A META-ANALYSIS OF STUDIES ON SELF-CONCEPT BETWEEN THE YEARS OF 1976 AND 1986

DISSERTATION

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

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August, 1987

Cook, Peggy Jo, A Meta-Analysis of Research Studies on Self-Concept Between the Years of 1976 and 1986. Doctor of Philosophy (Counseling and Student Services), August, 1987, 101 pp., 4 tables, 1 illustration, bibliography, 109 titles, meta-analysis bibliography, 34 titles.

This meta-analysis investigated the efficacy of counseling to favorably change self-concept; the effectiveness of the Tennessee Self Concept Scale (TSCS) in measuring self-concept change; and whether the TSCS is consistent with other self-concept instruments in measuring self-concept change when used in the same research study.

The meta-analysis inclusion criteria were: one or more psychotherapy or counseling treatments administered to the subjects; comparison of two groups, including an alternate treatment or control condition; investigated self-concept change; pre-post-test measurements of self-concept dependent variable were reported; sample was randomized and/or matched for equivalence; and sufficient information was reported to calculate or reconstruct an effect size.

Following the conservative Kulik (1984) approach, this synthesis was limited to counseling and psychotherapy treatments and excluded drug therapy, milieu therapy, hypnotherapy, peer counseling, et cetera. Of 504 studies identified, 34 complied with the inclusion criteria for the

meta-analysis. Twenty-two of the studies utilized the TSCS. The 12 additional studies utilized 1 of 7 other self-concept instruments. No study in this synthesis used more than 1 self-concept instrument.

The data indicate that the average treated client in the studies in this synthesis was better off than over 64% of the untreated controls indicating the efficacy of counseling to favorably change self-concept in small increments. The TSCS subgroup did achieve reliably higher means than the other subgroup, being greater than $2SE_m$. The two groups, however, were not significantly different at the .05 level of probability. No data was available to compare the TSCS with other instruments.

Of the 17 studies reporting specific post-test means on the TSCS measure, the average total positive score was 346.01, which is virtually the same average Fitts (1965) found of 345.57 for a normal population of 626 subjects.

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CHAPTER I

INTRODUCTION

One of the critical challenges for mental health professionals today is to empirically establish the efficacy of counseling and psychotherapy (Erwin, 1980; Eysenck, 1952; Glass, McGaw, & Smith, 1981; Glass, Smith, & Miller, 1977; Krumboltz, 1966, 1968; Rosenzweig, 1954; Strupp, 1973, 1981; Thoresen, 1969; Thoresen & Anton, 1974). The evidence for the effectiveness of psychotherapy is confused, often scientifically unsound, and unable to identify those therapeutic interventions that are helpful in bringing about positive client changes (Klineberg, 1981).

If mental health professionals are to know how to alter therapeutic interventions, research must provide disciplined inquiry (Thoresen, 1969).

> Published research in counseling has, on the whole, been of little value as a base or guide for professional practice. . .much of the research has been trivial, atomistic, and obsessed with statistics and technical matters of research design. (Goldman, 1976, p. 543)

The realistic fact is that, in the long-range perspective, few, if any, studies have made much difference in how therapeutic intervention is achieved (Garfield, 1981; Horan, 1980; Paul, 1967). "By saying more research is needed, and by doing more of the same, research promises to increase the irrelevancy and insignificance of research to theory and practice" (Thoresen, 1969, p. 264). The main conclusion of psychotherapeutic research, all too often, has been that "further research is needed to clarify the contradictions" (Goldman, 1976, p. 544).

One example of the confusion that exists in counseling and psychotherapy empirical studies is the measurement of change in self-concept. The concept of self has been widely researched and discussed in the counseling and psychological literature for some time (Ansbacher & Ansbacher, 1956; Cooper, 1979; Cooper & Arkin, 1981; Coopersmith, 1967; Fitts, 1978; Maslow, 1954; Rogers, 1942, 1951; Wylie, 1961, 1974). Many theorists and clinicians believe that an individual must develop a healthy perception of self-worth and personal value (self-concept and internal locus of control) to become a normal personality, fully functioning as a self-actualized competent person (Bonney, 1969; Coopersmith, 1967; Hasher & Zacks, 1979; Selfridge & Kolk, 1979; Weinberg, 1978; Wylie, 1961, 1974) and yet measurement of self concept and its change continues to be a research issue.

The Tennessee Self Concept Scale (TSCS) (Fitts, 1955) is one of the instruments most widely used in clinical research to measure self-concept change (Silvernail, 1985; Wylie, 1974; Wylie, Miller, Cowles, & Wilson, 1979). Fitts (1965) defines self-concept as indicated in the total P score:

> It reflects the overall level of self esteem. Persons with high scores tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly. People with low scores are doubtful about their own worth; see themselves as undesirable; often feel anxious, depressed, and unhappy; and have little faith or confidence in themselves. (p. 2)

The TSCS is a self-reporting instrument of 100 items on which the research subjects indicate to what extent they perceive the statements apply to them. The scale provides a total of 14 scores including the total positive score which assesses the individual's overall self-concept. According to Fitts (1965) the total score "is the most important single score" because it reflects the overall level of self-concept (p. 2). The test-retest reliability of the total positive score is .92 (Fitts, Adams, Radford, Richard, Thomas, Thomas, & Thompson, 1971).

Sharpley and Hattie (1983), as well as Hoffman and Gellen (1983, 1984), have challenged Fitt's claim of the generalizability of normed data across cultures. Also, questions have been raised as to the scale's validity in certain clinical uses and interpretations (Hoffman & Gellen, 1983, 1984; Shavelson & Hubner, 1976; Tzeng, Maxey, Forien, & Lanis, 1985). These questions, in addition to the inconsistent findings of measurement related to change in self-concept using the TSCS, indicated a need for an in-depth study of the efficacy of the use of TSCS in counseling and psychotherapy research.

A review of self-concept experimental studies across multiple settings showed "a multitude of different self-concept definitions" found in Silvernail (1985, pp. 8-11):

> Even a cursory review of existing theories and research studies reveals a multitude of different definitions, some more precise and exacting than others. 'Self', for instance, has been defined as "that which is designated in common speech by the pronouns of the first person singular, 'I', 'me', 'mine' and 'myself'"(41). [numbers are Silvernail's reference citations] Others have defined 'self-concept' in a similar manner: "the organization of all that seems to the individual to be 'I' or 'me'" (38). 'Self' has also been

defined as "a complex and dynamic system of beliefs which an individual holds true about himself, and each belief with a corresponding value" (134). Still other definitions of 'self-concept' include "a person's perceptions of himself" (152) and "what an individual believes about himself" (35).

Turning for a moment to 'self-esteem', a word often used interchangeably with self-concept, it has been described as "a positive or negative attitude toward a particular object, namely, self" (138) and as "feelings of personal worth . . . influenced by performance, abilities, appearance, and judgments of significant others" (59). And to demonstrate the interchangeability of the two terms, 'self-concept' has been defined as "the sum total of all the characteristics a person attributes to himself, and the positive and negative values he attaches to these characteristics" (136).

Many more definitions could be cited, each slightly different, but this quickly becomes a futile exercise. Accordingly, at least on the surface, there appears to be some confusion regarding the definition of terms (27, 73). Upon closer examination, however, some distinctions do

emerge. First, 'self' is distinguishable from 'self-concept'. The most widely accepted definition of 'self' is the one first cited (41). It is referred to as the "looking-glass self" - the idea that we perceive ourselves as reflected in a mirror. As we become aware of our reflection, we become aware of our 'self' (that is, we begin to use expressions such as 'I', 'me', and 'mine'). As we become aware of 'self', we begin to perceive ourselves in terms of roles, abilities, limitations, etc. These perceptions are, in part, self-determined, and in part, influenced by the way we believe others perceive us. Some theoreticians (69, 114, 165) believe these perceptions are strongly influenced by the "significant others" in our lives, while others (72, 107) believe the major influence is derived from identifications we make with particular social groups. In all probability it is not an either/or situation - both are likely to influence our views.

Thus, 'self-concept' can be defined as the way we perceive ourselves and our actions, and our opinions regarding how others perceive us. As such, our self-concept is multifaceted. For instance, we perceive ourselves in different

roles (child, student, parent) with different abilities (physical, mental) and different limitations. All these are subparts of our self and combine to form our general self-concept. Generally, theoreticians and researchers believe the key dimensions of the general self-concept are the sense of (1) body self, (2) cognitive self, (3) social self, and (4) self-esteem. The first three dimensions are self-explanatory, but the fourth dimension needs clarification.

Self-esteem is the evaluative dimension of our self-concept. While our self-concept describes our perceptions, our self-esteem evaluates these perceptions. In essence, it is the value we place upon the various dimensions of our general self concept. This suggests that our self-concept develops earlier than our self-esteem - we perceive our 'self' in certain ways (roles, abilities, etc.) and then we develop an evaluation of these self-images. Accordingly, we may have an accurate self-concept and either a positive or negative self-esteem concurrently.

Pulling this discussion together, then we first perceive our 'self' as separate entity. As we do, we begin to describe our self in terms of roles, abilities, and specific attributes; that

is, we develop a 'self-concept'. This self-concept is composed of many images, or dimensions. One dimension is 'self-esteem', the values we assign to each role, ability, attribute.

Given these definitions and distinctions, we can now describe some additional features of 'self-concept' (152).

1. The self-concept is multidimensional. It includes many subparts, and even these subparts may have more than one dimension. For example, one subpart may be labeled our physical self-concept. But the physical self-concept can be further divided into our perceptions of our physical appearance, physical ability, etc.

2. The self-concept is hierarchical. Certain descriptions and evaluations form the core of our self-concept; that is, they are closer to the essence of our self. For instance, our image as "teacher" may be more central to our being than our image as "golfer".

