THE EFFECTS OF SUBLIMINAL VISUAL SYMBIOTIC STIMULATION ON THE SELF-CONCEPT OF COLLEGE STUDENTS

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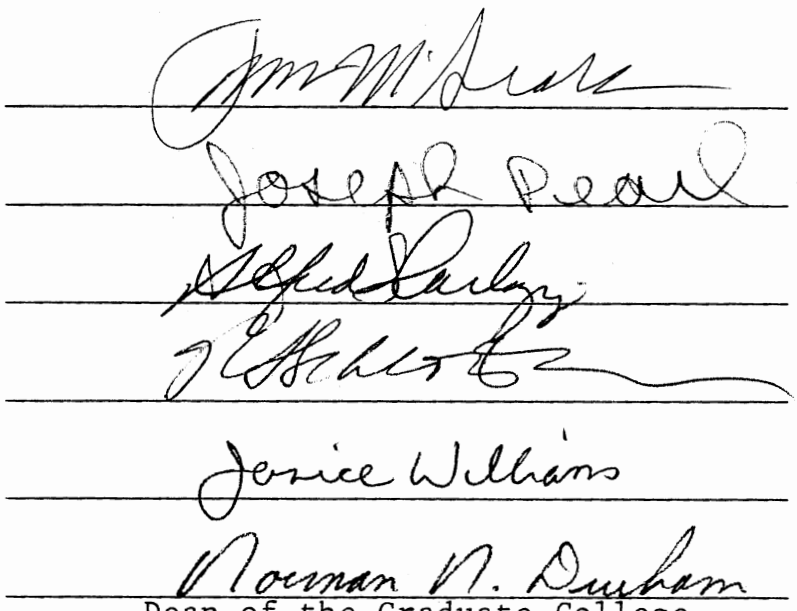

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CHAPTER I

INTRODUCTION

In the last 20 years, there has been considerable investigation of the effects of symbiotic activation through subliminal means. The symbiotic stage of development, in psychodynamic theory, is one the earliest phases of development, occurring from about 6 weeks to 5 months of age (Leichtman, 1985). During this stage, infants are completely dependent on their mothers and are neither psychologically nor biologically independent from their mothers (Goldenson, 1984). Their subjective and obviously preverbal view, is of "oneness" with mother. As development proceeds toward the end of this stage, the child becomes aware of its separateness from the mother and separation anxiety, the psychodynamic prototype for later anxieties, emerges. Resolution of separation anxiety leads to the development of narcissism, a stabilized representation of self and of self-esteem (Blanck & Blanck, 1979). Blanck and Blanck state that at the resolution of the symbiotic phase and "...with entry into the subphases of separation-individuation myriad opportunities exist for enhancement (or impairment) of self-esteem (p. 59)."

There are a number of indicators that inappropriate

resolution of the symbiotic stage results in various kinds of acute and chronic, behavioral and physiological disorders (Alberts & Gubernick, 1983). A constellation of symptoms, know collectivly as failure-to-thrive, includes children below the third percentile in height and weight. Although these children appear to have no organic or genetic malady, they show deficits in motor, language, cognitive and social skills. Loewald (1985) indicates that the source of the failure-to-thrive syndrome is related to the inability of parent and child to develop a satisfactory symbiotic relationship, complicating the subsequent phases involving separation and individuation.

The establishment and maintenance of a symbiotic relationship also appears to be important in normal adult development. "Symbiosis" comes from the Greek, which means, literally, living together. Silverman, Lachmann & Millich (1982) discuss the various ways individuals seek "oneness," in mates, religion, meditation, drugs, and group participation. Freud discussed altruism as "the urge toward union with others (Silberman, 1985, p. 461)," which implies that an urge toward symbiosis underlies altruistic behaviors.

Symbiotic activation involves addressing the resolution of the conflict arising from the symbiotic stage of development. By inducing unconscious fantasies of symbiosis (oneness) with the idealized mother experienced

by an infant, various psychopathogenic symptoms are hypothesized to be reduced (Silverman, 1983). In order to stimulate fantasies unconsciously, the stimulation is administered below the level of conscious awareness, that is, subliminally. This has usually been accomplished by exposing a phrase for a very short time (4 milliseconds), using a device known as a tachistoscope. The subject veiwing the phrase consciously perceives only a flash of light. The phrase most commonly used in this procedure is "Mommy and I are one."

Silverman (1983) provides a comprehensive overview of studies which have focused on the use of visual tachistoscopic stimulation in order to decrease, or in some cases promote, psychopathological states. The notion uniting these studies is that deviant behavior is the result of conflicts over aggressive wishes and unconscious libidinal drives arising from unmet symbiotic needs. These wishes and drives are the same as those which provide the impetus to proceed from the symbiotic stage into the separation-individuation stages (Blanck & Blanck, 1979).

Silverman (1983) categorizes these studies into three general groups: 1) laboratory studies which have considered clinical population samples and subliminal activation in order to promote or reduce manifested psychopathology related to unconscious conflicts in a single laboratory application of the treatment; 2) laboratory studies of

similar design but utilizing nonclinical population samples; 3) "adjunct studies" of experimental design applying the treatment over time to determine its efficacy in promoting adaptive behavior. He notes that there are few studies in the literature which address subliminal symbiotic activation through auditory stimulation, and he therefore reviews only those studies using visual (tachistoscopic) subliminal stimulation. The purpose of this study, which would fall into Silverman's third catagory, is to explore the effects of visual subliminal symbiotic stimulation on a major area of adaptive behavior, that of self-concept.

Several questions can be raised in this regard. The most fundamental is whether self-concept is affected by subliminal visual symbiotic stimulation. If self-concept is directly affected by the resolution of the symbiotic stage, as suggested by Blanck and Blanck (1979), it would follow that self-concept could be affected by symbiotic stimulation. How self-concept is affected by subliminal visual symbiotic stimulation is another consideration. Finally, any differences resulting from intersubject differentials (i.e. gender) appear to be worth investigating, as there are several studies indicating differential subject response related to the subliminal stimulus and gender of the subjects (Fisher, 1975; Fisher, 1976; Silverman, 1983).

The present study is designed to address some of these considerations by assessing the effects of visual subliminal stimulation on overall self-reported self-concept. This will be accomplished by administration of a self-concept scale (a pretest for preplanned comparisons) to the subjects, followed by exposure to one of three forms of visual subliminal stimulation (i.e., symbiotic, neutral, and no message; one of the independent variables), readministration of the self-concept scale (the dependent variable) and finally consideration of any gender differences as another independent (organismic) variable.

Statement of the Problem

The problem investigated in this study is: What, if any, are the effects of visual subliminal symbiotic stimulation on self-concept?

Research Questions

The following questions are posed in an effort to resolve the above stated problem:

1. Is there any affect on overall self-reported self-concept after exposure to visual subliminal symbiotic stimulation?
2. Is there any differential effect following subliminal visual symbiotic stimulation on self-reported self-concept based on the

subjects' gender?

Purpose of the Study

During the last two decades, there have been over 40 studies investigating the effects of visual (tachistoscopic) subliminal stimulation, the majority of which have indicated that it can effect both increases and decreases in manifested psychopathological behaviors (Silverman, 1983). The effect of stimulating oneness fantasies has been theorized to be a general effect, rather than effecting specific symptomology, perhaps involved in or related to the "placebo effect," in which the personal power of a professional influences the clinical outcome of a case (Silverman, Lachmann & Milich, 1982). It therefore seems appropriate to consider general personality constructs, such as self-concept, in attempting to guage the effect of subliminally introduced oneness fantasies.

