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META-ANALYSIS OF CORRECTIONAL TREATMENT PROGRAMS  
FOR JUVENILE DELINQUENTS

By

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University of Ottawa, in partial fulfillment of  
the requirements for the degree of  
Master of Arts

## ABSTRACT

A meta-analysis of correctional treatment programs for juvenile delinquents was carried out to ascertain 'what' works in terms of a single outcome measure; recidivism. Of the nine study variables examined; subject profile (age, sex, offence status), treatment setting, the conceptual framework, the context of intervention, the length of treatment, change agent and characteristics of the intervention strategy, only three were found to have a significant effect in determining a lowering of the recidivism rate. The results indicate that when a program contained a cognitive component and the setting in which the treatment took place was the community, there was a direct positive influence on the effect-size measure. Also important was the context in which the treatment was administered. An individual treated in concert with a group of family or significant others produced a greater effect-size measure. Other factors which appear to have some influence on recidivism were age and length of treatment.

These findings suggest that there are principle characteristics related to effective correctional programming and that current treatment programs should be reexamined and evaluated with respect to these variables.

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## CHAPTER I

### INTRODUCTION

#### The Debate

One of the major focuses in criminological research has been the debate about the effectiveness of correctional treatment programs. A decade ago Martinson (1974) published his controversial article, "What Works? - Questions and Answers about Prison Reform," addressing the issues pertaining to the efficacy of correctional rehabilitative treatment. After reviewing 231 studies published between 1945 and 1968 Martinson asserted that ". . . with few and isolated exceptions the rehabilitative efforts that have been reported had no appreciable effect . . ." (p. 10).

Although most frequently quoted, Martinson was neither the first nor the only researcher to assert that with respect to correctional treatment programs "almost nothing works." Bailey (1966) analysed 100 reports of empirical evaluations of correctional treatment programs published between 1946 and 1960. He stated that ". . . evidence supporting the efficacy of correctional treatment is slight, inconsistent and of questionable reliability" (p. 157).

Robinson and Smith (1971) in their review of the relative effectiveness of various correctional treatment

programs found ". . . no evidence to support any program's claim to superior rehabilitative efficacy of one correctional alternative over another" (p. 67). Kassebaum, Ward and Wilner (1971) concurred, reporting that "There is no evidence to support any program's claim to superior rehabilitative efficacy" (p. 56). Lipton et al. (1975) in a detailed and extensive evaluation of correctional treatment programs published between 1945 and 1960 emphatically concluded that ". . . while some programs have had modest success, . . . the field of corrections has not yet found satisfactory ways to reduce recidivism by significant amounts (p. 627).

Three years after Martinson's initial proclamation Wright and Dixon (1977) surveyed the literature on juvenile delinquency prevention efforts from 1964 to 1975 and concluded that "No delinquency prevention programs can be definitely recommended" (p. 60). In a more recent review of the literature pertaining to the treatment of delinquency, Romig (1978) asserted:

Behaviour modification should not be offered as a treatment modality . . . casework should be discontinued . . . group counselling should not be relied upon as a vehicle to rehabilitative . . . individual counselling and psychotherapy should be discontinued . . . rehabilitation programs that focus on the teachings of academic skills will fail to reduce recidivism . . . job placement, vocational training, occupational orientation, field trips and work programs do not positively affect juvenile delinquency. (p. 108)

Other programs cited by Romig (1978) as having failed included halfway houses, foster homes, group homes, residential centres, self-government therapeutic communities, confrontation therapy, differential treatment and shortened length of stay.

These conclusions, however, have not gone unchallenged. There are researchers who have rejected Martinson's conclusions. Palmer (1974), one of Martinson's primary detractors, asked whether or not "a careful reading of this challenging and influential article "What Works? - Questions and Answers About Prison Reform" really warrants the pessimistic forecast . . . regarding the futility of intervention in general" (p. 133). Palmer noted that in the studies which Martinson reviewed, "almost every method (of correctional treatment) turned out to be associated with some combination of positive results . . ." (p. 138). Adams (1977), a correctional sociologist, in an evaluation of correctional treatment research concluded that "almost any conceivable manner of treatment may be effective in at least some limited application . . ." (p. 325). In 1977 a Panel on Research in Rehabilitative Techniques was established to assess the state of knowledge about the effectiveness of rehabilitation. As Martin et al. (1981) noted, Criminal Justice policies were in a state of flux, past practices

were being challenged and future directions were uncertain. Evaluating literature published since 1968 not covered by the Lipton et al. (1975) report, they concluded:

although there is little reported literature that demonstrably works, the conclusion that nothing works is not necessarily justified (p. 3).

Martin et al. also stated that the Panel "firmly rejected the idea that efforts to facilitate the rehabilitation of criminal offenders and their integration into the community should be terminated in favour of either radical nonintervention or a purely punitive approach. (p. 22)

They further noted that two principal types of problems were limiting knowledge about rehabilitation:

. . . those having to do primarily with maintaining the integrity of treatment . . . in institutions dominated by other concerns . . . and those stemming from a variety of methodological problems termed 'problems of evaluation.' (p. 9)

Believing that both the quality of research and the outcome of treatment had improved since the studies reviewed by previous reviewers, Ross and Gendreau (1980) reviewed all the literature published between 1973 and 1978. They found:

a substantial number of correctional treatment programs whose effectiveness had been demonstrated through studies which employed at least quasi-experimental designs and statistical analysis of outcome data . . . Ross and Gendreau concluded that the studies "provided convincing

evidence that some treatment programs, when they are applied with integrity by competent practitioners to appropriate target populations, can be effective in preventing crime or reducing recidivism." (1980, p. xiii)

In 1979, to further confuse the issue as to the efficacy of correctional treatment programs, Martinson withdrew his "almost nothing works" conclusion stating that it was misleading. He acknowledged that to have judged criminal justice on the basis of the studies he reviewed as presumptuous. Rejecting the methodology used to reach his earlier conclusion as premature, Martinson (1979) contended that "contrary to my previous position, some treatment programs do have an appreciable effect on recidivism. . . ." (p. 244). In spite of Martinson's reversal of his proposition, the debate continues, with opposing positions firmly and strongly entrenched. It is not the purpose of this thesis, however, to add more rhetoric to a debate which has already stimulated enough controversy. Rather its purpose is to address the question: "What is the relation between treatment program outcome and program components?"

#### Another Question

Recently, criminologists have begun questioning whether or not the general approach to evaluating the efficacy of correctional treatment program is in fact adequate. For

example Baunoch (1977) argued that the question of whether or not a treatment program works is an inappropriate question because it only provides a general indication as to efficacy but it does little to determine the conditions under which the approach is useful or effective.

Sometimes programs may work; sometimes they may not. Baunoch noted that a more appropriate question would be to focus on "under what conditions will the program be effective in attaining a desired or in preventing an undesired result" (p. 19). Birkenmayer (1983) concurring with Baunoch, suggested that in the heat of debate, the wrong questions were being discussed. He contended that the train of reasoning should have evolved along the line of:

1. if something does not appear to work, then why is this the case?
2. if something does appear to work, then what are the critical components that make it work?

In presenting their arguments, Martinson, Palmer, Lipton et al., and their contemporaries had almost exclusively relied on two traditional procedures for the integration of the research findings through literature reviews. One, the narrative integration, "attempts to portray multiple findings in a connected verbal report" (Smith 1980, p. 47). Smith describes such a procedure as,

ill equipped to cope with the variability of social science. . . . They (narrative integrations) seldom portray a body of literature as it really is. . . . The impossibility of reading several hundred experiments, reflecting on their findings and then writing a narrative description (is) clearly apparent (p. 48).

The second integrative procedure, described by Pillemer and Light (1980) is to,

find the most common outcome and report this as the best 'answer' available. This type of literature review, however, leaves many questions unanswered. Which studies should be included? How should varied and sometimes conflicting results be dealt with? . . . Such decisions have often appeared subjective and haphazard . . . (p. 1)

Concurring with Pillmer and Light (1980) Hunter et al. (1982) noted that this method "used only part of the available information . . . and--worst of all--logically leads to false conclusions under circumstances that are quite common" (p. 143).

Pillmer and Light (1980) suggested that in order for integrated research findings to be of value they must be both understandable and provide 'answers' as to where does a treatment program work and where does it fail. They noted that the key goal of research integration should be to present a "clearer understanding of the complexities in the real world" where there are no clear-cut answers as to

whether a program works (p. 2). In the "real world," they note, a program may in fact work in some instances but not in others.

Hunter et al. (1982) contended that

In many areas of research the need today is not additional empirical data but some means of making sense of the vast amounts of data that have been accumulated. Given the increasing number of areas within psychology and the other social sciences in which the number of available studies is quite large and the importance of theory development and practical problem solving and integrating conflicting findings to establish general knowledge, it is likely that methods for doing this (research integration) will attain increasing importance (p. 27).

Traditional methods of research integration have been the methodological cornerstone upon which the controversy as to the efficacy of correctional treatment has been centered. Their use however did not go unchallenged. Early in the debate, Palmer (1978) contended that if a somewhat different conceptual and structural framework been used "the resulting perspective could have made treatment seem other than weak or effective" (p. 41). In examining the general question of traditional methods, Smith (1980) argued that these methods were fashioned to accommodate much smaller bodies of literature than encountered today, and reliance on them is proving to be ineffective in yielding adequate summaries of contemporary research findings. He noted that

as a means of integrating and synthesizing the results of a multitude of studies it lacks safeguards against prejudiced application and subjective bias. Smith also noted that the standards of verification, objectivity, replicability and clarity against which primary empirical research was judged, were ignored or forgotten when scholars turned to the problem of integrating the primary evidence.