3. The self concept, at least the general self-concept, is fairly stable. Our core perceptions develop early and change little through time. A long history of inconsistent perceptions is needed before these 'selfs'

change. However, as we descend the self-concept hierarchy - that is, move away from the core images - the self-concept becomes less stable. Our physical self-concept is set early and maintains a certain stability, but our perceptions of our physical appearance or agility, for example, change fairly easily with time, growth, and events.

4. Finally, the self-concept is evaluative. Not only do we develop a description of our self, but we also formulate evaluations of this description. These evaluations placed in the context of the other three features just described, suggest that the core evaluations are developed early in life and are resistant to change. Other less significant evaluations are constantly being developed, modified, discarded, and replaced by others.

To summarize, and for the purposes of this publication, a self-concept is defined as a person's perception of himself/herself. This perception is multi-dimensional, hierarchical, fairly stable, and evaluative. Clearly, this description cannot be viewed as an all-inclusive definition of self-concept. Even if we accept

these four as the salient features, unquestionably the total is greater than the sum of the parts.[1]

"The paucity of definitive findings" (Wylie, Miller, Cowles, & Wilson, 1979, p. 685) thus indicates the need for a scientific integration of self-concept research and findings. Meta-analysis is a scientifically rigorous alternative to the traditional methods of research integration through literature review (Glass, 1976).

Meta-analysis is a systematic approach to the problem of integrating a common research domain (Cook & Leviton, 1980; Cooper, 1979; Cooper & Arkin, 1981; Glass et al., 1981; Leviton & Cook, 1981). It is a major advance in methodology which embodies the rationale and procedures vital to the rigor of primary research (Bangert-Drowns, 1984). Meta-analytic research has brought out the pandemic problem of method specificity and demonstrated the need for more exact conceptual specification of therapeutic goals and procedures (Fiske, 1983). The quantitative analysis of

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[1] From Developing Positive Self-Concept, 2nd ed., (pp. 8-11) by David L. Silvernail, 1985, Washington, D.C.: National Education Association. Copyright 1985 by National Education Association. Reprinted by permission.

a research domain which statistically reflects the patterning of the particular outcomes of the studies being integrated is the essential purpose of meta-analysis (Rosenthal, 1983).

Meta-analysis is not a single method but rather an attitude toward data analysis which can take various forms depending on the reviewer's purpose. Approaches can range from descriptions of a body of literature to approximate data pooling techniques, where subjects from all studies are combined into one large comparison. Following the taxonomy recently reviewed by Bangert-Drowns (1984), the meta-analysis undertaken in this study conformed to the study effects approach.

The study effects approach is defined as the unit of analysis being each primary research study selected for inclusion in the meta-analysis. This approach is designed to ensure the statistical independence of each effect size. By representing a study only once, no single study carries more weight than any other, thus eliminating an arbitrary bias. Study effects meta-analysis, which has been used extensively by Kulik (1984), Kulik, Kulik, and Cohen (1979), Wortman and Bryant (1985), and Bangert-Drowns (1984), conforms to Glassian meta-analysis while avoiding the criticisms of Glass's method, referred to as the "apples-and-oranges" problem (Bangert-Drowns, 1984). This criticism of approach is focused on the Glassian method of

integrating poorly designed, flawed research studies with more scientifically designed experimental studies (Bangert-Drowns, 1984).

A meta-analysis of self-concept research outcome studies in general, and those using the Tennessee Self Concept Scale specifically, should advance both theory and application. The descriptive, diagnostic, predictive, and generative functions of meta-analyses provide information that help ensure that future self-concept research can be directed more efficiently (Cooper, 1979; Glass et al, 1981; Strube & Hartman, 1983; Wylie et al., 1979).

Statement of the Problem

Because of the equivocal results of studies of self-concept change, questionable research methodology in self-concept studies, and because use of the Tennessee Self Concept Scale has produced inconsistent data, there is a need for a consistent review of self-concept research. Therefore, this study was a meta-analysis of self-concept psychotherapy and counseling research reported during the last decade to examine the efficacy of therapeutic treatment to change the self-concept. The study also examined the efficacy of the Tennessee Self Concept Scale as a measurement of that change.

Synthesis of Related Literature

This study was a meta-analysis of self concept studies which is a systematic, scientific synthesis and statistical

quantification of the body of self concept research. Therefore, the synthesis of related literature in the traditional narrative form is brief and focused on inconsistencies in findings of self-concept research across various age groups and populations.

Self-Concept Studies of Elementary School Students

A limited number of counseling research studies with elementary school students, similar in research design and population and using counseling as the treatment did find a significant improvement in grades and self-concept following treatment (Barnes, 1977; Boyle, 1977; Clarkson, 1978; Dittloff, 1977; Grossman & Retish, 1976; Hayes, Cunningham, & Robinson, 1977; Peck & Jackson, 1976). None of these studies used the Tennessee Self Concept Scale as the measurement instrument.

However, other studies using counseling as the treatment, with the same similar research design and age groups, including two studies involving mentally retarded, learning disabled, and truant elementary children, did not achieve significant favorable self-concept change (Armstrong, 1978; Blohm, 1978; Buchanan, 1978; Calderone, 1978; Chandler, 1977; Clark, 1977; Dobbins, 1977; Jenson, 1978; Klarreich, 1977; Knickerbocker & Davidshofer, 1978; Lockwood, Salzberg, & Heckel, 1978; McMillan, 1978; Mitchum, 1978; O'Donnell, 1978; Paschal, 1977; Silver,

1978; Sobel & O'Brien, 1979). Buchanan (1978), Jenson (1978), McMillan (1978), Paschal (1977), and Silver (1978) used the Tennessee Self Concept Scale while the other studies in this list used a variety of other published and/or author-constructed instruments.

A total of 24 self-concept studies of elementary students revealed 7 studies that claimed significant self-concept change and 17 studies that reported no significant difference and recommended more research. These studies appeared to be methodologically inconsistent and treatments were of short durations.

Self-Concept Studies of Secondary School Students

Some studies have shown an overall significant improvement in the self-concept of secondary students. These studies have involved various group treatment procedures including personal mastery counseling (Callahan, 1979), para-analytical technique (Brandes, 1977), and facilitative communication training (Kelly, 1977).

A model workshop approach to self-concept building was investigated using success counseling (Washington, 1977). The technique focused on accomplishing two objectives: (a) helping disadvantaged urban adolescents to better understand the positive self, and (b) using the peer group as a base of support and reinforcement. Significant changes in self-concept were achieved and the technique was

recommended to assist the urban poor in gaining a positive conception of self and a sense of control over their environment (Washington, 1977).

Keeler (1978), found a program of group guidance had a significant, positive effect on the self-actualization characteristics of gifted secondary age students. A pre- and post-test, non-treatment control research design with treatment and control groups randomly selected was used. Randomly selected counselors implemented the treatment of group guidance to randomly selected students from a variety of school districts. The treatment group attended approximately 50 counseling sessions in a year-long program (Keeler, 1978). Keeler stated that the research clearly demonstrated that a school based group guidance program designed to assist gifted young adults in the self-actualization process can be an effective agent in achieving systematic goals and objectives.

In a study of the effect of group counseling on the self-concept and level of self-actualization of high school students, Mirrow (1977) found no significant changes in self-concept between the experimental and control groups using the Tennessee Self Concept Scale as the measure of self-concept. Significant differences did appear on the Time Competent and Inner Support Scales of the Personal Orientation Inventory (POI) between the experimental and control groups in the direction of increased

self-actualization for both experimental groups. The two experimental groups consisted of volunteers for group counseling, one of which was post-tested only. The treatment included the use of 2 group leaders, 1 male and 1 female, for 15 45-minute group sessions.

A similar experimental study designed to increase the self-concept of low self-concept tenth grade students (Cheney, 1977) utilized the pre- and post-test control group design. The subjects were randomly divided into the experimental and control groups. During the tenth grade year the experimental group received treatment and the control group received no treatment. The data revealed the experimental group had a significantly higher gain in self-concept scores than the control group on the inferred self-concept measure, the Florida Key, which was rated by English and mathematics teachers. However, there was no significant difference between the control and experimental groups on the Piers-Harris Children's Self Concept Scale, the self-report instrument used to measure self-concept change.

Self-Concept Studies of College Students

According to the research on self-concept of college students, a positive self-concept change can be achieved with short-term treatment modes of encounter and gestalt groups, sensitivity training, group counseling and psychotherapy. Finando, Croteau, Sanz, and Woodson (1977)

tested 72 male and female undergraduates to determine the degree of self-concept change after 36-hour marathon encounter and gestalt groups in a laboratory setting. The pre- and post-test changes in self-esteem scores on a semantic differential instrument did not indicate a difference between the two experimental groups. However, both experimental groups achieved significantly more positive change in self-esteem than did the control group as measured by scales derived from the "6 dimensions of the self-concept identified by Smith (1962)" (cited in Finando et al., 1977). This descriptive study did not randomize subjects or provide control for time, Hawthorne, leader, or task effects.

The Tennessee Self Concept Scale, the College Self Expression Scale, and the I, P, and C scales were used to evaluate the effects of group counseling on self-assertion, self-concept, and locus of control of college students (Saxon, 1979). The data indicated overall improvement of self-concept and the social aspects of self-concept. Saxon used a pre- and post-test control group design, with random assignment to treatment and control conditions. The results suggested that group counseling will help clients with weak social skills to improve their skills and self-concepts.

In assessing the effects of members' and leaders' expectations on group members' self-actualization and

self-esteem gain, Peteroy (1979) determined that varying the level of group expectations did not significantly affect self-actualization gain but did show significant increase in self-esteem. Peteroy recommended future research on the effect of group leaders' expectations on self-concept. Apparently, this study did not control for group leader's expectations on self-concept.

In a pre- and post-test randomized control group design study, Hill (1977) investigated the effects of a group counseling experience on self-concept, personality and academic achievement of college freshmen. The results of the study using the Tennessee Self Concept Scale indicated a significant difference in self-concept and in personality between the experimental group and the two control groups. However, there was no significant difference in academic achievement observed at the end of one academic quarter.