There appear to be equivocal findings regarding the effects of subliminal stimulation on self-concept. Bryant-Tuckett and Silverman (1984) found increases in self-concept, based on an adjective rating inventory measuring the difference between real and ideal self-concept, in emotionally disturbed teenagers following subliminal symbiotic stimulation. However, Thurer (1984) discerned no such effects using stimulus messages intended to produce increased self-concept directly rather than

through inducing oneness fantasies. The present research is designed to further consider these findings in the context of inducing oneness fantasies.

There is little research relating the effects of subliminal symbiotic stimulation using the auditory channel. Fisher (1975; 1976) has studied the effects of auditory subliminal stimulation on body boundary, but has not attempted symbiotic stimulation. Borgeat and Goulet (1983) investigated the effects of auditory subliminal stimulation on several physiological variables. The subliminal suggestions were intended to produce either relaxation or physiological activation, rather than addressing the effects of symbiotic activation. The findings of that study were significant for activating suggestions, but not for suggestions of relaxation. Habeck (1983) reported differential subject receptivity to subliminal auditory stimulation based on cerebral laterality. Other studies have indicated that auditory subliminal stimulation has no significant effects (Bouchard, 1984; West, 1984).

Hypotheses:

The following null hypotheses were tested in this study using a .05 level of significance:

1. The mean self-concept scale scores for men and women were drawn from populations having the same means.

2. The samples were drawn from populations in which

the differences between mens and womens self-concept scale means are the same for each type of subliminal stimulation and, similarly, the differences between any two subliminal stimulation group means is the same for men and women.

Definition of Terms:

VISUAL SUBLIMINAL SYMBIOTIC STIMULATION: The presentation of the message "Mommy and I are one" through a tachistoscopic device so as to be below the level of conscious awareness of the message (2 milliseconds per exposure).

VISUAL SUBLIMINAL NEUTRAL STIMULATION: The presentation of the message "People are walking" through a tachistoscopic device so as to be below the level of conscious awareness of the message (2 milliseconds per exposure).

VISUAL STIMULATION: The presentation of a blank slide through a tachistoscopic device so as to be below the level of conscious awareness (2 milliseconds per exposure).

SELF REPORTED SELF-CONCEPT: The Total Positive Score from the Tennessee Self-Concept Scale.

Significance of the Study

The experiment served to clarify whether self-concept in a specific population sample can be manipulated in a rapid, inexpensive, and efficacious manner. If this were

indicated, many psychopathologies and adjustment reactions could be better controlled than through time-consuming and expensive psychoanalytic approaches.

Limitations and Assumptions

The following limitations were inherent to this study. Only the construct of overall self-concept, as measured by the total positive score Tennessee Self-Concept Scale, was considered. Specific subareas of self-concept were not considered.

The subjects were volunteers who were enrolled in psychology classes and received extra credit in those classes for their participation. The large majority were young, ethnically white, adults. The subjects all reside in a mid-sized city in the southwestern United States. Caution should be exercised in generalizing the results of this study to other populations.

Although the subjects were "blind" to the nature of the stimulation to which they were exposed, the experimenter was not. Therefore the possibility of experimenter bias exists, however slight.

The data used in this study is based on a self-report instrument. The quality of it is therefore based on the honesty and accuracy of the respondents.

Organization of the Study

This chapter presented a short introduction of the subject of inquiry (visual subliminal stimulation) for the present investigation. It included a statement of the problem to be examined, the purpose of the study, definitions of terms used in the study, a brief description of the variables and the hypotheses examined by the study and its limitations. Chapter II presents a review of the literature examining subliminal stimulation and organized into two bodies of reference works. The first body consists of those studies which have examined visual subliminal stimulation and is subdivided into the three groups suggested by Silverman (1983); studies considering clinical population samples exposed to one session of treatment, those considering nonclinical population samples exposed to one session of treatment and studies exposing population samples exposed to multiple treatment sessions. The second body consists of studies investigating auditory subliminal stimulation. Specific methodological considerations are explored and deliniated in Chapter III. The results of this study are found in Chapter IV. Conclusions based on the results are presented and discussed in Chapter V. This final chapter also presents implications based on the research findings, considerations of future research efforts in this area and discusses the limitations of the present study.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The literature on subliminal symbiotic stimulation utilizing the visual modality comprises the first body of research considered in this study. Silverman (1983) divides these sources into three subareas. The first discusses those studies concerned with clinical population samples exposed in a laboratory setting with a single exposure to subliminal stimulation. The second subarea is comprised of nonclinical population samples treated similarly to the first group. The third group of studies is designated by Silverman as "treatment adjunct" studies which expose population samples, usually of a nonclinical variety, to repeated exposures of subliminal stimulation, and employ control procedures in true experimental designs. The second body of studies explored in this review address the auditory modality of subliminal stimulation.

Laboratory Studies with Clinical Samples

Intensification of Symptomology

Silverman (1983) cites 23 studies using clinical

population samples to test the efficacy of subliminal stimulation in the intensification of psychopathological behaviors. In these studies, the subjects are informed of the nature of the study, baselines on the dependent variable(s) are established, and the subjects are exposed to the treatment subliminal stimulus and a neutral control stimulus in counterbalanced, within-groups and "double-blind" designs. Finally a reevaluation of the pathological behavior (dependent variable) is conducted. Silverman notes that four different clinical groups have been considered in this fashion; 13 samples of schizophrenics, 4 samples of depressives, 3 samples of homosexuals and 3 samples of stutterers. He also cites 4 other studies using similar design and arriving at similar conclusions (supporting psychodynamic formulations of subliminal treatment leading to pathological intensification), one using alcoholic subjects, another using stutterers, a third using depressed college women and the fourth using male schizophrenics. A full discussion of these can be found in Silverman's (1983) article. Silverman also discusses 5 studies (3 using depressives and 2 using schizophrenic samples) of similar design which failed to support his psychodynamic proposition.

A scathing critique of Silverman's work and a study of pathological intensification are provided by Porterfield (1983). Thirty male schizophrenics were exposed to

aggressive subliminal stimulation ("Tiger eats person"), symbiotic merging ("mommy") and a group of meaningless letters. Thought pathology and form quality, determined from a series of inkblots, as well as performance the the Stroop Color-Word's interference task, were dependent variables. No significant changes were noted and Porterfield concluded that Silverman's theory failed to be replicated. Porterfield's criticisms of previous studies of subliminal stimulation include reliability problems, excessive rates of Type-1 error, heterogeneous subject groups, and the use of change scores in statistical analysis. He concludes that studies supporting subliminal psychodynamic stimulation are artifactual of "unreliable measures and overly liberal criteria for statistical significance."

Reduction of Symptomology

Studies in which pathological reduction in clinical populations, a topic more directly related to this paper, are also reviewed in Silverman (1983). The rationale for this approach is that symbiotic-like experiences, that is a merging with the "good mother of infancy," provides oral gratification. The phrase "Mommy and I are one," or derivatives of that phrase, have most commonly been used to satisfy the oral need and reduce aggressive, libidinal drives.

Silverman (1983) cites 11 studies conducted using male schizophrenic subjects which support this proposition. He cautions, however, that this support can be generalized only to relatively "differentiated" male schizophrenic populations, as the message appears to threaten the sense of self of undifferentiated male schizophrenics. Silverman reports that only one study using this population failed to support the proposition. He reports that Loveland's (1978) study did not support it and explains that the use of the "mommy" stimulus may have failed because it was conducted in the Southern U.S. where the dialectic "mama," rather than "mommy," is the common parlance.