Cooper and Rosenthal (1980) conducted an experiment in the integration of research findings that illustrated the inadequacies of traditional integration even with a small body of literature. They reported "the most glaring weakness of the traditional method seems to be its responsiveness to the biases of the particular review" (p. 442). Furthermore they noted that:

although subjectivity is the severest threat to the validity of traditional reviews, these reviews have also been criticized (a) because they neglect a large amount of information contained in primary research reports and (b) because they imprecisely weigh their conclusions with regard to the amount of research they cover." (p. 442)

In 1975 Lipton, Martinson and Wilks noted, "the concept of rehabilitation of offenders is a relatively recent development in our society . . . it is increasingly recognized that treatment should be administered in the light of accumulated knowledge . . ." (p. 3). What is required in research is, as Hunter et al. (1982) have stated, "some means of making sense of the vast amounts of data that have accumulated" (p. 27), so that those in the

position of initiating correctional treatment programs will be better able to base decisions on accurate and reliable facts.

Ross and Gendreau (1979) have begun this process; addressing the issue of why some programs work and some do not, in order to determine the principles of effective treatment. Their examination has led them to conclude that a number of characteristics appear to be prevalent in effective as opposed to non-effective correctional treatment programs:

1. Rather than relying on any single method, successful programs are multifaceted, incorporating a variety of intervention approaches.
2. Successful treatment programs do not rely on the "medical model" which assumes crime to be a symptom of some underlying pathology. Rather, effective programs assume that illegal behaviour is the result of a learned response to factors known to be associated with criminal activity; for example, inadequate employment skills or poor interpersonal problem solving skills.
3. Effective programs consider a multitude of factors which may be functionally related to the offenders criminal behaviour; social, economic, situational, cognitive, emotional and behavioural. Effective programmes derive from a reasonable theoretical

conceptualization of the cause of criminal behaviour.

4. Successful programs focus on the influencing of those causal factors of the offender's environment and/or behaviour which are assumed likely to cause him to recidivate.
5. Effective programs are intensive. They provide a high quality of intervention, for an adequate amount of time.
6. The influence of the offender's peer group is neutralized or is mobilized as a therapeutic pro-social force in effective programs. Role models demonstrate the possibilities and advantages of pro-social adjustment.

Recently Ross and Fabiano (1985) have included another component prevalent in effective treatment programs; the enhancement of an offender's cognitive development. Cognition, in this context refers to the ability to solve interpersonal problems and to understand other people's perception of the world. Ross and Fabiano (1985) make an important distinction between social cognition and cognition as measured by general intelligence. While an individual's social cognition may be limited by his general intelligence, these concepts are not synonymous. They note that "social cognition does not, just involve those skills which are required for successful performance on impersonal tasks such

as presented on IQ tests. On the contrary, social cognition involves the use of specific interpersonal cognition skills which allow one to understand what other people see, feel, think and intend." (p. 8)

Others have also begun the examination of program components. Martin et al. (1981) while recognizing that much of the current research is methodologically flawed, contend that there exists compelling evidence to suggest directions for future research in ways to rehabilitate offenders. In their review and assessment of existing research they concluded that:

1. There exists on the part of researchers a failure to formulate and test theory. The result of which is that abstract concepts are seldom translated into the concrete theory--guided hypothesis or formulations that are needed as guides to both program development and evaluation research (p. 17). Without a theoretical framework, there is no guide as to what elements of the intervention should be, or could be, changed to produce a successful intervention. (p. 27)
2. Often rehabilitation programs or particular interventions are viewed as panaceas or in simple all or nothing terms as to whether they work or fail. In developing effective rehabilitation programs, it is necessary to match offender, setting and intervention. One must consider various "conditioning variables," i.e., the stage in the development of criminal career and the age of the offender; the optimal strength or amount of treatment necessary to produce the desired outcome. (p. 18)
3. One must consider the relationship of the intervention to (i) the stage of the individual (ii) the stage in the development of a criminal career at which the intervention

takes place. . . . If the propensity for criminal behaviour is related to human development, then susceptibility to correction and the nature of an individual's response are likely to be related to it too. (p. 19)

4. Too often, correctional programs involve weak treatments that are expected to have powerful results. Promising intervention and treatments may well be rejected because they are tried in a form so weak as to fail to achieve a threshold effect (p. 20).
5. Evaluations of diverse rehabilitation programs suggest that no single . . . programmatic approach is consistently promising (p. 21).
6. A broad approach focusing on several loci of intervention (i.e., family, school, workplace, community) hold greater promise for integrating the various theories and intervention approaches than a programme or technique-oriented strategy (p. 22).

As Ross (1982) notes, effectiveness is dependent upon " . . . who did what to whom, why, where, for how long, with what intensity and for what goals" (p. 10). There are no simplistic one-dimensional answers to the question of efficacy of correctional treatment programs. Not all program strategies will be found to be equally applicable to the diverse offender populations they are expected to serve. However, through the identification, examination and analysis of the essential components and their interactions, it is hoped that correctional treatment program resources can be utilized to their optimum. Meta-analysis the technique used in this thesis, provides a method which can contribute to that goal. In the next chapter the rationale and procedures of meta analysis will be described.

## CHAPTER II

### META ANALYSIS

As noted in Chapter 1, it has been argued that reliance on traditional methods of research integration as a means of delineating contemporary summaries of research findings is ineffectual. Hunter et al. (1982) note that, given the number of areas in which the availability of empirical data is expanding, the importance of theory development, and practical problems associated with the interpretation of conflicting findings, the development of more appropriate integrative methods will attain increasing importance. He maintains that what's needed is a method that would allow information not otherwise available to be extracted, thus revealing

patterns of reliability invariant underlying relations and causalities, the establishment of which will constitute general principles and cumulative knowledge. (p. 26)

Research integration in the 1980's, according to Glass et al. (1981) requires a sophistication in techniques of measurement and statistical analysis not previously found in traditionally based methods.

He suggests that the findings of multiple studies be "regarded as a complex data set, no more comprehensive

without statistical analysis that would be hundreds of data points in one study" (p. 12). Having recognized the need for the development of a better method of integrating research for the purposes of drawing the dominate message from scores of separate studies, Smith (1980) proposed that the method meet three basic criteria:

1. Study findings should be transformed to commensurable expressions of magnitude of experimental effect or correlational relationships;
2. Features of studies that might mediate their findings should be defined, measured and their covariation with findings should be studied;
3. Methods developed must begin with the results of data analyses (means, variance, t-tests, and the like) that are typically reported by researchers. (p. 49)

In response to the dissatisfaction with traditional integrative research methods, Glass (1976; 1977; Glass, et al. 1981) and others (Rosenthal, 1980; Hunter et al., 1982; Hedges, 1982; Kraemer and Andrews, 1982), proposed an approach which, they maintain, constitutes a rigorous procedural alternative to those typifying traditional techniques. This approach, referred to as meta-analysis, is defined by Glass (1976) as "the statistical analysis of a large collection of analysed results from individual studies for the purpose of integrating findings" (p. 3). Primary research reports of individual, independent studies

constitute the data for statistical integration of the literature. To allow for this integration both the characteristics of the primary studies and their findings are qualified.

Essentially, what meta-analysis attempts to do is bring standard data analytic techniques to bear in reviewing research findings. Studies relevant to a conceptual issue are collected, and the summary statistics from each study are treated as units of analysis and the aggregate data is then analysed in quantitative tests of the proposition under investigation. Glass et al. (1981) described meta-analysis as:

nothing more than the attitude of data analysis applied to quantitative summaries of individual experiments. By recording the properties of statistics and their findings in quantitative terms, the meta-analysis of research invites one who would integrate numerous and diverse findings to apply the full power of statistical methods to the task. (p. 21)

### Historical Overview

Although meta-analysis is a relatively new approach to integrating research findings, the basic underlying concepts were first employed decades ago. Two researchers, Thorndike (1933) and Ghiselli (1949), working independently, developed a statistical procedure that allowed for the cumulation of

results across studies. Thorndike further refined his procedure by correcting for the observed variance of findings across studies for effects of sampling error. In 1957, a procedure was introduced by Underhill to portray multiple findings quantitatively and to aggregate the results across study distinctions. This procedure is described by Glass (1981) as the essence of the meta-analysis approach.

More recently, Light and Smith (1971) proposed a method by which studies with fundamental differences in research design could be integrated without creation of artificial differences. The procedure, referred to as the "cluster approach," analysed:

All studies which have data on a dependent variable and a specific independent variable or interest are examined. Three possible outcomes are defined. The relationship between the independent variable and the dependent variable is either significantly positive, significantly negative, or there is no significant relationship in either direction. The number of studies falls into any one of these three categories, with fewer falling into the other two, the modal category is declared the winner. This modal categorization is then assumed to give the best estimate of the direction of the true relationship between the independent and dependent variable. (Light and Smith, 1971, p. 433)

Although their procedure represented a more systematic approach to integration than traditional methods, Light and Smith recommended caution when using it. They noted that

the sample size of the study may unduly influence whether a relationship between two variables is identified as statistically significant or not. Subsequently, Hunt et al. (1982) concluded that the cluster approach was fatally flawed statistically as well as logically, and could therefore lead to false conclusions.

In light of the perceived inadequacies of earlier procedures, a methodological approach for use in solving the inherent problems of integrating a large body of research was introduced by Glass (1976). Glass's procedures were referred to as meta-analysis, the statistical analysis of findings of many individual analyses.

