PREDICTION OF ACHIEVEMENT IN READING, SELF-ESTEEM, AUDING, AND VERBAL LANGUAGE BY ADULT ILLITERATES IN A PSYCHOEDUCATIONAL TUTORIAL PROGRAM

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Examined the effectiveness of specific psychoeducational tutoring methods on achievement in reading, self-esteem, auding, and verbal language. Ss (N = 132) were youths and adults reading below fifth level who volunteered to participate in an adult tutorial project. After the assessment of entry level achievement, Ss received psychoeducational tutoring. Comparison of pre- with posttest scores indicated that Ss made significant improvement in reading, self-esteem, auding, and verbal language. Pretest scores were related most strongly to posttest scores. Initial verbal language scores were related significantly to posttest reading and auding scores. The study also tested the adequacy of a developmental reading model for adult illiterates. Auding and verbal language scores exceeded reading scores, as theorized. Further research is needed to determine whether gains in achievement continue and whether low intellectual levels or specific language disabilities are contributing to the low levels of reading, auding, and verbal language.

Results of the Adult Performance Level study that estimated that some 23 million adults are functionally illiterate spurred the publication of numerous surveys and descriptions of adult illiteracy programs (Hunter & Harman, 1979; Kozol, 1980; Newton, 1980). Included in one survey was a search to identify the effectiveness of these programs. Investigators concluded that little statistical data are available to indicate achievement or impact of adult literacy projects (Hunter & Harman, 1979). However, informal reports of literacy projects funded by federal education agencies are available.

Past Research-Adult Tutorial Programs

A Right to Read report (U.S. Department of Education, 1980) revealed that in 1977-78, 79 reading academies were funded and enrolled 29,181 youths and adults in 34 states and the District of Columbia at a cost of four million dollars. In another report on reading academies, Elbers (1980) revealed that an average gain of 2.06 years in reading ability was made during a 1-year period. The report also includes descriptions that indicate that a variety of assessment and instructional procedures were used to measure gains. The findings of five adult academies are described below.

The Outreach Reading Academy in California employed individual and small group instruction using functional reading units. Pre- and posttest results on the Gates MacGinitie test after 30 hours of instruction showed gains of 1.5, 2.0, and 2.2 for those reading on grade levels 0-3, 4-6, and 7-9, respectively.

The Derecho a Leer program in California offered two 2-hour instructional sessions and required 2 hours of homework per week. Pre- and posttest results on the Wide Range Achievement Test (WRAT) after 30 hours of instruction showed gains between 1.1 and 2.5.

The Lafayette Reading Academy in Indiana offered individual tutoring 3 hours per week. After 4 to 6 months, pre- and posttest results on the Woodcock Reading Mastery Test, the Analytical Reading Inventory, the Adult Basic Learning Examination, and the Adult Performance level revealed gains of 1.2 and less.

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than 1 year for participants whose grade levels were 0-3 and 4-10, respectively. An age breakdown showed that participants 16-35 years of age made less than 1 year gain and those over 35 years made a 1.7 gain.

The Jobs for Youth program in New York offered a laboratory setting wherein participants worked individually on objective based curriculum 5 hours per week. After 40 hours of instruction, pre- and posttest results on the Adult Basic Learning Examination revealed gains of 1.7, 1.2, and .4 for participants who were reading 0-3 level, 4-6 level, and 7-10 level, respectively.

The Houston Community College Reading Academy in Texas provided individual tutoring and small group instruction. After 40 hours, pre- and posttest results on the Slosson Oral Reading Test revealed an average gain of 1 year for those who were receiving individual tutoring.

From the above discussion, it can be concluded that reading academies around the nation use a variety of assessment and instructional practices. While such diversity makes comparisons difficult, it appears that 30-40 hours of individual instruction effectuate a gain in reading of 1 to 2 years.

Problems Related to Research in Adult Literacy Projects

The reports of past projects suggest that gain in reading achievement was the primary focus. Other factors that may impact on reading development such as language development or self-esteem were not reported. Discussions with regard to adult illiterates reveal that these factors also may be important in developing reading ability.

