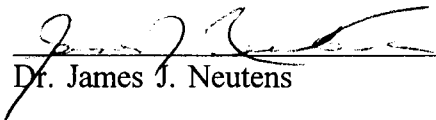


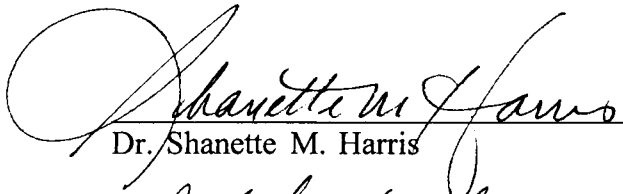
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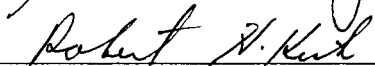
I am submitting herewith a dissertation written by Judith A. Ausherman entitled "A Meta-Analysis of Selected K through 12 Sexuality Education Studies". I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctorate of Education, with a major in Health Education.



Dr. James J. Neutens

We have read this dissertation and
recommend its acceptance:

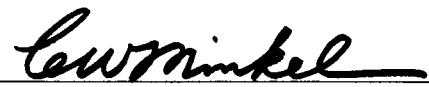


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**A META-ANALYSIS OF SELECTED
K through 12 SEXUALITY EDUCATION STUDIES**

a Dissertation

**Presented for the
*Doctorate of Education***

Degree

The University of Tennessee, Knoxville

Judith A. Ausherman

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ABSTRACT

The purpose of this study was to conduct a meta-analysis of selected sexuality education studies/research in order to determine the validity of findings/conclusions relative to programs' effects on knowledge, attitudes, and practices pertaining to human sexuality. Specifically, the study sought to determine: 1) the overall effect-size of sexuality education studies, 2) the overall effect-size of knowledge in sexuality education studies, 3) the overall effect-size of attitudes in sexuality education, and 4) the overall effect-size of behavior in sexuality education. An examination between selected program characteristics and outcomes was also conducted.

The unit of analysis in this project was sexuality education studies that had been completed during the years 1966-1993 that met the following criteria: 1) used quantitative outcome measurements, 2) included a treatment and control or comparison group, 3) age level inclusive of K through twelve, 4) specific program goals and cognitive, affective or action learning objectives, and 5) implemented in the United States.

A total of 144 studies were examined of which 13 (9%) met the criteria for selection and were included in the analysis. All the studies were conducted between 1976 and 1992. Eight studies (62%) came from published journals and 5 (38%) came from unpublished dissertations. The average effect-size for dissertations was .55, while the average effect size for journal articles was .51. A t-test showed no significant difference between the effect-sizes for journals and dissertations ($t = -.21$,

$p=.84$). The analysis of all the studies resulted in a total of 41 effect-sizes. These included 16 effect-sizes for knowledge, 18 effect-sizes for attitudes and 7 effect-sizes for behavior. The results of the effect-sizes were combined to create an overall effect-size of sexuality education studies.

The most commonly measured outcome measure from the 13 sexuality education studies was attitudes ($n=18$). The second highest measure was knowledge ($n=16$), and behavior ($n=7$) being the least frequently measured. The largest effect-size average was knowledge (effect-size = .846). Total effect-sizes for knowledge ranged from .065 to 3.105. The effect-size for behavior was the second highest (effect-size = .652). The range of effect-sizes for the behavior outcome measures ranged from -.191 to 1.426. The effect-size average for outcome measures for attitudes represented the lowest effect-size measure (effect-size = .303) with a range from .017 to 1.29. The overall effect-size for sexuality education programs was .53.

Like earlier narrative reviews, this meta-analysis found that increased knowledge and positive attitude changes were the most frequently reported achievements of sexuality education; changes in behavior were not reported as readily. However, the findings provide an indication of the magnitude of given outcomes, not just the frequency of studies which report significant or non-significant results.

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CHAPTER I

SIGNIFICANCE OF THE PROBLEM

Education performs an important role in promoting health and preventing illness, injury and premature death among children and adolescents (Foder & Dalis, 1989; U.S. Department of Health and Human Services (USDHHS), 1991; U.S. Department of Health Education and Welfare (HEW), 1979). Since the early 1900's, the nation's public schools have provided a setting for improving the health of children and adolescents (Means, 1975). Programs were originally designed to assist students in making informed choices about behavior which could be applicable for a lifetime. For example, many of the first health education programs focused on discouraging habits such as drug and alcohol use (Timmerick, Cole, James & Butterworth, 1988). The integration of more health education programs (e.g., alcohol and tobacco education, community health, family life) into schools has prompted educational officials and members of other disciplines to raise questions about the worth of these services which in turn, have prompted evaluations to determine the effectiveness of health education programs (Cleary, 1991; Robinson & Alles, 1984). Consequently, a number of large-scale school health research studies have been conducted. The results of these studies suggest that educational experiences influence the development of health-related knowledge, attitudes, and behavior. (Means, 1975; School Health Education Study (SHES), 1967).

Based on findings showing relationships among education, health-related knowledge, and behavior, communities have attempted to provide students with opportunities to engage in health-related skills and behaviors (Stone & Perry, 1990). The value attached to education in relation to disease prevention and health promotion are reflected in the numerous content areas of school health curricula. Some content areas include: community health; consumer health; environmental health; family life; growth and development; nutrition; personal health; prevention and control of diseases and disorders; safety and accident prevention; and substance use and abuse (Pollock & Middleton, 1989). However, the inclusion of specific topics areas within these broad health content areas are often debated. One of the most controversial topics is sexuality education. Of the many issues surrounding sexuality education, a most pressing concern relates to program effectiveness.

Values and beliefs regarding the appropriateness of imparting sex-related topics in public schools can lead to the expression of differences in opinion, which in turn, can promote conflict and disharmony. (Kantor, 1993, Yarber, 1992). Debates that stem from differing opinions about integrating developmentally based sex-related subject matter into classroom discussions has exerted influences on the quality and type of sexuality information offered. Confrontations with parents have encouraged school board members, administrators, and other educational officials to occasionally modify or remove components of sexuality education in order to reduce such

controversy (Luty, 1988). Program modifications that arise because of external factors, however, may lead to inconsistent and disjointed program services. This dismantling of program components may also have significant implications for the quality of knowledge in the area of sexuality education. Inefficient knowledge resulting from program alterations can deter students from making informed decisions about their sexual health. Additionally, evaluations designed to assess the effectiveness of sexuality education in the cognitive, affective, and behavioral domains are likely to be methodologically flawed, resulting in incomprehensible outcomes (Campbell & Stanley, 1963). In order to increase the likelihood that sexuality education produces favorable effects for student populations, well-designed summative and formative program evaluations are required (Dignan & Carr, 1992; Windsor, Baranowski, Clark & Cutter, 1984).

Although a considerable amount of interest, energy, and resources have been spent on the evaluations of sexuality education programs the results have largely been mixed and inconsistent. Available reports and summaries that discuss the effects of sexuality education provide unreliable information because empirical support is limited or absent (Dawson, 1986; Kilman, Wanlass, Sabalis & Sullivan, 1981; Kirby, 1980; Kirby, 1989; Marsiglio & Mott, 1986; Voss, 1980). Whereas comprehensive research reviews on sexuality education programs present summaries of various findings and offer suggestions to improve program effectiveness, most are

inadequate in synthesizing the results. Improvement suggestions based on the research findings of poorly designed qualitative studies make it difficult to draw useful conclusions or policy recommendations (Iverson & Levy, 1982). Thus, a quantitative synthesis of information about the effects of sexuality education programs is lacking in the literature.

Glass (1976) developed a strategy which statistically analyzes summary findings of empirical research. This statistical procedure allows the researcher to evaluate program effectiveness with specific criteria that yield a quantitative standard statistic for comparisons (Hembree, 1984; Tobler, 1986). These techniques offer empirical evidence rather than to conjecture and opinion (Bruvold, 1990; Hyde, 1986; Louis, Fineberg & Mosteller, 1990) and provide a meaningful assessment of the general effectiveness of programs (Iverson & Levy, 1986). Comparisons between quantitative meta-analysis and narrative reviews have also shown that meta-analytic procedures are the more objective of the two (Olkin, 1992).

Although meta-analysis has not been used to examine the effects of sexuality education programs, information resulting from this statistical strategy would benefit parents, school board members, administrators, superintendents, and educators in planning appropriate sexuality education programs for students in the public schools. These results can also assist with meeting the goals and objectives that correspond with comprehensive school health education and the "National Health Objectives for the Year

2000" (McGinnis & DeGraw, 1991).

Problem Statement

The purpose of this study was to conduct a meta-analysis on selected K through 12 sexuality education studies in order to determine the validity of findings relative to programs' effects on knowledge, attitude, and behaviors pertaining to human sexuality.

Research Questions

The questions this study sought to answer are the following:

1. What is the overall effect-size of sexuality education studies.
2. What is the overall effect-size of knowledge in sexuality education?
3. What is the overall effect-size of attitudes in sexuality education?
4. What is the overall effect-size of behavior in sexuality education?

Null Hypotheses

This meta-analysis was conducted in order to investigate the effectiveness of the general instructional outcome measures of sexuality education programs. Specifically the following null hypotheses were tested.

Hypothesis 1

The effect-size for knowledge equals zero. An effect-size of zero suggests that there is no difference in the mastery of the objectives related to

knowledge in the area of sexuality education between the control groups and the experimental groups.

Hypothesis 2

The effect-size for attitudes equals zero. An effect-size of zero suggests that there is no difference between the control and the experimental groups' mastery of the objectives related to attitudes in the area of sexuality education.

Hypothesis 3

The effect-size for behavior will equal zero. An effect-size of zero suggests that there is no difference between the control groups and the experimental groups' mastery of the objectives related to behavior in the area of sexuality education.

Delimitations

This study is delimited to:

1. Sexuality education programs studies that met the following criteria:
 - A. used quantitative outcome measurements.
 - B. included a treatment and control or comparison group.
 - C. include age levels from grades K through twelve.
 - D. specific program goals and cognitive, affective or action learning objectives were stated before implementation.
 - E. implemented in the United States.

2. Sexuality education studies which were conducted during the years 1966-1993.
3. All studies were reviewed by a single coder.

Limitations

The study was limited by the following:

1. Inter-library loan procedures at the University of Tennessee, Knoxville.
2. The response rate of authors to written requests for unpublished studies or missing data.

Definition of Terms

Affective domain: learning objectives which emphasize feelings, an emotion or a degree of acceptance or rejection. Usually expressed as interests, attitudes, appreciations, values, emotional sets or biases (Krathwohl, Bloom, & Masia, 1956, p.7)

Attitudes: a general feeling of favorableness or unfavorableness towards any concept (Ajzen & Fishbein, 1980).

Behavioral domain: learning objects which specify certain types of behavior that are used as evidence that the objective has been achieved.

Cognitive domain: objectives which pertain to the recall or recognition of knowledge and the development of intellectual abilities and skills (Bloom, 1956, p.7)

Effect Size: $\frac{\bar{X}_E - \bar{X}_C}{SD_C}$ where $\bar{X}_E$ represents the mean of the experimental group, $\bar{X}_C$ is the mean of the control group and SD_C is the standard deviation of the control group (Glass, McGaw & Smith, 1981).

Intervention: a planned and systematically applied combination of program elements designed to produce cognitive, affective, skill, or health status changes in children and adolescents in a specified setting and during a specific period (Windsor et al., 1984).

Sexuality education: intervention methods which seek to provide accurate information about human sexuality, assess sexual attitudes and develop interpersonal skills about taking care of one's sexual health. Sexuality education addresses the biological, sociocultural, psychological, and spiritual dimensions of sexuality from (1) the cognitive domain, (2) the affective domain, and (3) the behavioral domain, including skills to communicate effectively and make responsible decisions (Sex Information and Education Council of the U.S. (SIECUS), 1991).

Organization of the Study

Chapter II presents a review of the literature pertinent to this study. This review includes the (1) an overview of meta-analysis; (2) status of sexuality education programs in the public schools; (3) evaluations of sexuality education programs; (4) theoretical rationale for sexuality education; (5) objectives for the nation, and (6) the summary and conclusions. Chapter III describes the research methodology, literature search procedures, selection

criteria for studies, identification and coding of selected studies, and analysis of the data.

Chapter IV contains the results of the study. These results are discussed in Chapter V in relation to the hypotheses and recommendations for future research on this topic.