### Techniques of Analysis

More than just a collection of quantitative techniques, meta-analysis is more appropriately described as a systematic approach to the problems of integrating a common research domain (Strube and Hartmann, 1983). It is essentially a perspective that relies on many techniques of both statistical analysis and measurement. There are two basic approaches to the summation of results across studies; a combination of significant levels and a combination of effect size.

### Combination of Effect Sizes

The combination of effect sizes is of particular importance in applied areas where the question of efficacy, as it relates to treatment or intervention strategies, has a high priority. This approach hinges on the conversion of outcome measures to a common scale of measurement and format. The resultant calculation is free of the original measurement unit, thus enabling direct comparison among studies differing in sample size or other characteristics.

Once all outcomes for each study are comparably expressed as effect sizes they are amenable to direct statistical analysis. That is, each outcome can be treated as a datum and common statistical procedures can be applied to summarize and analyze the findings of all studies simultaneously or any subset of findings of interest. (Dush, Hurt and Schroeder, 1983, p. 410)

Effect size as first defined by Cohen (1969) referred to the degree to which the null hypothesis was false or conversely the degree to which a phenomenon was present in the population. Therefore the null hypothesis always means that the effect size is zero, whatever the manner of representation of a phenomenon in a particular research treatment. Cohen explained that;

when the null hypothesis is false, it is false to some specific degree, i.e., that the effect size (ES) is some specific non-zero value in the population. The larger the value, the greater the

degree to which the phenomenon under study is manifested . . . Thus, whether measured in one unit or another . . . the ES can itself be treated as a parameter which takes the value of zero where the null hypothesis is true and any other specific non-zero value when the null hypothesis is false. In this way the ES serves as an index of the degree of departure from the null hypotheses. (p. 10)

Essentially what the effect size defines is the magnitude of effect between the treatment/experimental and control group.

There are numerous procedures available that provide an estimate of effect size (Cohen, 1969, 1977; Glass, 1976; Cooper, 1979; Hedges, 1982). Many researchers, however, have chosen to use a size effect measurement referred to as the "d" index; the difference between the experimental and control group means divided by the within-group standard deviation;

$$d = \frac{X_E - X_C}{S_X}$$

The within-group standard deviation is determined from the variance of the experimental and control groups, therefore;

$$S_X = \frac{(N_E - 1) S_E^2 + (N_C - 1) X_C^2}{N_E + N_C - 2}$$

The formula for the "d" index makes the assumption that both the experimental and control group standard deviations are comparable. Glass (1976; 1977; Glass et al, 1981) recommends that the control group standard deviation be used

in instances where;

1. the standard deviations based on the control and experimental groups differ significantly;
2. there are two or more treatment conditions; with equal or roughly equal means but dissimilar standard deviations, and only one control condition.

Glass contends that the standardization of the mean differences by the control-group standard deviation at least has the advantage of assigning equal effect sizes to equal jeans. Rosenthal (1984) concurs, citing this solution as "a very reasonable alternative . . . because it is always possible that the experimental treatment itself has made the standard deviation of the experimental group too large or too small relative to the standard deviation of the control group" (p. 22).

To this point effect size has been described as an abstract parameter which can take on varying values. It is a number that tells how far apart the means of the treatment and control group are in terms of their common standard deviation. Glass et al. (1981) explains that the effect size is usually meaningful without comparison to anything else. An effect size of zero is, as Glass states, categorically clear, and a negative effect size is also understandable in and of itself. Effect size transforms

different scales of measurement and their magnitude into common scales. Essentially, the value of the calculated effect size describes the experimental effect in standard deviation units, and accordingly it reveals the degree of overlap in the distribution of scores for the experimental and control groups in terms of comparable percentiles. Therefore, an effect size of + 1.0 indicates that the average individual in the experimental group exceeds 84% of persons in the control group. By converting the findings of studies to a common metric, the estimate of average impact can then be based on a wide range of conceptually related measures and larger sample of studies. Further, the qualification of characteristics of studies can permit the eventual statistical description of how properties of studies influence the principle findings. In interpretation of results, Glass et al. (1981) advised that "There is no wisdom whatsoever in attempting to associate regions of the effect size metric with descriptive adjectives a small, moderate, large and the like" (p. 104). If one study has an effect of 1.2 standard deviation units and another study .6 standard deviation units, the effect size in the first study may be described as twice that of the second study independent of sample size. Glass et al. (1981) warns that "after decades of confusion, researchers are finally ceasing to speak of regions of the correlation coefficient scale as low, medium or high. The same error should not be repeated

in the case of the effect size metric" (p. 104). As Cohen (1969) noted, such qualitative concepts can run the risk of being misunderstood.

### Combination of Significant Levels

Strube and Hartman (1983) describe the second meta-analytic approach was a combination of significant levels. They content that, from a theoretical point of view, it is important to know whether a particular result occurred due to chance. Statistical significance of probabilities across studies determines whether a set of results could have arisen by chance.

In 1972, Edgington contended that the principle problem in research integration was the combining of significant levels into a joint test of the null hypothesis. The essential elements of this method have been described by Cook and Leviton (1980). First, the probability of values from each test of the relevant theoretial hypothesis are combined to reflect the probability, across the studies, with which the null hypothesis can be rejected. There are a variety of procedures available for combining probabilities. Rosenthal (1978; 1980) has provided a summary of the most common methods; their advantages, limitations and indications for the use of each.

The second element, referred to as the file drawer problem, involves estimating the number of studies, with no effect conclusions, that would be required to change the obtained probability to the .05 level. This provides some assurances that, even if studies have been missed by the review, the results will not be biased in favour of reaching conventional statistical levels.

Although combining probability values is important in determining an effect exists, it is not comprehensive. It does not describe the magnitude of effect, nor does it take into consideration the effect the sample size may have on whether an outcome is judged to be statistically significant. To counter these deficiencies, Rosenthal (1980) has recommended that a third element; the calculation of effect size. He notes that for any effect size, other than zero, the degree of statistical significance is monotonically related to the size of the sample. Therefore, while results may be either significant or non-significant, the magnitude of effect may be very small or very large. It is important to remember that effect sizes are less dependent on sample size than are significant levels. Rosenthal (1980) concluded that it is essential that "for each combined estimate, an estimate of the probable size of the effect in terms of a standard deviation unit, or a correlation coefficient, or other estimate" (p. 44) be given.

### Variability of Meta-Analytic Results

There are a variety of techniques available for the calculation of both effect size and significance levels. Because of this, caution must be taken when interpreting the results of a meta-analysis. Strube and Hartmann (1982) have noted that the results may vary depending on the specific techniques used. To control for this, the receiver must decide what techniques most adequately address the issues under investigation and clearly delineate the techniques used. As a general recommendation, Strube and Hartmann (1983) suggest that a review concern itself with the average effect sizes, estimate of stability and examination of variation through an analysis of mediating variables.

The examination of these variations can illustrate two critical issues; do the differences in outcome appear to be only random sampling variation around a single population parameter or is there the existence of a family or a cluster of distinct underlying population parameters.

A number of strategies and procedures exist that can be used to identify these sources of variation. One method used with either significance levels or effect sizes, involves computing a correlation of study characteristics. This identifies whether a given phenomena is general or dependent on specific levels or values of the variable under

examination. Another more complex analysis, the multiple regression, has according to Strube and Hartmann (1983) "the advantage of providing a measure of the proportions of variances accounted for in either effect sizes or significance levels, statistically controlling for the effects of other variables that represent interactions" (p. 16).

While meta-analytic techniques provide the basic results it is possible to extract further quantitative information. It is the examination of the opposite or contradictory finding that may emerge; the variation in study outcomes, that results in the identification of underlying relationships.

#### Summary

In summary, meta-analysis provides the means by which the results of a large body of independent research studies; within a specific conceptual domain, can be systematically integrated. The purpose of a meta-analysis is to:

1. establish a clear and concise summation of results including categorizing and summarizing of study characteristics and variables;
2. yield information pertaining to the "why" of a particular relationship or underlying process, and;

3. suggest areas for future research endeavors.

### Critique of the Meta-Analytic Approach

At this juncture it is important to examine the numerous articles critiquing meta-analysis and where appropriate address the criticisms. Proponents of the approach contend that meta-analysis offers a distinct advantage over traditional methods of research integration particularly when a large number of studies exist. It enhances the ease with which data can be manipulated and according to Cook and Leviton (1980) "increases the ability to compute relationships that test whether particular irrelevancies of method or particular substantive variables influence the dependent variable in ways that aid interpretation" (p. 460). Meta-analysis also has the ability to reduce the potential of cognitive overload particularly when a large number of cross-tabulations are required to test for differences among methods and constructs (Cooper 1979). In addition it can provide a means by which additional sources of information; not readily apparent when primary research studies are examined using traditional integration methods. Pillemer (1984) explains that "when a number of studies is large, statistical procedures are often necessary to tease out

subtle differences" (p. 33). The sample offered by Pillemer was based on a 1981 study by Eagly and Carli. They used meta-analysis to re-examine a study of sex differences in abilities to decode non verbal cues. Initially the study had identified a clear trend of female superiority in decoding ability. Eagly and Carli in their reanalysis concluded that in fact both male and female researchers portray their gender more favorably than members of the opposite sex do. Pillemer concluded that it would have been impossible to observe the impact of the evaluator's sex on reported results using any of the traditional integration methods, it was only through the use of statistical analysis; more specifically meta-analysis, that this bias became apparent.