Most of what has been written about these factors comes from informal observations. It has been observed that some adult illiterates have accumulated wisdom from diverse life experiences and that the handicap of educational deprivation actually may have sharpened their senses so that they cultivated shrewdness, the ability to think, and a high level of common sense (Ulmer, 1969). Illiteracy in adulthood, however, presumably leads to low self-esteem (Newman, 1980). Verbal deficiencies have been noted frequently, but attributed to idiosyncratic language patterns or anxiety rather than a lack of word knowledge or ability (Bowren & Zintz, 1977).

Research with respect to these observations has been hampered by the fact that there are few standardized tests appropriate for adult illiterates. While these adults may have a wide range of experiences and use a variety of coping skills, such coping skills and experiences are not measured on standardized tests. Therefore, in adult literacy projects it is difficult to ascertain entry level skills so that instructional programs can be planned accordingly.

The purpose of this article is to present the findings of an evaluation of an adult tutorial project undertaken at The Johns Hopkins University. The Johns Hopkins University established an adult academy that offers individual assessment and psychoeducational instruction to adults who are reading below fifth level. Assessment and instructional practices were based on an audition-language developmental model of reading.

A Developmental Reading Model

The developmental reading model is predicted on a language-based theory of reading. As defined by Johnson and Myklebust (1967), reading is “a visual symbol system superimposed on auditory language [p. 148].” Because language is a prerequisite for learning to read, it also should be the basis of reading instruction.

Sticht et al. (1974) have described a developmental audition-language model of reading as follows:

The model proposes four major sets of processes in a developmental sequence to describe the development of audition and reading: (a) the basic adaptive processes (BAPs—seeing, hearing, cognitive, motor movement), (b) the
It is hypothesized that: (1) auding and verbal language abilities surpass reading abilities and that (2) auding is predictive of reading performance after decoding skills are acquired. While much of the data that support this model are based on studies of children, some preliminary studies show the model to be valid for adult beginning readers (Sticht, 1979).

Implications for Tutorial Instruction

The educational implications derived from the developmental reading model are clear. Teaching new vocabulary and concepts to unskilled readers requires an oracy-to-literacy sequence to instruction. Methods for teaching reading and writing must incorporate strategies that first develop auding and speaking abilities in the content areas. Then reading and writing are introduced. This sequence of instruction reduces the learning burden by not requiring the simultaneous learning of new vocabulary and decoding.

In addition to incorporating an appropriate sequence of instruction, tutorial methods for adults must reflect what is known about adult motivation. Kidd (1973) and Knowles (1973) suggest that the demands of the adults' present situations orient their learning to the here and now. Adults are motivated by immediate application of new skills. This means that in tutoring the unskilled adult reader, the tutor must provide appropriate reading instruction based on the adults' identified needs and interests. This requires the incorporation of instruction to develop reading skills with materials of interest to adults. Because there is a dearth of materials written on easy levels for adults, tutors cannot rely on workbooks or other traditional instructional materials. Instead, they must rely on their own skills in applying instructional methods that allow for the development of reading ability in the areas of interest to adults.

A Psychoeducational Tutorial Method

A psychoeducational tutorial method that embraces the basic tenets of both the developmental reading model and adult motivational theory has been developed at The Johns Hopkins University. Known as the Directed Listening-Language Approach (DL-LEA), it is an oracy-to-literacy method of teaching reading. A directed listening stage has been added to the language experience approach. The DL-LEA enables the tutor to integrate the teaching of auding, language, and reading skills with materials of interest to adults.

The DL-LEA is a method that integrates the learning of any subject matter and learning to read. The beginning reader learns basic concepts and facts that pertain to subject matter in an oracy-to-literacy sequence. The method is intended for those who cannot read the material themselves because they lack the necessary sight vocabulary or word recognition skills. The DL-LEA begins with the beginning reader's background of knowledge in the subject area and develops that knowledge through discussion and directed listening. Reading is introduced when the beginning reader summarizes the important points learned and observes as the tutor writes the exact words. The final product is a summary by the beginning reader of content materials. The summary is used to teach reading and reinforce skills. The DL-LEA combines the use of a directed listening technique and the language experience approach.