CHAPTER II

REVIEW OF LITERATURE

INTRODUCTION

The review of related literature is divided into the following areas for discussion: (a) an overview of meta-analysis; (b) status of sexuality education in the public schools; (c) evaluations of sexuality education programs; (d) theoretical rationale for sexuality education; (e) the objectives for the nation, and (f) the summary and conclusions.

Meta-Analytic Method

Producing primary research and evaluation of studies without a systematic integration of previous studies can be scientifically and educationally wasteful (Walberg & Haertel, 1980). Large numbers of reports, summaries and studies of programs and program effects can also result in a confusing assortment of information (Iverson & Levy, 1982). Therefore, systematic integration of related studies should be utilized to provide better research synthesis.

Meta-analysis is used to synthesize conclusions from various related studies (Hembree, 1984). Bangert-Drowns (1988) cites two distinct advantages over narrative reviews (a) it uses more precise measure of study outcomes, the effect size, which is comparable across studies and (b) uses statistical tests to look for relations between effect-sizes and characteristics of the reviewed studies. In essence, meta-analysis allows the researcher to

collect and evaluate sexuality education programs based upon specific criteria and the use of a quantitative standard statistic for comparison of results (Goldmon, 1991). Narrative reviews of research outcomes have had substantial problems and personal bias, therefore meta-analysis techniques have been implemented to draw empirical conclusions rather than merely qualitative reviews (Hyde, 1986).

The outcome of the meta-analysis is derived from four steps. First, evaluations relevant to a specific topic are collected. Secondly, specific features of these evaluations are described quantitatively. Next, outcomes are formulated into a common measure called the effect-size, the standardized difference between the experimental and the control groups on a specific criterion. Finally, the researcher utilizes statistical methods to find relations between study features and study outcomes (Bangert-Drowns, 1986).

Meta-analysis provides a stronger basis for conclusions than any of the single study comparisons. The differences of single outcomes are transformed into standardized scores and compared across similar groups of study, the results represent a controlled comparison of effects (Iverson & Levy, 1982). Meta-analysis also offers the possibility of comparing variables which single studies ordinarily do not compare, such as date of publication, aspects of study design and analysis (Louis, Fineberg & Mosteller, 1985).

Meta-analysis is becoming increasingly popular in the social and behavioral sciences; but since its inception there have been many critics.

Criticisms of meta-analysis have been grouped by Glass et al. (1981) into four major categories:

1. It is illogical to compare studies conducted with different measuring techniques, different types of variables and different subjects because they are dissimilar.
2. Results of poorly designed studies are included along with quality studies.
3. Results of meta-analysis are based on findings that researchers report. Findings will be biased since nonsignificant findings are rarely published.
4. Results from the same study may have multiple results which may bias or invalidate the meta-analysis results (Glass, et al. 1981 p. 218).

The first concern of meta-analysis is commonly called the "apple and oranges problem". Critics complain that the use of a series of studies which investigates a particular independent variable can obscure critical differences among subgroups of studies (Bangert-Drowns, 1988). Others contend that it is not appropriate to integrate information from different sampling procedures, different cultural and historical configurations, and primary-level statistical analyses (Mullen, 1989). In other words, a researcher can not use different studies to answer the same question.

In responding to the first criticism, Glass et al. (1981) charge that researchers perform data analysis in their own research in which they average data results from different persons. "These persons are as different as much like apples and oranges in their way as studies are different from each other" (p. 220). The synthesis of results from many people are no less substantial

than the synthesis of scores from standardized studies. Hunter & Schmidt (1990) also propose that the original purpose of meta-analysis was to "paint a very general, broad, and inclusive picture of a particular research literature" rather than answer a very narrow and specific question. Other researchers and theorists suggest that the variation among different studies can be separated into components to assist in understanding the reasons for differences in outcomes (Pillemer & Light, 1980).

If definitions and criteria affect the type of study to be included in the synthesis, procedures can be utilized to examine the differences empirically. One way to deal with differences in studies is to code the characteristics for each study and test whether the findings differ on the specific characteristics of the studies (Glass, 1977, Wolf, 1986). "A meta-analysis seeks a full, meaningful statistical description of the findings of a collection of studies, and this goal typically entails not only a description of findings in general but also a description of how findings vary from one type of study to the next" (Glass et al., 1981, p. 79).

The second criticism supports the "garbage in garbage out" mentality (Mullen, 1989). This logic suggests that if poorly designed studies are used, then inadequate results will be produced. The inclusion of highly flawed studies in a research synthesis may decrease the credibility of the results, therefore the quality of study designs should be reviewed (Hedges & Olkin, 1985). However, the meta-analyst can control for these "highly" flawed

studies by coding the quality of the designs used in each study and examining the differences between poorly designed studies and those which were well designed (Wolf, 1986).

The third criticism cites availability bias which influence the meta-analyst's selection of only published studies that meet predetermined inclusion criteria. Failing to report unpublished studies in meta-analysis may produce misleading generalizations. For example, when Smith (1980) conducted a meta-analysis of sex bias in counseling and psychotherapy, she reported that not only the magnitude but the direction of effect was different in published and unpublished studies. The effect-size from published data demonstrated counselor bias towards females. On the other hand, the effect-size from unpublished studies demonstrated counselor bias in favor of females. Smith (1980) proposes, however, that meta-analysis be thought of as a type of survey research. "The goal should be to provide an accurate, impartial, quantitative description of the findings in the population of studies on a particular topic. No survey would be considered valid if a sizable subset or stratum of the population was not representative in the cumulative results" (Smith, 1980, p. 22). Therefore, the researchers search procedures should attempt to include all forms of literature including: journal articles, dissertations, theses, project reports, papers from scholarly meetings, reports to foundations, and unpublished studies (Hembree, 1984).

There is however difficulty in obtaining a representative sample of

documents from various sources. Cahen (1980) suggests that the researcher appropriate a time frame to search the literature extensively and accurately read and code the data in the studies for analysis. Glass et al. (1981) also suggest that if the problem of selective publication cannot be adequately integrated in the research literature, then analyzing it separately by mode of publication should be utilized.

Another problem associated with the data collection process is incomplete or missing data. One approach to minimizing this concern is to contact the primary investigator to obtain absent or incomplete information (Bryant & Wortman, 1984). Glass (1977) suggests that editors should become more sensitive to the need for research synthesis and request a copy of the original data which would be kept on file for those researchers wanting to check findings which are reported in journals.

Finally, the forth criticism pertains to the number of multiple results within the same experimental study that could be used in the meta-analytic strategy. Researchers handle this issue in different ways. For example, Glass et al. (1981) choose to "lump" results into the same analysis and average all findings within a study. Glass (1977) suggests that various outcome measures found in psychotherapy such as happiness, emotional health or improved social relations could be lumped together for a general investigation of the effects of psychotherapy. Yet, precautions should be taken to protect against bias that may result when a small group of studies contribute

excessive data.

As researchers continue to conduct literature reviews based on the quantitative format of meta-analysis and move away from the traditional literary format, scrutiny will persist. Regardless of the criticisms, however, evidence indicates that meta-analysis is an accepted procedure that continues to grow in the social sciences (Cooper, 1984).

Status of Sexuality Education in the Public Schools

Recognizing the benefits of health promotion and disease prevention, many states have taken steps to implement sexuality education. The majority of these programs are supported by the general population due to health concerns related to AIDS, teenage pregnancy, and STDs (Glazer, 1989). According to the Sex Education and Information Council of the United States (SIECUS) 1992 report, 47 states and the District of Columbia either recommend or require sexuality education (Haffner, 1992). Of those 47 states, 17 have a legislative requirement that all school districts provide sexuality education to students at some level in the educational process. Sexuality education is required from kindergarten through twelfth grade in 12 states. Whereas curricula are suggested and mandated by states, local districts make decisions concerning the specific subjects to be implemented (Haffner, 1992).

Some restrictions may be imposed on the type of information teachers are allowed to discuss in the classroom. According to the Alan Guttmacher

summary findings (1989) one in five sexuality education teachers face obstacles in imparting sex-related information to students. These problems include: curricula limitations; types of material utilized in the classroom; pressures from parents to avoid sex-related topics; and active efforts of community groups and school officials who hold different values and beliefs to oppose sexuality education. As a result of these restrictions, the dissemination of accurate, consistent, and complete information that may dissipate myths and misconceptions about sex-related topics is lacking in some areas of the country (Calamidas, 1990).

Researchers suggest that there are many inconsistencies in the number of classroom hours spent teaching sexuality education. Evaluations of sexuality education programs suggest the amount of time individual teachers devote to any one topic in sexual education is minimal. Davey (1990) evaluated the number of sexuality education hours taught in Illinois public schools. The mean number of hours for grades 9 through 12 was approximately three. The average number of hours reported nationally was substantially more. Guttmacher (1989) reported the nation's schools devoted approximately 18 hours of instruction per academic year. Research suggests that more hours are required to produce significant changes in students' knowledge, attitude, and behaviors. Summary findings of the School Health Education Evaluation (SHEE) suggest that average effects are achieved for general health practices when more than 30 hours of classroom instruction are

provided (Connell & Turner, 1985). Effects for all three domains reach a general stability level when about 50 classroom hours of instruction are provided (Connell & Turner, 1985). Time in the classroom is important in order to meet the needs of students. Moreover, program evaluation is critical in determining the overall effectiveness of sexuality education programs. The primary problem of existing school-based sexuality education lies in the evaluation methods of existing programs as to their effects on adolescent knowledge, attitudes and sexual behaviors (Meredith, 1989).

Overview of Evaluation Studies

Within the literature a large number of studies provide information on the effects of sexuality education. Many researchers have summarized the reviews of sexuality education programs (Dawson, 1986; Gunderson & McCary, 1980; Kilman et al., 1981; Kirby, 1985; Marsiglio & Mott, 1986; Voss, 1980;). Some researchers criticize studies for the lack of rigor in experimental design (Kirby, 1989), absence of control populations (Eisen et al. 1992), and evaluation measures that fail to discern sex-related changes beyond those in knowledge and attitudes (Kirby, Barth, Leland, & Fetro, 1991).

Researcher's reviews reveals a scarcity of studies that utilized experimental design. Kirby (1980) reported that evaluations often lack comparison groups. One way to analyze the effects of sexuality education programs is to employ experimental designs that consider the differences

between the treatment group and comparison group (Kirby, 1985; Voss, 1980). When a control group is not utilized, it is impossible to conclude that a specific sexuality education course influences changes in student knowledge, attitudes or behaviors (Campbell & Stanley, 1963).

Kilman et al. (1981) assessed the impact of 33 empirical studies which assessed the effectiveness of sexuality education. A number of methodological problems were discussed. Some of which include: (a) lack of control group, (b) lack of equivalent control group to the experimental group, (c) results mostly dependent on questionnaire data, and (d) failure to include follow-up. In general, studies show gains in sexual knowledge and shifts toward more tolerant sexual attitudes. Studies showed mixed results in reporting changes in sexual behavior. The researchers also discussed the lack of systematic investigations of the effectiveness of sexuality education programs in either elementary school, junior high school or high school settings. They also suggested examining the issue of effectiveness with more empirical data.

Other reviews reported the following methodology characteristics which influence the effectiveness of sexuality education programs: (a) lack of systematically investigating student motivation; (b) the variation of instructor's training or evaluating the instructor's knowledge or educational background; (c) the type of program format and intervention utilized; (d) the lack of operationalized programs goals; and (e) the level of reliability and

validity of the instruments are not reported (Kirby, 1985; Voss, 1980).

Other evaluations have focused on the discrepancy in schools' reports of teaching and what actually takes place in the classrooms. DeMauro's (1990) evaluation of 23 states' curricula for sexuality education, found that "most curricula did not focus on human sexuality as an area of study and exploration. Also, a large percentage of the guidelines were out-of-date" (p. 4). School policies tended to support family-life education and human reproduction, but too often pregnancy prevention and birth control were not emphasized. In fact, eight out of 10 teachers from various disciplines who taught family life, believed they needed help teaching topics relating to pregnancy prevention and STDs (Guttmacher, 1989).