The research study of Hilyer and Mitchell (1979) was designed to measure the effects of group counseling combined with physical fitness training on the self-concept of college students. A randomized pre- and post-test design was used with two treatment groups and a control group. The 10-week, one hour weekly, group counseling fitness group achieved a significant increase in self-concept as measured by the TSCS (Fitts, 1965). Limitations of this study are that no controls were

available on the outside activities of the subjects used in the study, and other variables that might have effected changes in self-concept other than the treatment were not readily identifiable. Hilyer and Mitchell (1979) also raised other questions such as, "How much of the treatment effect is the result of the counseling and how much is the effect of the running? Would you get the same results from counseling alone?"

In a study designed to investigate the effects of group counseling on the self-concept and achievement of black college freshmen, a pre- and post-test randomized control group design was used (Davis, 1978). The Tennessee Self Concept Scale was used to measure self-concept change. The treatment group received counseling for a 14-week period. The control group was conducted by the investigator in a more didactic manner. The group counseling program with under-achieving black college freshmen resulted in a significant favorable self-concept change. Davis concluded that group counseling was an effective means of altering the self-concept of the subjects in the study. Improving self-concept, however, did not insure that a corresponding increase occurred in scholastic achievement, and Davis further concluded that self-concept was not a reliable predictor of scholastic achievement for the subjects in the study.

Using sensitivity training, Lavoie (1974-75) evaluated the phenomenological transformation of the self-concept towards self-actualization of 30 college seniors, 30 female teachers, and 30 nuns. Significant self-concept change was obtained, but did not demonstrate permanence in follow-up procedures.

Self-Concept Studies of Adults--Aged, Terminally Ill, Disadvantaged, and Prisoners

The final subsection of studies related to specific populations are of importance because they involve research subjects in unusual circumstances and environments who are frequently in some manner socially and/or emotionally deprived.

Significant gains in self-concept were found in Roessler's (1978) study of the effects of a structured personal-adjustment training program (PAS) on visually handicapped adults. The data indicated the subjects not only showed a significant increase in self-esteem but tended to make greater progress in goal attainment. Roessler concluded the PAS program could be an effective approach to group counseling visually handicapped clients with low self-concept.

The effectiveness of Rational Behavior Therapy (RBT) group counseling with disadvantaged rural adults was examined by Newhouse and Schwager (1978). The data indicated the experimental subjects showed significant

increase in self-concept, greater self-acceptance, and a decrease in the use of irrational beliefs and self-talk on the Personal Orientation Inventory. It was concluded by Newhouse and Schwager (1978) that RBT group counseling could be effective in favorably changing the self-concept of disadvantaged populations.

To examine the relationship between an existential-type group psychotherapy and its effects on attitudes about death and dying, self-concept, and perception of a meaningful existence of persons who face imminent death, Linderberg (1978) selected 7 female outpatients who had metastatic cancer as members of the treatment group. The group met for 10 consecutive sessions, 1-1/2 hours per session over a 12-week period. Each participant was the subject of an intense $N = 1$ study. The research design was exploratory and quasi-experimental. The data revealed a significant positive change in self-concept and it was concluded that existential-type group psychotherapy was significantly feasible and useful for persons, particularly outpatients, who are severely, critically, or terminally ill.

Treatment modalities of Transactional Analysis, Rational Behavior Therapy, and Encounter Techniques were investigated by Simonis (1977) to examine their relative effectiveness in changing the self-concept of inmates at a federal penitentiary. The inmates were randomly assigned

to different treatment and non-treatment categories. Treatment sessions were 90-minutes once a week for a period of 12 weeks. Pre- and post-test measures of self-concept of the experimental subjects were made. The control group received testing only. The Personal Orientation Inventory (POI) was used to measure the self-concept change. The results showed that a group therapy experience of the length and structure of that in the study did yield a significant positive increase in the self-concept variable as measured by the POI for all inmates tested. Transactional Analysis facilitated the greatest change in Feeling Reactivity and Synergistic Awareness.

Summary

Studies involving elementary students generally showed a lack of significant change in self-concept following treatment. These findings may be evidence of the ineffectiveness of the treatment procedure, or possibly a need for more reasonable time periods for therapy within which self-concept could be expected to change. They may be related to the measurement instrument used as well. Also, more consistent, concise definition of terms, and more specific methodological information to allow for critical evaluation of procedures and sampling techniques is imperative to professional accountability.

The body of research data related to secondary students and self-concept change is also inconclusive.

Some studies claimed to achieve favorable self-concept change (Brandes, 1977; Callahan, 1979; Kelly, 1977; Washington, 1977) and others reported no significant changes in self-concept (Cheney, 1977; Keeler, 1978; Mirrow, 1977). Although the Cheney and Keeler studies both provided treatment for approximately one year and used relatively rigorous research designs for human subjects, neither reported significant self-concept change. Keeler reported a significant positive effect on the self-actualization characteristics but no significant self-concept change as measured by the Tennessee Self Concept Scale. Cheney used the Piers-Harris Children's Self Concept Scale to measure self-concept change and reported no significant difference. The fact that Keeler reported a significant positive effect on the self-actualization characteristic but not on self-concept change raises the question of how self-actualization can indicate a change without a self-concept change since it is believed that self-actualization is the process of changing self-concept (Fitts et al., 1971; Wylie et al., 1979).

The studies in the college age subsection involving marathon groups, sensitivity training, group counseling, and group psychotherapy appear to support therapy as effective in increasing self-concept in college age students even in a relatively short time. Yet, there are a number of questions regarding the lasting effect of the

self-concept change, experimenter bias, and confounding variables, indicating a need for more in-depth study of the self-concept research domain.

It may be of some significance that all four studies in this subsection reported a consistent increase in self-concept change and none of them used the Tennessee Self Concept Scale. It is also possible that these particular sample populations were at the low end on the self-concept continuum, making a significant change easier to achieve. A meta-analysis of the self-concept research domain can provide additional information for educators and clinicians to facilitate specific therapeutic interventions for these special populations as well as the general public.

The literature shows the inconsistency of findings in the educational and psychological research in relationship to therapy and changes in self-concept. Inconsistency of findings is demonstrated specifically in self-concept changes as measured by the instruments designed for children. Taking into consideration the highly significant position the self-concept development has achieved in education and the social sciences, a meta-analysis of self-concept research in general is warranted, and specifically research which utilizes the TSCS as the measure of positive self-concept change.

The meta-analysis procedure used in this study statistically integrated studies of comparable quality. The effect size, the magnitude of the effect of the treatment, were calculated to show the kind of effect produced, if any. The magnitude of effect was compared across type of treatment modalities and across type of outcome to determine whether the treatment had greater effect on some outcome variables than others. This is a complex and important methodological process of extracting knowledge from the body of research accumulated to make the information more functionally available to the educator and clinician to facilitate meeting the therapeutic needs of the general public.

CHAPTER II

PROCEDURES

This chapter presents the definition of terms, research questions, and the meta-analysis sampling and coding procedures.

Definition of Terms

Due to the nature of meta-analysis the definition of terms for this study is presented in three sections: (a) definitions related to criteria of prior research studies used in the meta-analysis; (b) terms that have specific meaning for the meta-analysis; and (c) definitions of self-concept as indicated by the instruments used.

Definitions Related to Criteria of Prior Research Studies Used in the Meta-Analysis

Counseling versus psychotherapy continuum--counseling deals with the so-called normal individuals whose problems are developmental in nature, while psychotherapy is concerned with individuals who are deficient in some respect. Counseling is largely characterized by terms such as conscious awareness, problem solving, educative, supportive, and situational. Psychotherapy is concerned with reconstruction, depth emphasis, analysis, and focus

on the unconscious with emphasis on neurotic and emotional problems (Wylie et al., 1979).

Group counseling--a dynamic inter- and intrapersonal process whose content is generated out of the feelings and behavior of the individual group members. The leader is a professionally trained counselor who is capable of creating a climate of trust, openness, responsibility, and interdependency through the therapy processes of understanding, caring, and conflict management. The group is comprised of persons functioning within the normal ranges of adjustment who are seeking increased awareness of self and others so that they may better deal with developmental situations (Berg & Johnson, 1971).

Self-actualization--Maslow's term to describe the process of becoming integrated to the point of developing capacities and of accepting one's motives and goals in life (Maslow, 1954).

Self-affirmation--the process of recognizing, becoming aware of, accepting, and verbally and functionally affirming characteristic truths about one's self (Good, 1973).

Self-concept--the individual's perception of self as a person including abilities, appearance, performance on the job, and other phases of daily living (Good, 1973). Amplified, the self is defined as "a complex and dynamic

system of beliefs which an individual holds true about himself, and each belief with a corresponding value" (Wylie et al., 1979).

Therapy, counseling--sociopsychological assistance or counseling which involves considerable involvement in personality restructuring and environmental change (Good, 1973).

Therapy, group--a technique employed by qualified therapists for assisting, chiefly through a process of group interaction and exploration in a permissive, cooperative atmosphere, relatively homogeneous groups of individuals into gaining insights and understandings of the probable causative background of the individual's present mental, emotional, and social conflicts. The goal sought is some degree of conflict resolution for better orientation for each member of the group. A synonym is group psychotherapy (Berg & Johnson, 1971; Good, 1973).

Terms That Have Specific Meaning For the Meta-analysis

Meta-analysis--"the essential character of meta-analysis is that it is the statistical analysis of the summary findings of many empirical studies--the attitude of data analysis applied to quantitative summaries of individual experiments" (Glass, McGaw, & Smith, 1981, pp. 21, 217). Meta-analysis is the integration of research

studies through statistical analysis of the primary analysis of individual studies, the application of research methods to the characteristics and findings of research studies (Bangert-Drowns, 1984; Rosenthal, 1983).

