



The effects of autogenic exercises and the ability of college students to think abstractly as measured by electromyographic biofeedback
by Dennis Lorry Weems

A dissertation submitted in partial fulfillment of the requirements for the degree of DOCTOR OF EDUCATION

Montana State University

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Abstract:

This study concerns itself with the effect of skeletal -muscle tension and the ability of college students to think abstractly. It used an Autogen 1700 Electromyograph (EMG) to measure muscle potentials produced during a mathematics test designed to elicit abstract thinking in college students. Two specific muscle groups were measured during the abstract thinking ability test. They were frontalis and trapezius muscle groups.

The Pretest-Posttest Control Group experimental design was used to collect the data. Statistical analysis was performed on two dependent variables: mathematics test raw scores and test item indices obtained on the EMG during the mathematical test administration. A Student's "t" was used to analyse the difference between group means of the experimental and control groups. This method was chosen to determine whether or not the "treatment" (autogenic relaxation exercises and biofeedback) was at all related to observed differences in the group means. Further statistical treatment was performed on each dependent variable in conjunction with five biographical variables. These biographical variables are: gender, age, marital status, GPA, and handedness. Multiple-regression analysis was performed to find out if either abstract thinking or skeletal muscle tension could be predicted by the five independent variables operating jointly and/or individually.

The study found that the treatment was capable of significantly increasing abstract thinking ability in the experimental group. It was found that differences between experimental and control groups' posttest measures of abstract thinking ability were also significant.

It was discovered that the control group increased their abstract thinking scores significantly. However, an analysis of gain scores between the experimental and control groups shows that the experimental group increased their scores by a group average of 3.16 scores while the control group increased their scores by a group average of 1.32 scores. The study found that only the independent variable "gender" was statistically significant when used to predict abstract thinking ability or skeletal muscle tension. A review of the control group raw data shows that men tended to gain .987 on the item tension indices scale while women tended to gain .282 on the same scale.

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STUDENTS TO THINK ABSTRACTLY AS MEASURED
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by

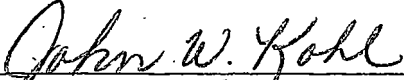
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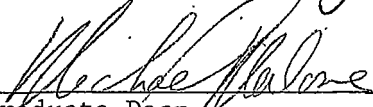
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ABSTRACT

This study concerns itself with the effect of skeletal muscle tension and the ability of college students to think abstractly. It used an Autogen 1700 Electromyograph (EMG) to measure muscle potentials produced during a mathematics test designed to elicit abstract thinking in college students. Two specific muscle groups were measured during the abstract thinking ability test. They were frontalis and trapezius muscle groups.

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Chapter 1

INTRODUCTION

In September, 1968, two researcher/educators published their "polemical tract" entitled the Teaching-Learning Paradox: A Comparative Analysis of College Teaching Methods. Robert Dubin and Thomas Taveggia under a contract with the Division of Educational Laboratories of the Office of Education and under the auspices of The Center for the Advanced Study of Educational Administration, University of Oregon at Eugene, produced this state-of-the-art review of some four decades of studies done on the comparative college teaching methods in the United States. These studies began with the period just following World War I and continued through to the 1960's. The authors proceeded not to merely present a collection of "findings" and "conclusions" of past studies but rather to restudy all the available "data" and draw their own conclusions.

It has only been in the current decade that recognition has grown apace that we really do not know what the linkage is between teaching and learning. . . . This monograph will have made significant contribution if it does nothing more than fortify the conclusion that we have not yet established adequate theories of the linkages between teaching and learning. (Dubin and Taveggia, 1968).

The findings of this study do not hold many surprises for most educational practitioners. "We are able to state decisively that no

particular method of college instruction is measureable to be preferred over another, when evaluated by student examination performances" (Dubin and Taveggia, 1968, p. 10).

The fundamental conclusion of this study implies that educators cannot afford to ignore the teaching-learning link. The authors go on to extend their conclusion by stating:

We do, however, believe that anyone working or doing research at the college level of instruction can most readily make useful contribution when this linkage between teaching and learning becomes the center of their attention. (Dubin and Taveggia, 1968, p. 8).

It is the abundance of evidence that is presented in the Dubin/Taveggia study as well as the author's own experience and observations regarding adult college level teaching that prompts the writer to take the exhortation of the Dubin/Taveggia study and "make useful contributions" by taking a small step in the direction of removing some of the myths and persistent traditionalisms which have prevented the empirical determination of the learning-teaching process.

If one conceptualizes the teaching-learning process from a systems analysis viewpoint there are two basic models which become most evident. The first is the familiar "black box."