Some schools report assisting students in making responsible choices regarding sexual behavior, but findings do not always support these claims. For example, an evaluation which involved 200 large school districts cited that 94% of the respondents felt that providing sexuality education was to promote decision-making skills about sex, but only 18% covered sexual decision-making in a comprehensive manner (Sonenstein & Pittman, 1984). Other research which evaluated behavior indicated that students who have not participated in a sexuality education program were as much as five times more likely to have begun sex than those who had participated (Howard & McCabe, 1990). On the other hand, some researchers report no difference in the behavior of teenagers who have had sexuality education to those who

have not (Marsiglio & Mott, 1986),

Reasons for the conflicting findings could be due to the lack of effective evaluation procedures. For example, according to the 1982 National Survey of Family Growth (NSFG), exposure to formal sexual education appeared to have no dependable effect on the probability that a teenager would begin to have intercourse (Dawson, 1986). Dawson (1986) noted the NSFG neglected to report information on the content, quality or quantity of the sexuality education programs used in the study and recommended that the validity and usefulness of the findings should be viewed with caution.

Other researchers examined the extent of sexual activity and use of contraception and the impact of a sexuality education class on knowledge and behavior of a selected sample of volunteer male high school students (Finkel & Finkel, 1975). Findings suggested that those students who participated in a mandatory course scored higher in knowledge than those who had not participated. Sexual activity was reported as erratic and did not seem to be influenced by the course. Inferences from the data suggest that sexual activity had begun before the age of thirteen, therefore sexuality education programs which started in high school were too late for most of these youths. Finkle & Finkle (1975) also suggest that correct information about sexual intercourse and contraception might be more effective if it is provided before adolescents begin to have sexual relations.

Educators in the public schools play an important role in shaping and

influencing students' cognitive, affective, and psychomotor behaviors. But when program objectives are not evaluated, provisions for teacher training is not provided, and course limitations are imposed, critical differences in program effectiveness become apparent (Calamidas, 1990; demauro, 1990). Therefore, evaluations of program effectiveness are critical in determining how well sexuality education meets the goals of affecting student knowledge, attitudes, and behaviors.

Published literature and project reports that provide assessments of sexuality education programs are the subject of many review articles, but few offer systematic summaries of the outcomes. Light & Pillemer (1986) conclude that research findings will continue to report conflicting results because the number and diversity of studies call to question even an expert's ability to "put it all together" without formal instruments.

Despite the abundant research in sexuality education, individual evaluations have not convincingly answered fundamental questions about the effectiveness of sexuality education in public schools. Characteristics of the program settings, treatments, and students vary greatly from study to study, making it impossible to draw general observations about future sexuality education programs based on the success or failure of past individual programs (Bangert-Drowns, 1988). A quantitative synthesis of information about the general effectiveness of sexuality education programs is lacking in the literature.

Theoretical Rationale for Sexuality Education

Theoretical models simplify and improve understanding of the complexities of health behavior (D'Onofrio, 1992). By obtaining information about the reasons individuals avoid high-risk behavior, more specific educational objectives can be developed to assist in the promotion of behaviors that are conducive to optimal health (Cummings, Jette, & Rosenstock, 1978). The Health Belief Model (HBM) was developed to help explain health-related behavior. Hochbaum (1952) studied the factors which motivate people who are illness-free to seek health screenings, while others fail to take protective measures (Glanz, Lewis, & Rimer, 1990). Many investigations have clarified and expanded the HBM beyond health screening to incorporate all preventative actions, illnesses, and sick-role behaviors (Glanz et al., 1990).

The HBM postulates that the likelihood of engaging in health-related action is based on individuals' beliefs along four personal dimensions: (a) perceived level of susceptibility to a particular condition; (b) perceived degree of severity of consequences which might result from contracting the condition; (c) estimation of recommended health action's potential benefits in preventing or reducing susceptibility and/or severity; and (d) views of possible psychological and other cost barriers related to the proposed health action (Maiman, Becker, Kirscht, Haefner & Drachman, 1977). The HBM

was designed to assist in understanding the nature interrelationship among variables that influence health behavior (Kolbe, Iverson, Krueter, Hochbaum, & Christiansen, 1981) and to specify the relationships among beliefs and behaviors. However, this model has been criticized for failure to offer useful insight into the process through which beliefs are actually formed and changed (Hochbaum, Sorenson, Lorig, 1992). To provide a more complete framework for prognosis and program planning some health educators combine components of other theories with the HBM (D'Onofrio, 1992).

One theory that has been combined with the HBM is social learning theory (SLT). The SLT addresses the psychosocial dimensions of health behavior and provides methods for promoting behavior change (Perry, Baranowski, & Parcel, 1990). More specifically, this theory explains behavior by considering continuous reciprocal interactions that occur within and between individuals (e.g., thoughts, emotional reactions, and expectations) in relation to environmental influences (Creswell, Newman, & Anderson, 1985).

Bandura (1977) suggests that learning involves two distinct processes--observational learning and self-regulation. Observational learning incorporates the ability to learn complex behaviors through modeling the performance of others and guided participation. Self-regulation consists of the ability of individuals to exercise control over behavior by arranging environmental stimuli, forming cognitive supports, and generating

consequences for their own actions.

A concept introduced by the SLT which is often added to the HBM is self-efficacy. The components of self-efficacy include incentives, outcome expectations and self-efficacy expectations (Bandura, 1977; Strecher, DeVellis, Becker, & Rosenstock, 1986). Such concepts appear to have important implications for understanding individual's emotional and behavioral responses to health-related programs. One study which combined these theories was the School/Community Program Risk Reduction Among Teens. The outcome objective of the program was to reduce the occurrence of unintended pregnancy among never-married adolescents (Vincent, Clearie, & Schluchter, 1987). The adolescents in a target county were trained in analytic and communication skills such as decision-making, assertiveness, self-esteem enhancement. Information was also provided on human reproduction anatomy, physiology, and contraception. Participants received feedback and encouragement from adult models and peers, thereby directly experiencing success and enhancing self-efficacy (Vincent, Clearie, Johnson, & Sharpe, 1988). This intervention was designed to enhance adolescent's ability to respond with competence to internal and external influences and postpone sexual involvement. A three-years follow-up revealed a decline in the proportion of teenage pregnancies in the target county as compared to steady increases in pregnancy rates in the counties that served as a comparison. (Vincent, Clearie, & Schluchter, 1987). This finding suggests

that programs developed on theory can provide ideas about learning activities that are most effective in modifying the important influences on behavior.

Whereas the use of general principles from a single theory can offer benefits, selectively combining aspects of multiple theories can make such gains. Some researchers, for example, have applied components of the HBM and the SLT to adolescent contraceptive programs. These interventions focus on increasing adolescents' awareness of the probability of personally becoming pregnant or causing pregnancy; the serious negative personal consequences of teenage maternity or paternity; and the personal and interpersonal benefits of delayed sexual activity and consistent, effective contraceptive use (Eisen, Zellman, & McAlister, 1990). Part of the design is to also decrease the psychological, inter-personal, and logistical barriers to abstinence or consistent use of contraceptives (Eisen et al., 1992). Petosa & Jackson (1991) utilized the HBM to develop an instrument to assess adolescent knowledge, beliefs and preventative intentions concerning acquired immune deficiency syndrome (AIDS). The conceptual framework was designed to measure: (a) perceived susceptibility to AIDS, (b) perceived seriousness of AIDS, (c) barriers to action, (d) general knowledge of AIDS, (e) knowledge of transmission, and (f) cues and safer sex intentions. The researchers reported significant effects in safer sex intentions for the seventh grade cohort, but the absence of significant effects for the ninth and eleventh-grade students. Older students who had higher levels of sex related

knowledge, greater perceived susceptibility, perceived severity, and lower perceived barriers, were not associated with safer sex intentions. Based on the results of this study, recommendations for educational programs designed to promote safe sex behavior should focus on health related motivations up to the seventh grade. Therefore, efforts should be directed at reinforcing health knowledge and motives in ninth and eleventh graders so they will not only have safe sex intention, but follow through with the behaviors. Incorporation of other theories, such as the SLT, were recommended to further understand situational and social factors that often interact with personal intentions (Petosa & Jackson, 1991).

Theories can guide the selection, development and application of a variety of strategies and methods (Hochbaum et.al., 1992). In addition, applied and skillfully adapted theories can assist in predicting the outcomes of various interventions (Hochbaum et. al, 1992). The HBM establishes the foundation for exploring a variety of alternatives to understand adolescents' sexual behaviors (Petosa & Jackson, 1991) and can be further applied as the basis for designing a curriculum that encourages similar objectives pertaining to sexuality education (Eisen & Zellman, 1987).

Objectives for the Nation

Many national health promotion and disease prevention objectives can be directly impacted by what does or does not occur in the school setting (Stone, 1988). National objectives which are specifically related to sexuality

education include: (a) reducing pregnancies among teenagers younger than eighteen; (b) reducing the proportion of all unintended pregnancies; (c) decreasing the proportion of adolescents who engage in sexual intercourse; (d) increasing the effectiveness with which family planning methods are used; (e) including instruction in sexually transmitted disease transmission prevention in the curricula of all middle and secondary schools; and (f) increasing the proportion to at least 85 percent of people aged 10 through 18 who have discussed human sexuality (USDHHS, 1990). These changes in behavior require education programs that emphasize the knowledge, attitudes and behavior needed to refrain from sexual intercourse. Additionally, programs should increase the use of contraceptives and condoms for those who are unwilling to refrain from sexual intercourse (MMWR, 1992). Therefore, sexuality education is an approach which can be used as primary prevention to broaden young people's understanding of intimate human behavior (Thornburg, 1985).

Well-implemented programs can promote responsible sexual decision making, increase the tolerance of students' attitudes towards sexual practices of others and increase knowledge about sexuality and sexual health (Ku, Sonenstein & Pleck, 1992; Weis, Rabinowitz & Ruckstul, 1992). If national objectives that pertain to family planning, sexually transmitted diseases (STDs), and human immunodeficiency virus (HIV) infection are to be met, sexuality education should start early and continue as a child grows and

develops. In addition to integrating developmentally related subject matter, well-designed summative and formative programs evaluations should be required to increase the likelihood of favorable effects for student populations.

Our society is a crisis-motivated society. One only needs to examine how swiftly the AIDS crisis affected the manner in which public schools address sexuality. Statistics on teenage pregnancy or sexually transmitted diseases should not be the only criteria used to implement effective prevention and health promotion programs. Sexuality education should be integrated into curriculum from kindergarten through high school, with regular units pertaining to age-appropriate sexuality. (Driskill & DelCampo, 1992).

Summary

The literature review was conducted to examine the existing related literature pertinent to this study and to discuss reviews of meta analysis. In order to improve sexuality education programs and curricula in the public schools, a systematic way to evaluate and compare programs must be utilized. The increased numbers of teenage pregnancies and the proportion of adolescents acquiring sexually transmissible diseases pose serious questions about how students are gaining knowledge, changing attitudes and acquiring skills through sexuality education. Research on the evaluation of the effectiveness of these programs has traditionally been narrative. Therefore, it

is the scope of this research to present a scientific and systematic way to evaluate and compare sexuality education efforts involving school-age students. Meta-analysis offers an improvement over traditional methods of reviewing research and is more precise in removing sources of subjectivity (Smith, 1980).

CHAPTER III

METHODOLOGY

INTRODUCTION

This chapter describes the research methodology. First an overview of the study is presented. This overview is followed by a description of the procedures used to conduct the meta-analysis of selected sexuality education studies. The meta-analytic procedure involves specific stages: (1) literature review, (2) selection criteria, (3) identification and coding, and (4) analysis of data. The final section is a summary.

Study Overview

The purpose of this study was to conduct a meta-analysis sexuality education studies/research in order to determine the validity of findings/conclusions relative to programs' effects on knowledge, attitudes, and behavior pertaining to human sexuality for K through 12 research participants. Specifically, the study was designed to answer the following research questions:

- (1) What is the overall effect-size of knowledge in sexuality education?
- (2) What is the overall effect-size of attitudes in sexuality education?
- (3) What is the overall effect-size of behavior in sexuality education?

Literature Review

The review procedures were designed to identify sexuality education program which have been conducted using K through 12 grade subjects from

the year 1966 through 1993. Studies were located through computer database searches. Searches on data-bases using a compact disc-read only memory storage device (CD-ROM) included: (a) Literature in Psychology (PsycLit), (b) the Educational Resources Information Center (ERIC), and (c) Dissertation Abstracts International.

Descriptors used to search the data-bases consisted of: (a) sex-education, (b) family-life education, (c) sexuality education, (d) human sexuality, (e) health education, (f) elementary, (g) junior high (h) secondary, (i) high school, (j) adolescents, (k) secondary-school, (l) evaluation, and (m) public schools. Combinations of each descriptor were also used.