Research methods--such considerations as are normally addressed in conceptualizing, designing, and analyzing empirical research: problem selection; hypothesis formulation; definition and measurement of constructs and variables; sampling; and data analysis (Glass et al., 1981).

Effect size--the mean difference between the treated and control subjects divided by the standard deviation of the control group. Effect size is essentially a Z score representing the degree of success produced by an experimental treatment on a specific measure in a given experiment at a particular point in time (Glass et al., 1981).

Estimate average effect--term used in recognition of the error component in statistical data. The average effect is achieved by totaling the calculated effect size of each primary study, then dividing by the total number of primary studies. This procedure averages the effect sizes to obtain an estimate of the average treatment effect (Glass et al., 1981).

Regression analysis--the effect of any particular characteristic or feature variable tested by using that variable--i.e., duration of therapy in hours, whether group or individual therapy, diagnosis of subjects as neurotics or psychotics (see Coding Form in Appendix A) as a predictor in a regression analysis that uses the effect size as the dependent variable.

Study effects approach--the unit of analysis used is each primary research study selected for inclusion in the meta-analysis thus ensuring the statistical independence of each effect size (Bangert-Drowns, 1984).

Definitions of Self-Concept as Indicated by Instruments

Tennessee Self Concept Scale--the TSCS reflects the overall level of self esteem. High scores indicate that persons tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly. Low scores indicate that people are doubtful about their own worth; see themselves as undesirable; often feel anxious, depressed, and unhappy; and have little faith or confidence in themselves (Fitts, 1965).

Rosenberg Self-Concept Inventory--Rosenberg defines self-concept as "a positive or negative attitude toward a particular object, namely, self" (Rosenberg, 1965).

Personal Orientation Inventory--the POI defines self-concept as "how one feels about one's identity" (Shostrom, 1966).

Primary Self-Concept Inventory--Muller and Leonetti (1974) define the self-concept, as measured by the PSCI, as "the self-description the individual provides of himself" (p. 5).

Florida Key: A Scale to Infer Learner Self Concept--Purkey (1970) defines self-concept as "a complex and dynamic system of beliefs which an individual holds true about himself, and each belief with a corresponding value."

The Self-Esteem Inventory--Coopersmith (1967) defines self-esteem as including "one's self-assessment in relation to general self, social self, parents and peers" (pp. 5-6).

Piers-Harris Children's Self-Concept Scale--Piers and Harris define self-concept as "that self-perception which measured by 'The Way I Feel About Myself'" (Piers & Harris, 1969).

Self-Concept Inventory--the Inventory, developed by the Instructional Objectives Exchange, defines self-concept as "what an individual believes about the self" (Buros, 1970).

Research Questions

Because of the meta-analysis focus of this study, the following research questions were addressed.

1. Does the educational and psychological research, as a whole, indicate the efficacy of counseling to favorably change self-concept?

2. Is the Tennessee Self Concept Scale effective in measuring self-concept change?

3. Is the Tennessee Self Concept Scale consistent with other self-concept instruments in measuring self-concept change, when used in the same research study?

Procedures

The procedures used in this meta-analysis study were (1) meta-analysis sample selection, (2) coding characteristics of the primary studies, (3) effect size calculations, and (4) statistical analysis of the data.

Meta-Analysis Sample Selection

This research identified and collected all self-concept studies reported between 1976 and 1986 that tested the effects of counseling and psychotherapy on the self-concept variable. To determine the magnitude of effect of the therapy in each study, Glass's formula for calculating the effect size was used. The effect size is the mean difference between the treated and control

subjects divided by the standard deviation of the control group (Glass et al., 1981):

$$ES = \bar{X}_T - \bar{X}_C \; / \; s_C \; .$$

Using the Dialog Information Retrieval System, a computer search was completed on the data bases of Psychological Abstracts, Dissertation Abstracts International and the Educational Research Information Center. The computer search descriptors used were Tennessee, self, concept, scale, counseling, and psychotherapy.

Each self-concept study reported between 1976 and 1986 was examined by specific inclusion criteria to control for the "apples to oranges problem" (Bangert-Drowns, 1984, p. 28).

The inclusion criteria for this meta-analysis were: (a) one or more psychotherapy or counseling treatments or interventions were administered to the subjects; (b) two groups were compared, one of which received the treatment or intervention and the other group received an alternate treatment or control condition; (c) the treatments or interventions investigated favorable self-concept change; (d) pre- and post-test measurements of the self-concept dependent variable were reported; (e) the sample was randomized and/or matched for equivalence; and (f)

sufficient information was provided in the research report to calculate or reconstruct an effect size.

Studies of drug therapies, hypnotherapy, occupational therapy, milieu therapy, peer counseling, and success training were excluded. Even though sensitivity training, marathon encounter group, and psychodrama use the same qualified professional therapists and have essentially the same therapeutic helping interests, these studies were excluded to limit the integration to comparable studies.

Five hundred and four studies were identified as self-concept studies. From these studies, 34 complied with the inclusion criteria and were selected for the meta-analysis.

Coding Characteristics of the Primary Studies

Glass et al.(1981) characterized features of studies as substantive and methodological. The substantive characteristics are those that are particular to the domain under investigation. The methodological characteristics coded included treatment domains, outcome measure domains, and treatment modality. Methodological characteristics coded included random assignment and other methods used to equate groups, type of comparison group, awareness of treatment administrators, and the type of outcome measure technology. Quantitative and categorical variables (see Coding Form in Appendix A) were used to code study features

as independent variables. The total positive score of the Tennessee Self Concept Scale was used to compute the effect size, and all other dependent self-concept measurement variables were averaged. In addition, a single adjusted effect size was calculated for each primary study on the self-concept measure. Individual effect sizes were computed using Glass's formula and an average effect size per category was calculated. A priori categorization of effect sizes initially was the duration of treatment since this appears to be one variable that varies considerably throughout the research and may be a major contributing factor in the inconsistent findings. Comparison of average effect sizes in the pre-established category were made following Glass's methodology and regression models were developed to examine the effects of study features on study outcomes (Bangert-Drowns, 1984).

Each study was read by two reviewers, the researcher and one research assistant (Letty Lynn Maloney, PhD, Educational Research Consultant). Training for the coding was provided by Sharron Ronco, a doctoral candidate in Educational Research whose dissertation topic is the meta-analysis research methodology, under the supervision of William Brookshire, PhD. The meta-analysis coding required approximately three person hours per study.

The characteristics of the primary studies and their findings were described, classified, coded (see Coding Form in Appendix A), and quantified so that the statistical integration could be performed. The quantification involved measurement in its metric aspects. The point of measuring and coding of study characteristics was to relate the properties of the studies to the study findings. The measurement problem in meta-analysis is the classifying, coding, and quantifying of the characteristics and findings based on written reports. The reports of the research are stable, but coder agreement is the area of vulnerability. Reliability is dependent on different readers (coders) seeing and judging characteristics of a study in the same way (Glass et al., 1981, pp. 75-77). Careful reading of each research study and coding are essential as a matter of reliability. The quality of the reporting of the primary research, such as the clarity of definitions, adequacy of reported information, as well as the degree of coder inference effects the reliability of measurements (Bangert-Drowns, 1984; Glass et al., 1981). The Coding Form was modified as the process required when the actual studies selected by the meta-analysis research design were evaluated for coding. When the two coders disagreed on the judging of the characteristics of a study re-analyzing was

done until unanimous agreement between the two research coders was achieved.

Effect Size Calculations

The effect size was calculated on the Tennessee Self Concept Scale outcome measurements. The effect size of other self-concept variables the researcher of the original primary study chose to measure were averaged. Outcome measures on variables other than self-concept measures were not calculated in this study. If effects were measured at more than one time after treatment as a follow-up procedure, the last measure was used to calculate the effect size in this study. A comparison was made between the average ffect size of the TSCS and the average of the effect size of all other self-concept dependent measures.

The unit of analysis was each primary research study selected for inclusion in this meta-analysis. This ensured the statistical independence of each effect size. By representing a study only once to each analysis, no single study carried more weight than any other, thus eliminating an arbitrary bias. Glass's effect size was used as an outcome measure and parametric statistical tests were used to identify relationships between study features and study outcomes.

The effect size calculation equations used in this meta-analysis are listed in Appendix B (Glass et al.,

1981). Nineteen studies reported post-test means and standard deviations. Six studies reported post-test data in terms of F-ratios. Three effect sizes were calculated from reported t-tests. Other inferential test data or estimates of the standard deviations were used in the remaining (6) studies to calculate effect sizes.

Analysis of Data

Analysis of the data consisted of four steps.

1. Descriptive statistics for the body of data as a whole, contrasting the average effect size (ES) on the Tennessee Self Concept Scale and the average ES for all other self-concept measures.

2. Regression analysis was applied to test which variables made a unique contribution to R^2 of sufficient magnitude to warrant further study.

3. The regression analysis was done twice; once on the Tennessee Self Concept Scale average effect size and then on the average effect size of all other dependent self-concept measures.

4. The variables from the regression analysis were used to perform a multifactor analysis of variance using levels of independent variables and types of dependent measure.

The statistical analyses were done at the North Texas State University computer center utilizing the Statistical Package for Social Sciences (SPSS-X) software system.

CHAPTER III

RESULTS AND DISCUSSION

This chapter presents the results and discussion of findings of the meta-analysis including a review of the selection procedure for admissible studies, a descriptive profile of the studies, analysis of data, interpretation of the results, discussion of the research questions addressed, and recommendations for further research.

This study was a meta-analysis of self-concept studies which is a statistical approach for integrating the findings of individual studies. The systematic, scientific synthesis and statistical approach consisted of: (a) defining the problem and establishing criteria for admissible studies; (b) locating the research studies; (c) classifying and coding the methodological and substantive characteristics of the primary studies; (d) effect size calculations on a common metric scale; and (e) the statistical analysis of the data.