The Directed Listening Technique (DL). The directed listening technique is a process for motivating and guiding the beginning reader to listen. It capitalizes on the fact that although beginning readers may not have the skills to read the
materials themselves, they do have the ability to listen and learn from them. Even individuals who are reading only on second- or third-grade levels, generally, can listen and comprehend material written at higher levels.

To facilitate auding, the tutor motivates and directs the listening using a problem-solving approach to generate questions. The problem-solving approach is used to develop oral language and promote discussion about the topic. As the student shares previous experiences and knowledge, points of dispute and obvious gaps in knowledge become apparent. With curiosity thus stimulated, the beginning reader is motivated to listen for specific information that will clarify and refine previous knowledge. The major point, however, is that the beginning reader know the why and what of listening. The tutor then reads aloud a short passage from a textbook, manual, workbook, newspaper, magazine or anything relevant to the topic.

The Language Experience Approach (LEA). The language experience approach (LEA) is an instructional method that has been advocated by Kozol (1980) and Newton (1980) for use with youths and adults. It is a method for teaching reading that emphasizes that reading is just talk written down. It makes use of the experiential backgrounds of the learner and affords a high degree of individualization with regard to topic and development of reading skills. Conventional LEA procedures have been described by Stauffer (1970) and adapted for tutor use by Colvin and Root (1972). In developing the conventional language experience story, the beginning reader talks about anything. As the beginning reader talks, the tutor writes the exact words.

In the DL-LEA, however, the beginning reader talks about information related to the direct listening stage and the subject matter that has been read aloud by the tutor. The tutor requires the recall of specific facts to clarify disputes, develop knowledge, and substantiate inferences and opinions. After the discussion the beginning reader sequences and summarizes the facts into sentences, which constitute the LEA story. The sentences are written by the tutor as the beginning reader dictates and observes. The written story is the final product of the DL-LEA. The story is used to teach reading skills and provide reading practice.

The DL-LEA, then, is based on a sound developmental reading model and the basic principles of motivation and learning. Tutors at The Johns Hopkins University tutorial project are trained to utilize it as the primary method of instruction.

Implications for Research

Because the developmental reading model indicates the use of a specific instructional strategy, the effectiveness of such a strategy must be measured. In addition, the developmental reading model suggests the possibility of predicting gains in achievement. It is possible that one or more components of the model alone or in combination with other characteristics may be predictive of posttest achievement. Specifically, age, grade completion, and entry levels of reading, self-esteem, auding, and verbal language may be predictive of posttest scores.

This study was designed to evaluate the effects of a psychoeducational tutorial method on specific skills and the extent to which specific entry level characteristics predict posttest scores. The study was undertaken to answer two major questions: (1) Do Ss demonstrate significant gains in reading, self-esteem, auding, and verbal language? and (2) Are pretest measures predictive of posttest scores?

**Method**

**Subjects**

Participants were drawn from the metropolitan Baltimore area and inmate populations at two penal institutions. They learned about the program through a variety of advertising strategies. A total of 132 volunteered for the program.
Approximately 95% were male; consequently, sex differences were not examined in this study. The group was racially heterogeneous; preliminary statistical analyses showed that race was not associated with any of the variables under study, however. Participants' ages ranged from 13 to 71 (mean age = 27.8 years; SD = 11.8). The mean educational level of the group was 7.5 years (SD = 2.4).

Procedures

Testing of Participants. Participants were pretested individually by Academy staff. The assessment battery consisted of the Reading Subtest of the Wide Range Achievement Test (WRAT) (Jastak & Jastak, 1965); the Coopersmith Self-Esteem Inventory, Form C, (Coopersmith, 1967); Reading Evaluation—Adult Diagnosis (READ), (Colvin & Root, 1976); and Verbal Opposites subtest of the Detroit Test of Learning Aptitude (DTLA) (Baker & Leland, 1967).

The Reading Subtest (Level II) of the WRAT measures isolated word recognition and consists of 74 words arranged in order of difficulty. Scores are reported in terms of grade level. Split-half reliabilities are generally high, averaging .93, and the validity of the test has been well established (Jastak & Jastak, 1965).