In addition to computer searches, documents were obtained using the interlibrary loan network. To glean the literature further, manual page searches were conducted using information retrieved from computer on-line databases, recent journals, University Microfilms Inc., and bibliographies of selected studies. In addition, letters requesting program information were sent to SIECUS.

Selection Criteria

The criterion for selection was based on the guidelines offered by Glass et al. (1981). Characteristics of each study were coded, and inclusion or exclusion was determined by the success or failure in meeting baseline selection criteria. The criteria for selection was patterned after suggestions offered by (Bangert-Drowns, 1986), and recommendations from narrative

reviews of sexuality education (Dawson, 1986; Kilmann et al., 1981; Kirby, 1980; Kirby, 1985; Kirby, 1989; Kirby, 1991; Voss, 1980). These criteria include: only treatment in the form of sexuality education programs administered to traditional elementary, junior high, or high school students were included in this meta-analysis. Studies of non-traditional students described as emotionally disturbed or homebound were not included in the meta-analysis (Voss, 1980). Also, the sexuality education had to have specific goals and objectives in the cognitive, affective and/or behavioral domain stated prior to implementation.

The research design also had to meet specific standards for inclusion. Because knowledge, attitudes and behaviors can change naturally over a specified period of time, a control or comparison group was necessary to be included. Campbell & Stanley (1963) note that simple pretest-posttest one-group design measures are not as informative as controlled comparisons. A sexuality education program might be considered ineffective for producing no change in knowledge, attitudes or behavior, but without data from a comparison group, findings of no change does not provide interpretable information. Only programs/studies which utilized at least a "no treatment" control group were included.

Standards regarding the selection of the control and comparison groups also had met standards for inclusion. Ideally, students are randomly assigned to the experimental or control group. Randomization of students is

not always possible in school systems because intact groups exist, therefore if a researcher provided evidence of significant pretest differences between experimental and control groups, these studies were not included in this meta-analysis.

A final inclusion criteria pertains to the geographical setting of the evaluation. Because attitudes toward sexuality education differ among countries (Friedman, 1992), the cultural and geographic limits of this study only included studies that were conducted in the United States.

Identification and Coding

Effect-sizes were separated into categories which met specific criteria and analyzed. Those were (1) knowledge--primarily measures cognitive achievement and students' acquisition of facts about growth and development, human reproduction and other sex-related topics, (2) affective--these programs focused on providing an opportunity to explore and assess sexual attitudes in order to develop insight pertaining to members of both genders, (3) behavioral--these programs focused on effecting decision-making and communication skills or risk-taking behavior (SIECUS, 1991).

Characteristics of programs within the selected studies were coded for analysis purposes (Appendix A). The dimensions were chosen based on previous meta-analytic and narrative reviews of sexuality education. These dimensions included publication status, aspects of treatment, research participant qualities, and experimental design.

Three variables related to publication status were coded:

1. *Study identification number*: 001-00N
2. *Publication date in year*: 19NN
3. *Publication Source*: The three types of documents were (a) unpublished technical reports, including clearinghouse documents, presented papers, etc.; (b) dissertations/thesis; and (c) professional publications, including articles, scholarly books, etc.

Nine variables described aspects of treatment:

1. *Primary delivery mode*: Sexuality education could have been presented by (a) lecture; (b) group discussion; (c) audio visual; (d) small group discussion; (e) role-playing; or (f) mixed methods.
2. *Type of treatment*: Treatments were (a) information only, (b) affective strategies; (c) behavioral strategies; d) knowledge and affective; e) knowledge and behavioral strategies; (f) affective and behavioral strategies; and (g) knowledge, affective and behavioral strategies.
3. *Primary staff*: The primary leader responsible for leading the treatment was (a) the researcher; (b) a classroom teacher; (c) a peer; (d) a consultant; or (e) mixed staffs.
4. *Trained staff*: Those implementing program had specific preparation before implementation or no training.
5. *Program focus*: Program's primary goals were to (a) increase knowledge; (b) provide knowledge content with emphasis on values

clarification and skills; (c) abstinence only; (d) behavior change as primary focus; or (e) used a theoretical approach.

6. *Duration of the study*: The duration of the study was recorded by the number of days the study lasted.

7. *Duration of follow-up*: The number of months later the follow-up was conducted were recorded.

8. *Number of minutes per class*: Records the length in minutes of each meeting/class.

9. *Total time of treatment*: Records the total time in minutes students met during the treatment.

Five variables described the experimental design of the study:

1. *Subject assignment*: Students were assigned to experimental or control group by random assignment or non-random.

2. *Control for evaluator involvement*: Studies which had control were those which the evaluator or principle investigator (PI) did not write teaching materials or teach the experimental or control group. Those studies lacking control, the evaluator or PI wrote teaching materials or taught the experimental or control group.

3. *Control for school effects*: control were those in which experimental and control groups students were located in the same school; lacking control were experimental and control groups located in different schools.

4. *Control for author-bias in criterion test:* Studies which controlled for bias in authorship used standardized instruments as measures. Those studies which used locally developed instruments or a combination were considered to be lacking control.

5. *Type of Control Group:* The control group was either a (a) conventional control group which received a course that was usually taught; (b) no instruction was taught to the control group; or (c) a placebo or alternative treatment was implemented.

Six variables described the research participants:

1. *Solicitation of subjects:* Students were (a) required to take the sexuality education program as part of the curriculum; (b) they were volunteers, or (c) they were assigned to programs.

2. *Number of subjects:* Number of students in the control group and number in experimental group.

3. *Number of female and male subjects:* Percentage of students in control and percentage in the treatment group.

4. *Ethnic background:* Percentages of white, black or other in control and percentages in the treatment groups.

5. *Ages of subject and grade level:* minimum age, maximum age, and average age.

6. *Grade level of subjects:* minimum grade, maximum grade, average grade level.

Analysis of Outcomes

A numerical effect size (ES) was calculated after the study selection phase. Effect-sizes were grouped into three sets (i.e. knowledge, attitudinal, and behavioral measures) and analyzed separately between study features and study outcomes (Appendix B).

The formula created by Glass et al. (1981) was used to calculate individual ES statistics:

$$ES = \frac{\bar{X}_E - \bar{X}_C}{SD_C}$$

where, $\bar{X}_E$ is the mean of the experimental (treatment) group, $\bar{X}_C$ is the mean of the control and SD_C is the standard deviation of the control group.

Studies that reported incomplete data were not used.

Based upon available data in each study, the most appropriate formula was used to calculate the effect size statistic. An effect size measure for studies that reported t-statistics was calculated using Glass's formula:

$$ES = t \sqrt{\left(\frac{1}{n_E}\right) + \left(\frac{1}{n_C}\right)}$$

Each study was coded and effect-size measures were calculated for each outcome measure. For clarification, an example follows: a program reported three outcome measures (Knowledge, Attitudes and Behavior) for boys and girls at the 7th, 8th and 9th grade level. The total number of

effects for this study would consist of 3 outcome measures X 2 sexes X 3 grade levels; total number of effects = 18 (Tobler, 1986). The number of effects were then averaged for each outcome measure and recorded as one effect. Selected program characteristics were also examined in order to describe the relationship to program outcome measures.

Summary

In order to determine the overall impact of sexuality education programs a meta-analysis of selected studies was conducted. The decision to consider inclusion or exclusion of a particular study was based on specific criterion.

After selecting the studies, each study was coded and effect-size measures were calculated separately. These totals were then averaged in order to determine the overall effects size of the studies included specifically regarding knowledge, attitudes, or behavioral change. Major characteristics of each selected program/study were also coded to compare the relationship between program characteristics and program results.

CHAPTER IV

RESULTS AND DISCUSSION

The purpose of this chapter was to present and discuss the results of the meta-analysis. The chapter is divided into the following areas for discussion: (1) selected studies, (2) excluded studies, (3) research questions, (4) results of each hypothesis, (5) program characteristics, (6) discussion, and (7) summary.

Selected Studies

A total of 144 studies were examined of which 13 (9%) met the criteria for selection and were included in the analysis. The major features of these evaluations are described in Chart 1. All the studies were conducted between 1976 and 1992. Eight studies (62%) came from published journals and 5 (38%) came from unpublished dissertations. Forty-one effect-sizes were analyzed from the selected studies. The analysis included 16 effect-sizes for knowledge, 18 effect-sizes for attitudes and 7 effect-sizes for behavior. The results of the effect-sizes were combined to create an overall effect-size of sexuality education studies. The average effect-size for dissertations was .55, and the average effect-size for journal articles was .51. A t-test showed no significant difference between the effect-sizes for journals and dissertations ($t = -.21, p = .84$).

Excluded Studies

One-hundred and thirty-one (91%) studies were excluded from the

analysis. Forty-seven (33%) were excluded in the analysis because college students and adults were the research participants. Forty-two (29%) were descriptive in nature. Twenty-nine (20%) failed to have a control group and used a pretest-posttest design. Six (4%) were conducted in a foreign country. Seven (5%) met the selection criteria, but yielded insufficient data to calculate the effect-size statistic (Figure 1). Letters written to the authors in an attempt to obtain the missing information were unsuccessful (Appendix C).

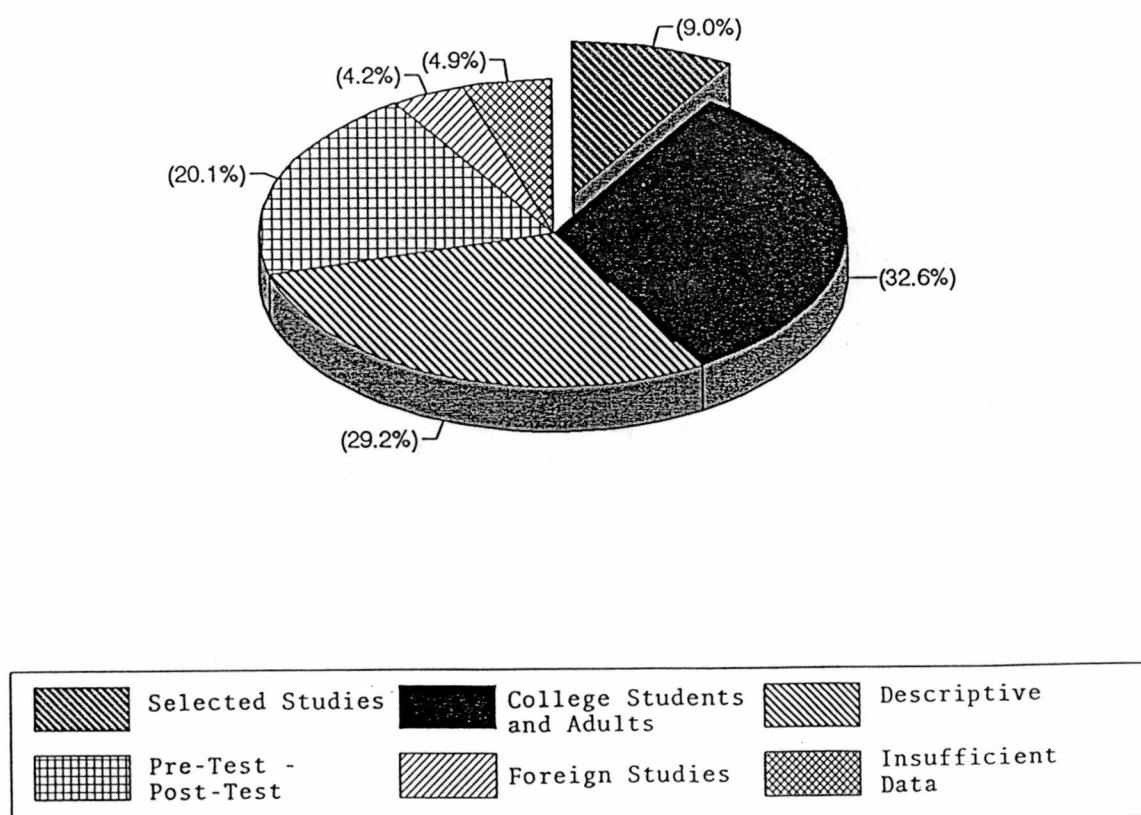


Figure 1
Major Criteria for Excluded Studies

Research Questions

The research questions addressed were as follows:

1. What is the overall effect-size of sexuality education studies?
2. What is the overall effect-size of knowledge in sexuality education?
3. What is the overall effect-size of attitudes in sexuality education?
4. What is the overall effect-size of behavior in sexuality education?