The admissible criteria used for this meta-analysis were: (a) one or more psychotherapy or counseling treatments or interventions were administered to the research subjects; (b) two groups were compared, one of which received the treatment or intervention, and the other

of which received an alternate treatment or control condition; (c) the treatments or interventions investigated favorable self-concept change; (d) pre- and post-test measurements of the self-concept dependent variable were reported; (e) sample was randomized and/or matched for equivalence; and (f) sufficient information was provided in the research report to calculate or reconstruct an effect size (ES).

The current synthesis has been limited to experimental or quasi-experimental studies examining the efficacy of treatments designed to favorably change self-concept. The term experimental requires the most exacting application of several criteria. Since some of the studies used in this meta-analysis failed to meet some of these criteria, they are technically referred to as quasi-experimental. Therefore to avoid the awkwardness of referring to the entire set of studies used in this synthesis as "experimental or quasi-experimental," the term experimental or treatment is used to refer to the entire set of studies which includes both experimental and quasi-experimental. To be included in the meta-analysis these experimental studies assigned a treatment to favorably change self-concept to one group and compared the mean score of this group to the mean of one or more other treatment or control/comparison groups. The meta-analysis specifically limited the treatment to counseling and psychotherapy,

excluding all other approaches to favorably change self-concept such as open classroom, skill development studies, drug therapy, hypnotherapy, and peer counseling.

Selection of Admissible Studies

After study abstracts were obtained from the Dialog Information Retrieval System on the Psychological Abstracts, Dissertation Abstracts International and Educational Research Information Center databases for the period from 1976 to 1986 on self-concept studies, these procedures were followed.

1. On the first iteration all non-treatment research reports such as reviews, scale critiques, sample administrations, studies with treatment therapies that did not meet the inclusion criteria (drug therapies, hypnotherapy, occupational therapy, milieu therapy, and peer counseling), analog studies, studies published prior to 1976, and studies with no control or comparison (including single case studies) were rejected.

2. Copies of the remaining titles were secured (one title from a Canadian journal could not be located).

3. The articles and dissertations were read on a second iteration for meeting the inclusion criteria, independently by the researcher and a research associate. Studies which did not report sufficient statistical information to calculate an estimated effect size were also rejected.

4. The researcher and a research associate independently coded the admissible studies using the meta-analysis coding form developed for this research (see Appendix A). The meta-analysis coding required approximately three person hours per study. A total of 16 journal articles and 18 dissertations was included in this meta-analysis. These studies are listed in a separate section following the references.

5. The intercoder reliability was defined as unanimous agreement and required negotiation until consensus was achieved on coding differences and questions of appropriate categories for the coded variables. Effect sizes were calculated by computer using Glass' formula for differences in post-test means divided by the standard deviation of the control group and alternate formulas for effect sizes when only F-test or t-test statistics were provided (see Appendix B for formulas). One effect size on the self-concept dependent measure was calculated per study. None of the studies accepted for inclusion utilized more than one self-concept scaling measure. When simultaneous comparisons were made in a single study (several therapy techniques compared), an effect size was calculated for each and an average effect size was reported for the study. By representing a study only once to each analysis, no single study carried more weight than any

other, thus eliminating an arbitrary bias to counter current criticisms (Bangert-Drowns, 1984, p. 24).

6. An unbiased effect size was calculated for each study using the Hedges and Olkin (1985, p. 81) formula for correcting for small sample bias:

$$g' = (1 - 3/4N - 9)g$$

where g' is the unbiased effect size, N is the size of the combined treatment group and the control group, and g is the effect size. Glass also recommends this bias correction factor to attenuate for the small sample bias.

Of the 504 titles generated for the time period, 397 were rejected as non-treatment or interventions not specified by the inclusion criteria; 19 studies were published earlier than 1976; 40 studies did not meet specified control/design criteria; 6 articles did not include sufficient statistical data to calculate an effect size (including one study with contradictory information which could not be clarified when the author was contacted by telephone); 7 studies were unavailable in English translations; and 1 study could not be located. Thirty-four studies were accepted for inclusion in the meta-analysis with 22 utilizing the Tennessee Self-Concept Scale and 12 utilizing other scales (a total of 8 different self-concept measures were represented).

Descriptive Profile

All coded data were put into the North Texas State University computer center to utilize the SPSS-X Batch system for further analysis. Descriptive statistics including means, standard deviations and frequencies were calculated for the TSCS subset effect sizes (22 studies), the Other Self-Concept Measures subset effect sizes (12 studies), and the combined average effect size for all 34 studies in each of the substantive and methodological variables coded. The mean unbiased effect sizes for each subgroup and the total study are presented in Table 1.

Table 1

Unbiased Mean Effect Sizes for Self-Concept Studies by Measurement Scales

Groups	N	Mean ES*	Standard Error**
TSCS Measures	22	.46	.107
Other Measures	12	.19	.205
Total	34	.37	.098

*Unbiased Effect Size **Standard Error of ES

The mean unbiased effect size for the TSCS subgroup was more than twice that of the Other Self-Concept Measures subgroup. In the Other Self-Concept Measures subgroup, 5 studies had negative effect sizes indicating some post-test results were smaller for treatment groups than for control groups. For the total study, the 95% confidence interval for the mean effect size (.16 to .56) did not include 0 which indicates an overall treatment effect was achieved (Glass et al., 1981).

Glass et al. (1981) characterized features of studies as substantive and methodological. Those characteristics that are particular to the area or problem under investigation (favorable self-concept change in this synthesis) are called substantive including the client diagnosis, hospitalization, intelligence levels, therapy modality, treatment location, therapy duration, therapist experience, and treatment type. The methodological characteristics are features of the research method including blinding of experimenter, assignment to groups, experimental mortality, internal validity, publication form, and publication date. A coding form was designed to describe quantitatively these characteristics. After coding was initiated, the coding form was progressively revised in response to unanticipated variations in study characteristics. An example of this is the study feature "Similarity of Therapist and Client" used in Smith and

Glass (1977) Meta-Analysis of Psychotherapy Outcome Studies. They reported greater effect sizes for studies where the therapist was very similar to the client. However, in this meta-analysis, this feature was deleted due to non-reported data in the primary studies. The study identification number, principal author, and client description were used for case identification only. Table 2 on the following pages lists the studies by author, selected descriptive characteristics, and the calculated unbiased effect sizes.

The studies in this meta-analysis listed in Table 2 were all drawn from volunteer participants and essentially from samples diagnosed as normal with the exception of one hospitalized sample diagnosed as schizophrenics. Intelligence levels were not reported in most of the studies and were assumed to be average from the description of the study samples. Only one study tested subjects who were below average in intelligence. All studies used a group therapy modality as the principal mode of therapy delivery. There were no cases of experimental blinding with all reporting that the researcher conducted the therapy or knew of the composition of the treatment and control groups. The average duration of therapy for the 34 studies was 1.6 hours per week and the average duration of treatment was 10 weeks. The average age of the clients was 18.8 years with 5 studies not reporting the precise age.

Table 2

Meta-Analysis Studies in Self-Concept Change From 1976-1986

Author, Date	Subjects	Type of Therapy	Duration of Therapy/Treatment*	Test Used	Effect Size**
Armstrong, 1978	40 secondary	cognitive	1.00/20	Piers-Harris	.86
Barnes, 1977	58 primary	affective	1.00/09	Primary SCI	.00
Blohm, 1978	48 primary	cognitive	1.00/14	Primary SCI	.32
Buchanan, 1978	104 college	behavioral	1.00/10	TSCS	-.84
Carver, 1985	110 college	cognitive	3.00/14	TSCS	.07
Cerneglia, 1978	53 adults	affective	1.00/...	TSCS	.32
Chandler, 1977	99 primary	cognitive	2.00/02	Piers-Harris	-.51
Clarkson, 1978	67 primary	cognitive	3.00/08	SC Inventory	-.98
Davis, 1978	40 college	cognitive	1.00/14	TSCS	.26
Dittloff, 1977	60 primary	combination	0.50/14	Florida Key	1.87
Fryrear, 1977	30 secondary	behavioral	1.00/05	TSCS	.97
Garber, 1976	20 secondary	cognitive	1.50/10	TSCS	.90
Hayes, 1977	46 primary	behavioral	1.00/12	Coopersmith	.66
Helffenstein, 1982	16 adults	behavioral	7.00/03	TSCS	1.30
Hill, 1977	60 college	behavioral	2.00/10	TSCS	.40
Hilyer, 1979	120 college	cognitive	4.00/10	TSCS	.48
Jensen, 1978	30 secondary	behavioral	1.50/08	TSCS	-.41

*Hours per week/weeks.

**Unbiased effect size.

Table 2--Continued

Author, Date	Subjects	Type of Therapy	Duration of Therapy/Treatment*	Test Used	Effect Size**
Klarreich, 1981	60 secondary	combination	2.00/06	TSCS	.19
Knapp, 1984	35 college	behavioral	1.25/04	TSCS	.33
Lewter, 1984	35 college	cognitive	3.00/14	TSCS	.72
McMillan, 1978	52 college	behavioral	1.50/08	TSCS	.71
Mirrow, 1977	32 secondary	cognitive	0.75/15	TSCS	1.31
Mitchum, 1978	192 primary	cognitive	0.50/08	Coopersmith	.10
O'Donnell, 1978	120 secondary	combination	1.00/04	Coopersmith	-.04
Ostein, 1979	42 adults	cognitive	1.00/06	Rosenberg	.10
Paschal, 1977	100 college	cognitive	2.00/12	TSCS	.85
Pavlak, 1985	40 secondary	cognitive	2.00/08	TSCS	.21
Perovich, 1980	72 college	cognitive	2.00/11	TSCS	.36
Piercy, 1976	56 secondary	combination	1.00/24	TSCS	.32
Reardon, 1977	32 secondary	combination	1.00/06	TSCS	.92
Saxon, 1979	46 adults	behavioral	1.75/07	TSCS	.50
Sheridan, 1984	48 secondary	cognitive	0.75/14	Piers-Harris	-.02
Simonis, 1977	96 secondary	combination	1.50/10	POI	-.08
Wolff, 1980	36 college	behavioral	1.50/06	TSCS	.28

*Hours per week/weeks.