It is at this point that sex differences (as well as differences between differentiated and undifferentiated schizophrenics) emerge. Silverman (1983) cites two studies which note that male and female schizophrenics respond to different symbiotic messages. For females a message substituting "Daddy and I are one" for the "mommy" message appears to be effective in pathology reduction. This effect was replicated by Jackson (1983). In a counterbalanced and "double-blind" design using male and female differentiated schizophrenics, pathology reduction was observed in females after exposure to the "daddy" stimulus. This did not occur with the "mommy" stimulus or with a neutral message ("People are walking;" a commonly used control subliminal stimulus). The males responded to

the "mommy" stimulus, but not the "daddy" or control stimuli. It therefore appears that with differentiated schizophrenic populations, subliminal symbiotic merging for the purposes of pathology reduction is only effective when the merging is toward the opposite sex parent. It is of interest to note that in one study Silverman cites, Dauber's (1980) work with depressed college women, pathological reduction was not observed with the "Mommy and I are one" stimulus, but a similar message, "Mommy and I are two," did appear to reduce depression (at least among those women who, following the investigation, related to that stimulus associations of "closeness, togetherness, and a figurative oneness").

Criticisms similar to those cited in Porterfield (1983) are stated by Poloway (1984) in his study of subliminal psychodynamic activation with heroin addicts. Half of his 80 subjects were addicts and half were not. After viewing a subliminal neutral stimulus ("People stand"), subjects completed a story recall task which functioned as a covariate, dependent measure. The experimental subliminal message, "Hate Mommy," or one of three control messages ("Love Mommy," "Hate Daddy" or "Love Daddy") was administered. The major hypothesis, that addict subjects in the "hate mommy" group would feel less hostile toward their mother, was not supported. Poloway contends that these results indicate that subliminal

psychodynamic stimulation does not work, as its "proponents" opine.

Presummary: Studies of Clinical Populations

The literature pertaining to the application of subliminal psychodymic activation through the visual modality to clinical population samples can be divided into two distinct catagories; those attempting to intensify pathology and those attempting to reduce it. Silverman (1983) discusses over 20 articles dealing with the former group. Many of the studies conducted were his own work and the work of supervisees or other associates. The conclusion drawn by Silverman is that subliminal symbiotic activation using the "Mommy and I are one" stimulus is effective in the intensification of pathological behaviors in schizophrenics, depressives, homosexuals (male) and stutterers. When results appear nonsupportive or equivocal, Silverman tends to explain the weaknesses in terms of technical mistakes in the application of the subliminal stimulation and is explicit in his support of the theory. However, there are several studies in which there have been no significant effects. Of the attempts at replication of the psychodynamic proposition which have failed, Porterfield (1983) may be the most critical. His criticisms include the use of unreliable dependent measures, high false positive rates, heterogenous subject

samples and other technical shortcomings of the research.

Silverman and his associates are also the major contributers to the research on pathology reduction via subliminal symbiotic stimulation. The general conclusion drawn by Silverman (1983) is that the "mommy" stimulus is effective in pathology reduction when applied to male, well-differentiated schizophrenics. Studies considering gender differences regarding response to subliminal stimulation suggest that females (depressives and schizophrenics) are more likely to be affected by messages such as "Daddy and I are one" or "Mommy and I are two" (Dauber, 1980 and Jackson, 1983). Poloway (1984) failed to find effects using variations of the subliminal messages and leveled many of the same criticisms regarding research design as Porterfield (1984) cited.

Laboratory Studies of Nonclinical Samples

At this point, hypotheses and the visual stimulus messages begin to diverge. Two general groups of studies, one which continues along the course of symbiotic subliminal stimulation's effect on adaptive/pathological functioning and another group which investigates effects on competitive activies (e.g. dart throwing), are considered by Silverman (1983). In keeping with the design of this study, only the former group will be discussed. The interested reader is referred to Silverman for a discussion

of the latter.

Two studies of visual subliminal stimulations affect on anxiety are reviewed by Silverman (1983). These studies (Florek, 1978 and Silverman & Grabowski, 1982) investigated using a different message than previously used. The stimulus message "My lover and I are one" was reasoned to promote symbiotic experiences and was used in Florek's work with college undergraduates. The result of this was, as hypothesized, a reduction in anxiety and an increase in word recognition. However, Silverman points out that the significance of the outcome was dependent on the females used in the study. By way of replication and extention, Silverman and Grabowski employed both the "mommy" and "lover" stimulus messages and found significant anxiety reduction in the males using only the "mommy" message whereas the females responded only to the "lover" message. Silverman and Grabowski account for the results by speculating that females are less differentiated from their mothers and are therefore threatened by the "mommy" stimulus, while the males find the ambiguity of the "lover" stimulus a threat to their heterosexuality.

Adjunctive Studies with Nonclinical Samples

The studies in this section differ from those previously discussed in several ways. They are between-groups designs (as opposed to within) and use the

subliminal tachistoscopic approach combined with other theraputic modalities. The use of control groups tend to make these studies more germane to the present investigation. Most of these studies utilize the "mommy" stimulus to promote adaptive behavior while using the control stimulus "People are walking" as a neutral message. Fourteen studies, (including those utilizing clinical populations) 11 of which support the subliminal psychodynamic hypothesis, are reviewed by Silverman (1983). Because these studies more closely parallel the present one, only nonclinical samples are discussed and primary sources are considered.

Systematic desensitization and subliminal symbiotic stimulation were used in the treatment of 20 female insect phobics with half receiving the "mommy" stimulus and the other half receiving the "people" message in a study by Silverman, Frank and Dachinger (1974). These volunteer subjects received four treatment exposures in a "double-blind" experimental arrangement. Dependent measures were behavioral steps (in a 26-item hierarchy of fear), subject's ratings of subjective discomfort, and experimenter's ratings of the subject's discomfort. Exposure to the subliminal stimulus was carried out when the subject rated her discomfort above 20 on a scale to 100. Significant differences between the two groups ($p < .05$; one-tailed t tests) were indicated for the

experimental group on the subject's and experimenter's ratings of anxiety, but not on behavioral steps. No follow-up was conducted.

Two studies of obese women treated with a combination of behavior modification and subliminal stimulation in order to induce weight reduction are reported in Silverman, Martin, Ungaro and Mendelsohn (1978). Volunteer subjects were screened in order to omit those judged as psychotic or border-line psychotic resulting in a total of 26 subjects who were randomly assigned to experimental and control groups. Each subject was exposed to 8 weekly individual treatments in a "double-blind" ANCOVA procedure, with weight in pounds as the covariate and dependent measure. Exposure to visual stimulation followed inducement of arousal toward an eating situation. Follow-up data were collected 4 weeks post-treatment in the first study and at 4 and 12 weeks in the second. In the first study no significant differences were noted immediately after treatment, but significant differences favoring the experimental hypothesis emerged at follow-up ($p < .01$). The results of the second experiment were the same as the first, with significance demonstrated only at follow-up, and the means of the two groups diverging further over time. It is interesting to note that the control groups gained weight following the experiment, while the experimental groups, in both instances, continued to lose

weight following the termination of treatment.

The effects of subliminal stimulation on a group of female cigarrette smokers was the subject of investigation by Glover (1979). In this paradigm, the usual symbiotic messages were not used, nor was the tachistoscopic method of presentation. Rather, the subjects of the study chose words on the basis of their imputed emotionality. Words rated high on emotionality were interspersed through films shown to the experimental subjects. Films without subliminal stimulation were used with the control group. A pretest-posttest one way ANCOVA design yielded no significant differences between the experimental and control groups. Glover states that some differences were noted in individuals' smoking behaviors, but that these were not pronounced enough to reach statistical significance.

Smoking behaviors were further studied, this time using the subliminal symbiotic ("mommy") message and a neutral message ("people"), by Palmatier and Bornstein (1980). Subliminal activation was used in combination with behavioral treaments designed to decrease smoking. A total of 34 subjects were randomly assigned to the treatment or control group. The treatments were constructed so as to be "double-blind." A total of 12 treatments were implimented over a 3-week period. The experimental group showed a significant decrease in smoking behaviors in the 4-week

follow-up, however, after 12 weeks following treatment, the subliminal stimulation group no longer demonstrated a statistically significant difference from the other groups.