Overall Effects of Sexuality Education

In order to answer the research questions, multiple effect-sizes from single studies were averaged into an overall effect-size. The overall effect-size statistic represents the average difference between the experimental and control group in standard deviation units. The average total effect-size effect for experimental and control groups on 20 outcome measures across 13 studies was .53. Total effect-sizes from single studies ranged from .13 to 1.94.

The most commonly assessed outcome measure from the 13 sexuality education studies was attitudes (n=18). The second highest measure was knowledge (n=16), with behavior (n=7) the least frequently measured. The largest effect-size average was knowledge (effect-size = .846). Total effect-sizes for knowledge ranged from .065 to 3.105. The effect-size for behavior was the second highest (effect-size = .652). The range of effect-sizes for the behavior outcome measures was -.191 to 1.426. The effect-size average for outcome measures for attitudes represented the lowest effect-size measure

(effect-size = .303) with a range of .017 to 1.29.

Response to Hypothesis

- H1: The effect-size for behavior will equal zero. An effect-size of zero suggests that there is no difference in the mastery of the objectives related to knowledge in the area of sexuality education between the control groups and the experimental groups.

The effect-size for knowledge was .846. This effect is significantly different from zero, $t(16)=4.349$, $p < .001$. The standard deviation for 16 knowledge effect-size measures is .778; thus the 95% confidence interval (using the Student's t distribution with $n - 1$ degrees of freedom) of the true average effect-size is between .4315 and 1.260 (Glass, 1981, p. 29). The null hypothesis (H1) was rejected.

- H2: The effect-size for attitudes equals zero. An effect-size of zero suggests that there is no difference between the control and the experimental groups mastery of the objectives related to attitudes in the area of sexuality education.

The effect-size for attitudes was .303. This effect is significantly different from zero, $t(18)=4.474$, $p < .001$. The standard deviation for 18 effect-size measures for attitudes was .287; thus the 95% confidence interval of the true average effect-size is between .160 and .446 (Glass, 1981, p. 29). The null hypothesis was rejected.

- H3: The effect-size for behavior will equal zero. An effect-size of zero suggests that there is no difference between the control groups and the experimental groups mastery of the objectives related to behavior in the area of sexuality education.

The effect-size for behavior was .652. This effect is significantly different from zero, $t(7)=3.038$, $p < .001$. The standard deviation for 7 effect-size measures was .568. Thus the 95% confidence interval of the true average effect-size is between .127 and 1.178 (Glass, 1981, p.29). The null hypothesis was rejected.

Program Characteristics

Three (23%) of the studies failed to report data related to the gender of program participants. Of the ten remaining studies, the average percentage of female and male subjects was 52% and 48%, respectively.

Seven (54%) of the studies failed to report data regarding the racial/ethnic background of the program participants. Six (46%) of the remaining studies reported data on the ethnicity of the research participants. One study reported only Black participants ($n=172$). One study reported using only White participants ($n=348$). One study used White ($n=419$) and Nonwhite ($n=198$) participants, these percentages were based only on participants taking the pre-test. Percentages on the post-test participants were not reported. One study reported using White ($n=102$), Black ($n=3$), and Native Americans ($n=2$) participants. Two studies reported the inclusion of Whites, Latinos, Asians, Blacks, and Native Americans.

The average age of participants was 15.07 years. Participants ranged from grade 5 through 12 with the average grade level being 8. Out of the 13 studies, most ($n=9$) studies only reported the average age of program

participants and not specific ages of the subjects. Four studies did not provide any information on the ages of the participants.

The programs quality and effect-sizes were analyzed. Six variables related to the aspects of treatment were coded. Three (23%) of the studies reported using a single lecture mode of delivery while ten (77%) used mixed modes consisting of lecture, group discussion, role playing, videos and other audio visual methods. A t-test revealed no significant difference between the effect-sizes of programs using a single mode of delivery and mixed modes ($t=.62$, $p=.53$).

An analysis of the program presenters responsible for administering the specified sexuality education programs revealed that the studies had a combination of teachers, social workers, nurses, and health educators ($n=6$) or the classroom teacher ($n=5$) as the primary change agent. Two studies used the researcher as the program presenter. A t-test comparing the single change agent studies with those using a mixed staff revealed no significant differences ($t=.627$, $p=.539$). All of the studies reported that the primary change agent had training prior to implementation of the specific program.

Most of the studies primary focus was to increase knowledge ($n=8$). Three studies had a theoretical approach and two studies focused primarily on changing behavior. Analysis of variance for effect-size total by program focus revealed that no two groups were significantly different from each other ($F=.94$ $p=.409$).

All of the studies reported data on the duration of the programs. Program duration ranged from 2 days to 8 months. The mode ($n=4$) was 15 weeks followed by 10 weeks ($n=2$). The average duration for all the programs was 11.21 weeks.

Concerning the number of hours usually spent teaching units on sexuality education, the average was 15.8 hours. The range was from 7.5 hours to 34 hours of instruction. The mode ($n=3$) was 6 hours of instruction.

Four (30%) of the studies reported data regarding the length of follow-up in months. Follow-up periods ranged from 0 to 24 months. Two studies reported follow-up after six months, while one reported 18 months and one reported 24 months until follow-up. There was insufficient data reported therefore an effect-sizes could not be calculated from the follow-up data.

Five variables described the experimental design of the study. A majority ($n=8$) of the studies non-equivalent control group design, four used a pretest-post-test control group design and one study used a Solomon four-group design. Analysis of variance for effect-size total by nature of design revealed that no two groups were significantly different from each other.

Control for evaluator involvement was coded. In six (46%) of the studies the principle investigator wrote some portion of the teaching material, and in seven (54%) did not write any portion of the teaching material. No significant differences were found ($t = .657, p=.519$).

School effects were controlled by coding for control and experimental

groups who were in the same school compared to those studies where the control group was in a different location. In five studies (38%) the control and experimental groups were in the same school, while eight studies (62%) used other locations for the control. A significant difference in the overall effect-sizes were found ($t=2.468$, $p=.04$).

Control for author bias was coded. Two studies (15%) locally developed instruments and 11 (85%) used standardized instruments. There was not a significant difference in the effect-sizes when a t-test procedure was used ($t=.907$, $p=.376$). All of the studies reported information concerning the reliability of the instruments used.

Discussion

Despite the abundant research in sexuality education, individual narrative evaluations have not convincingly answered fundamental questions about the effectiveness of sexuality education in primary and secondary schools. Available reports and summaries based on studies of program effects provide confusing information with limited empirical support (Dawson, 1986; Kilman et al., 1981; Kirby, 1980; Kirby, 1989; Marsiglio & Mott, 1986; Voss, 1980). Moreover, summarized reviews reveal a scarcity of studies that utilize an experimental design. Also, summarized findings suggest the lack of systematic investigations of the effectiveness of sexuality education programs in elementary school, junior high school, and high school settings. This meta-analysis exclusively examined the validity of findings of

selected K through 12 grade sexuality education studies relative to programs' effects on knowledge, attitudes and behavior.

This meta-analysis has confirmed some of the criticism offered in narrative reviews of sexuality education programs. In this study, 144 sexuality education programs were examined with 131 (91%) excluded from the final analysis because of failed to meet the specified criteria. Such an exclusion rate suggests that sexuality education research suffers from lack of rigor in experimental design. The lack of elementary age participants in experimental studies also supports previously summarized findings (Kilman et al., 1980, Kirby, 1985, Voss, 1980).

Lack of studies which utilize experimental design may be contributed in part to the controversial and sensitive nature of sexuality program content and legal constraints which operate on the public school system (Cooper, 1982). Cosby (1970) reported difficulty obtaining a sample population due to the controversy concerning family-life education. In fact, nineteen schools declined to participate. Freedman (1985) also documented that two of the nine schools selected for the study refused to participate because of parental concerns about the "intrusive" nature of the evaluation. One study reported that interest groups who were concerned about the discussion of birth control in the curriculum pressured school board members about their apprehension. Consequently two school districts withdrew from the study. Other schools districts selected as possible locations for the study were unwilling to

participate because the evaluation questionnaire was confidential, but not anonymous and included questions about sexual intercourse and pregnancy (Barth et al., 1992).

These issues have important implications for evaluations. When the scope of the program evaluation is limited to areas and topics that can only be legally tested without parental permission, resulting findings must be viewed with caution. Factors that compromise the possible effects of an experiment also have significant implications for interpretation and utilization of the results. In addition, comprehensive understanding of important questions regarding the effects of sexuality education remain indeterminate when selective program topics are excluded from some studies and research participants are not a true representation of the K through twelve population.

Another dilemma in understanding the true effectiveness sexuality education research is the lack sufficient data to comprehensively code study characteristics and/or calculate effect-sizes. Seven studies which met the selection criteria yielded insufficient data to calculate the effect-size statistic. Similarly, some studies lacked specific program and subject characteristics which prevented study of the relationship between specific program characteristics and effect-size. For example, Kirby et al. (1992), reported various detailed characteristics of the subjects including the ethnicity of subjects for Whites, Latino, Asian, Black, and Native American. However information regarding knowledge gain across subpopulations was not shown,

although reported to be significant. Attempts to clarify results or gain sufficient data to code effect-sizes were unsuccessful.

In addition to the problem of evaluating research using meta-analysis, locating studies that report or produce negative or non-significant findings is also difficult. In the case of this meta-analysis, follow-up evaluations were reported, but reported insufficient data to calculate an effect-size. Also, contributing to incomplete data in follow-up were the attrition of research participants. Barth, et al. (1992) reported an attrition rate pretest to follow-up of 31% for males and 29% for females for 311 youths. Locating and acquiring more information about missing data or non-significant findings in evaluation studies could make vital contributions to understanding the effectiveness of sexuality education if examined meta-analytically.

Evaluations of programs effectiveness are critical in determining how well sexuality education meets the goals of affecting student knowledge, attitudes and behavior. However, a potential barrier to the implementation of sexuality education is not assessing the needs of the students prior to implementation. Of the 13 studies included in this meta-analysis, only one study gathered data from a needs assessment before implementation of the program. Jorgensen (1981) asserts that preadolescent and adolescents have a range of stages in cognitive development and inquiry. Additionally, there may be inappropriate content and teaching methods contained in the typical course for the ability of many adolescents to integrate, understand, and

internalize information necessary for reducing the likelihood or frequency of coitus and improving the use of contraceptive behavior among those who choose to be sexually active (Jorgensen, 1981).

Some of the criticisms offered in narrative reviews of sexuality education programs are supported by this meta-analysis. Empirical evidence to suggest that sexuality education research conducted on selected K through 12th grade subjects have positive effects is also offered. All the calculated effect-size measures for knowledge, attitudes and behaviors were in a positive direction. Also noteworthy is the fact that all the persons who were designated as change agents had extensive training prior to implementation sexuality education.

The results of this study clearly suggest that sexuality education has positive effects. The overall effect-size for sexuality education programs was .531. Essentially, this means that .531 standard deviations separate the average student in the experimental group from the average student in the control group. In essence, the overall effect-size for this meta-analysis suggests that the average participant in the experimental group has a score that exceeds 70% of the participant in the control group (Hedges & Olkin, 1985). As stated previously, effect-sizes can be regarded as standard differences between performances of individuals in the treatment or experimental group (Iverson and Levy, 1982). The effect-size refers to the magnitude in a standardized score (z-score) rather than its statistical

significance (Hedges & Olkin, 1985). It represents the average difference between the experimental and control groups in standard deviation units.

The largest outcome effect-size (.846) was for knowledge. This finding suggests that the average subject in the experimental group has a score that exceeds 80% of the subjects in the control group. The majority (n=12) of the studies measured knowledge about sexuality education of the subjects. Thus, the immediate effects on knowledge were positive. The second largest effect-size (.652) was for the behavior outcome measure. Behavior outcome measures included performance tests on refusal skills after viewing a series of videotaped vignettes (Gilchrist & Schinke, 1983), sexual and contraceptive decision-making skills were obtained using a 10-item response scale for certain scenarios (Herz et al., 1984), and self-reports of using birth control and/or safer-sex practices (Barth et al., 1992; Kirby et al., 1991). Approximately 74% of the students in the experimental group outperformed the average students who had not received sexuality education as measured by specific outcome assessments. These findings are inconsistent with reports from narrative evaluations which have criticized the lack of significant changes beyond knowledge and attitudes. However, the small number of studies included in this meta-analysis limit the extent to which these findings should be taken at face value. More research should be conducted to better understand the effects of sexuality education on behavior.