**Unbiased effect size.

An average of 59.4% of the clients were males. There was an average 6.8% experimental mortality for the 34 studies and an average of 3.1 therapists were utilized per study. The average number of therapists was particularly skewed by one study utilizing 21 counselors in a district-wide classroom study. Only 8 studies reported a post-post therapy measurement with the average of 10.5 weeks for those studies reporting follow-up measures.

Cross-tabulations of the number of cases in each subgroup and the total study were made for the study features of publication form, training of the experimenter, internal validity, type of treatment therapy, simultaneous comparisons made (yes or no), significance obtained or claimed, method of calculating effect sizes, experience of the therapists, and location of the therapy. Initial inspection of the data showed no differentiation in the categories of hospitalization, intelligence level, modality, source of means, and client diagnosis. These categories were deleted from further analysis. Table 3 on the following page lists the unbiased effect sizes by categories of the study features.

The number of cases in individual categories of the study was generally small and thinly spread as is evident in Table 3. The categories of assignment of client and assignment of therapist were used to determine the level of internal validity, therefore, only effect sizes for

Table 3

Unbiased Mean Effect Sizes ($\overline{ES}$) and Standard Errors (SE) By Self-Concept Measure and Category of Study Features

Variable	TSCS Measures			Other Measures		
	N	$\overline{ES}$	SE	N	$\overline{ES}$	SE
Publication Form						
Journal	14	.53	.13	2	.32	.34
Dissertation	8	.35	.12	10	.16	.25
Training of Experimenter						
Psychology	7	.59	.16	0	...	...
Education	15	.40	.14	12	.09	.20
Age Group						
Elementary	0	...	...	7	.21	.34
Secondary	8	.55	.20	3	.28	.29
College	9	.23	.15	0	...	...
Graduate	2	.78	.07	0	...	...
Adults	2	.89	.40	2	.01	.09
Elderly	1	.32	.00	0	...	...

Table 3--Continued

Variable	TSCS Measures N	$\overline{ES}$	SE	Other Measures N	$\overline{ES}$	SE
Internal Validity						
High	14	.59	.10	10	.28	.23
Medium	3	.78	.14	1	.00	.00
Low	5	-.11	.23	1	-.51	.00
Simultaneous Comparisons						
Yes	10	.25	.17	6	.18	.38
No	12	.64	.12	6	.20	.20
Type of Therapy						
Cognitive	7	.48	.13	6	-.04	.26
Behavioral	8	.35	.24	1	.66	.00
Affective	1	.32	.00	1	.00	.00
Combination	6	.60	.16	4	.46	.19
Location of Therapy						
School	3	.54	.50	9	.26	.27
College campus	11	.31	.13	0	...	...
Hospital	1	.31	.00	0	...	...
MH Clinic	2	.55	.36	0	...	...
Residential Fac.	2	.57	.36	0	...	...
Prison	1	.97	.00	1	-.08	.00
Other Clinic	2	.81	.49	2	.03	.07

Table 3--Continued

Variable	TSCS Measures N	TSCS Measures $\overline{ES}$	TSCS Measures SE	Other Measures N	Other Measures $\overline{ES}$	Other Measures SE
Experience of Therapists						
Expert	4	.63	.25	1	.00	.00
College Professor	1	.97	.00	0	...	...
Counselor	5	-.10	.23	7	-.11	.19
Graduate Students	10	.58	.11	4	.74	.42
Combination	2	.63	.27	0	...	...
Significance Obtained						
Self-concept	8	.69	.08	3	.67	.69
Other Outcomes	3	-.19	.32	2	.04	.05
Both Outcomes	3	.67	.32	0	...	...
None	8	.39	.18	7	.002	.21
Calculation of ES						
Means Difference	11	.40	.16	8	.22	.29
F-test	4	.68	.27	2	.21	.11
T-test	1	.90	.00	2	.08	.59
Other	6	.34	.19	0	...	...

internal validity categories are reported in Table 3. Glass et al. (1981) recommended that internal validity be judged on the basis of the assignment of subjects to treatment and extent of experimental mortality in the study. To be judged high, a study had to have used random assignment of subjects and have a rate of mortality less than 15%. Medium internal validity ratings were given to studies with randomization but high mortality and low validity studies were those whose matching procedures were quite weak or non-existent or where mortality was severely disproportionate. Six of the cases were judged to have low internal validity and in both the TSCS subset and the Other Self-Concept Measures subset their average effect sizes were negative showing a lower self-concept score in the treatment groups than the control groups.

The unbiased effect sizes ranged from -.84 to 1.30 for the TSCS studies and from -.97 to 1.87 for the Other Self-Concept Measures studies. Larger average effect sizes were found for those studies published in journals than in dissertations, for experimenters trained as psychologists than educators, for older subjects, for those studies where simultaneous comparisons were not included, and for those studies using a cognitive or combined therapy approach. Several categories showed differences in means greater than 2 standard errors which permits a rough estimate of significant difference (Glass et al., 1981, p. 45).

However, one-way analyses of variance comparing the variance within and between each group for each categorical variable showed no statistically significant differences among categories with the exception of the category of internal validity for the TSCS subgroup with the group mean for the low internal validity being significantly different than the other categories ($F(2,19) = 6.69$, $p = .006$).

Categories of individual variables were examined in an attempt to reduce the number of variables for logical inclusion in the regression analysis because with only 34 effect sizes to analyze, the number of total degrees of freedom for the analysis is 33 which was less than the total study features coded. Several of the variables were recoded into dichotomies for the remainder of the analysis. Publication form and training of experimenter were already dichotomies (journal versus dissertation and psychology versus education, respectively). The type of treatment therapy was recoded into "cognitive" versus "other" with all those cases with a cognitive component as cognitive and all behavioral and affective as other. The experience of therapist was recoded into two groups, "clinician or professional counselor" versus "graduate students." Significance claimed was recoded into "obtained" versus "not obtained." The effect size calculation method was recoded into "post-test mean differences" versus "other inferential data." Internal validity was recoded into

"valid" versus "threatened validity" and location of therapy was recoded into "school locale" versus "other locales."

Analysis of Data

This study sought to find $\underline{R}^2$ values of sufficient magnitude to warrant further study analyzing the impact of the substantive and methodological study features on the unbiased effect sizes of the primary studies. No theoretical model was proposed a priori, therefore each of the study features was examined for possible inclusion in a regression equation. During the first stage of analysis bivariate reqressions with the unbiased effect sizes were performed and then a stepwise regression method was used to extract the most parsimonious combination of variables for explaining variation in the effect sizes. The stepwise selection method in SPSS-X examines all variables for inclusion and removal according to criteria determined by the software program (.05 level for entry, .10 level for removal) and tests the variables in a series of iterations until no variables in the equation need to be removed and no variables not in the equation are eligible for entry (SPSS-X User's Guide, 2nd ed., p. 666). After the stepwise procedures, each of the variables isolated were entered into separate regression equations. The dependent variable of unbiased effect size for the total meta-analysis ($\underline{N}$=34) was tested first, then the dependent

variable of unbiased effect size for the TSCS scale subset (n=22), and lastly, the Other Self-Concept Measures subset (n=12).

Scatterplots of the continuous variables versus unbiased effect sizes showed generally low correlations and weak linear relationships. Examination of the mean and variance of the average age of the subjects in the meta-analysis showed that these were roughly proportional to each other for the total group and each subgroup, therefore a square root transformation of age was explored for possible inclusion in the regression equation. "A decision regarding which transformation is appropriate is made by exploring the relation between the variances and the treatment means. The nature of this relationship determines which transformation to use" (Ferguson, 1981, pp. 246-247).

Two additional variables were created by computer recoding as being conceptually important. The interaction between duration of therapy and duration of treatment as total time spent in therapy and the interaction between duration of therapy and experience level of the therapist as the intensity of therapy were entered into the analysis. The dichotomized categorical variables were recoded as "dummy" variables to be entered into the regression analysis. These included dummy variables for publication form, for the training of researcher, for the type of

treatment, for experience level of therapists, for method of calculating effect sizes, for experimental validity, for location of therapy, and for simultaneous comparisons. Each variable was coded as "1" for presence of this variable and "0" for absence.

Table 4 lists the combination of variables extracted from the multiple regression analysis that yielded significant $\underline{R}^2$ values in the stepwise procedure. Regression coefficients, degrees of freedom, multiple $\underline{R}$ values, $\underline{R}^2$ values, and accompanying analysis of variance data are presented in the table for the TSCS group of effect sizes, the Other Self-Concept Measures effect sizes and for the total study.

The interaction between duration of therapy and experience level of therapist (intensity of therapy) was an important factor in explaining variance in both the Other Self-Concept Measures effect size group and the total study. The size of the treatment group and the duration of therapy were other predictors of effect size found in the stepwise regression analysis. Table 4 shows the unstandardized regression coefficients for the independent variables and the additive constant for the predicted regression equation. $\underline{F}$-ratios associated with each of the equations were all significant. Multiple correlation coefficients are also listed and the $\underline{R}^2$ values associated with these combination of variables.