Strube and Hartmann (1983) have stated that an advantage to using the meta-analytic approach is that greater precision can identify the more promising areas on which to focus initial empirical investigation. As a result they contend that the identification and development of new theoretical frameworks can proceed in a more efficient manner. They do caution, however, that if the statistical techniques of meta-analysis are misapplied this precision will only be illusionary.

Cooper (1979) in his critique of meta-analysis argued that the advent of this approach has facilitated the

advancement of the theoretical process within a scientific discipline. He defines process as "more precise and confident statements about segments of our world" (p. 131). Cooper has concluded that process will follow the adoption of quantitative procedures on both abstract and practical grounds. The theoretical process is according to Cooper related to two kinds of abstract advancements:

1. Methodological; in either research design and/or analysis, involving the development of increasingly precise measurement instruments, and;
2. Increase in the amount of research data being produced. Replication increases confidence in uncovered relationships when results are shown to be consistent.

Cooper argues that meta-analysis has facilitated these advancements both "methodologically through analysis refinements and precision of measurement and through improvement of research analysis on replication using statistical techniques. Cooper (1981) has stated:

that replacing the present literary model would almost necessarily increase measurement precision. In addition this particular replacement relates directly to the issue of accumulating evidence. Areas having statistical combinations, therefore, should benefit theoretically from the more exact description, sounder inferences, and greater confidence in observed phenomena that such a technique allows. (p. 132)

In addressing the issue as to the advancement of the theoretical process on practical grounds Cooper has cited meta-analysis' potential to allow for the testing of certain kinds of interactions, through statistical combinations, without running additional subjects. This is accomplished by the expansion of sample size and the observations that accumulate from assembling a large number of research studies. In addition, meta-analysis has the ability to detect and subsequently explain sources of inconsistent and contradictory findings. It can also control for and eliminate rival hypotheses of studies sharing similar methodological techniques. While traditional methods may examine the effects of a few alternatives hypothesis, through the use of meta-analysis the review may access the issue on a larger number of alternative hypothesis in a more systematic manner. Another advantage of meta-analysis, is that it can lead to a fuller awareness of sample restrictions. These restrictions become possible mediating variables for future research investigation. Cooper (1979) does however, issue a caution. He notes that "the ability to test certain interactions with meta-analysis does not mean that all problems of conceptualization and methodological artifact can be resolved" (p. 143). In his final comments about meta-analysis, Cooper (1979) states that the "final advantage of meta-analysis deals with the

power of research to uncover relationships" (p. 144). As noted earlier, since a study's findings is directly related to the number of subjects involved, meta-analysis enables the researcher to examine a vastly increased subject pool. An increase which can result in the effect size proving significant as opposed to non significant.

Probably one of the most significant contributions of meta-analysis is its ability to utilize all of the information available from a large body of research findings. It not only provides a measure of how much change has taken place between the treatment and control groups but it also allows for the use of a full range of statistical procedures to uncover underlying relationships.

The meta-analytic approach, however is not without limitations. Critics have questioned whether the approach is in fact fairer and more objective than the traditional qualitative methods. Leviton and Cook (1981) contend that "to ignore the qualitative judgements inherent in meta-analysis is to invite abuse of the method by having it seen as more infallible "objective" test that needs only to be pulled off the shelf and some data be plugged into it" (p. 232). This approach does not absolve the researcher of having to make responsible and informed subjective decisions and judgements. Some of the issues that must be addressed

include; what studies should be reviewed, data quality, what coding conventions are to be used and what statistical techniques are appropriate. It is important to note that, regardless of the integrative method used; be it meta-analysis or traditional, the procedure cannot overcome the limitations of the data upon which it is based. Shapiro and Shapiro (1983) argue that meta-analysis "can only hold a mirror to the scientific community, summarizing the conclusions and the quality of the available evidence concerning the substantive questions at issue" (p. 43).

Wilson and Rachman (1983) have criticized adherents to the meta-analytic approach, for their all-encompassing policy of including any study in the analysis, irrespective of quality of research design and method. In his discussion of the issue, Eysenck (1984) charges that meta-analysts, by entirely disregarding any question pertaining to the quality of data, are simply following the old adage of: garbage-in garbage-out. In response, Glass and Kleigl (1983) submit that "if design flaws are critical, they will show a correlation with study findings expressed as effect sizes. The weakness need not be judged a priori" (p. 37). They conclude their argument by stating that rather than garbage-in, garbage-out, meta-analysis examines that which is garbage judged by a prior standard. What might be nearer the truth is "garbage-in--information out" (p. 37).

Another criticism of meta-analysis relates to the use of broad constructs and generalizations. It has been argued that this may result in a disregard for theoretical relevance, thus resulting in misleading inductive inferences (Cook and Leviton, 1980) Glass et al. (1980), however, contends that broader constructs allow the data to decide whether relationships need specifying in less global terms. He maintains that it is more advantageous to have knowledge of broad constructs than it is about a subcategory. According to Glass et al. (1980), the search for meaningful generalizations necessitates grouping different "things" together into broad constructs; knowledge is gained by the orderly disregard of information. As a means of countering this problem Cook and Leviton (1980) recommends that the meta-analyst provide a clear detailed breakdown of the broad constructs by theoretically relevant variables. Wilson and Rachman (1983) warn that if this is not done, any attempted replication of the meta-analysis will in all probability, result in confusing and contradictory results. They maintain that "depending on what judgements are made and what classification systems are adopted individual meta-analysis will yield different results" (p. 60). Fiske (1983), however does not view this as a problem, contending that one "should not be disturbed by the fact that meta-analysis . . . may yield disparate findings. Disagreements between findings helps us by uncovering the

contribution of particular design variables to summarize outcomes" (p. 68).

Another issue with regard to the validity of results (generalizations) derived from broad constructs relates to the representativeness of the sample used. This is of particular importance when the review is focused on a small sample of studies. Cook and Leviton (1980) contend that if a "very small number of studies are heterogenous with respect to methods and constructs, this "implies that the studies are best considered as constructual replications in the broadest sense, and with constructual replications the likelihood of method and construct factors limiting the degree of obtained correspondence is high" (p. 461). With small samples it is impossible to test whether this is the case or not. Cook and Leviton (1980) note however, that if instead of constructual replications the intent is for an exact replication, "more confidence can be placed in small samples because the studies, while not identical, will be "somewhat" similar. In concluding, they argue that "the conundrum here is that constructual replications are more valuable than exact replications, for constructual replications make heterogeneous many more of the methodological and substantive irrelevancies that can condition a particular relationship. Yet when studies are heterogeneous, we must have larger samples to be confident

that the studies are representative of an underlying distribution" (p. 461).

While meta-analysis may be inappropriate for small numbers of studies, there are also limitations and dangers associated with the analysis of large numbers of studies. According to Cook and Leviton (1980) "as the number of studies increases so too does the likelihood of invalid inductive leaps that create credible conclusions out of spurious findings" (460). This may also result in assuming that, because the data reveals a consistent set of relationships, the estimate is unbiased or alternatively that subsidiary analyses have been conducted which show no bias of importance resulted from the principle forces which bias would be expected (Cook & Leviton 1980). Alternatively, Copper (1979) contends that there is evidence to support the contention that biases are distributed throughout the research process and are equally weighed. This assumption is of particular importance when considering effect size. Cook and Leviton argue that in "order to take the precision of an effect size seriously, one must assume that there exists an equal bias across studies. That is, irrelevancies that inflate a relationship in one direction in some studies are counterbalanced by equally potent irrelevancies inflating it in the opposite direction in other studies" (p. 445). In instances where the assumption of counterbalanced biases is wrong, a misplaced specificity

will result which "can have mischievous consequences because of apparent "objectivity", "precision" and "scientism" (p. 455). As a safeguard against biases, Strube and Hartmann (1982) recommend that the research collect as large and complete a sample of studies as possible.

The limitations of meta-analysis should not be used as the basis for abandoning the technique. What this approach is, is a sophisticated method that should not be applied indiscriminately. It is incumbent that the meta-analyst be aware of both its advantages and potential limitations. Only then, will it be a useful tool by which large bodies of research can be integrated in a systematically structured manner.

#### A Meta-Analysis of Correctional Treatment Programs

The meta-analytic approach has been applied to several bodies of literature, in the fields of education and psychology. As noted in Chapter I, the conclusions as to the efficacy of correctional treatment programs has been based on traditional methods of research integration. However, Garrett (1984), having established that a better method was needed to review this literature, undertook an evaluation of correctional treatment programs using meta-analysis. Her purpose was to:

integrate the findings of individual studies on the effectiveness of correctional treatment of juvenile offenders, to assess what "works" with certain offenders in certain settings and to say by how much offenders receiving treatment differed from those not receiving treatment following the program. (p. 50)

She limited her study to primary research published between 1960 and 1983, which used a comparison group or pre-test treatment design. The dependent measures included educational achievement, institutional, psychological and vocational adjustment and recidivism. The analysis was designed to clarify the relationship between study, treatments and subject characteristics and treatment outcome measures. Backed by what Garrett described as systematic quantitative evidence she concluded that:

adjudicated delinquents were found to respond positively to treatment on many criteria. The change was modest in some cases, substantial in others, but overwhelmingly in a positive direction. One can say. . . . that treatment works. (p. 154)

This study however was not without its limitation; Garrett recommends that future meta-analysis might "do well to concentrate on one outcome measure in all its forms" (p. 155). In her concluding remarks she stresses the need for future research and hopes her findings will help provide direction.