In a study done by Parker (1982), final examination grades in an undergraduate law course were used as a dependent variable in order to further consider the adaptation-enhancing effects of subliminal symbiotic stimulation. Sixty subjects participated and were equally divided and randomly assigned to one of three groups. Besides the usual experimental and control messages ("mommy" and "people"), a new experimental message "My prof and I are one" was used in this "double-blind" methodology. A matched group (matched on previous grade point average) ANOVA was used to test for differences between groups. Significant differences between experimental and control groups did not emerge after 2 weeks, but did on a mid-term, a follow-up and in the final exam grade. Although both expermental groups ("mommy" and "prof") scored significantly higher than the control, the "mommy" stimulus was concluded to have a more general effect than the "prof" message.

Linehan and O'Toole (1982) investigated the effects of subliminal stimulation on self-disclosure in group counseling, in another attempt to test the adaptation-enhancing effects of such stimulation. A total of 36 female undergraduates were assigned randomly to

either a treatment or control group. The "people" message was used as the neutral message. Self-disclosure in group counseling was rated by two judges who were unaware as to experimental or control group assignment. The data were analyzed using a split-plot ANOVA, and supported the main hypothesis ($p < .05$) that the "mommy" group would provide more self-disclosures.

The hypothesis that subliminal symbiotic stimulation has adaptation-enhancing effects has been tested in another language than English. Ariam and Siller (1982) extended the paradigm to the Hebrew language in the Israeli culture. Two versions of the "mommy" message, using differing colloquilisms were compared to "My teacher and I are one" and "People are walking in the street" subliminal messages. A total of 72 students were randomly assigned to one of the four groups mentioned. The dependent measure was final examination grades in mathematics. Both "mommy" groups were found to have significantly higher scores on the dependent measure after analysis using a one-way ANOVA ($p < .05$). Other adjunctive measures, grades in other classes and scores on an anxiety scale, showed no such differences.

Application of subliminal psychodynamic activation in combination with assertiveness training was investigated by Packer (1983). Only women demonstrating nonassertive behaviors were considered. A mixed (both between and within subjects) design was used in order to manipulate

dosage amounts among experimental groups. Packer's conclusions include the suggestion that assertiveness difficulties in women relate to issues of separation and object loss. Experimental groups receiving a higher dosage of subliminal stimulation appeared to demonstrate significantly more assertive behavior than the control and lower dosage groups, and this difference appeared to be maintained at follow-up.

Two differing subliminal messages, one symbiotic ("mommy") and one oedipal ("Winning mom is ok" for males and "Winning dad is ok" for females) and a control ("people") group were compared on their efficacy in reducing racial prejudice in 76 white college students (Hobbs, 1983). Subliminal stimulation was used a total of 24 times over a period of six weeks. There was no significant difference between the groups of females, but males in the oedipal group showed significantly more prejudice, contrary to the study's main hypothesis, following the treatment. Hobbs also considered final examination grades as a dependent variable. Both male experimental (oedipal and symbiotic) groups differed significantly from the control group, although not from each other. The females in the experimental groups did not differ from the control on this variable either.

Frauman, Lynn, Hardaway and Molteni (1984) investigated the effects of psychodynamic subliminal

stimulation on hypnotic rapport and susceptibility. The subjects, 72 male undergraduates, were matched on susceptibility, exposed to two sessions of either the experimental ("mommy") treatment or the neutral ("people") message. In this "double-blind" study the dependent measures were projective procedures about relationships with the subjects' mother, a teacher and the hypnotist, and a measure of which topics they would be willing to talk to the hypnotist about in later sessions. The results of a MANOVA indicated that the subjects in the experimental groups were not significantly more susceptible to hypnosis but chose more positively valenced topics to later disclose to the hypnotist.

Willingness to self-disclose following subliminal stimulation was also studied by Mitchell (1984). Six levels of stimulation, including subliminal praise, supraliminal praise, subliminal reprobation, subliminal neutral, subliminal symbiotic and supraliminal reprobation, were presented to a total of 120 undergraduate students. The only statistically significant finding was found in comparing the subliminal praise to the subliminal neutral message groups. The main conclusion drawn from this work is that praise statements relating to pride, when presented subliminally, can increase willingness to self-disclose.

The adaptation-enhancing effects of subliminal stimulation on 64 emotionally disturbed adolescents were

investigated by Bryant-Tuckett and Silverman (1984). The subjects were matched for age, IQ and reading ability and exposed to either subliminal symbiotic ("mommy") or neutral ("people") stimulation five times per week for six weeks. The experiment was conducted in a double-blind procedure and a MANCOVA was used to analyze the data. Outcome measures were reading scores, report card grades in reading, frequency of homework completion, independent classroom work, mathematic scores, self-concept and time spent watching television. Significant differences between the treatment and control groups were found in reading scores, homework return, independent work time, arithmetic achievement and self-concept.

A computer assisted spelling program combined with subliminal stimulation was utilized with 48 seventh-graders in a study by Thurer (1984). Outcome measures were scores in spelling tasks and self-concept as measured by the Brookover Academic Self-Concept Scale. Stimulus messages were designed which were hypothesized to increase self concept. The messages related to self ("I'm OK, I'm Great") and to the learning process ("I learn, I succeed"), and served as two different experimental conditions. A control group received nonsense syllable stimuli. A total of three experimental sessions were conducted. Statistical analysis revealed no significant differences among the experimental and control groups.

Berry (1984) compared the effects of educative support groups and subliminal stimulation on college women demonstrating bulimic behaviors. Four groups were utilized; the group and experimental stimulus, the group and a neutral ("people") stimulus, and "attention-placebo" combined with experimental and neutral stimulation. The experimental stimulus message "Mommy and I are two" was used as there is some indication of its efficacy in affecting symbiotic intensification in females (Silverman, 1983). Conclusions include the finding that the support group helped control bingeing and emotional distress whether or not paired with subliminal stimulation. Improvements on psychological factors related to bulimia were noted in all groups. Subliminal symbiotic stimulation did appear to have an independent treatment effect on some symptoms of emotional distress and on eating restraint.

The effect of subliminal symbiotic stimulation on eating restraint in 96 male university students was investigated by Roseman (1985). Three groups were used; two "mommy" groups (one subliminal and the other supraliminal) and one subliminal "people" group. Scores on sensation-seeking were also considered. The analysis of the data (ANOVA) indicated that there was a significant difference in eating restraint demonstrated by the subliminal experimental groups over the control. The greatest eating restraint was demonstrated by high

sensation-seekers exposed to subliminal symbiotic stimulation.

Presummary: Studies with Nonclinical Samples

Studies dealing with visual subliminal psychodynamic activation with non-clinical population samples can be divided into two general groups. The first group, laboratory studies, are generally within-groups designs utilizing one-time treatments in double-blind, counterbalanced procedures. The other group of studies, termed "adjunctive," (Silverman, 1983) typically use between-groups designs, exposing the subjects to multiple treatments of either the experimental or control condition. Procedures using subliminal stimulation combined with other treatment modalities under double-blind conditions are common. This group of studies, because of the use of non-clinical samples and between-groups designs, appears to be more generalizable to the present study.

Only two laboratory studies were found in the literature (Florek, 1978 and Silverman & Grabowski, 1982) which apply to adaptive, as opposed to competitive, behaviors. The conclusion drawn from Florek's work is that subliminal visual stimulation using the "My lover and I are one" as a stimulus message appeared to significantly effect increases in word recognition and reduction of anxiety in college females. Silverman and Grabowski replicated this

finding regarding anxiety and extended the design, finding additionally that, whereas the females responded only to the "lover" message with anxiety reduction, males responded similarly only to the "mommy" message.