Table 4

Regression Analysis for TSCS Effect Sizes*, Other Self-Concept Measures Effect Sizes*, and Total Study Effect Sizes*

Independent Variables	Regression Coefficients**	Multiple R	R Square	Standard Error	F Value	Prob. of F
TSCS Measures						
Size of Treatment Group	-.010	.436	.190	.461	4.70	.042
Additive Constant	.786					
Degrees of Freedom (1,20)						
Other Self-Concept Measures						
Intensity of Therapy	-.236	.745	.555	.499	12.46	.005
Additive Constant	.991					
Degrees of Freedom (1,10)						
Total Study						
Experience of Therapists	-.922	.676	.457	.455	8.43	.0003
Intensity of Therapy	.163					
Duration of Therapy	-.677					
Additive Constant	1.128					
Degrees of Freedom (3,30)						

*Unbiased Effect Size

**Unstandardized coefficients

Because of their importance in other psychotherapy studies (Silvernail, 1985, p. 29; Matheny, K., Aycock, D., Pugh, J., Curlette, W., & Cannella, K., 1986, pp. 516-520; Smith & Glass, 1977, p. 756), the duration of therapy and duration of treatment variables were further tested for the total study by constructing a third degree polynomial regression to ascertain if an alternate non-additive model would yield significant results with these study features. Neither of these variables in a multiplicative polynomial model revealed significant changes in $\underline{R}^2$ values.

The TSCS was not the instrument of choice in any of the primary research studies with subjects of elementary age. An analysis of variance comparing the total group unbiased effect size by significance obtained and age group showed no significant interaction between these sub-categories. As reported earlier, a series of analyses of variance were performed to test for significant difference in effect sizes in the levels of each categorical variable. With the exception of the category of internal validity, no significant differences were found.

In the absence of any other variables of particular conceptual interest as reported in previous meta-analyses on counseling or psychotherapy interventions, no further variable explanations were pursued (Pedhazur, 1982, p. 229).

A final one-way analysis of variance was performed to test for significant differences in the two subgroups using the TSCS measures and Other Self-Concept measures. The mean effect sizes for the two groups were not significantly different with $\underline{F}(1,32) = 1.67$, $\underline{p} = .205$. However, the mean unbiased effect sizes differed by more than $2\underline{SE}_m$ (see Table 1) which is deemed a reliable difference by Glass et al. (1981, p. 45).

Interpretation of Results

No attempt is made to interpret these results as causal, but rather as this sample specific descriptions.

> In non-experimental research. . .the most important thing to note is that such [regression] equations reflect average relations between a dependent and a set of independent variables, and not necessarily the process by which the latter produce the former. (Pedhazur, p. 222)

Furthermore, in the absence of a theoretical model about the relationship among variables, no meaningful decision about the order of entry of variables into the regression equation can be made (p. 199).

The multiple regression $\underline{R}^2$ results show that in this meta-analysis study, 45.7% of the variation in the unbiased effect size for the total study was explained by the experience level of the therapists, the intensity of therapy, and the duration of the therapy.

In the TSCS subgroup, 19% of the variation was due to the size of the treatment sample. For the Other Self-Concept Measures subgroup, 55.5% of the variation was explained by the intensity of treatment variable.

Treatment sample size was negatively related to the effect sizes in the TSCS Measures subgroup. This means that effect sizes increased as sample size decreased. This result is compatible with the generally accepted procedures in group counseling that smaller, more intimate groups are more effective in such efforts to improve self-confidence and self-esteem.

For the Other Self-Concept Measures subgroup, the intensity of therapy was negatively related to effect size which was indicative of the fact that in this subgroup the 4 studies conducted by less experienced therapists yielded higher effect sizes. Of the remaining 7 studies with more experienced therapists, the average effect size found was negative (See Table 3).

The duration of therapy was negatively related to the total study effect sizes which means that the effect sizes increased as shorter therapy sessions were conducted, an expected result because of the number of studies in this synthesis where children with their shorter attention spans were the primary subjects.

For the total study, the experience of therapists was negatively related to effect size outcomes. This is not

an unexpected result given that generally the more experienced therapists handled cases that were more difficult and challenging in nature.

All other variable predictors were positively related indicating that an increase in one was associated with a corresponding increase in the effect size.

These results, although not as detailed, are compatible with Smith and Glass's (1977) research on psychotherapy interventions. They also reported duration of therapy and experience of therapists to be important factors in accounting for total variance in effect sizes along with other variables such as client presentation, modality, age, and diagnosis which did not appear in the regression equations of this synthesis (pp. 755-759).

None of the other substantive or methodological variables showed sufficient $\underline{R}^2$ values to warrant further study. One can expect to find the greater part of prediction achieved in a regression analysis attributable to a relatively small number of variables and the inclusion of additional variables contributing only small and diminishing amounts to prediction (Ferguson, 1981, p. 472).

These findings further suggest that the strict inclusion criteria of the meta-analysis generated studies of self-concept change with common parameters during the period under investigation.

Research Questions Addressed

1. Does the educational and psychological research, as a whole, indicate the efficacy of counseling to favorably change self-concept?

These data show for the overall study that the experimental groups' average effect size was .37 with a standard deviation of .57. The magnitude of an effect size indicates the difference between groups in standard deviation units relative to the standard deviation of the control group. Cohen's (1969) interpretation of an effect size of .20 as small, .50 as medium, and .80 as large, would indicate that these studies, on the average, produced small increments of change. However, using the assumption that the effect sizes are from normal distributions, viewing them in terms of overlapping distributions for the control and treatment groups, these interventions showed a .37 standard deviation superiority over the control group. Thus, the average client in the studies in this synthesis was better off than over 64% of the untreated controls. For the TSCS subgroup with an average effect size of .46, the average treated subject score would be greater than 67% of the control group. Figure 1 illustrates the effect of therapy on the outcome for the total study in terms of the treatment and control groups distributions for this synthesis.

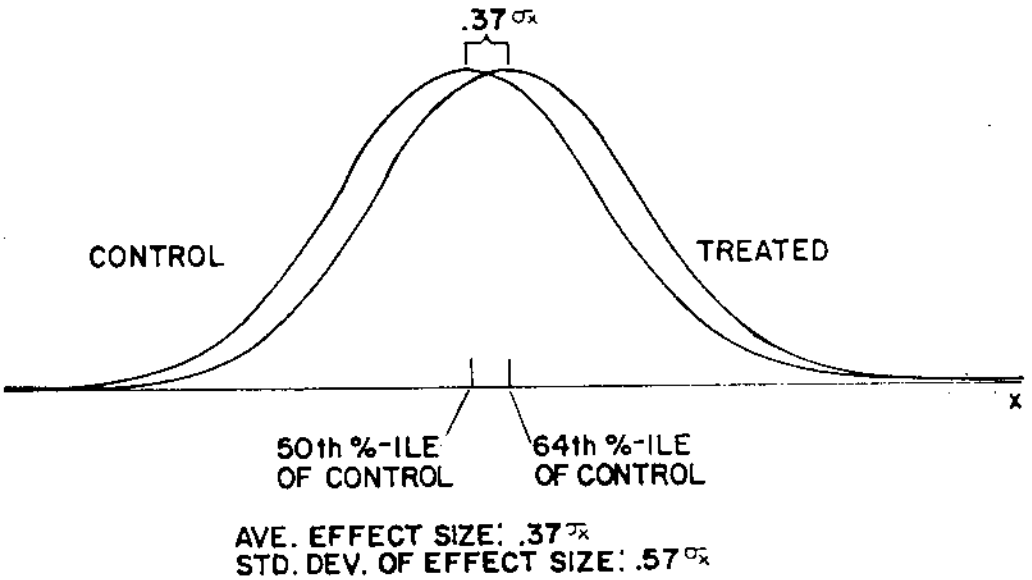

Figure 1. Effect of therapy on outcome for total study

Smith and Glass (1977, p. 754) used the method in Figure 1 to illustrate the .68 standard deviation superiority they found in the treated groups in their study of psychotherapy interventions. Willig (1985) also used this procedure to interpret favorable results in a meta-analysis of bilingual education effectiveness.

Rosenthal (1983) stated:

> It is absurd to label as "modest indeed" an effect size equivalent to increasing the success rate from 34% to 66% (e.g., reducing a death rate from 66% to 34%). . . . Even so small a correlation as .20, accounting for only 4% of the variance is associated with an increase in success rate from 40% to 60%--"hardly a trivial effect." (p. 11)

Translating the average .37 effect size for this meta-analysis into a correlation estimate using Glass's (1981) formula for effect size in terms of a correlation estimate, there is a 17% increase shown in effectivity for these studies. From the distribution analysis and this point of view, the data from this meta-analysis study does indicate the efficacy of counseling to favorably change self-concept in small increments.

2. Is the TSCS effective in measuring self-concept change?

Taking into consideration Silvernail's (1985, pp. 8-11) conclusion that the self-concept is fairly stable, and Wylie's (1979, pp. 685-686) suggested explanations for the "elusiveness of adequate conceptual and operational definitions and difficulties in relating the constructs to other variables," it is suggested that the possible usefulness of self-referent constructs has not as yet been adequately tested, and therefore such constructs deserve further consideration in the light of more sophisticated hypothesizing and research methods.

In this synthesis, seven cases (21%) showed negative effect sizes. If the therapies of any type were ineffective and design and measurement flaws were immaterial, excluding any publication bias for those studies which show significant results, one would expect to find half the effect size measures to be negative. Only

two (9%) of the TSCS effect size measures were negative. Therefore, even though the regression analysis showed relatively few results of substantive or methodological characteristic impact, there was measurable self-concept change revealed in the synthesis. Additional questions are generated: Are the increments of change relatively small because the self-concept is so stable that the change is not measurable? Or, did the counseling interventions not make any difference?

> The most striking examples of null findings occur in the researches involving over-all self regard, where such scores have not been shown to be related to such proposed antecedents as age, race, sex, socioeconomic level, or psychotherapy or to such proposed correlates as creativity indices and persuasibility. . . .There are many null findings involving specific aspects of self-conception as well, but generally speaking one can see some sensible patterns beginning to emerge in some such studies. . . .
>
> Assuming for the moment that over-all self-regard is a plausible construct (or closely related group of constructs), one might propose that the null results from so many researches may reflect the lack of construct validity of purported self-regard indices. For example such

instruments may be too insensitive to reflect the actually occurring effects or associations with these other variables.