Purpose and Delimitation of the Present Study

In this thesis meta-analysis was used to integrate the findings of correctional treatment programs designed for juvenile delinquents, to assess the effectiveness of what "works" in terms of a single outcome measure, recidivism. The study variables included; subject profile (age and offence status), treatment setting, the conceptual framework under which the treatment was initiated, context of intervention, length of treatment, change agent and intervention strategies. These were examined with respect to each other and the outcome variable to determine underlying relationships.

The criteria for selection of studies was similar to that used by Lipton et al. (1975) and Ross and Gendreau (1980) in their reviews of the literature. To be included a study must;

1. represent an evaluation of a treatment method applied to individuals identified as adjudicated juvenile delinquents;
2. include empirical data resulting from an experimental or quasi experimental design;
3. contain measures of change in the dependent variable, recidivism;
4. have been published between 1965 and 1985.

In addition to the above criteria, studies were excluded when one or more of the following conditions existed:

1. the treatment program was only described and subjectively evaluated;
2. the study contained clinical speculation only, as to the feasibility of a treatment method;
3. insufficient data was presented to support the conclusion(s) or to permit viable reanalysis, and;
4. treatment methods were inadequately described, thus making it impossible to properly evaluate the study.

## CHAPTER III

### METHOD

Meta-analysis consists of a set of techniques wherein a large number of research studies can be systematically integrated, analysed and quantified. The expressed purpose of this thesis was to use the meta-analytic approach to discern whether correctional treatment programs for juvenile delinquents are effective and more importantly to determine the conditions under which they were most effective.

#### Selection of Studies

The selection of studies was based on the parameters established by Logan (1972). He defined a set of methodological conditions required for a scientifically sound test of effectiveness for correctional treatment programs. Logan proposed that the relevant criteria should include, as a minimum the following:

1. There must be an adequate definition or set of techniques, such that the components of the program can be clearly identified.
2. The technique must be something that can be replicated in all its components at different

times, with different subjects and by different researchers.

3. There must be a division of the offender population into treatment and control groups. Ideally these two groups should differ as little as possible as to characteristics and their bases for selection.
4. There must be clear evidence that the treatment group is in fact receiving the treatment as defined in the study but the control group is not.
5. There should be a before and after treatment measure of behavior and a comparison made between groups.
6. There must be a definition of "success" that is sufficiently operational, such that a valid and reliable measurement of treatment can be provided. This definition should be compatible with "ordinary notions" of success. It should refer to the correction or prevention of further criminal activity (behavior). One measure that addresses this requirement is the recidivism rate. This measure should not include personal adjustment, happiness mental health, employment or family relations.
7. There should be some follow-up or delayed measurement in the community for both the treatment and control groups. Behaviour while still under

supervision is not a valid measure of rehabilitative success.

The studies that meet these criteria and were included in this meta-analysis are listed in Appendix A. It should be noted that specialized areas of correctional treatment, such as drug addiction, alcoholism and treatment for individuals deemed psychologically impaired, for example psychopaths, were not considered for analysis.

#### Procedure for Retrieval of Studies

Standard literature search techniques were used to collect and assemble relevant studies. The following computerized bibliographic retrieval services were utilized:

1. National Criminal Justice References Services (NCJR);
2. Education Resources Information Centre (ERIC);
3. National Council of Mental Health (NCMH);
4. Psychological Abstracts.

In addition criminological, sociological, psychological and educational journals were searched. The bibliographies of articles obtained through the above-mentioned services, were themselves reviewed for further pertinent studies. Another source consulted was the Ross and Gendreau (1980) book which provided additional references not available

through other sources. Attempts were also made to obtain material applicable to this thesis, from various agencies; such as the California Youth Authority, the National Technical Information Services and Superintendent of Documents: U.S. Government Printing Office. A pool of approximately 317 articles and documents were identified for possible inclusion in this study.

### Classification of Study Variables

In order to facilitate the comparison of correctional treatment program effect sizes and to make it easier to relate these study variables a coding sheet was developed, using the Smith et al. (1980) study of pschotherapeutic outcomes and the Garrett (1984) meta-analysis of correctional treatment programs for juvenile delinquents, as a point of reference. The selection of variables for examination was based on two criteria:

1. The majority of studies were likely to include information on the variables in question; and,
2. it was suggested by previous researchers (Gendreau and Ross, 1983-1984; Ross, 1982b; Martin et al. 1981; Ross and Gendreau, 1980) that these variables probably have a functional relationship to the outcome of the treatment program.

Selected variables included:

1. Subject Profile - This included subject demographics: sex; mean age of the subjects and type of offence committed. Note: all studies with mixed juvenile and adult offenders (who were defined as 21 years or older) population were excluded.
2. Treatment Setting - Location in which the treatment program was delivered: institution or community (non residential and residential).
3. Conceptual Framework - The theoretical basis from which the delinquent behavior is viewed and from which the particular modes of treatment intervention are formulated.
4. Context of Intervention - This variable delineated the circumstances within which the intervention program was delivered; for example individual, group or a mixture of these.
5. Length of Treatment - The duration of the treatment program.
6. Change Agent - Individual(s) who implemented the intervention program.
7. Intervention Strategies - In the first level of review, the type of therapeutic intervention was recorded as specified in the article. These were then operationally classified into therapy types

according to key concepts within therapies and schools of thought in therapy.

8. Outcome Measures - The effect size was calculated for every outcome measure of recidivism that was judged to convey nonredundant information. Where applicable more than one effect size was computed in a study.

Two additional variables were examined:

1. Was the program multifaceted? Did it employ a variety of techniques in the intervention strategy. It should be noted that a single intervention strategy can employ a variety of techniques; i.e., a Behavioral Modification strategy may include a token economy, operant conditioning and verbal conditioning, thus be identified as incorporating a multifaceted approach.
2. Was there a social cognitive component, as defined by Ross and Fabiano (1985), to the intervention strategy? Programs were identified as having a cognitive component if they employed one or more of the following intervention modalities which could influence cognitive functioning: modelling, negotiation skills training, problem solving, interpersonal skills training, role-playing,

rational emotive therapy and cognitive behavior modification.

The coding of the articles was achieved through the employment of two raters; a student enrolled in the Masters of Applied Criminology program and a Ph.D. student in a Clinical Psychology program. They worked independently of each other, using an agreed upon coding convention. Where discrepancies existed, a third rater was employed. The interrater reliability was defined as the percentage agreement between coders. The overall interrater reliability was 97.7%.

#### Data Analysis

Glassian meta-analysis described by Hunter et al (1982) as a quantum improvement over traditional integrative research methods, was used to calculate effect sizes. The essential characteristics of this procedure are:

1. A strong emphasis is placed on effect sizes as opposed to significance levels. Glass believes that the purpose of research integration is more descriptive than inferential and he feels that the most important descriptive statistics are those that indicate most clearly the magnitudes of effects.
2. Glassian meta-analysis implicitly assumes that the variance of effect sizes is real and should have some substantive explanation. These explanations are sought in the varying

characteristics of the studies. The study characteristics that then correlate with the study effect size are examined for their explanatory power. The general finding has been that few study characteristics correlate significantly with study outcomes.

3. A strong empirical approach is adopted for determining which aspects of the studies should be coded and tested for possible association with study outcomes. Glass (1976; 1977) believes that all questions are "empirical" and de-emphasizes the role of theory or logic in determining which variables should be tested as potential moderators of study outcome. (Hunter et al. 1982)

The main advantage, of the Glassian method, is that it does not require the assumption that effect sizes are constant across studies and it uses more of the available information from individual studies. The latter advantage is of critical importance since many research studies do not contain information pertaining to the means or standard deviations.

In these instances effect size can be obtained from a number of other equations; including the t-statistic, F ratio, chi-squared, correlation coefficient and others (see Glass et al, 1981 for computation details). The calculation of effect size, however, is made even more difficult when experimental outcomes are expressed as dichotomous variables; this nonparametric statistical technique hides essential information. Glass et al (1981) have proposed an approach which attempts to recover the

underlying metric information using the theory of probit transformations to convert percentages to effect sizes (see Finney 1977).

Once the findings were converted to an effect size measurement, the results were amenable to standard statistical procedures, which were then applied to summarizing and analyzing the findings of all studies of investigation.

Firstly descriptive statistics; standard methods of tabulating findings such as the establishment of averages, frequency distributions and variability (sampling error), were calculated on the characteristics of the data. This was used as a guide for further statistical analyses. Also calculated were average effect sizes for different values of independent variables, and all continuous variables, including effect size, were intercorrelated.

To study the association and relationship between the variables and study characteristics, three analytic procedures were used. Since the findings were measured on the metric scale, a Pearson-product-moment correlation coefficient was determined and to statistically compare effect sizes with the independent variables, a multiple regression analysis was performed. An analysis of variance was used to examine main and interaction effects of the mediating variables.

It is important to note that each finding was regarded as independent; thus the results of the inferential statistics were calculated under the assumption of independence.

## CHAPTER IV

### RESULTS & DISCUSSION

An examination of 317 reports and articles published between 1970 and 1985 yielded 46 studies which met the criteria for inclusion in this study. Of these studies, 16 reported two or more appropriate comparisons for a total of 68 effect size (ES) measures. These effect size measures then became the dependent variable, which was treated as an experimental datum.

#### Description of Data Base

Table I summarises the relevant information pertaining to the subjects involved in the study. The average age of the subjects was 13.2 years, with a range of between 11 years and 18 years. The greatest portion of studies involved male delinquents and mixed (male and female) populations. Relatively few studies examined the effects of treatment on the female juvenile offender.