The most commonly measured, yet smallest effect-size (.303) outcome

was attitudes. This effect-size measure suggests that the average participant in the experimental group has a score that exceeds 62% of the participants in the control group. The immediate effects on attitudes were positive.

Similar to the narrative reviews discussed earlier, this meta-analysis shows that changes and increases in knowledge and attitudes were the most frequently reported achievements of sexuality education. However findings in behavior were not reported as readily. These findings provide an indication of the magnitude of given outcomes for sexuality education programs rather than the frequency of studies which report significant or non-significant results.

Summary

The purpose of this chapter was to provide the results and discussion of a meta-analysis. Results and analysis of data were reported for (1) selected studies, (2) excluded studies, (3) research questions, (4) results of each hypothesis, and (5) program characteristics.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The purpose of this study was to conduct a meta-analysis of selected sexuality education studies in order to determine the validity of findings/conclusions relative to programs' effects on knowledge, attitudes, and behavior pertaining to human sexuality. Specifically, the study sought to answer the following research questions:

1. What is the overall effect-size of sexuality education studies?
2. What is the overall effect-size of knowledge in sexuality education?
3. What is the overall effect-size of attitudes in sexuality education?
4. What is the overall effect-size of behavior in sexuality education?

The unit of analysis in this project was sexuality education studies which were conducted between the years 1966 - 1993 and met the following criteria:

1. used quantitative outcome measurements.
2. included a treatment and control or comparison group.
3. age level inclusive of K through twelve.
4. specific program goals and cognitive, affective, or behavioral

learning objectives.

5. implemented in the United States.

The meta-analytic procedure involves specific stages. A literature review was designed to identify sexuality education studies/programs which met the above criteria. Selected studies were coded into categories and analyzed.

The above procedures resulted in the examination of 144 studies, 13 of which were included in the analysis. These 13 studies produced 41 effect-sizes. A total of four effect-size categories were calculated. Effect-sizes were grouped into three sets, knowledge, attitudinal, and behavioral measure, and averaged separately. Finally a total effect-size across the 13 studies were averaged to determine the grand mean. The average effect-size across all the studies and each averaged effect-size for knowledge, attitudes, and knowledge were used to answer the research questions. Analysis of each were then used to accept or reject the null hypotheses.

Findings

Hypotheses Related Findings

The data analysis produced the following findings:

1. The average effect-size for thirteen studies was .531.
2. The average effect-size for the outcome measure for knowledge was .846. The null hypothesis was rejected.
3. The average effect-size for the outcome measure for attitudes was

- .303. The null hypothesis failed to be accepted.
4. The average effect-size measure for behavior was .652. The acceptance of the null hypothesis was rejected.
 5. Five unpublished dissertation and eight published journals were included in this analysis. No significant difference was found between the effect-sizes for published and unpublished studies.

Program Characteristic Findings

The data analysis produced the following findings related to the program characteristics.

1. The availability of information relative to subject characteristics for variables gender, ethnic origin, and age was inadequate.
2. Seventy-seven percent of the programs used mixed modes of delivery while 23% used a single mode of delivery. No significant difference was found between the two.
3. Fifty-four percent of the studies had one person as the primary change agent while 46% had a combination of change agents. No significant difference were found between the two.
4. All of the studies provided training for the change agent.
5. The average age of the program participants was 15 years. The average grade level was 8.
6. Sixty-two percent of the studies primary focus was to increase knowledge. Twenty-three percent incorporated a theoretical

approach and 15% primarily focused on changing behavior.

Analysis of variance for effect-size totals revealed no two groups were significantly different from each other.

7. The average duration of all the programs was 11.21 weeks. The average of instructional time was 15.8 hours.
8. Thirty-one percent of the studies conducted follow-up. Data in follow-up studies were lacking.
9. Studies which incorporate experimental design using K through 12 grade subjects is lacking.

Conclusions

Based upon the findings related to the hypotheses and research questions of the meta-analysis, the following conclusions were formulated:

1. Sexuality education programs included in this meta-analysis have had positive results.
2. The overall quality of reporting results for sexuality education research needs to be improved.
3. Research using K through 12 grade subjects in sexuality education and utilizing experimental design is lacking.

Recommendations

The following recommendations for future research are made:

1. The need for consistent reporting of research data is needed in journals. Rather than simply reporting whether a study was

significant or not significant, specific program outcome data should be reported on all final reports.

2. Studies should strive to include consistent data on disparities so comparisons and relationships can be made on all the outcome data.
3. More studies should include detailed follow-up data so long-term effectiveness can be measured.
4. Studies should report more detailed information on how teachers or program instructors were trained. This would assist in replication of the training programs prior to teaching and analysis of strategies which are effective. Also, change agents knowledge and attitudes should be explored to determine the relationship between knowledge, attitudes, and implementation of sexuality education.
5. Future studies should include a needs assessment to better assess the overall subjects' interests in the area of sexuality education.
6. Sexuality education research is needed using elementary grade subjects.
7. Efforts should be made to explore differences of districts which chose to not participate in sexuality education with those who chose to implement sexuality education. More parent/community involvement should be utilized in the planning processes and implementation.

8. As the information networks expand and become more assessable, data banks should provide information on all research being conducted. Electronic journals should be established to provide findings of research with significant and nonsignificant findings.

CHAPTER VI

EPILOGUE

This epilogue is to assist future researchers who conduct meta-analysis, but may not understand the importance of utilizing this technique. Primary research will continue to increase in magnitude. Also large numbers of reports, summaries and studies of programs will be produced, studied and evaluated. Results of single studies may cause a confusing assortment of information. Therefore, systematic integration of related studies should be utilized to provide better research synthesis.

Meta-analysis is used to synthesize conclusion from various related studies. The outcome of the meta-analysis is derived from four steps. First, evaluations relevant to a specific topic are collected. Secondly, specific features of these evaluations are described quantitatively. Third, outcomes are formulated into a common measure called the effect-size, the standardized difference between the experimental and the control groups on a specific criterion. Finally, the researcher utilizes statistical methods to find relations between study features and study outcomes (Bangert-Drowns, 1986).

Meta-analysis provides a stronger basis for conclusions than any of the single study comparisons. The differences of single outcomes are transformed into standardized scores and compared across similar groups of study. The standardized score is called an effect-size. The overall effect-size statistic represents the average difference between the experimental and control group

in standard deviation units. As stated throughout this research, the effect-size refers to the magnitude in a standardized score, also known a z-score. The effect-size is calculated rather than the studies statistical significance.

Since there are a number of formulas and strategies to use when conducting a meta-analysis, the researcher must select a technique based on the specific research question formulated. In conducting a meta-analysis the researcher must develop a systematic coding and filing strategy. This researcher primarily followed techniques and formulas developed by Glass et al. (1981). The recommendation of this researcher is to avoid complex conversion formulas until one understands the basic concept of research synthesis.

There is a need for more research which utilizes an experimental design. As mentioned before, many constraints in the schools and using school age subjects mitigate against extensive research on sexuality education. Conducting research which utilizes an experimental design remains problematic. Particularly when parental permission is often needed and local districts having varied restrictions on the content which can be included and the age-appropriateness for some subject matter for sexuality education programs. One way to increase the effectiveness of sexuality education programs would be to involve the parents in the planning stages of sexuality education programs.

Research suggests that more hours are required to produce significant

changes in students' knowledge, attitudes and behaviors. Summary findings of the School Health Education Evaluation suggested that average effects are achieved for general health practices when more than 30 hours of classroom instruction are provided (Connell, Turner, & Mason, 1985). Yet, many sexuality education programs that are planned usually appropriate less than 30 hours of instruction time. In order to maximize the learning and relevance of a health related experience more time should be allocated for instruction. Evaluations measures that fail to discern sex-related changes beyond knowledge and attitudes should be questioned if inadequate time has been allotted for this program.

Conducting a meta-analysis has made this researcher aware of the volume of research conducted in the area of sexuality education. There are also many critics who scrutinize the lack of apparent results for students in knowledge, attitudes or behaviors after receiving sexuality education. The data from my research not only provide empirical evidence that suggest the overall effectiveness of sexuality education, they also identify a number of characteristics which may contribute to enhancing other programs. Some of the areas where improvements are needed include 1) utilizing experimental design for research, 2) involving parents in the planning stages, 3) allowing an adequate amount of time for instruction, and 4) providing adequate training for those implementing programs.

There is a lack of research which utilize a control and comparison

group design in sexuality education programs with K through twelfth grade participants. Therefore, it is the hope of this researcher that more effort be made by future researchers to conduct studies which utilize a control and comparison design using students from K through twelfth grade. Also, after more primary research of this caliber is completed, that other researchers would synthesize the results of single studies and compare the overall effectiveness of sexuality education to this meta-analysis.

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APPENDICES

APPENDIX A

AUTHOR(S) _____ STUDY ID _____
PUBLICATION SOURCE _____

ASPECTS OF TREATMENT

1. PRIMARY MODE OF DELIVERY:

- | | |
|---------------------|------------------|
| 1. lecture | 4. role playing |
| 2. group discussion | 5. mixed methods |
| 3. AV | _____ |

2. TYPE OF TREATMENT:

1. information only
2. affective strategies
3. mixed _____

3. PRIMARY STAFF:

- | | |
|------------------------|-----------------|
| 1. the researcher | 4. a consultant |
| 2. a classroom teacher | 5. mixed staff |
| 3. a peer | _____ |

4. TRAINED STAFF:

1. NO 2. YES _____

5. PROGRAM FOCUS:

1. increase knowledge
2. provide knowledge content with emphasis on _____
3. abstinence only
4. behavior change as primary focus
5. used theoretical approach _____

6. DURATION OF STUDY:

7. DURATION OF FOLLOW-UP:

8. NUMBER OF MINUTES PER CLASS & TOTAL TIME IN MINUTES STUDENT MET:

EXPERIMENTAL DESIGN CHARACTERISTICS

1. SUBJECT ASSIGNMENT

1. RANDOM 2. NONRANDOM

2. CONTROL FOR EVALUATOR INVOLVEMENT

1. PI WROTE TEACHING MATERIAL 2. DID NOT WRITE MATERIAL

3. CONTROL FOR SCHOOL EFFECTS

1. SAME SCHOOL 2. OTHER LOCATION _____

4. CONTROL FOR AUTHOR BIAS

1. LOCALLY DEVELOPED 2. STANDARDIZED INSTRUMENTS _____

DESCRIPTION OF SUBJECTS

1. SOLICITATION

1. REQUIRED AS PART OF CURRICULUM
2. VOLUNTEERS
3. ASSIGNED TO PROGRAM _____

2. AGES OF SUBJECTS

MINIMUM _____ MAXIMUM _____ AVERAGE _____

3. GRADE LEVELS

- A. ELEMENTARY _____ B. SECONDARY _____

4. ETHNIC BACKGROUND

1. White _____
2. Black _____
3. Hispanic _____
4. Asian _____
5. Native Amer. _____
6. Other _____

CONTROL GROUP DATA

EXPERIMENTAL GROUP DATA

FEMALES

MALES

KNOWLEDGE

MEAN

SD

t-statistic

OTHER INFORMATION

ATTITUDE

MEAN

SD

t-statistic

OTHER INFORMATION

BEHAVIOR

MEAN

SD

CHI-SQUARE

OTHER INFORMATION

Final Coding

1. Studyid	
2. primode	
3. treatmt	
4. pristaff	
5. trained	
6. pgmfocus	
7. durstudy	
8. durfolup	
9. totalmin	
10. subjasmt	
11. ctrleinv	
12. ctrlacef	
13. ctrlabis	
14. solisubj	
15. subjaage	
16. avgralel	
17. ethnicbk	
18. ncontf	
19. nexpf	
20. ncontm	
22. nexpm	
23. ncont	
24. nexp	

DATA

1. meancntk	
2. meanexpk	
3. sdcntk	
4. meancnta	
5. meanexpa	
6. sdcnta	
7. meancntb	
8. meanexpb	
9. sdcntb	
10. sswithin	
11. sssex	
12. ssge	
13. dfwithin	
14. posttrt	
15. postcon	
16. tvaluk	
17. tvalub	
18. tvalua	
19. chisqk	
20. chisqb	
21. chisqa	