The literature regarding adjunctive studies is a mixture of results ranging from clearly supportive to clearly nonsupportive. Several studies consider the effects of subliminal stimulation on maladaptive behavior. Insect phobic females apparently exhibited and felt less anxious following subliminal stimulation, but did not change behaviorally in regard to a fear hierarchy (Silverman, Frank & Dachinger, 1974). Obese females exposed to subliminal stimulation lost significantly more weight than the control group, but Silverman, Martin, Ungaro and Mendelsohn (1978) report that it only occurred at a 12-week follow-up. Smoking behaviors were not significantly changed by Glover's (1979) application of subliminal visual (but neither tachistoscopic nor psychodynamic) stimulation. Although Palmatier and Bornstein (1980) report significantly lower levels of smoking behaviors in response to subliminal symbiotic stimulation, the significant difference disappeared by the end of 12 weeks. Directly contradicting the proposed hyposthesis, racial prejudice was observed to increase in subjects exposed to subliminal symbiotic treatment (Hobbs, 1983). Subliminal stimulation appeared no more effective

than educative support groups in the treatment of bulimia (Berry, 1984). It did appear to affect eating-restraint in obese male university students (Roseman, 1985).

Many of the adjunctive studies consider academic behavior and attitudes. Parker (1982) reports significantly higher examination grades in a law class by subjects exposed not only to the "mommy" message, but also to the message "My prof and I are one." Increased grades in math in Israeli subjects exposed to subliminal symbiotic stimuli in Hebrew is reported by Ariam and Siller (1982). However, the effect did not generalize to other classes and no differences in anxiety could be substantiated. Emotionally disturbed students were observed to exhibit significant differences in reading, homework, independant work, math and self-concept after exposure to subliminal stimulation, although television-watching was unaffected (Bryant-Tuckett & Silverman, 1984). Thurer (1984) reported no change in spelling or self-concept resulting from subliminal (but not symbiotic) stimulation.

A final group of adjunctive studies adresses issues relating to counseling and psychotherapy. Linehan and O'Toole (1982) reported higher rates of self-disclosure among subjects exposed to subliminal stimulation. Similarly, subliminal praise statements appeared to increase willingness to self-disclose (Mitchell, 1984). Assertive behavior was observed to increase after exposure

to subliminal stimulation, in relation to the amount of treatment received (Packer, 1983). Hypnotic susceptibility was not reported to be affected after subliminal treatment (Frauman, Lynn, Hardaway & Molteni, 1984).

Auditory Subliminal Stimulation

The literature to this point has consisted of investigations into visual subliminal stimulation, most often using a tachistoscope. As Silverman (1983) points out, there have been few studies investigating the use of subliminal stimulation using other perceptual modalities. It should be noted that even though the literature regarding auditory subliminal stimulation is sparse, a casual perusal of most any popular psychology magazine reveals any number of products, usually cassette tapes, purporting to promote all sorts of individual change to the buyers willing to expose themselves to auditory subliminal stimulation.

Fisher (1975) reported a series of studies on the effects of auditory subliminal stimulation on body boundary definiteness in college students, as measured by the Holtzman Inkblots. Body boundary, measured by barrier scores, is a component of the total body image. In previous work using supraliminal auditory stimulation, Fisher reports that no effect on body boundary differentiation was found in women exposed to aggressive or

positive and supportive messages. Similar results were found with men, except that men exposed to hostile messages tended to have reduced boundary definiteness. In this series of 8 studies, subjects were exposed to subliminal messages with themes of hostility, depression, body, vulnerability and reassurance. The conclusion of the work notes that men respond to subliminal messages with a boundary decline, but only if "primed" regarding the nature of the subliminal stimulus. Priming consists of subtley introducing the general nature of the forthcoming subliminal stimulation to the subject. Women's body boundary definition did not appear to be affected by either the out-of-awareness stimulation, with or without priming.

The effects of auditory subliminal stimulation on the Barrier score of the Holtzman Inkblots as a measure of boundary response is further discussed by Fisher (1976). The series of 5 studies used a test-retest procedure, with the posttest and auditory stimulation administered simultaneously. Fisher reported results indicating the same boundary impact occurs whether or not male subjects were aware of being exposed to subliminal stimulation. No boundary impact was observed in women under either condition, although when exposed to an "extended hostility tape," women showed some boundary loss. The necessity of "priming" was reinterated but needed only to be generally related to a subliminal input to activate the boundary

effect. A competing visual input (a light flashing periodically) was observed to militate against boundary effects of a subliminal auditory message.

Borgeat and Goulet (1983) report on the effect of subliminal auditory stimulation on psychophysiological measures. Suggestions for activation, deactivation and a no message control were given while EMG, heart rate, skin conductance levels and responses and the skin temperature of 18 subjects were recorded. The subjects were monitored during a mathematic test designed to be somewhat stressing. The subjects were "primed" in a general way and participated in 4 subliminal sessions over as many weeks. The results of a MANOVA indicated support for the influence of activating subliminal suggestions on these measures, but not for deactivating suggestions.

The effect of subliminal auditory stimulation as it relates to cerebral hemispheric laterality in children was investigated by Habeck (1983). Ninty-six children aged 8 - 12 years were screened for their auditory threshold prior to treatment. Subliminal stimuli included verbal and nonverbal messages imbedded in a tape recorded message. Results indicated left-hemispheric subjects to be more sensitive to the subliminal message than those with right-hemispheric preference. Subjects who processed unilaterally appeared to be more affected than those processing bilaterally. Subliminal stimulation seemed to

influence the subjects' affect significantly more than their impressions of a neutral face.

The use of subliminal stimulation in the reduction of anxiety was evaluated by Bouchard (1984). A total of 60 volunteers reporting anxiety were randomly assigned to one of four groups. The treaments consisted of subliminal relaxtion, subliminal symbiotic activation, relaxation training and a neutral musical stimulus control condition. Pretest and posttest measures were on the Taylor Manifest Anxiety Scale. The treatments were self-administered via tape recorded programs daily for 10 days. Although all four groups reported significant reductions in anxiety, there were no significant differences among them.

The effect of auditory subliminal symbiotic stimulation on trait anxiety was investigated by West (1984). Thirty inpatients in a VA setting and diagnosed as suffering from generalized anxiety disorder were exposed to subliminal symbiotic stimulation or a control procedure and tested with the State-Trait Anxiety Scale and a measure of skin temperature. Although both dependent measures showed significant reduction, there was no significant difference between the treatment and control groups.

Presummary: Auditory Subliminial Stimulation

There is little literature regarding auditory subliminal stimulation and those studies investigating it

in relation to psychodynamic activation are still more rare. Consequently, the only area of convergence appears to be the mode of stimulation. Fisher (1975 and 1976) is most concerned with the effects on body boundary arising from exposure to various subliminal messages. His conclusions note significant boundary decline in men exposed to hostility messages, but only if "primed" toward the general theme of the subliminal message. Boundary loss appeared to occur in women only after extended hostility stimulation. Fisher also noted that response to subliminal stimulation can be limited by other, competing stimuli. Borgeat and Goulet (1983) observed significant physiological changes in response to subliminal activation messages but not for deactivation (relaxation) messages. Children demonstrating left cerebral hemisphericity appeared more responsive to auditory stimulation than those with right hemisphericity (Habeck, 1983). Bouchard (1984) found symbiotic stimulation no more effective in anxiety reduction than relaxation and control conditions. Similarly, auditory subliminal symbiotic stimulation was no more effective in anxiety reduction or altering skin temperature than control procedures (West, 1984), although dependent measures were significantly lowered by both the experimental and control conditions.