There were three predominant offence status population categories; status, person & property and mixed offence histories. The offence categories resulted in an average ES range of from .38 to .64. An analysis of variances indicated the means were not significantly different at the 0.05 level, with an  $F = 2.137$ .

Table 1

Subject Characteristics			
	<u>N</u>	<u>%</u>	
<u>Sex</u>			
All male	37	54.4	
All female	9	13.2	
Mixed	20	29.4	
Not specified	2	3.0	
<u>Age (years)</u>			
Mean	13.2		
Median	15		age not specified 13.2%
Mode	16		
SD	5.4		
Range	11-18		
<u>Offence Status</u>			
Status	16	23.5	.56
Property related	2	3.0	.49
Person related	1	1.5	.64
Property & person	16	23.5	.47
Mixed	15	22.0	.60
Status & property	7	10.3	.41
Not specified	11	16.2	.38

F=2.137

This meta-analysis, Table 2, examined studies conducted in a variety of treatment settings; institutional, community - non residential and residential. Although there was a difference in the average ES measure, this difference was not significant,  $F = 2.02$ .

Table 2

Treatment Setting			
	<u>N</u>	<u>%</u>	<u>ES</u>
Community non-residential	45	66.2	.62
Community residential	5	7.4	.60
Institutional	18	26.4	.29

F=2.02

In situations where the treatment group setting differed from the control group setting the following results were obtained.

Table 3

Treatment Setting; Treatment Group vs Control Group				
<u>Treatment</u>	vs	<u>Control</u>	<u>N</u>	<u>ES</u>
Community - residential		Institutional	2	.73
Institutional		Community - non residential	1	- .17
Community - non residential		Institutional	2	- .45

No conclusive interpretation can be put on these results because of the small sample sizes. It is, however, interesting to note that in at least two instances juvenile offenders responded more positively to an institutional as opposed to an community non residential setting. In both circumstances the conceptual framework was sociological and the intervention strategy employed was a combination of the

Interpersonal Maturity Theory and Vocational - Personal Developmental Counselling. It may be that under certain conditions a more structured institutional setting as opposed to a community non residential environment is required for the effective initiation of a treatment program.

Table 4 illustrates the effectiveness of the various theoretical basis from which the offender is viewed and from which particular intervention strategies are formulated.

Table 4

Conceptual Framework			
	<u>N</u>	<u>%</u>	<u>ES</u>
Behavioral Modification	10	14.7	.46
Social Learning	5	7.3	1.08
Systems Theory	6	8.8	.66
Crisis Intervention	1	1.5	1.28
Differential Treatment	6	8.8	-.02
Reality Therapy	1	1.5	3.08
Interpersonal Maturity Level Classification	3	4.4	1.44
Sociological	9	13.2	.19
Other (distinctive theories that could be attributable to one of the above conceptualizations)	13	19.1	.70
Not specified	14	20.6	.18

Although in an analysis of variance,  $F = .95$ , the differences between the categories were not significant, there are theories which seem to predominate in terms of producing an effective treatment outcome. Of these, four

appear significant, crisis intervention, social model theory, reality therapy and interpersonal maturity level classification. The latter three have a social cognitive component. The importance of this will be discussed later in the chapter. In addition, treatments that were based on a theoretical principle were on an average 5 times more effective than those that had no prescribed theoretical bias.

Table 5

Context of Treatment			
	<u>N</u>	<u>%</u>	<u>ES</u>
Individual	22	32.4	.91
Group	15	22.1	.49
Family	6	8.8	.37
Individual & Family	4	5.9	.72
Individual & Group	11	16.2	.28
Group & Family	1	1.5	.59
Individual, Group & Family	5	7.4	1.44
Individual & Significant Others	2	2.9	1.57
Individual, Family & Significant Others	2	2.9	.91

The context within which treatment took place had noticeable ramifications with respect to the eventual outcome. An analysis of variance of the context in which treatment was rendered, indicated a significant difference  $F=3.34$ , at the 0.05 level. As indicated in Table 5, working with the juvenile offender in association with those who can

have direct influence on the individual's immediate environment or whom the individual may respect and use as a role model, (significant others) positively influences the effect size. It appears that treatment of an offender on an individual bases also results in a positive effect size outcome, however, when individual treatment is in conjunction with group sessions the positive result is negated. It can only be hypothesized that any positive outcomes in an individual session are countered in a group situation where the individual may be subtly influenced by negative peer group pressure.

Table 6 indicates that when blocked into time periods as prescribed by Garrett (1984) the results as to the effect of treatment length appear to indicate a negative relationship between treatment length and outcome; the longer the treatment length, the less effective the treatment. The optimum treatment period seems to be between 13-26 months.

Table 6

Length of Treatment			
	<u>N</u>	<u>%</u>	<u>ES</u>
0 - 12 months	18	26.5	.52
13 - 26 months	13	19.1	.66
27 - 52 months	13	19.1	.48
Over 52 months	1	1.5	-.56
Varied - dependent on Individual Offender	4	5.9	.18
Not Specified	19	27.9	.44

Table 7

Change Agent			
	<u>N</u>	<u>%</u>	<u>ES</u>
Graduate Student	9	13.2	.52
Undergraduate	5	7.4	1.27
Psychologist/Social Worker	5	7.4	.58
Trained Professional	30	44.1	.51
Trained Volunteer	4	5.9	.64
Untrained Volunteer	4	5.9	.25
Other	3	4.4	
Not Specified	8	11.8	

The most effective change agents, Table 7, appear to be undergraduate students and trained volunteers. In both instances it can be assumed that the individuals in question have chosen to participate in a particular program for a prescribed period of time. This, it can be hypothesized, results in both an enthusiasm and emotional commitment which if emulated by a professional who interacts with juvenile offenders on a daily basis, might result in "burnout." It also should be noted that such individuals are likely to be close in age to the juveniles than other agents and therefore may provide more effective role models. The most ineffectual change agent although most cost effective, is the untrained volunteer. Although they like their trained counterparts, may be young, enthusiastic and committed,

without training and guidance their energy and their modelling may remain unfocused and ineffective.

On the question of whether multifaceted treatment approaches are more effective than a unitary approach, the results indicated no significant difference  $F = 1.30$  at the 0.05 level. This appears to contradict Ross and Gendreau's (1980) assertion that all effective programs are multi-faceted and suggests that if the "right" program is used (or the right combination of programs) a positive outcome may ensue.

Table 8

Multifaceted vs a Unitary Approach			
	<u>N</u>	<u>%</u>	<u>ES</u>
Multifaceted	34	50.0	.58
Single	34	50.0	.44

As illustrated in Table 9, if an intervention strategy contained a social cognitive component it was approximately twice as effective as a program containing no cognitive component. Ross and Fabiano (1985) identified various programs which incorporate cognitive components; rational behavior training, reality therapy and the interpersonal maturity level classification system treatments. This,

however does not preclude the possibility that social cognitive components can be integrated into other intervention strategies. For example a program that is essentially based on a behavioral modification approach may also include a cognitive component.

Table 9

Cognitive vs Non-Cognitive Components			
	<u>N</u>	<u>%</u>	<u>ES</u>
Cognitive (Social)	28	41.2	.76
Non-Cognitive	40	58.8	.34

In examining the time period between the end of treatment and when the outcome measure was taken, Table 10, there appears to be no discernable pattern with regards to recidivism rates. There was an initial decrease in effect size from the 7th to 18th month period. The treatment effect then seems to stabilize somewhat only to decrease again after 43 months. Unfortunately with 25% of the studies not reporting on the follow-up period, and coupled with data unavailable for some time frames, this tends to limit the analysis.

Table 10

Follow Up			
	<u>N</u>	<u>%</u>	<u>ES</u>
1 - 6 months	2	3.0	.90
7 - 12	19	27.9	.39
13 - 18	6	8.8	.39
19 - 24	10	14.7	.78
25 - 30	1	1.5	1.13
29 - 36	8	11.8	.55
37 - 42			
43 - 48	2	2.9	-.35
49 - 54			
55 - 60	1	1.5	.37
61 -	2	2.9	-.06
Not Specified	17	25.0	-

### Inferential Statistical Analysis

Contrary to what was expected, the variables thought to covary with the recidivism effect size did not do so. This result corroborates the Hunter et al (1982) observation that in general, findings of a Glassian meta-analysis do not correlate significantly with study outcome. In examination of the correlation matrix, there were a number of negative inverse relationships; age (-.185), length of treatment (-.181) and follow-up (-.128). Thus there is an indication that as these variable increase there is a predictive decrease of the effect size measure.

The results of a multiple regression analysis, Table 11, indicated that generally, the average effect size of

correctional treatment programs cannot be predicted from knowledge about the characteristics of the studies. Only two study variables accounted for any of the variance of the effect size; treatment setting and the presence of a social cognitive component.

Table 11

Multiple Regression Analysis			
	<u>R<sup>2</sup></u>	<u>F</u>	<u>Significance Level</u>
Social Cognitive Component	.06	5.54	.02
Treatment setting	.13	6.11	.00

Intervention Strategies

The results as to the effectiveness of the various intervention strategies, Table 12, are inconclusive. It appears that the most effective therapies; Interpersonal Maturity, Reality therapy and Behavioral cognitive, are those which implicitly incorporate social cognitive components. An exception is child advocacy, with an average ES of 1.31. This result, as with all others in this section, should be interpreted with some caution because of the small number of studies involved.

