC	.046
				SR	PRCS	.382
				SR	SRIA-S	.364

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Kleinsasser	1968	10	SK/C	OA		-.003
				ASR		.064
				SR	AD	.211
				BR	BC	-.202
				SR	PRCS	.117
				SR	SRIA-S	-.137
Krugman	1985	37	SD/T	OA		.219
				ASR		.247
				SR	PRCS	.237
				BR	BC	.163
				SR	FT	.256
Lamb	1965	7	SD+SK/T+C	OA		.173
				SR	PRCS	.229
				BR	BC	.117
LeTendre	1977	7	SD/T	BR	BC	.057
Leyden	1941	54	SK/T	OA		.089
				ASR		.119
				SR	SAS	.163
				SR	SEI	.074
				BR	AS	.030
Lieng	1976	24	SD/T	OA		.415
				ASR		.424
				SR	PRCS	.370
				SR	AD	.490
				SR	SRIA-S	.413
				BR	BC	.385
Lima	1975	5	SD/T	ASR		.499
				SR	FSS-S	.901
				SR	AD	.035
				SR	PRCS	.562
Little	1976	66	SD+SK/T+C	OA		.321
				ASR		.364
				SR	PRCS	.388
				SR	PRPSA	.340
				BR	BC	.238
		22	SK/C	OA		.273
				ASR		.240
				SR	PRCS	.286
				SR	PRPSA	.194
				BR	BC	.340
Littlefield	1987	205	SK/C	SR	PRSPA	.086
Lohr	1975	24	SD+SK/T+C	SR	PRCA	.281

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Longo	1984	38	SD+SK/T+C	OA		.243
				ASR		.242
				APR		.287
				SR	PRCS	.427
				PR	PS	.421
				BR	BC	.155
				SR	AD	.058
				PR	HR	.153
		19	SK/C	OA		-.054
				ASR		.008
				APR		-.028
				SR	PRCS	-.010
				PR	PS	-.120
				BR	BC	-.230
				SR	AD	.026
				PR	HR	.064
Lynd	1976	18	SD/T	OA		.245
				ASR		.363
				APR		.126
				SR	PRCS	.347
				SR	AD	.380
				PR	HR	.209
				PR	SS	.044
Mannion	1984	64	SD/T	OA		.305
				ASR		.410
				SR	PRCS	.440
				SR	SUDS	.380
				PR	HR	.095
Marshall	1982	5	SK/T	OA		.414
				ASR		.486
				ABR		.367
				BR	CASB	.332
				SR	SUDS	.411
				BR	BC	.384
				SR	FT	.561
		7	SD/T	OA		.397
				ASR		.434
				ABR		.372
				BR	CASB	.132
				SR	SUDS	.304
				BR	BC	.473
				SR	FT	.565
		7	SD+SK/T+T	OA		.510
				ASR		.404
				ABR		.581
				BR	CASB	.397
				SR	SUDS	.307
				BR	BC	.674
				SR	FT	.501

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Marshall	1982	24	SK/T	OA		.268
				ASR		.261
				ABR		.273
				BR	CASB	.299
				SR	SUDS	.310
				BR	BC	.260
				SR	FT	.212
Marshall	1976	31	SD/T	OA		.238
				ASR		.186
				SR	FT	.275
				SR	SUDS	.097
				BR	BC	.343
Marshall	1977	6	SD/T	OA		.816
				ASR		.817
				SR	FT	.863
				SR	SUDS	.772
				BR	BC	.813
		6	SK/T	OA		.567
				ASR		.388
				SR	FT	.448
				SR	SUDS	.329
				BR	BC	.925
		6	SK+SD/T+T	OA		.883
				ASR		.924
				SR	FT	.985
				SR	SUDS	.863
				BR	BC	.801
McCroskey	1972	435	SD+SK/C+C	SR	PRCA	.285
McCroskey	1970	24	SD+SK/C+C	SR	PRCS	.626
		24	SK/C	SR	PRCS	.240
McKinney	1982	14	SD/T	OA		.370
				APR		.212
				PR	HR	.233
				PR	PS	.190
				SR	PRCS	.688
		28	SD+SK/T+C	OA		.318
				APR		.222
				PR	HR	.177
					PS	.267
					PRCS	.511
McManus	1975-1976	24	SD+SK/T+C	SR	PRCA	.129
			SK/C	SR	PRCA	.000
McSweeny	1975	27	SD/T	OA		.174
				ASR		.218
				BR	BC	.044
				SR	PRCS	.145
				SR	AACL	.298
				SR	AD	.210