The Coopersmith Self-Esteem Inventory, Form C, (Coopersmith, 1967) consists of 25 descriptive statements to which the S responds "like me" or "unlike me." Statements were read aloud to the S, and the examiner recorded the answer. The 25 items are a subtest of 50 items used by Rogers and Dymond (1954) and correlate .86 with the larger form. No reliability data are available for the short form, but the reliability would be expected to be comparable though slightly less than that for the long form (.88 test-retest; Coopersmith, 1967). Coopersmith (1967) has shown that the scores on the test are related to a number of relevant variables including behavior ratings of esteem, creativity, and academic achievement.

The READ, an informal reading inventory developed by Colvin and Root (1976), was used to assess auding (listening comprehension). Examiners followed directions for determining auding outlined by Stauffer, Abrams, and Pikulski (1978). Briefly, the examiners read passages aloud to the S until the S answered less than 75% of the questions correctly. The highest level at which the S answered 75% of the questions correctly was determined to be the auding level. The use of the informal inventory employing standardized procedures was warranted because there is no standardized measure of auding appropriate for an adult population (Farr, 1969).

The Verbal Opposites Subtest of the DTLA was used to assess verbal languages. The test consists of 96 words arranged in order of difficulty. The words are pronounced by the examiner, and the S supplies the associated antonym. Scores are reported with reference to mental age norms. The test has acceptable validity and reliability according to Baker and Leland (1967).

Academy staff used results of the assessments to develop individual tutoring plans. The plans outlined strategies for integrating the participants' instructional needs and The Johns Hopkins University Academy procedures.

Training of Tutors. Tutors who volunteered to give individual instruction were trained in The Johns Hopkins University Academy procedures. They received 12 hours of group instruction in tutoring procedures. Specifically, the use of the DL-LEA and instructions for keeping records of progress were stressed.

Program Implementation. Academy staff matched participants and tutors. Most participants received 1 hour of instruction two times a week. Because of variability in attendance, the number of tutoring hours varied slightly, with a mean of 15.9 hours (SD = 8.1). Progress was monitored weekly using the specific record-keeping procedures. Additional tutor training sessions were held each month. Participants were posttested on the assessment measures in May and June of 1980.
Statistical Analyses

A series of t-tests were performed to see whether there were any significant gains in reading (word recognition), self-esteem, auding, and verbal language. Multiple regression analyses were performed to determine the contribution of age, grade completion, and pretest levels on reading, self-esteem, and language posttest scores. Because not everyone took all of the tests, Ns varied across analyses and are reported accordingly.

RESULTS

Gains in Performance

Mean scores for pre- and posttest scores on the reading, self-esteem, auding, and language variables are presented in Table 1, with t-test results of the significance of differences between pre- and posttest scores. Significant gains were found for all four variables.

TABLE 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest</th>
<th>Posttest</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>X</td>
</tr>
<tr>
<td>Reading</td>
<td>64</td>
<td>3.54*</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>61</td>
<td>62.72b</td>
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<tr>
<td>Auding</td>
<td>22</td>
<td>4.00c</td>
</tr>
<tr>
<td>Verbal language</td>
<td>33</td>
<td>11.29d</td>
</tr>
</tbody>
</table>

*p < .001 (two-tailed).

Grade level as measured by the WRAT.

Scale score as measured by the Coopersmith.

Grade level as measured by IRI.

Mental age as measured by the Detroit.

Predicting Posttest Performance

In the second set of analyses, posttest scores were regressed on pretest scores for the four variables along with age and grade completion. No variable accounted for significant amounts of variance in posttest scores beyond what could be accounted for by pretest scores on that measure. Therefore, simple correlations are reported here for all relationships that were statistically significant. A summary of those findings can be found in Table 2; a brief description of those findings follows.

Reading. Reading posttest level was associated with the highest grade completed, reading pretest level, and verbal language pretest level. In short, those who had more education and higher prior levels of reading and verbal language ability had the highest reading scores at the end of the program.

Self-esteem. The only significant relationship found was with pretest self-esteem scores. This means that the Ss with the highest scores at the outset of the program were the Ss with the highest self-esteem at the end of the program.

Auding. Final auding scores were associated with initial language, auding, and reading levels. The higher an individual's initial score on verbal language, auding, and reading, the more likely it is that the individual would show a relatively higher posttest level of auding.