Table 12

Intervention Strategies		
	<u>N</u>	<u>ES</u>
Psychodynamic	0	-
Dynamic-eclectic	2	-.58
Non-directive	1	.01
Rational emotive	0	-
Transactional	2	.19
Behavioral modification	9	.17
Reality therapy	1	1.51
Cognitive behavioral	4	.72
Vocational personal	0	-
Undifferentiated	8	.11
Placebo	2	.48
General eclectic	6	.61
Interpersonal maturity	2	1.92
Outward bound	1	.64
Academic upgrading	1	.62
Job placement	0	-
Positive peer culture	0	-
Child advocacy	1	1.38

Behavioral modification, one of the most predominately used treatment strategies has an average effect size measure of only .17. One must question why behavioral modification

has been such a popular treatment modality. It may be related to the fact that, in most instances, a token economy was the primary intervention tool. The convenience and ease of administration of this technique; especially in an institutional environment, along with giving the impression of eliciting positive behavioral changes in the offender may explain the popularity of use of this modality. The effect however, appears to diminish quite rapidly over time.

The dynamic-eclectic approach which focuses on the medical model and has its origins based on personality theories developed by Sullivan and Alexander, appears to negatively influence the recidivism rate,  $\overline{ES} = -.58$ . This would seem to add credibility to Ross' and Gendreau's (1979) contention that successful treatment programs do not rely on the medical model which assumes crime to be a symptom of some underlying pathology.

Two studies (Chandler 1973; Sarason et al 1973) examine the effects of a placebo treatment strategy. Although placebo is usually synonymous with a control group situation, in these instances it was an active intervention procedure. The placebo treatment offenders, like their primary treatment counterparts, experienced therapist attention coupled with other non-specific and informal therapeutic effects. This situation was far removed from that of the usual "no-treatment" control condition. The no treatment control groups, in both studies had no contact

with those individuals implementing the treatment program. It can be hypothesized, albeit somewhat cautiously, that the placebo conditions, of daily interaction with a positive role model in a non threatening constructive environment promoted a behavioral change, which in turn, resulted in a lowering of the recidivism rate ( $\overline{ES} = .48$ ).

When examining the results of treatments based on multi-faceted intervention strategies, Table 13, the outcomes appear somewhat ambiguous. Behavioral modification when coupled with any number of other treatment approaches has a greater effect than that obtained when it is the only intervention strategy. However, for other intervention strategies the results are less than what would be achieved alone. A cognitive behavioral strategy results in an  $\overline{ES}$  of .72 yet in combination with vocational-personal developmental counselling the  $\overline{ES}$  is .41. The dynamics of a multi-faceted intervention strategy appear to influence the outcome measure in a complex manner. While in some instances the combination of intervention strategies may result in benefits greater than the sum of the individual strategies or what either would achieve if employed alone the results indicate that the opposite may equally apply; the combination of strategies may result in a negative interaction.

When comparing the average effect sizes of the single versus multi intervention strategies; .60 and .71

Table 13

Intervention Strategies - Combining Two or More Therapy Types		
	<u>N</u>	<u>ES</u>
Behavior modification + cognitive behavioral	5	.61
Behavioral modification + undifferentiated	2	.36
Behavior modification + positive peer culture	1	1.07
Behavior modification + job placement	1	1.83
Non directive + vocational-personal	1	1.13
Non directive + cognitive-behavioral	1	.64
Interpersonal maturity + vocational-personal	3	.04
Dynamic-eclectic + cognitive behavioral	1	.75
General eclectic + academic upgrading	1	.59
Academic upgrading + vocational-personal	1	.66
Cognitive behavioral + vocational-personal	1	.41
Behavioral modification; cognitive behavioral; vocational-personal	1	.98
Vocational-personal; academic upgrading; job placement	2	-.06
Transactional; behavioral modification; positive peer culture	1	.41
Psychodynamic; academic upgrading; job placement	1	1.36
Cognitive behavioral; general eclectic; child advocacy	1	1.82
General eclectic; academic upgrading; job placement	1	.30
General eclectic; academic upgrading; job placement; positive peer culture	2	-.18
Rational emotive; cognitive behavioral; eclectic behavioral; vocational-personal	1	.83

respectively, the latter appears slightly more effective.  
An analysis of variance, however, was not significant  
 $F = .09$ .

## CHAPTER V

### CONCLUSION

This study has endeavoured to go beyond the general question as to the effectiveness of correctional treatment programs for juvenile delinquents. Garrett (1984) in her study had addressed that issue and convincingly argued that "yes treatment is effective" (p. 140). As Ross and Gendreau's (1980) review indicates, the important question is no longer "does treatment work" but under what conditions does it work. The purpose of the present study was to ascertain 'what' works in terms of a single outcome measure (recidivism) and to identify principle characteristics inherent in effective correctional programming. One of the major conclusions is that there are no 'ideal' single intervention strategies or combination of strategies which, if applied to the general juvenile offender population, would result in a wholesale reduction in recidivism.

An apparent factor critical to the determination of effectiveness relates to the presence or absence of social cognitive components in the treatment program. This finding seems to lend support to the view that criminal behavior is not some underlying pathological condition that has resulted in the commission of anti-social acts, rather it is

associated with a number of cognitive factors such as a narrow egocentric view of the world, with a limited ability in interpersonal cognitive skills and an inability to comprehend and appreciate the views of others (Ross & Fabiano, 1985).

The environment in which treatment is implemented also appears to be of critical importance. The results suggest that in most circumstances the most effective treatment environment is within the community. Although there were no perceptible differences between community-residential and non-residential settings, there were some indications that care must be taken when determining whether to have an individual remain within their home environment or placed in a community residential setting. While cost effectiveness is of considerable importance it should not be the primary determining factor. An important point to consider is whether the juveniles' family is amenable to and supportive of the proposed treatment program. The family's attitude is especially important in light of the finding that the most successful context in which treatment can take place is within the family or with significant others from the community.

A somewhat surprising finding was that the seriousness of the offence committed did not appear relevant with respect to a reduction in the recidivism rate. The significant factor was the offenders' age. This is not

surprising when one considers that the younger the individuals are, the less likely they are to have made a strong personal commitment to maintaining the status quo related to criminal activity and, generally speaking, they are probably more malleable and open to the idea of change.

Although this meta-analysis has not been able to provide a simple answer, it has endeavoured to clarify some of the variables necessary for the design of effective programs for juvenile delinquents. It is important at this juncture to note the limitations of this study in the hope that future research can build on these results.

The major weakness of this study relates to the relatively small sample size. The researcher is caught in a conundrum; conflict between the need of setting stringent criteria requirements in order to evaluate only credible research studies and the need to obtain a sample size large enough, such that the results are not in question. The unfortunate aspect is that many studies are lost to the researcher because relevant data was not reported in the primary study or there were no comparative control conditions. A larger data base is required for a more detailed analysis as to the interrelationships between study variables and the outcome measure. In many cases the missing information, or it's inadequate articulation, accounted for almost a quarter or more of the responses in a

specific variable field, i.e., conceptual framework, treatment duration and follow up. It is incumbent on future researchers to include this data for without it, decisions as to correctional policy will continue to be based on supposition rather than fact.

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**APPENDIX A**

**STUDIES INCLUDED IN THE META-ANALYSIS**

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**APPENDIX B**

**FORMAT FOR CODING RESEARCH ARTICLES**

FORMAT FOR CODING RESEARCH ARTICLES

IDENTIFICATION NUMBER OF RESEARCH ARTICLE

A. Subject Profile

All demographic information concerning treatment and control group

- Sex:
1. All male
  2. All female
  3. Mixed

Age: The average age of subjects for each outcome measure. If the average age has not been reported, the median or modal age, or the midpoint of the range was used.

Offence Status: Denotes the type of offence that characterizes the treatment and control groups.

1. Status offences or minor delinquencies  
e.g., runaway, truancy, curfew violations,  
ungovernable
2. Property related offences  
e.g., theft, burglary, vandalism
3. Person related offences  
e.g., assault and all violent crimes
4. Property and person related offences
5. Mixed refers to subjects whose offences range over  
the above categories
6. Status and property related offences

B. Treatment Setting

Treatment group

1. Community - non residential
2. Community - residential  
e.g., group homes or other relatively small homelike  
setting located in the individuals home  
community
3. Institutional

**C. Conceptual Framework**

1. Behavioral Modification
2. Social Learning Theory
3. Systems Theory
4. Crisis Intervention
5. Differential Treatment
6. Reality Therapy
7. Interpersonal Maturity Level Classification
8. Vocational/Academic Skills Development
9. Sociological
10. Other

**D. Context of Intervention**

1. Individual
2. Group
3. Family
4. Individual and family
5. Individual and group
6. Group and family
7. Individual, group and family
8. Significant others,  
e.g., peers  
teachers  
relatives other than parents
9. Individual and significant others
10. Individual, family and significant others

**E. Length of Treatment**

The time is reported in weeks. In instances where the rate was reported as hours, divide the number of hours by 7 and round off to the nearest full week. If duration varied according to each individual treated it was coded as 000.