APPENDIX B

```

***** JOB (R5687,151448544,0:07),JA,CLASS=A
**LASER OUTPUT DEST=CENTRAL,PAGEDEF=GP2012,FORMDEF=GP2012
** EXEC SAS
**SASLIST DD SYSOUT=X,OUTPUT=*.LASER
**SEXED DD *
***RSUB      SE2      DAT      A1
**
**SYSIN DD *
*MS FILEDEF SEXED DISK SEXED DAT Z ;
  options ls=72;
/* Program to calculate effect sizes for meta-analysis. In a nutshell, a */
/* literature search has been done and summary statistics such as means or */
/* t- values are pulled out and input in the data file 'sexed.dat'. */
/* The literature tends to report one set of summary stats (i.e. means */
/* and std. deviations or simply t-values or chi-squares). Obviously, */
/* the infile will have a lot of missing values */

/* The formulas for calculating an effect size depend on what summary stats */
/* are reported. Thus, the if statements below. */

/* read in the data */
data metsexed;
  INFILE SEXED ;
  INPUT STUDYID PUBS PRIMODE

      TREATMNT PRISTAFF TRAINED PGMFOCUS DURSTUDY
durfolup totalmin subjasmt ctrleinv ctrlscef ctrlabis
solisubj subjaage avgradel $ ethnicbk $
  ncontf nexpf ncontm nexpm
ncont nexp meancntk meanexpk sdcntk meancnta meanexpa
sdcnta meancntb meanexpb sdcntb sswithin sssex ssgs dfwithin
POSTTRT POSTCON TVALUK1-TVALUK6
  TVALUB1- TVALUB6
  TVALUA1-TVALUA6
  chisq chisqb chisqa @@;
/* collapse 6 tvalue scores into one by taking the mean */
  tvaluk=mean(of tvaluk1-tvaluk6);
  tvalub=mean(of tvalub1-tvalub6);
  tvalua=mean(of tvalua1-tvalua6);

/* formula to calculate std. dev. for response if not reported */
/* ssgs refers to sums of squares for sex by group interaction */

if sdcntk = . then sdcntk = (((sssex + ssgs + sswithin)/(2+dfwithin))**.5);

/* Depending on the stats. reported, calculate various effect sizes */

/* esk= effect size for knowledge */

if meancntk ne . and meanexpk ne . and sdcntk ne . then
  esk = (meanexpk-meancntk)/sdcntk;
if (meancntk = . or meanexpk = . or sdcntk = .) and
(nexp ne . and ncont ne . and tvaluk ne .)
then esk = tvaluk * ((1/nexp + 1/ncont)**.5);
if (meancntk = . or meanexpk = . or sdcntk = . or tvaluk = .) and
(nexp ne . and ncont ne . and chisq ne .) then
  esk = (chisq/(nexp+ncont))**.5;

/* effect size for behavior */

```

```

if meancntb ne . and meanexpb ne . and sdcntb ne . then
  esb = (meanexpb-meancntb)/sdcntb;
if (meancntb = . or meanexpb = . or sdcntb = .) and
  (nexp ne . and ncont ne . and tvalub ne .)
then esb = tvalub * ((1/nexp + 1/ncont)**.5);
if (meancntb = . or meanexpb = . or sdcntb = . or tvalub = .) and
  (nexp ne . and ncont ne . and chisqb ne .) then
  esb = (chisqb/(nexp+ncont))**.5;

/* effect size for attitude */

if meancnta ne . and meanexpa ne . and sdcnta ne . then
  esa = (meanexpa-meancnta)/sdcnta;
if (meancnta = . or meanexpa = . or sdcnta = .) and
  (nexp ne . and ncont ne . and tvalua ne .)
then esa = tvalua * ((1/nexp + 1/ncont)**.5);
if (meancnta = . or meanexpa = . or sdcnta = . or tvalua = .) and
  (nexp ne . and ncont ne . and chisqa ne .) then
  esa = (chisqa/(nexp+ncont))**.5;

/* OVERALL EFFECT SIZE AS MEAN OF OTHER THREE */
/* determine average grade level and individual grades */
array gra (8) grade5-gradel2;
do x=1 to 8; gra(x)=0; end;
if index(avgradel,'5')>0 then grade5=1;
if index(avgradel,'6')>0 then grade6=1;
if index(avgradel,'7')>0 then grade7=1;
if index(avgradel,'8')>0 then grade8=1;
if index(avgradel,'9')>0 then grade9=1;
if index(avgradel,'10')>0 then gradel0=1;
if index(avgradel,'11')>0 then gradel1=1;
if index(avgradel,'12')>0 then gradel2=1;
avgralel=0;
do x=1 to 8;
  if gra(x)=1 then avgralel=avgralel+x+4;
end;
IF AVGRALEL>0 THEN
  avgralel=avgralel/ sum(of grade5-gradel2);

/** create race variables */
array race (6) white black hispanic asian nativam otherrac ;
do x=1 to 6;
  test=put(x,$1.);
  if index(ethnicbk,test)>0 then race(x)=1;
  else race(x)=0;
end;
run;
proc sort; by studyid;
proc means noprint; by studyid;
  output out=mps
  mean=;
  title 'means per study - all vars';
RUN;
proc format;
  value sm 1='single' 2='mixed';
  value s5t 1='single' 2='5 theory';
  value td 1='control/trt' 2='true random' 3='pre-post';
  value pf 1='knowledge' 2='behavior' 3='theoretical';
  value ltttn 1='<=10 wks' 0='>10 wks';

```

```

data perstudy;
  set mps;
  ESOVRALL=MEAN(ESK,ESB,ESA);
  if studyid in(1,9,19,14,18) then trtdsn=1;
  else if studyid in(2,41,42,43,17) then trtdsn=2;
  else if studyid in(7,81,82,83,11,13,16) then trtdsn=3;
  if 1<=primode<=4 then primode2=1;
  else if primode=5 then primode2=2;
  if treatmnt in(1,2) then treatmn2=1;
  else if treatmnt=3 then treatmn2=2;
  if 1<=pristaff<=4 then pristaf2=1;
  else if pristaff=5 then pristaf2=2;
  if pgmfocus in(1,2) then pgmfocu2=1;
  else if pgmfocus=4 then pgmfocu2=2;
  else if pgmfocus=5 then pgmfocu2=3;
  if 1<=durstudy<=10 then lt10=1;
  else if durstudy>10 then lt10=0;

  format trtdsn td.
         primode2 treatmn2 pristaf2 sm.
         pgmfocu2 pf.
         lt10 ltn. ;

proc print;
title 'all data';
run;
title 'preliminary distributions';
PROC freq;
  tables studyid trtdsn primode--pgmfocus subjasmt--solisubj
         grade6-gradel2 white--otherrac ;
proc univariate plot normal;
  var durstudy--totalmin subjaage avgralel ncontf--chisqa
  tvaluk--tvalua esk esb esa
  esovrall ;
run;
  /** research questions **/
proc anova data=perstudy;
  class trtdsn;
  model ESK ESA ESB ESOVRALL=trtdsn;
  title 'treatment of design';

data t1;
  set perstudy;
  if primode in(1,2) then primode=1;
  else if primode=5 then primode=2;
  else delete;
  format primode sm.;
proc ttest data=t1;
  class primode;
  VAR ESK ESA ESB ESOVRALL;
  title 'primary mode of delivery';
data tla;
  set perstudy;
  if primode2 in(1,2);
proc ttest data=tla;
  class primode2;
  VAR ESK ESA ESB ESOVRALL;
  title 'primary mode of delivery - single/mixed';

```

```

data t2;
  set perstudy;
  if pristaff in(1,2) then pristaff=1;
  else if pristaff=5 then pristaff=2;
  else delete;
  format pristaff sm.;
proc ttest data=t2;
  class pristaff;
  VAR ESK ESA ESB ESOVRALL;
  title 'primary staff';
data t2a;
  set perstudy;
  if pristaf2 in(1,2);
proc ttest data=t2a;
  class pristaf2;
  VAR ESK ESA ESB ESOVRALL;
  title 'primary staff - single/mixed';
data t3;
  set perstudy;
  if pgmfocus in(1,2,4) then pgmfocus=1;
  else if pgmfocus=5 then pgmfocus=2;
  else delete;
  format pgmfocus s5t.;
proc ttest data=t3;
  class pgmfocus;
  VAR ESK ESA ESB ESOVRALL;
  title 'program focus';
  /** ITEM 3 **/
PROC FORMAT; VALUE PF 1='JOURNAL' 2='DISSERTATION';
DATA T3; SET;
  IF PUBS IN(1,2);
  FORMAT PUBS PF.;
PROC TTEST;
  class PUBS;
  VAR ESK ESA ESB ESOVRALL;
title 'Item 3: t-test for publication source';
run;
  /** ITEM 6(DURFOLUP), 7/4B(DURSTUDY) **/
PROC CORR data=perstudy;
  VAR DURSTUDY;
  WITH ESK ESA ESB ESOVRALL;
title 'Item 7(=4b): Correlation of Duration in weeks & effect sizes';

  /** other aspects of treatment **/
proc anova data=perstudy;
  class treatmnt;
  model ESK ESA ESB ESOVRALL=treatmnt;
  title 'type of treatment';
data q2;
  set perstudy;
  if treatmn2 in(1,2);
proc ttest data=q2;
  class treatmn2;
  VAR ESK ESA ESB ESOVRALL;
  title 'type of treatment - single/mixed';

proc anova data=perstudy;
  class pristaff;

```

```

        model ESK ESA ESB ESOVRALL=pristaff;
proc anova data=perstudy;
    class pgmfocus;
    model ESK ESA ESB ESOVRALL=pgmfocus;
    title 'program focus';
proc anova data=perstudy;
    class pgmfocu2;
    model ESK ESA ESB ESOVRALL=pgmfocu2;
    title 'program focus - knowledge/behavior/theoretical';

proc reg data=perstudy;
    model ESK =durstudy;
    plot p.*durstudy='k' esk*durstudy / overlay symbol='o';
    title 'duration of study';
proc reg data=perstudy;
    model ESa =durstudy;
    plot p.*durstudy='a' esa*durstudy / overlay symbol='o';
run;
proc reg data=perstudy;
    model ESb =durstudy;
    plot p.*durstudy='b' esb*durstudy / overlay symbol='o';
run;
proc reg data=perstudy;
    model ESOVRALL=durstudy;
    plot p.*durstudy='b' esovrall*durstudy / overlay symbol='o';
data ql0;
    set perstudy;
    if lt10 in(0,1);
proc ttest data=ql0;
    class lt10;
    var ESK ESA ESB ESOVRALL;
    title 'duration of study - <10 wks /11+ wks';
proc reg data=perstudy;
    model ESK =totalmin;
    plot p.*totalmin='k' esk*totalmin / overlay symbol='o';
run;
proc reg data=perstudy;
    model ESa =totalmin;
    plot p.*totalmin='a' esa*totalmin / overlay symbol='o';
run;
proc reg data=perstudy;
    model ESb =totalmin;
    plot p.*totalmin='b' esb*totalmin / overlay symbol='o';
run;
proc reg data=perstudy;
    model ESOVRALL=totalmin;
    plot p.*totalmin='b' esovrall*totalmin / overlay symbol='o';
    title 'classtime';
run;

    /** experimental design characteristics **/
data tel; set perstudy;
    if subjasmt=.;
proc ttest;
    class subjasmt;
    VAR ESK ESA ESB ESOVRALL;
    title 'subject assignment';
data te2; set perstudy;
    if ctrleinv=.;
proc ttest;