Language. Final language scores were associated significantly with verbal language and self-esteem pretest scores. In this case, Ss with higher verbal language ability and self-esteem scored higher on the verbal language posttest than those with lower verbal language ability and self-esteem.
### Prediction of Achievement

#### TABLE 2
PREDICTING POSTTEST SCORES FROM PRETEST MEASURES

<table>
<thead>
<tr>
<th>Pretest measures</th>
<th>Reading</th>
<th>Self-esteem</th>
<th>Auding</th>
<th>Verbal language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.17</td>
<td>-.01</td>
<td>-.13</td>
<td>-.18</td>
</tr>
<tr>
<td></td>
<td>(64)</td>
<td>(61)</td>
<td>(22)</td>
<td>(34)</td>
</tr>
<tr>
<td>Grade completion</td>
<td>.50**</td>
<td>.04</td>
<td>.22</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>(57)</td>
<td>(55)</td>
<td>(20)</td>
<td>(30)</td>
</tr>
<tr>
<td>Reading pretest</td>
<td>.90**</td>
<td>.09</td>
<td>.54*</td>
<td>.36*</td>
</tr>
<tr>
<td></td>
<td>(64)</td>
<td>(61)</td>
<td>(22)</td>
<td>(34)</td>
</tr>
<tr>
<td>Self-esteem pretest</td>
<td>.20</td>
<td>.81**</td>
<td>-.03</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>(62)</td>
<td>(61)</td>
<td>(22)</td>
<td>(34)</td>
</tr>
<tr>
<td>Auding pretest</td>
<td>.27</td>
<td>.16</td>
<td>.73**</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>(52)</td>
<td>(50)</td>
<td>(22)</td>
<td>(34)</td>
</tr>
<tr>
<td>Verbal language pretest</td>
<td>.49**</td>
<td>.16</td>
<td>.61**</td>
<td>.84**</td>
</tr>
<tr>
<td></td>
<td>(64)</td>
<td>(61)</td>
<td>(22)</td>
<td>(33)</td>
</tr>
</tbody>
</table>

* *p < .01.

** *p < .001.

Note.—Numbers in parentheses represent number of Ss.

### Discussion

#### Gains in Achievement

The results of the study revealed that adult beginning readers provided with individual psychoeducational tutoring demonstrated significant gains in reading, self-esteem, auding, and verbal language. Scores revealed Ss to be reading at 3.5 mean grade level prior to tutoring and at a 4.6 mean grade level after tutoring, demonstrating a mean gain of 1.6 grade levels. Ss entered the program reading substantially below the estimated level needed to function successfully in society. Although they made significant gains after tutoring, they were still reading at low levels that indicated a need for further tutoring.

In the area of self-esteem, Ss scored at a mean of 62.7 level, which is slightly below the 70-80 average range. The mean posttest level was 70.3, a mean gain of 8 points. This gain was significant and improved self-esteem to within the low end of the average range.

In the area of auding, Ss scored at the 4.0 grade level on the pretest and at the 5.2 grade level on the posttest, a mean gain of 1.2 grade levels. In verbal language, pretest scores revealed Ss to be functioning at 11.3 mental age and a 12.7 mental age after tutoring. This equates roughly with sixth- and seventh-grade respectively, and reflected a mean gain of 1.4 years.

Speculation about the Ss' low verbal language and auding levels must include several factors. Because Ss completed fewer years of school, they were probably less comfortable taking tests and were not familiar with test-taking strategies. Therefore, test anxiety may have lowered the scores. In addition, the tests employed may have been inappropriate for this population. As discussed previously, appropriate standardized tests were not available. The investigators selected from available measures tests with relevant content and acceptable validity and reliability.