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Meichenbaum	1971	11	SD/T	OA		.374
				ASR		.534
				ABR		.377
				APR		.131
				BR	BC	.647
				SR	PRCS	.603
				SR	AACL	.739
				SR	AD	.261
				PR	WC	.165
				PR	SD	.097
				BR	NA	.107
		11	CM/T	OA		.395
				ASR		.565
				ABR		.371
				APR		.282
				BR	BC	.656
				SR	PRCS	.724
				SR	AACL	.642
				SR	AD	.328
				PR	WC	.236
				PR	SD	.095
				BR	NA	.086
		10	CM+SD/T+T	OA		.259
				ASR		.388
				ABR		.170
				APR		.154
				BR	BC	.408
				SR	PRCS	.432
				SR	AACL	.425
				SR	AD	.307
				PR	WC	.207
				PR	SD	.095
				BR	NA	.086
		10	SK/T	OA		.144
				ASR		.191
				ABR		.063
				APR		.154
				BR	BC	.408
				SR	PRCS	.095
				SR	AACL	.322
				SR	AD	.155
				PR	WC	.083
				PR	SD	.225
				BR	NA	-.282

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Morey	1973	30	CM+SK/T+C	OA		.280
				ASR		.363
				ABR		.195
				SR	FT	.234
				SR	PRCS	.493
				BR	BC	.109
				BR	AS	.282
Morgan	1970	30	SK/C+T	OA		.447
				ASR		.412
				SR	PRCS	.466
				SR	AACL	.358
				BR	BC	.518
Morley	1974	30	CM+SK/T+C	OA		.275
				ASR		.344
				ABR		.203
				SR	FT	.345
				SR	PRCS	.344
				BR	BC	.111
				BR	AS	.298
Mulac	1974	108	SK/C	SR	SPS	.081
Mylar	1972	26	SD/T	ASR		.379
				SR	PRCS	.142
				SR	SUDS	.617
Nichols	1969	38	SD+SK/T+C	SR	PRCA	.523
Nicolleti	1972	20	SD/T	SR	PSAI	.460
Norman	1975	12	SD+CM/T+T	OA		.359
				ASR		.503
				APR		.213
				SR	AD	.143
				PR	HR	.163
				SR	PRCS	.759
				SR	SRIA-S	.608
				BR	BC	.217
				PR	PS	.263
		12	CM/T	OA		.302
				ASR		.403
				APR		.211
				SR	AD	-.014
				PR	HR	.159
				SR	PRCS	.631
				SR	SRIA-S	.591
				BR	BC	.181
				PR	PS	.264