Two other methodological possibilities relevant to null results are that (a) too narrow a range of over-all self-regard has been examined to enable sizeable associations with other variables to be obtained, (b) too few steps on the self-regard range have been used, or inappropriate statistical analyses have been made, leading researchers to overlook nonlinear association. . .the striking incidence of null findings we are trying to explain does not stem from the unimportance of self-regard, but rather may be attributable to two factors: the maintenance of self-regard, far from being unimportant is psychologically crucial; and researchers have overlooked many of the psychological subtleties which must be considered in designing and interpreting research concerning the relationship of self-regard with other variables. (Wylie et al., 1979, pp. 690-692)

The meta-analysis data indicates the TSCS subgroup did achieve higher means than the Other Self-Concept Measures subgroup, but there was no statistically significant difference between the two subsets. However, no attempt

can be made to interpret these results as due to the effective measurement of self-concept change by the TSCS.

3. Is the TSCS consistent with other self-concept instruments in measuring self-concept change, when used in the same research study?

This meta-analysis study discovered that none of the self-concept studies utilized multiple testing instruments. When the TSCS was the instrument of choice, no other self-concept measuring instrument was used. As indicated above, the difference in the two subgroups does show greater self-concept change among those studies using the TSCS than those using the other self-concept scales. The mean of the TSCS subgroup was .46 versus the mean of the Other Self-Concept Scales subgroup being .19. The other instruments were used primarily with younger subjects. An analysis of variance had shown that these groups were not statistically different.

Although only 34 effect sizes were generated, 1,699 subjects were studied in this meta-analysis with over half of them treated by psychotherapy interventions. This aggregate of 850 subjects represents more than the sample used in establishing the norms on such instruments as the TSCS. Of the 17 cases reporting the post-test means on the TSCS measure, the average total positive score was 346.01 which is virtually the same average Fitts (1965) found of 345.57 for a normal population of 626 subjects.

Conclusions

A major result of the current synthesis has been the reiteration of Horan's (1980) statement:

> We have not proven that aggregated counseling and psychotherapy schools are effective at all, much less have we shown that they are equally effective. More fundamentally, however, our experimental subjects often do not receive treatments appropriate to their clinical problems, our treatments are frequently not deployed as purported, and finally our so called control groups rarely address one of the most powerful artifacts of all. In spite of these faulty beliefs and customs, we now have the methodological sophistication to lay a firm conceptual and empirical basis for our field. But unless we choose to purge these myths from our midst, the practice of counseling and psychotherapy will remain just that. (p. 1)

Wylie et al., (1979) raised a question, "What suggestions can one draw from an over-all view which might justify this refusal to give up in the face of the state of available research findings?" The answer is that both lay persons and professional individuals from many disciplines evidently continue to be impressed with the importance of the topic of self-concept variables and the over-all self

regard and development of human beings despite the "paucity of definitive findings and indeed, despite numerous resounding failures to obtain support for some of their most strongly held hypotheses" (p. 685).

Again the urgent statement is made, "Additional research is needed in many areas," as Silvernail (1985) stresses the need for a more comprehensive understanding of the construct "self-concept," how it develops, what influences it, how it changes, and how to consistently and sensitively measure the changes (p. 52). Fiske (1983) encourages the multi-disciplined researchers, educators, and health service providers to contribute to the quality of subsequent studies by designing more exact conceptual specifications of therapeutic goals and procedures, for more comparability and standardization among investigations and publications.

This synthesis clearly indicates the complex and diverse task set before the self-concept researcher. The procedures for classifying patients, for example, are such that no two clinicians can be expected to make the same categorizations independently. A treatment plan is as complex as a patient or client, and even two therapists from the same school cannot be expected to conduct the identical treatment. Therefore, meta-analytic research appears at this point in time to be providing its greatest service to educational and psychological research in

stimulating more critical empirical evaluation of treatments, focuses constructive attention on the adequacy of primary research design, and method specificity. Other challenges are related to the matter of congruence between outcome measures and the conceptualized goals for a treatment as well as the question of congruence between such measures and the actual treatment processes. Shapiro and Shapiro (1983) present data showing a general increase in effect size can be achieved with outcome measures more specific to the treatment. This raises the question again of the efficacy of the Tennessee Self Concept Scale. The current synthesis revealed that self-concept studies are urgently needed that include the TSCS and two or three other standardized self-concept instruments to provide a comparison of consistency between the measuring instruments, and indicate the efficacy of the TSCS to measure self-concept change.

It is acknowledged that the overall effect size for this meta-analysis is definitely at the low end of the continuum. However, it is also recognized that the task of attempting to favorably change self-concept is momumental and worthy of the investment of personal and material resources to make whatever theoretical and methodological improvements are necessary to put such work on a more scientifically respectable base in light of today's more sophisticated hypothesizing and research methods. Even a

small effect size of .37 is congruent with the way self-concept develops in small, progressive increments (Silvernail, 1985, pp. 8-11).

Using the Kulik (1984) approach to meta-analysis of assigning only one effect size to each primary study did reduce the opportunities for internal regression analysis of the study features, but it also provided a focused study in which all the data were relevant to self-concept change and not any other outcome behaviors. Future research on self-concept change will be able to compare results more precisely on the basis of this synthesis.

Recommendations

Based on the findings and conclusions of this meta-analysis, the following recommendations are made:

1. Since the self-concept characteristic is apparently stable it is recommended that studies be designed with a duration of treatment of at least a year. This could provide a therapeutic environment for favorable self-concept change in small progressive increments over time, allowing self-affirmation to develop progressively as in the self-developmental process.

2. The current synthesis revealed a large number of studies were done by graduate students. Therefore, it is recommended that graduate programs be designed to encourage doctoral students to initiate the dissertation process earlier. Many research studies limit the duration of time

to a single semester or less. To facilitate favorable self-concept change a more realistic time design must be generated.

3. A significant number of research studies secured their samples from college populations. It is recommended that more self-concept research be designed involving the general population, to move away from the convenient sample to the public at large that we are targeted to service in the applied sciences.

4. A final recommendation is to challenge scientifically the claim of generalizability made for the TSCS. Renorming and reanalyzing data from specific cultures and replication studies of various dissertations used by Fitts to support the use of the TSCS would be valuable to reaffirm the validity and reliability of the instrument. This is particularly relevant since the TSCS subscales were claimed to fulfill the need for measuring multi-dimensional descriptions of the self-concept.

APPENDIX A

SELF-CONCEPT META-ANALYSIS CODING FORM

Code	Information
_____	Study Identification Number
_____	Author/Experimenter
_____	Publication Date
_____	Publication Form: (1)Journal (2)Dissertation
_____	Training:(1)Psychology (2)Education
_____	Blinding:(1)E did therapy (2)E knew composition but did not do therapy
_____	Diagnosis:(1)psychotic(2)neurotic(3)normal
_____	Hospitalization
_____	Intelligence: (1)below (2)average (3)above
_____	Mean Age
_____	Age Group:(1)Elementary (2)Secondary (3)College (4)Graduate Student (5)Adults (6)Elders
_____	Percent Male
_____	Solicitation:(1)Self-referral (2)Volunteer (3)Solicited by E (4)Referred (5)Assigned by authority

_____Assignment of Client:(1)Random
(2)Matching (3)Other

_____Assignment of Therapist:(1)Random
(2)Matching (3)Nonrandom
(4)Single therapist
(5)Other

_____Percent Experimental Mortality

_____Internal Validity:(1)High (2)Medium (3)Low

_____Simultanenous Comparisons: (1)Yes (2) No

_____Treatment Type:(1)Cognitive (2)Behavioral
(3)Affective
(4)Cognitive/behavioral
(5)Cognitive/affective
(6)Behavioral/affective

_____Modality:(1)Individual (2)Group (3)Mixed

_____Location:(1)School (2)College center
(3)Hospital (4)MH clinic
(5)Residential facility
(6)Prison (7)Other

_____Duration of Therapy

_____Duration of Treatment

_____Number of Therapists

_____Experience of Therapists:(1)Expert
(2)Professor
(3)Counselor
(4)Graduate Students

(5)Combination

_____Outcome Measure Instruments:(1)TSCS

(2)Rosenberg

(3)Piers-Harris

(4)Coopersmith

(5)Primary SCI

(6)Florida Key

(7)POI (8)Other

_____Other Outcome Measures: (1)Yes (2)No

_____Number of Weeks Post Therapy Measure

_____Number in Sample Treatment

_____Number in Sample Control

_____Total N of Experiment

_____Significance Obtained: (1)On self-concept measure (2)On other measures (3)On both (4)None

_____Calculation of Effect Size: (1)Mean Difference (2)F-test (3)t-test (4)Other estimates

_____Source of Means: (1)Unadjusted post means (2)Covariance adjusted (3)Gain scores (4)Other

_____Unbiased Effect Size (TSCS)

_____Unbiased Effect Size (Other)

APPENDIX B

FORMULAS FOR CONVERTING REPORTED STATISTICS TO GLASS'S EFFECT SIZE (ES)

The effect size is the mean difference between the treated and control subjects divided by the standard deviation of the control group. The formula used was:

$$ES = \overline{X}_T - \overline{X}_C \; / \; s_C$$

When only t statistics were reported in the studies the effect size was achieved as follows:

$$ES = t \; (1/n_T + 1/n_C)^{1/2},$$

where T = treatment group size and C = control group size.

When only r statistics were presented in the report the conversion formula used was:

$$ES = 2r/(1 - r^2)^{1/2}.$$

When F statistics were reported the effect size conversion required a two-step procedure:

1. the absolute value of t was calculated:

$$|t| = (F)^{1/2};$$

2. then the t conversion formula was used to calculate the effect size.

Source: Glass, McGaw, & Smith, 1981.

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