Summary of Subliminal Symbiotic Literature

The literature on subliminal psychodymamic, or symbiotic, stimulation is predominated by studies utilizing the visual modality, and the stimulation is most often done with a tachistoscope. Much of this work was contributed by Silverman and his students and associates. Following Silverman's (1983) organizational structure, three groups of studies were reviewed. The first, laboratory studies with clinical samples, included investigations into both the reduction and intensification of pathology. The second group focussed on laboratory studies with non-clinical population samples. The third group of investigations considered adjunctive studies with non-clinical populations, and is therefore the most applicable to this investigation. The body of work utilizing auditory subliminal stimulation is limited and most does not often address the question of symbiotic, or psychodynamic, activation. Although subliminal stimulation does appear to effect thoughts and behavior, the effects do not consistantly emerge, and specific conclusions regarding efficacy are elusive.

Studies of pathological intensification have generally supported the hypothesis that subliminal symbiotic stimulation can increase pathology, especially in male schizophrenics. However, there are researchers who are critical of that assessment (Poloway, 1984) and have

suggested that many of the positive results can be disputed on methodological grounds. The bulk of the research does appear to offer tentative support, but the notion of promoting pathological behavior through any mode seems rather absurd.

Subliminal symbiotic stimulation in the reduction of pathology in clinical populations also appears to have some research support. It has appeared most effective with samples of male, well-differentiated schizophrenics (Silverman, 1983). Gender differences emerge in this body of work, and it appears that subjects respond more often when the subliminal message promotes symbiotic feelings toward the opposite sex parent (Jackson, 1983 and Dauber, 1980). As in the previous case, most of the research does support the use of subliminal stimulation in pathology reduction, but there are studies indicating no significant effect and dissenting views regarding its use (Porterfield, 1983).

There are essentially two groups of research considering the effects of subliminal stimulation on non-clinical population samples; laboratory studies which follow the within-groups procedures considered above and adjunctive studies using between-groups designs. Many of the laboratory studies consider competitive tasks as dependent variables, such as dart-throwing, and are not reviewed because of their lack of applicability to this

research. Two laboratory studies that are germane appear to indicate the effectiveness of subliminal stimulation in the reduction of anxiety (Florek, 1978; Silverman & Grabowski, 1982). Gender differences are indicated as women responded most to the message "My lover and I are one" whereas males responded differentially to the "mommy" message.

Adjunctive studies using between-groups designs can be conceptualized as applying to one of three areas; maladaptive behaviors, academic behaviors/attitude and issues relating to counseling/psychotherapy. Subliminal symbiotic stimulation has been indicated to be effective in treating behavior disorders including insect phobias (Silverman, Frank & Dachinger, 1974), obesity (Silverman, Martin, Ungaro & Mendelsohn, 1978), smoking (Palmatier & Bornstein, 1980) and over-eating (Roseman, 1985). One study indicating no effect addressed the issues of smoking (Glover, 1979) and another considered bulima (Beery, 1984). Racial prejudice was observed to increase following subliminal psychodynamic stimulation (Hobbs, 1983).

Parker (1982) found subliminal symbiotic stimulation effective in producing higher examination grades in a law class. In a cross-cultural study, subliminal symbiotic stimulation in another language (Hebrew) was observed to increase mathematics grades (Ariam & Siller, 1982). Improvement in reading, homework, independent work, math

and self-concept in emotionally disturbed adolescents was observed by Brayant-Tuckett and Silverman (1984) following subliminal symbiotic stimulation. However, Thurer (1984) notes no change in spelling and self-concept after subliminal (though not symbiotic) treatment. Changes in behaviors relating to counseling and psychotherapy indicate subliminal stimulation to be effective in increasing self-disclosure in group therapy (Linehan & O'Toole, 1982), willingness to self-disclose (Mitchell, 1984), and assertive behaviors (Packer, 1983). No effect on hypnotic susceptibility was observed by Frauman, Lynn, Hardaway and Molteni (1984).

Few studies have considered the effects of auditory subliminal stimulation. Fisher's (1975 and 1976) work indicates that men are more likely to respond to subliminal stimulation relating to hostility with body boundary decline than are women. Fisher also observed that competing liminal stimuli militate against subliminal stimulation. Bourget and Goulet (1983) noted changes in psychophysiological measures following subliminal messages encouraging activation. Habeck's (1983) work indicated differential response to subliminal messages based on cerebral hemisphericity. However, subliminal stimulation did not appear to lower anxiety more than control conditions, according to Bouchard, (1984). This finding was reinterated by West's (1984) work.

CHAPTER III

METHODOLOGY

Discussed in this chapter are the procedures for selection of subjects for the study. Treatment and control methods, will be described. The experimental design, apparatus and statistical procedures used to test the hypotheses explained in Chapter I are considered.

Subjects

The subjects used in this study consisted of 90 college students drawn from a large university in the Southwestern United States. They aggreed to participate in the research on a voluntary basis. Both male and female subjects were included in each of the experimental and control groups (male $\underline{n}$ = 45; female $\underline{n}$ = 45). At the outset of the research, 150 subjects (75 males and 75 females) were used. In the course of the eight week procedure, 42 students dropped out of the study. In order to maintain equal cell sizes, the data from 18 subjects (16 females and 2 males) were randomly dropped from the analysis, using random numbers generated on a personal computer.

The volunteer subjects ranged in age from 18 to 45. The mean age of the female subjects was 21.3 years, 21.9

years and 20.3 years in the no message group, "People" group and the experimental group, respectively. The mean age of the male subjects was 21.9 years, 19.7 years and 20.9 years in the no message group, "People" group and the experimental group, respectively. A total of 88 of the subjects were Caucasian, one was black and one Korean. All subjects were concurrently enrolled in undergraduate courses in psychology and received extra credit for their participation.

Instrument

The dependent variable utilized in this study was the Tennesee Self-Concept Scale (TSCS). It consists of 100 self descriptive items relating to personality and state of mental health arranged on a 5-point Likert scale. The TSCS reportedly requires from 10 to 20 minutes for the subject to complete. The scale's counseling form yields 9 self-esteem subscales (identity, self-satisfaction, behavior, physical self, moral-ethical self, personal self, family self, social self and self-criticism) and the total positive score.

The TSCS was normed on a sample of 626 people ranging in age from 12-68. Although the manual (Fitts, 1965) notes that college students, whites and those ranging in age from 12-30 years are over-represented in the norms, studies utilizing high school students, army recruits, teachers and

black nursing students have yielded means and standard deviations similar to the norm group.

The reliability of the total positive score, estimated by a test-retest procedure using 60 college students over a two-week period, is reported in the TSCS Manual (Fitts, 1965) to be .92.

The manual (Fitts, 1965) reports validity based on content, group discrimination, and correlation with other personality measures. Content validity was supported by subjecting each item to a group of judges and including the item only if there was unanimous aggreement that it was classified appropriately. The TSCS is reported to have significantly differentiated ($p < .001$) between a group of 369 psychiatric patients and 626 nonpatients. Fitts also reports that a group of 75 people characterized as high in personality integration scored significantly different than the norm group and in the direction opposite of the patient group.

Correlations in the expected directions with the MMPI and other personality measures are reported in the TSCS Manual (Fitts, 1965) to support the construct (or concurrent) validity of the scale. Significant ($p < .01$) negative correlations between the total positive score of the TSCS and the MMPI were indicated for subscales F, Hs, D, Pd, Pa, Pt, Sc, Si, and Es. A significant correlation ($r = .68$) between the total positive scale and Izard's Self

Rating Positive Affect Scale is also reported.

Procedure

The volunteer subjects in the study were first given a consent form discussing the general nature of this subliminal study. This included the information that subliminal influence on self-concept was the subject of study but did not mention the specific messages utilized. A copy of the consent form appears in the Appendix.