**F. Change Agent**

Those individuals working directly with the treatment group:

1. Graduate student in social sciences
2. Undergraduate student  
e.g., social sciences, nursing, teaching
3. Psychologist or Masters of Social Work
4. Trained professional  
e.g., counsellor, social worker, probation officer,  
correctional staff

5. Volunteer (trained)
6. Volunteer (untrained)
7. Other

## G. Intervention Strategies

### 1. Psychodynamic Therapies

Psychodynamic therapies were those employing concepts such as unconscious motivation, transference relationship, defence mechanisms, structural elements of personality (id, ego, superego), ego development, and analysis. Therapies to be coded in this category include:

- Psychoanalysis
- Psychodynamic psychotherapy
- Ego therapy
- Intensive psychotherapy
- Leading therapy
- Cathartic therapy
- Direct analysis
- Groups psychotherapy

### 2. Dynamic-eclectic Therapies

Dynamic-eclectic therapies are based on dynamic personality theories, but employ a wider range of techniques than the more orthodox Freudian theory. Therapies to be coded in this category include:

- Insight therapy
- Psychosomatic psychotherapy
- Problem-solving group counselling
- Traditional psychotherapy
- Marital or family psychotherapy

### 3. Alderian Therapy

Alderian therapy is based on the notion of never-ending strivings of the personality to escape from a sense of inferiority. Striving for superiority alienates people from love, logic, community life, and social relationships. Therapies to be coded in this category include:

- Alderian therapy
- Individual analysis

4. Hypnotherapy

Hypnotherapy (Wolberg, Erikson) is one type of therapy that uses hypnosis as a tool for increasing relaxation and suggestibility and weakening ego defenses. Hypnotherapy is closely related to psychodynamic theory, suggesting that such neurotic states as anxiety, hysteria and compulsions are susceptible to this treatment.

5. Client-centered or Nondirective Psychotherapy

Client-centered or nondirective psychotherapy is associated with Rogers, Truax, Carkhuff, Gendlin, and Axline, among others. The key concepts of this therapy include the necessary conditions of therapist congruence, empathy, and unconditional positive regard for the client. Therapies to be coded in this category include:

- Rogerian therapy
- Client-centered psychotherapy
- Reflection therapy
- Interaction psychotherapy
- Nondirective play therapy

6. Gestalt Therapy

Gestalt therapy was developed by Perls and, like Rogerian therapy, is humanistic and phenomenological in philosophy. The healthy person can readily bring into awareness all parts of his personality and apprehend them as an integrated whole. Therapy is a process of heightening awareness through immediate here-and-now emotional and physical experiences and exercises and integrating alienated elements in the person. Therapies to be coded in this category include:

- Gestalt therapy
- Marathon group therapy
- Gestalt growth group
- Microgroup psychotherapy
- Encounter group

7. Rational-Emotive Therapy

Rational-emotive therapy was developed by Ellis and rests on a cognitive theory of human personality and therapeutic intervention. Irrational beliefs are common for people in distress and pervasive in our society. They include the notion that one must be

universally loved, or that failure at a task is utterly catastrophic. The therapist confronts the irrational reactions and teaches the client to confront them himself. The objective of therapy is to replace the irrational, self-defeating cognitions with logical and empirically valid cognitions.

#### 8. Other Cognitive Therapies

Other cognitive therapies comprise a family of therapeutic theories to Ellis's rational-emotive psychotherapy in that the place of cognitive process--faulty beliefs, irrational ideas, logically inconsistent concepts--is central. These therapies are often active, didactic, directive, sometimes bordering on being horatory. The therapists confront logical inconsistencies, interpret faulty generalizations and self-defeating behaviours, assign tasks, and generally use suggestion and persuasion to get the client to give up his self-defeating belief system. Therapies to be coded in this category include:

- Rational stage-directed therapy
- Semantic desensitization
- Cognitive control
- Fixed-role therapy
- Rational therapy
- Systematic rational restructuring
- Play desensitization
- Cognitive rehearsal
- Verbal desensitization

#### 9. Transactional Analysis

Transactional analysis is primarily associated with Eric Berne, who developed a personality theory based on three ego states--the parent, adult and child--and the interrelationship of these ego states within a person and between persons. All beliefs, cognitions, and behaviours are under the control of these ego states. Therapy consists of ongoing (usually group) diagnosis and interpretation of the structural elements of communication and interaction, with the goal of improved reality testing and complementary transactions.

10. Behaviour Modification

Therapies to be coded in this category include:

Behaviour modification  
Operant conditioning  
Token economy  
Contingency contracting  
Aversive conditioning  
Verbal conditioning  
Conditioned relaxation  
Systematic counselling  
Stimulus satiation

11. Reality Therapy

Reality therapy is identified with William Galsser and is based on the idea that persons who deny reality are unsuccessful and distressed. Reality is achieved by the fulfillment of the basic needs--to love and be loved and to feel self-worth (success identity). The therapist establishes a personal relationship with the client; attends to present behaviour in light of the theory; and encourages the formation of value judgements about correct behavior and a plan for changing behaviour, rejecting excuses for a failure to changes, and the development of self-discipline.

12. Systematic Desensitization

Systematic desensitization is a therapy based on scientific behaviourism, primarily associated with Wolpe. In this therapy, anxieties are eliminated by the contiguous pairing of an aversive stimulus with a strong anxiety-competing or anxiety-antagonistic response. The usual procedure is to teach the client deep muscle relaxation (a response antagonistic to anxiety) and then introduce anxiety-provoking stimuli, arranged in hierarchies, in connection with the relaxation until the client can confront and overcome the anxiety directly. Therapies to be coded in this category include:

- Systematic desensitization
- Reciprocal inhibition
- Counterconditioning

13. Implosive Therapy

Implosive therapy, developed by Stampfl, operates on many problems similar to those addressed by

systematic desensitization and is based on classical conditioning models. The therapist directs the client's imagery so that he is forced to imagine the worst possible manifestation of his fear, and the connection between conditioned stimulus and conditioned response is extinguished. Therapies to be coded in this category include:

- Implosive therapy
- Flooding

14. Cognitive Behaviour Therapies

Cognitive behaviour therapies are a family of treatment programs in which the scientific laws of learning (according to Skinner) are invoked. The client is viewed as a recipient of reinforcement or conditioning. Therapies to be coded in this category include:

- Cognitive-behavioral therapy
- Contact desensitization
- Behavioural self-control
- Self-control desensitization
- Modeling
- Modeling reinforcement
- Self-reinforcement
- Self-modeling
- Covert reinforcement
- Anxiety management training
- Cognitive behavior modification
- Covert sensitization
- Covert assertion
- Social learning theory

15. Eclectic-Behavioural Therapy

Eclectic-behavioural therapy is a collection of treatments that employs behavioural principles in training programs designed to affect a variety of emotions and behaviours. Assertiveness training is the principal therapy. Therapies to be coded in this category include:

- Assertiveness training
- Self-defeating behaviour workshop
- Desensitization plus skills counseling
- Practiced imagination therapy
- Behavioural rehearsals

16. Vocational-Personal Developmental Counselling

Vocational-personal developmental counselling involves providing skills and knowledge to clients to facilitate adaptive development. Frequently, a trait and factor approach is used with aptitude and personality testing, diagnosis, prescription, and interaction with the client to facilitate the development of personal, social, education, and vocational skills. Therapies to be coded in this category include:

- Study skills counselling
- Vocational counselling
- Personal achievement skills counselling
- Social adjustment skills counselling
- Counseling and instruction about psychological processes

17. "Undifferentiated Counselling"

"Undifferentiated counseling" refers to therapy or counselling that lacks descriptive information and references that would identify it with proponents of a theory. It is usually practised in schools, but sometimes is used as a foil against which a more highly valued therapy can be compared. That it cannot be attributed to any single theorist or group of writers is indicative of its lack of theoretical explication. Therapies to be coded in this category include:

- School counselling
- Success sharing groups
- Supportive counselling
- Nondirective counselling

18. Placebo Treatments

Placebo treatments are often included in an experimental study of effectiveness. Placebos were used to test the effects of client expectancies, therapist attention, and other non-specific and informal therapeutic effects. Placebo treatments would include:

- Relaxation training
- Attention control
- Relaxation and suggestion
- Relaxation and visualization of scenes in anxiety hierarchy
- Groups discussion

- Reading and discussing a play
- Informational meetings
- Bibliotherapy
- Minimal contact counselling
- Pseudo-treatment control
- Lectures

19. General Eclectic Counselling

Bits and pieces of justified therapies put together in an ordered and well thought-out manner.

20. Interpersonal Maturity Level Classification

Interpersonal maturity level classification assesses the client in terms of their cognitive maturity. The treatment provides for the individual to increase their maturity level. It includes helping the individual to perceive accurately and respond more appropriately to the demands of society and its institutions; training in social perception and role-taking skills; and training in interpersonal sensitivity and accuracy of self appraisal.

21. Outward Bound

Outward bound provides the opportunities for concrete 'impressive' accomplishment as well as for excitement and challenge, promote personal growth. The requirement to pace oneself counteracts the desire to act impulsively, while the requirement of persistence in challenges encourages the development of endurance. The program also encourages the individual to re-examine attitudes towards authority figures and the concept that laws and regulations are to be ignored.

22. Academic Upgrading

23. Job Placement

24. Positive Peer Culture

25. Child Advocacy

Involves mobilizing required community resources for the youth in order to insure durability of desired change and to provide legitimate avenues for attainment of the youth's goal.

H. Was the program multifaceted incorporating a variety of intervention approaches?

1. Yes
2. No

I. Was there a social cognitive component; as defined by Ross and Fabiano (1985), to the intervention strategy(ies) employed?

1. Yes
2. No

Intervention strategies were classified as containing social cognitive components if they employed one or more of the following approaches: negotiation, decision making, interpersonal and problem-solving skills, modelling role-playing, rational emotive therapy and cognitive behavior modification.

J. Effect Size

Sample Size: The sample size for the treatment group was recorded first followed by the sample size for the control group.

Follow-up: The time period between the end of treatment and the outcome measure was recorded in days. Thirty days equalled one month. If the follow-up period was less the one month code 000.

Outcome measure: The effect size was determined using the Glassian procedure.



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