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Norman	1975	12	SD/T	OA		.334
				ASR		.421
				APR		.189
				SR	AD	.133
				PR	HR	.124
				SR	PRCS	.509
				SR	SRIA-S	.620
				BR	BC	.363
				PR	PS	.254
Osberg	1981	45	SD/T	OA		.226
				ASR		.319
				SR	PRCS	.218
				SR	SRIA-S	.421
				BR	BC	.073
				PR	PS	.190
Paul	1966	25	SD+SK/T+C	SR	SCI	.537
(article)		18	SK/C	SR	SCI	.165
Paul	1966	30	SD+SK/T+C	OA		.437
(book)				APR		.314
				SR	AD	.464
				PR	PS	.408
				BR	BC	.655
				PR	HR	.219
		15	CM+SK/T+C	OA		.245
				APR		.166
				SR	AD	.273
				PR	PS	.307
				BR	BC	.377
				PR	HR	.024
		37	SK/C	OA		.107
				APR		.024
				SR	AD	.208
				PR	PS	.058
				BR	BC	.172
				PR	HR	-.010
Paul & Shannon	1966	10	SD+SK/T+C	ASR		.738
				SR		.791
				SR		.686
Paulson	1951	271	SK/C	SR	PRCS	.082
Richter	1974	10	SD/T	BR	BC	.357
		10	SK/C	BR	BC	.357
Robinson	1955	413	SK/C	SR	SAS	.095

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Russell	1972	22	SD+SK/T+C	OA		.166
				ASR		.244
				APR		.089
				SR	AD	.173
				SR	SRIA-S	.387
				SR	PRCS	.173
				BR	BC	.085
				PR	HR	.126
				PR	PS	.052
		21	SK/C	OA		.166
				ASR		.223
				APR		.089
				SR	AD	-.011
				SR	SRIA-S	.409
				SR	PRCS	.272
				BR	BC	.149
				PR	HR	.020
				PR	PS	.159
Russell	1976	42	SD/T	PR	PRCS	.503
Saidel	1976	30	SD/T	OA		.190
				BR	BC	.100
				PR	HR	.280
Sanders	1967	26	SD/T	OA		.171
				SR	PRCS	.067
				BR	AS	.207
				PR	BC	.238
Sayner	1972	7	SD/T	OA		.526
				SR	SRIA-S	.809
				PR	HR	.213
				BR	AS	.557
Schleifer	1978	8	SD/T	OA		.239
				ASR		.252
				SR	AD	.283
				SR	SRIA-S	.200
				SR	PRCS	.274
				BR	BC	.197
		7	CM/T	OA		.210
				ASR		.206
				SR	AD	.301
				SR	SRIA-S	.142
				SR	PRCS	.174
				BR	BC	.224
Schmulowitz	1976	38	CM/T	OA		.148
				SR	PRCS	.037
				BR	SDS	.137
				PR	SD	.270

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Schmulowitz	1976	36	SD/T	OA		.131
				SR	PRCS	.052
				BR	SDS	.152
				PR	SD	.190
Schuler	1982	18	SD+CM/T+T	OA		.150
				ASR		.175
				SR	PRCS	.124
				SR	AACL	.307
				SR	PRCA	.094
				BR	BC	.179
				PR	HR	.045
Seiffert	1976	15	SD/T	OA		.459
				ASR		.501
				SR	AACL	.408
				BR	BC	.291
				SR	FT	.746
				SR	PRCS	.418
				SR	SAI-T	.433
Sherman	1974	9	SD+SK/T+C	OA		.411
				SR	PRCS	.367
				BR	BASA	.455
		10	SK/C	OA		.235
				SR	PRCS	.204
				BR	BASA	.267
Slutsky	1975	21	SD/T	OA		.188
				ASR		.213
				APR		.175
				SR	FT	.180
				SR	AD	.275
				PR	HR	.076
				PR	PS	.274
				BR	BC	.140
				SR	PRCS	.183
Straatmeyer	1974	30	CM+SK/T+C	OA		.338
				ASR		.363
				ABR		.315
				SR	FT	.166
				SR	PRCS	.556
				BR	BC	.127
				BR	AS	.504
		27	SK/C	OA		.238
				ASR		.235
				ABR		.241
				SR	FT	.180
				SR	PRCS	.289
				BR	BC	.065
				BR	AS	.418