```

```

        class ctrleinv;
        VAR ESK ESA ESB ESOVRALL;
        title 'control for evaluator involvement';
data   te3; set perstudy;
        if ctrlscef=.;
proc   ttest;
        class ctrlscef;
        VAR ESK ESA ESB ESOVRALL;
        title 'control for school effects';
data   te4; set perstudy;
        if ctrlabis=.;
proc   ttest;
        class ctrlabis;
        VAR ESK ESA ESB ESOVRALL;
        title 'control for author bias';
run;
        /** description of subjects **/
proc   format; value sf 1='required/assigned' 2='volunteer';
data   dsl; set perstudy;
        if solisubj =3 then solisubj=1;
        if solisubj in(1,2);
        format solisubj sf.;
proc   ttest;
        class solisubj;
        VAR ESK ESA ESB ESOVRALL;
        title 'solicitation of subjects';
proc   reg data=perstudy;
        model ESK =subjaage;
        plot p.*subjaage='k' esk*subjaage / overlay symbol='o';
run;
proc   reg data=perstudy;
        model ESa =subjaage;
        plot p.*subjaage='a' esa*subjaage / overlay symbol='o';
run;
proc   reg data=perstudy;
        model ESb =subjaage;
        plot p.*subjaage='b' esb*subjaage / overlay symbol='o';
run;
proc   reg data=perstudy;
        model ESOVRALL=subjaage;
        plot p.*subjaage='b' esovrall*subjaage / overlay symbol='o';
        title 'ages of subjects';
proc   reg data=perstudy;
        model ESK =avgralel;
        plot p.*avgralel='k' esk*avgralel / overlay symbol='o';
run;
proc   reg data=perstudy;
        model ESa =avgralel;
        plot p.*avgralel='a' esa*avgralel / overlay symbol='o';
run;
proc   reg data=perstudy;
        model ESb =avgralel;
        plot p.*avgralel='b' esb*avgralel / overlay symbol='o';
run;
proc   reg data=perstudy;
        model ESOVRALL=avgralel;
        plot p.*avgralel='b' esovrall*avgralel / overlay symbol='o';
        title 'average grade level';
proc   ttest data=perstudy;
        class white;

```

```

    VAR ESK ESA ESB ESOVRALL;
    title 'subject ethnicity incl white';
proc ttest data=perstudy;
    class black;
    VAR ESK ESA ESB ESOVRALL;
    title 'subject ethnicity incl black';
proc ttest data=perstudy;
    class hispanic;
    VAR ESK ESA ESB ESOVRALL;
    title 'subject ethnicity incl hispanic';
proc ttest data=perstudy;
    class asian;
    VAR ESK ESA ESB ESOVRALL;
    title 'subject ethnicity incl asian';
proc ttest data=perstudy;
    class nativam;
    VAR ESK ESA ESB ESOVRALL;
    title 'subject ethnicity incl native american';
proc ttest data=perstudy;
    class otherrac;
    VAR ESK ESA ESB ESOVRALL;
    title 'subject ethnicity incl other races';

```

APPENDIX C

Judith Ausherman
Health, Leisure, and Safety
1914 Andy Holt Avenue
The University of Tennessee
Knoxville, TN 37996

May 26, 1993

Micheal Young, Ph.D.
Program in Health Sciences
University of Arkansas
Fayetteville, Arkansas

Dear Dr. Young,

I am presently in the process of completing my Doctoral Degree in Health Education at The University of Tennessee in Knoxville. As partial fulfillment for my degree, I am currently working on the completion of my dissertation which is a meta-analysis of selected K through 12 sexuality education studies in order to determine the validity of findings relative to programs' effects on knowledge, attitudes, and practices pertaining to human sexuality.

My research is aimed at evaluating program effectiveness with specific criteria which yield a quantitative standard statistic for comparisons. These techniques provide empirical evidence as opposed to conjecture and opinion. I feel such findings will provide a meaningful assessment of the general effectiveness of sexuality education programs. Information resulting from this statistical strategy may be of benefit to parents, school board members, administrators, superintendents, and educators in planning appropriate sexuality education programs for students in the public schools.

In searching the literature for relevant studies, the research conducted by you and your colleagues entitled "Abstinence-Oriented Sexuality Education" met the selection criteria. However, after reviewing the article in the Family Life Educator, 1992, 10(4), 4-8, I find that additional information is needed before it can be integrated into my research effort.

Please provide specifics about program goals, methodology, outcome measures and evaluation procedures as well as how the program was developed. If possible, could you please provide additional information about the specific results (pretest and posttest results with actual means and standard deviations of the experimental and comparison groups) regarding the impact of the program will prove invaluable.

I look forward to your prompt response regarding this matter. Thank you for taking the time to read and respond to this letter.

Sincerely,

Judith A. Ausherman
Doctoral Candidate
Health Education
The University of Tennessee

APPENDIX D

Table of the Standard Normal Cumulative Distribution Function $\Phi(z)$

	z									
	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.50000	0.50399	0.50798	0.51197	0.51595	0.51994	0.52392	0.52790	0.53188	0.53586
0.1	0.53983	0.54380	0.54776	0.55172	0.55567	0.55962	0.56362	0.56749	0.57142	0.57535
0.2	0.57926	0.58317	0.58706	0.59095	0.59483	0.59871	0.60257	0.60642	0.61026	0.61409
0.3	0.61791	0.62172	0.62552	0.62930	0.63307	0.63683	0.64058	0.64431	0.64803	0.65173
0.4	0.65542	0.65910	0.66276	0.66640	0.67003	0.67364	0.67724	0.68082	0.68439	0.68793
0.5	0.69146	0.69497	0.69847	0.70194	0.70540	0.70884	0.71226	0.71566	0.71904	0.72240
0.6	0.72575	0.72907	0.73237	0.73565	0.73891	0.74215	0.74537	0.74857	0.75175	0.75490
0.7	0.75804	0.76115	0.76424	0.76730	0.77035	0.77337	0.77637	0.77935	0.78230	0.78524
0.8	0.78814	0.79103	0.79389	0.79673	0.79955	0.80234	0.80511	0.80785	0.81057	0.81327
0.9	0.81594	0.81859	0.82121	0.82381	0.82639	0.82894	0.83147	0.83398	0.83646	0.83891
1.0	0.84134	0.84375	0.84614	0.84849	0.85083	0.85314	0.85543	0.85769	0.85993	0.86214
1.1	0.86433	0.86650	0.86864	0.87076	0.87286	0.87493	0.87698	0.87900	0.88100	0.88298
1.2	0.88493	0.88686	0.88877	0.89065	0.89251	0.89435	0.89617	0.89796	0.89973	0.90147
1.3	0.90320	0.90490	0.90658	0.90824	0.90988	0.91149	0.91309	0.91466	0.91621	0.91774
1.4	0.91924	0.92073	0.92220	0.92364	0.92507	0.92647	0.92785	0.92922	0.93056	0.93189
1.5	0.93319	0.93448	0.93574	0.93699	0.93822	0.93943	0.94062	0.94179	0.94295	0.94408
1.6	0.94520	0.94630	0.94738	0.94845	0.94950	0.95053	0.95154	0.95254	0.95352	0.95449
1.7	0.95543	0.95637	0.95728	0.95818	0.95907	0.95994	0.96080	0.96164	0.96246	0.96327
1.8	0.96407	0.96485	0.96562	0.96638	0.96712	0.96784	0.96856	0.96926	0.96995	0.97062
1.9	0.97128	0.97193	0.97257	0.97320	0.97381	0.97441	0.97500	0.97558	0.97615	0.97670
2.0	0.97725	0.97778	0.97831	0.97882	0.97932	0.97982	0.98030	0.98077	0.98124	0.98169
2.1	0.98214	0.98257	0.98300	0.98341	0.98382	0.98422	0.98462	0.98461	0.98500	0.98574
2.2	0.98610	0.98645	0.98679	0.98713	0.98745	0.98778	0.98809	0.98840	0.98870	0.98899
2.3	0.98928	0.98956	0.98983	0.99010	0.99036	0.99061	0.99086	0.99111	0.99134	0.99158
2.4	0.99180	0.99202	0.99224	0.99245	0.99266	0.99286	0.99305	0.99324	0.99343	0.99361
2.5	0.99379	0.99396	0.99413	0.99430	0.99446	0.99461	0.99477	0.99492	0.99506	0.99520
2.6	0.99534	0.99547	0.99560	0.99573	0.99585	0.99598	0.99609	0.99621	0.99632	0.99643
2.7	0.99653	0.99664	0.99674	0.99683	0.99693	0.99702	0.99711	0.99720	0.99728	0.99736
2.8	0.99744	0.99752	0.99760	0.99767	0.99774	0.99781	0.99788	0.99795	0.99801	0.99807
2.9	0.99813	0.99819	0.99825	0.99831	0.99836	0.99841	0.99846	0.99851	0.99856	0.99861
3.0	0.99865	0.99869	0.99874	0.99878	0.99882	0.99886	0.99889	0.99893	0.99896	0.99900
3.1	0.99903	0.99906	0.99910	0.99913	0.99916	0.99918	0.99921	0.99924	0.99926	0.99929
3.2	0.99931	0.99934	0.99936	0.99938	0.99940	0.99942	0.99944	0.99946	0.99948	0.99950
3.3	0.99952	0.99953	0.99955	0.99957	0.99958	0.99960	0.99961	0.99962	0.99964	0.99965
3.4	0.99966	0.99968	0.99969	0.99970	0.99971	0.99972	0.99973	0.99974	0.99975	0.99976
3.5	0.99977	0.99978	0.99978	0.99979	0.99980	0.99981	0.99981	0.99982	0.99983	0.99983
3.6	0.99984	0.99985	0.99985	0.99986	0.99986	0.99987	0.99987	0.99988	0.99988	0.99989
3.7	0.99989	0.99990	0.99990	0.99990	0.99991	0.99991	0.99992	0.99992	0.99992	0.99992
3.8	0.99993	0.99993	0.99993	0.99994	0.99994	0.99994	0.99994	0.99995	0.99995	0.99995
3.9	0.99995	0.99995	0.99996	0.99996	0.99996	0.99996	0.99996	0.99996	0.99997	0.99997
4.0	0.99997	0.99997	0.99997	0.99997	0.99997	0.99997	0.99998	0.99998	0.99998	0.99998

From: Hedges, L. V. & Olkin, I. (1985). Statistical Methods for Meta-Analysis. San Diego, CA. Academic Press.

APPENDIX E

SELECTED STUDIES

1. Barth, R. P.; Fetro, J. V.; Leland, N.; & Volkan, K. (1992). Preventing adolescent pregnancy with social and cognitive skills. Journal of Adolescent Research, 7 (2), 208-232.
2. Coates, E. E. (1970). Some apparent effects of the acquisition of factual human reproductive information upon selected attitudes of upper elementary students. Dissertation, University of Tennessee.
3. Crosby, J. F. (1970). The effects of family life education on the values and attitudes of adolescents. Dissertation, Syracuse University.
4. Fox, D. J.; Steinmann, A.; & Losen, S. M. (Spring, 1974). The impact of sex education on the sex role perceptions of junior high school students. International Mental Health Research Newsletter, 16 (1): 13 - 14.
5. Freedman, Jonathan Mack (1985). High school family life education: A program evaluation focusing mediating effects of student and psychosocial variables on marital attitudes, self-concept, and interpersonal relationships (affective, classification, values). Dissertation, Vanderbilt University.
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11. Schinke, S. P.; Blythe, B. J.; & Gilchrist, D. (1981). Cognitive behavioral prevention of adolescent pregnancy. Journal of Counseling Psychology, 28 (5), 451-54.
12. Thomas, L. L.; Long, S. E.; Whitten, K.; Hamilton, B.; Fraser, J.; & Askens, R. V. (1985). High school students' long-term retention of sex education information. Journal of School Health, 55 (7), 274-278.
13. Wingard, H. E. (1976). The effects of presenting and discussing specifically stated behavioral objectives on learning in a ninth-grade unit on sex education. Unpublished Dissertation, Southern Illinois University at Carbondale.

VITA

Judith Ann Ausherman was born in the Bronx, New York on April 2, 1959. Her education was enriched by traveling overseas. A portion of her elementary years were spent at Taipei American School. Her family settled in Chapel Hill, North Carolina in 1973. She graduated from Chapel Hill High School in 1977 and enrolled at North Carolina State University in Raleigh, NC.

She transferred to East Carolina University, N.C. and obtained a B.S. degree in Health and Physical Education in 1982. In January of 1983 she moved to St. Croix, USVI, to teach at St. Joseph High School. As a physical education teacher, she became interested in educating students about their total health rather than their physical well-being. As a result, she began the pursuit toward a M.S. and doctorate in Health Education. She obtained her M.S. in Health Education at East Carolina University, NC in 1989. The following year she enrolled in the doctoral program as a graduate teaching associate at The University of Tennessee, Knoxville. She obtained her Ed.D in Health Education in 1994.

She is currently an Assistant Professor at Cleveland State University in Cleveland, Ohio. Her primary research and practice is in school health education. She hopes one day every school will have a comprehensive school health education program.