The self-concept scale was then administered individually. Subjects were randomly assigned to one of three conditions, using the "fishbowl" method, the subjects themselves actually reaching into a large container filled with slips of paper denoting their group assignment (group "A," "B" or "C"). The experimental and neutral message groups were exposed to the subliminal visual messages, via a tachistoscopic device, for two milliseconds per exposure. The messages, or no message for the control group, were exposed via a tachistoscopic device for two milliseconds. The experimental group was exposed to the subliminal symbiotic message "Mommy and I are one" and a control group received the message "People are walking." A third group was be exposed to no message, only to tachistoscopic flashes of light through a blank slide. The message (or absence of it) was repeated five times per treatment, at intervals of five seconds, once per week for eight weeks (a

total of 40 exposures to the message, or lack of it). The self-concept scale was again administered individually, following the final treatment session.

Apparatus

The tachistoscopic device utilized was a modified Konica T3 Autoreflex single lens reflex (SLR) camera. The lens was removed and the camera was mounted on a tripod, adjusted to the height of the individual subject. A slide with the experimental, control message (printed in capital letters of pica size) or no message was placed behind the reflex and exposed at the 500 setting (two milliseconds) just as film would be in a normal SLR camera. The back of the camera was opened and a light source using a 60 watt bulb was placed immediately behind the slide in order to illuminate it upon exposure. The apparatus was field tested in order to assure its efficacy as a tachistoscopic device.

Analysis of the Data

A true experimental design was used and a total of three separate analysis were performed on the data. The Total Positive score from the TSCS pretest was used in a 2 X 3 analysis of variance (gender X treatment; symbiotic, neutral and no message) factorial design. This procedure was used prior to treatment as a preplanned comparison, in

order to assure initial equality among the groups. It was performed twice, initially on the total sample (n = 150) and again on the data produced from the subjects who completed the experiment (n = 90). This design was repeated on the posttest data in order to assess the main effects of the independent variables and any interaction effects among them. The final ANOVA was computed only on the subjects who completed the experiment.

Summary

The subjects in this study consisted of a total of 90 men and women who volunteered to participate in the experiment for extra credit in undergraduate psychology classes at a large southwestern university. The study began with 150 subjects, 42 dropped out before completion of the study (28 males and 14 females) and the data from 18 subjects (16 females and 2 males) were randomly discarded from the final analysis in order to maintain equal cell sizes. All six experimental cell can be characterized as predominantly white, young adults and their mean ages ranged from 19.7 years to 21.9 years.

The subjects gave written informed consent and completed the Tennessee Self-Concept Scale (TSCS). They were then exposed to the experimental message, a control message or no message, via a tachistoscopic device for two milliseconds, five times per week for eight weeks (a total

of 40 exposures). They then completed the TSCS a second time.

Three 2 X 3 (gender X treatment) analyses of variance were performed on the data yielded. The first tested whether there were significant differences between the groups comprising the initial sample on the self-concept measure (n = 150). The second was used to consider whether there were initial differences among the subjects who completed the study, on the level of self-concept. The final ANOVA was used to test whether significant differences existed between the experimental and control groups on the level of self-concept, following the eight week treatment.

CHAPTER IV

RESULTS

Introduction

The purpose of this chapter is to present the results of the statistical analysis to determine whether the effects of subliminal symbiotic visual stimulation are expressed on the self-reported self-concept of college students. A description of the results of three separate analyses of variance used to test this hypothesis are included.

Statistical Analysis of the Data

The first analysis of variance was utilized to determine whether there was any significant difference between the three groups (experimental message, neutral control message and no message control) on the level of self-reported self-concept as measured by the Tennesee Self-Concept Scale (Fitts, 1965). This analysis compared the self-concept scores of a total of 150 students who volunteered for the study at its inception. The results of the ANOVA, the mean values and standard deviations are recorded in Table 1.

Table 1

Results of Analysis of Variance

Source	Degrees of Freedom	Sum of Squares	Mean Square	F	Sig. Level
Gender	1	2705.131	2705.131	2.866	.089
Group	2	2183.71	1091.85	1.157	.318
Interaction	2	487.697	243.849	.258	.682
Within	144	135934.551	943.99		
Total	149	141311.068			

Means and Standard Deviations by Group

	Female	Male
Symbiotic	335.84 30.29	339.52 32.12
Neutral	325.24 33.4	337.6 18.1
No Message	335.84 36.52	345.28 26.66

The data analysis indicated that the sample means for the three groups averaged accross all levels do not differ significantly. Similarly, there do not appear to be significant differences for the interaction of gender and treatment group. This analysis suggests that the original subject sample, when assigned to treatment groups, was not significantly different on expressed levels of self-concept. There is no suggestion of initial differences between the groups in this respect. The mean and standard deviation of the TSCS (Fitts, 1965) are 345.52 and 30.7, respectively. The six groups did not differ significantly from this and may therefore be described as expressing a self-reported level of self-concept within the average range.

The second ANOVA was performed on the data generated from the pretests of the subjects who completed the eight week study. This procedure was utilized to test whether the subjects who finished the entire procedure differed significantly at the outset of the study on the level of self-concept. The results of this analysis are presented in Table 2.

Table 2

Results of Analysis of Variance

Source	Degrees of Freedom	Sum of Squares	Mean Square	F	Sig. Level
Gender	1	1795.603	1775.603	1.916	.167
Group	2	4317.427	2158.713	2.304	.104
Interaction	2	447.194	223.597	.239	.896
Within	84	78701.727	936.925		
Total	89	85261.95			

Means and Standard Deviations by Group

	Female	Male
Symbiotic	332.2 35.3	346.33 28.9
Neutral	329.2 37.5	339.1 18.4
No Message	349.2 35.3	352.27 18.1

Analysis of the data generated from the 90 students who completed the experiment suggest no significant differences based either on the main effects of gender and treatment or the interaction of those two variables. Initial equality of the groups was again suggested. It appears unlikely that this data was differentially affected by subject mortality whether by dropping out of the study or by randomly discarding data for the purpose of maintaining equal cell size. Group means and standard deviations are consistant with the means and standard deviations of the instrument. Taken together, the two preliminary data analyses suggest that the six groups were not significantly different on the self-concept measure. These analyses further indicate that the groups expressed a level of self-concept in the average range.

A third ANOVA was computed on the scores of the same 90 subjects considered in the second analysis, following 40 stimulations over an eight week period. The purpose of this analysis was to determine if any significant differences on the measure of self-concept emerged following the experimental and control treaments. The results of this analysis are recorded in Table 3.

Table 3

Results of Analysis of Variance

Source	Degrees of Freedom	Sum of Squares	Mean Square	F	Sig. Level
Gender	1	1969.352	1969.352	2.112	.146
Group	2	869.094	434.547	.466	.854
Interaction	2	1462.957	731.479	.785	.146
Within	84	78318.654	932.365		
Total	89	85261.95			

Means and Standard Deviations by Group

	Female	Male
Symbiotic	333 27.9	352.5 31.9
Neutral	345.9 32.6	345.67 23.5
No Message	345.87 34.6	354.73 24.6

The summary of the data in Table 3 suggests no significant differences between the three groups on the level of expressed self-concept. Group means and standard deviations continued to be consistant with the mean and standard deviation of the Tennessee Self-Concept Scale. Differences do not appear based on either gender or treatment group nor on the interaction of those to effects. The null hypothesis, tested at an alpha level of .05, that there would be no significant differences between males and females in groups exposed to subliminal symbiotic, subliminal neutral or no message groups, failed to be rejected in this analysis.

Summary

On the basis of these analyses, several conclusions can be made. The groups appeared equal on the self-concept meassure at the outset of the study. This was also indicated when subject mortality and the random discarding of data to maintain equal cell size were considered. The subjects used in the study expressed an average level of self-concept. Finally the reseach hypothesis, that subliminal symbiotic visual stimulation has an effect on the self-concept of college students, was not supported in this experiment.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate whether the application of subliminal symbiotic visual stimulation over an eight week period had any effect on the expressed level of self-concept of college students. The independent variables of gender and treatment group (subliminal symbiotic, subliminal neutral and no message) were compared to the total positive score of the Tennesee Self-Concept Scale (Fitts, 1965).