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Succerman	1977	28	SD/T	OA		.120
				ASR		.128
				SR	PRCS	.184
				SR	AACL	.133
				BR	BC	.042
Thorpe	1976	32	CM/T	OA		.167
				ASR		.183
				SR	PRCS	.044
				SR	SRIA-S	.321
				BR	BC	.202
				PR	SS	.086
				SR	AACL	.183
Toy	1973	30	SD+SK/T+C	ASR		.459
				SR	PRCS	.518
				SR	SRIA-S	.605
				SR	AD	.254
Trexler	1972	33	CM+SK/T+C	OA		.197
				ASR		.171
				ABR		.229
				PR	PS	.184
				BR	BC	.186
				SR	FT	.125
				SR	PRCS	.218
				BR	AS	.272
Trier	1974	40	CM/T	OA		.266
				ASR		.452
				APR		.218
				SR	SRIA-S	.400
				BR	BC	.078
				PR	SD	.089
				PR	HR	.148
				SR	AD	.253
				SR	RS	.428
				SR	RS	.369
				SR	SAI-T	.360
Trussell	1978	30	SD/T	OA		.215
				SR	PRCS	.116
				BR	BASA	.315
Watson	1984	18	SK/T	ASR		.479
				SR	UCS	.537
				SR	PRCA	.460
				SR	RES	.441
		19	SD/T	ASR		.488
				SR	UCS	.583
				SR	PRCA	.487
				SR	RES	.410

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Watson	1984	15	CM/T	ASR		.540
				SR	UCS	.597
				SR	PRCA	.510
				SR	RES	.513
Weinberger	1976	15	SD/T	OA		.332
				ASR		.255
				SR	PRCS	.207
				SR	AACL	.268
				BR	BC	.562
				SR	SAI-S	.291
Weingarten	1973	24	SD+SK/T+C	ASR		.155
				SR	AACL	.208
				SR	PRCS	.137
				SR	SRIA-S	.120
		33	SK/C	ASR		.055
				SR	AACL	.081
				SR	PRCS	.010
				SR	SRIA-S	.073
Weissberg	1977	41	SD/T	OA		.399
				ASR		.450
				SR	PRCS	.321
				SR	AACL	.579
				BR	BC	.298
		22	CM/T	OA		.524
				ASR		.591
				SR	PRCS	.440
				SR	AACL	.753
				BR	BC	.378
Weissberg & Lamb	1977	10	SD/T	OA		.399
				ASR		.321
				BR	BC	.526
				SR	PRCS	.394
				SR	AACL	.278
		10	CM/T	OA		.509
				ASR		.386
				BR	BC	.753
				SR	PRCS	.522
				SR	AACL	.251
		6	SK/T	OA		.525
				ASR		.463
				BR	BC	.648
				SR	PRCS	.650
				SR	AACL	.276

Author	Year	N	Treatment Type/Setting	Measurement Type	Measurement Device	Effect Size
Worthington	1984	5	SK/T	OA		.623
				ASR		.615
				SR	PRCS	.489
				SR	FT	.665
				SR	AACL	.853
				BR	BC	.654
				SR	PRCA	.453
		5	SD/T	OA		.601
				ASR		.582
				SR	PRCS	.753
				SR	FT	.485
				SR	AACL	.465
				BR	BC	.675
				SR	PRCA	.626
		11	SK+SD/T+T	OA		.700
				ASR		.671
				SR	PRCS	.742
				SR	FT	.817
				SR	AACL	.684
				BR	BC	.820
				SR	PRCA	.439
Woy	1972	22	SD/T	OA		.266
				ASR		.301
				SR	PRCS	.109
				SR	SRIA-S	.281
				SR	AD	.513
				PR	HR	.213
				BR	BC	.215
Zemore	1975	32	SD/T	OA		.523
				ASR		.588
				SR	PRCS	.537
				SR	AACL	.651
				BR	BC	.327
				SR	FT	.576
Zimmerman	1974	18	SD/T	OA		.338
				BR	BC	.324
				SR	PRCA	.352

LIST OF REFERENCES

LIST OF REFERENCES

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