The subjects were 45 men and 45 women who participated in the study in order to obtain extra credit in undergraduate psychology classes. They were predominantly white, young adults. The original pool of 150 subjects (75 male and 75 female) was narrowed to the final sample by subject mortality and by discarding data randomly in order to obtain equal cell sizes.

Analysis of the total positive scores yielded by the Tennessee Self-Concept Scale, administered prior to treatment, indicated that both the original subject pool

and the final sample expressed a level of self-concept in the average range. In neither instance were there any significant initial differences between the six treatment groups on the level of self-concept. Following the eight-week treatment paradigm, the subjects in all six groups continued to express a level of self-concept in the average range and no significant differences between the groups were indicated. The liberal alpha level utilized ($p < .05$) was not reached and therefore the null hypothesis was not rejected.

Limitations

This experimental design attempted to control threats to internal and external validity in several different ways. Contemporary history and the maturation process were controlled by running all the subjects during the same period of time, although it is likely that most of the subjects were somewhat more "psychologically sophisticated" at the conclusion of the experiment by virtue of having been in psychology classes. Although pretesting procedures to control for initial differences between the groups may have altered their posttest scores, any changes were not significant. The measuring instrument (the Tennessee Self-Concept Scale) was used before and after treatment but change scores were not considered.

Regression toward the mean did not appear to be a

differential effect as all groups before and after the experiment scored in the average range. Differential subject selection limits the generalizability of this study. All subjects were in undergraduate psychology classes, received extra credit if they finished the study and were quite predominantly young and Caucasian. Differential mortality was controlled by randomly discarding data beyond those who dropped out. However, many more men dropped out of the study than women (38 men compared to 14 women). Although the subjects were "blind" to the actual stimulation to which they were exposed, the experimenter was not, and the possibility of experimenter bias exists. Because no statistically significant differences are indicated in the study, it is unlikely that these threats to validity, either singularly or in combination, distort the final conclusions.

The outcome of the study must also be considered in view of the degree to which "subliminality" was achieved. In most of Silverman's work, experimental subjects were exposed to stimulations for four milliseconds. Because of the numerous (40) repetitions of the stimulation, the experimenter chose to limit stimulus exposure to two milliseconds. Following the eight-week study and completion of the self-concept scale, the subjects were asked to describe what message they believed they were exposed to and their degree of certainty (from 10% to

100%).

Of the females who were exposed to a blank slide, nine (47%) believed this to be the case. Eight of them (43%) had no idea what the message might be. One believed the message to be "MOMMY AND DADDY ARE ONE" and another believed the slide read "DO CROSS HERE." Nine males (56%) in this group believed there to be no message. Six (38%) had no idea what it might read and one recounted an extensive positive message relating to the enhancement of love and reinforcement of religion.

In the neutral message group, 15 of the females (75%) correctly identified the message as "PEOPLE ARE WALKING." The remaining five identified it as "PEOPLE," "PEOPLE WERE WALKING," "PEOPLE WERE TALKING," and "PEOPLE LIKE YOU FOR WHO YOU ARE." Nine of the males (60%) correctly identified the message while four others gave responses that identified the first word of the message and two had no idea what the message was.

A total of 82% (16) of the females in the experimental group correctly perceived the message to be "MOMMY AND I ARE ONE." Four others identified the first word, one identified it as "MANDY" and another had no idea what the message was. In the experimental group, there was a disparity between the males and females unobserved in the other groups. Five of the males (31%) correctly identified the message. Three (19%) had no idea and three others wrote

that they believed it to be a nonspecific positive message. Other suggestions included "MOMMY CAN I GO OUTSIDE," "BY NOW YOU KNOW MY NAME," "A SUBLIMINAL MESSAGE" and "MONEY AND I ARE ONE."

Despite the experimenter's efforts to maintain the "subliminality" of the messages by cutting exposure time from four milliseconds to two milliseconds, many of the subjects were able to correctly identify it following the eight week study. The subjects were observed casually by the examiner to discuss among themselves what they believed their messages to be and it may be that this resulted in inflated rates of apparent "supraliminality." (This notion may be supported by the response of one female who believed the blank slide to read "MOMMY AND DADDY ARE ONE.") It is interesting to note that the group indicated by the literature (Jackson, 1983; Silverman, 1983; Silverman and Grabowski, 1982) to be most likely to respond to the subliminal symbiotic message, the male experimental group, was less able to correctly identify it. Although that group had the highest level of "subliminality," their responses on the dependent variable were not significantly different from the groups for whom the messages were apparently supraliminal.

Discussion and Conclusions

The major conclusion of this study is that subliminal symbiotic visual stimulation does not appear to have any effect on the self-expressed self-concept of college students. However, this conclusion may not extend to other populations and should be generalized only to young, caucasian student populations whose self-concept measures within the average range.

There are several possibilities as to why the treatment appeared to have no effect. It may simply be an ineffective treatment modality. The symbiotic stimulus may have no effect on those with an average self-concept because they may have successfully and realistically dealt with the separation anxiety and individuated adequately from their mother at the conclusion of the sybiotic phase of their development. The treatment effect may require more time, more exposures or both in order to be exherted to such as degree as to be measureable in this type of paradigm. Finally, it may be, based on the subjects perceptions, that two millisecond exposures utilizing similar tachistoscopic devices are not subliminal but are supraliminal.

Recommendations for Further Research

There are many considerations that may clarify the efficacy of the use of subliminal symbiotic visual

stimulation. Because of the transient nature of the student sample utilized, there could be no follow-up. Studies using temporally longer paradigms may demonstrate different results. Utilizing subjects with poor self-concepts, rather than those meassuring in the average range, with control procedures similar to those in this experiment and, if possible, using "double-blind" procedures, may result in a significant treatment effect. Subject samples with greater cultural and chronological diversity would also be useful in elucidating whether the subliminal symbiotic theory has validity. It is also likely that the use of more rapid exposures (e.g. one millisecond), especially when utilizing a subject sample with the reading recognition skills of typical college students, will achieve a higher degree of true "subliminality."

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APPENDIX

Informed Consent for Participation in Research

Your voluntary participation in a research project on the effects of visual stimulation presented below the level of consciousness on self-concept is subject to an understanding of the following provisions. You must be 18 years or older to participate. You can refuse to participate or withdraw from the project at any time. Any questions you have regarding the project will be answered with the exception of the specific messages used in the subliminal exposures. You will be informed, should you request it, of your scores on all measures utilized and an interpretation provided at that time. Following the study, the specific message and the theoretical intent will be explained to you upon request. The results of the study will be provided to you upon request. The messages used have never been indicated to have any adverse effect on subjects in similar studies. Subjects in the experimental group may benefit from an increased degree of self-esteem. Your confidentiality will be protected by a coding system based on your gender, initials and the group to which you are assigned, which will be entered on test protocals, rather than names. Only the experimenter will have access to those codes. Following the study all protocals will be shredded. Participation will require approximately one hour of your time (10 to 15 minutes for each of two self-concept scales and 3 to 5 minutes for each treatment) over an eight week period.

I have read and understand the above provisions. I understand that no medical service or compensation is provided to subjects by Southwest Missouri State University as a result of injury from participation in research. I agree to participate in this study based on the above provisions.

VITA

Dean Parker Montgomery, Jr.

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE EFFECTS OF SUBLIMINAL VISUAL SYMBIOTIC STIMULATION ON THE SELF-CONCEPT OF COLLEGE STUDENTS

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