A major question concerns the overall intellectual ability of this population. Are the low verbal language levels a consequence of not learning to read rather
than an indication of overall intellectual ability? Studies have shown that language development is greatest during the school years and falls off thereafter. Ss' low level of verbal language functioning could be explained by the fact that the average grade completion was 7.5. Furthermore, it is theorized that the vocabulary of most literate adults is acquired through reading (Smith, 1978). Therefore, the verbal language development of nonreading adults who have dropped out of school is likely to be low. In addition, it is believed that illiterates become outsiders and adapt for survival by forming a subculture of their own. The subculture further isolates and alienates them from the mainstream (Lyman, 1976). Therefore, the low verbal language scores could reflect the general alienation from the mainstream of society. Recognizing that illiterate adults have demonstrated a level of intellectual functioning by the very process of surviving in a literate society, it is likely that low verbal language ability was a consequence of the concomitant fewer years of schooling, inability to read, and alienation from the literate mainstream of society. Although significant gains were made in auding and verbal language, posttest scores indicate the need for further tutoring.

Predicting Achievement

Results of the correlation analyses revealed that a number of variables were associated with posttest achievement levels. For reading, self-esteem, auding, and verbal language, Ss with the highest pretest scores had the highest posttest scores. Reading also was associated with high grade completion and verbal language pretest scores. For language, high reading pretest scores were related significantly and for auding, reading and verbal language pretest scores were related significantly.

Reading. Ss with the highest grade completion had the highest reading scores at the end of the program. This may be indicative of higher levels of motivation that sustained these Ss in formal school environments despite their poor verbal language and reading abilities. Motivation may have affected the levels of enthusiasm and effort exhibited during the tutorial instruction, which ultimately resulted in higher gains in reading achievement.

Moreover, these Ss may have acquired some reading ability, but had very limited experiences with reading and thereby forgot the skills. Therefore, they benefitted from the practice provided by reading with a tutor. Initially, the tutoring and homework practice provided the only reading tasks they undertook, but ultimately they became aware of the greater variety of materials they were capable of reading and spent more time reading.

On the other hand, Ss with low pretest reading scores were nonreaders who never learned to read. Moreover, in their efforts to learn to read they adopted strategies that impeded the learning to read process. For example, when asked to read, some Ss responded with naming letters of a word, while others struggled to use phonics to "sound out the letters." Even if some rudimentary reading skills were acquired, Ss had few interesting materials to read. Without practice, these rudimentary skills were not retained. In the tutoring program, reading practice in interesting materials was provided.

Higher verbal language pretest scores were associated with high reading achievement. This finding is not surprising in view of past research that has shown language development to be correlated with reading achievement for children. For these adult beginning readers, then, verbal language development was also a critical factor in subsequent reading achievement.

Self-esteem. Results of the analysis revealed that the Ss with the highest pretest scores on the self-esteem measure had the highest posttest scores. Contrary to popular belief, it does not appear that for these adults self-esteem was associated to a significant degree with reading ability. This could be explained by the fact that illiterate adults use a variety of defense mechanisms that allow them to mask
their inability to read. Self-esteem, therefore, may be related to the ability to use coping strategies rather than to specific literacy skills per se.

**Auding.** Ss with higher pretest scores had higher posttest scores. It could be theorized that as in reading, those who had acquired some auding skills were able to hone these skills. Those with very low auding scores could have a specific language or memory problem that impaired their ability to receive, understand, store, or retrieve information auditorily. Special help could be needed in these cases.

**Language.** Final verbal language scores were associated with high pretest scores on reading and verbal language. This finding substantiates the inextricable relationship between verbal language and reading. It also demonstrates how each contributes to the development of the other, i.e., while language is a precursor of reading, once reading is developed, it enhances language development.

The significant contributions of both verbal language and reading substantiate the validity of the developmental reading model for the adult beginning reader. Auding, verbal language, and reading contribute inextricably to the development of auding, verbal language, and reading skills.

**CONCLUSIONS**

Results of this study support the use of psychoeducational methods with adult beginning readers. Specifically, the DL-LEA effectuated significant gains in reading, self-esteem, auding, and verbal language. In predicting posttest scores, auding, language, and reading pretest skills contributed significantly. Although Ss made significant gains, their achievement in reading, auding, and verbal language was at low levels, which indicates the need for further tutorial instruction.

Future studies might explore the language, learning, and intellectual abilities of adult illiterates. Specific semantic, syntactic, and phonological components of language were not addressed in this study; nor were verbal and performance aspects of intelligence compared. Results suggest that these aspects of intelligence be compared to determine the extent to which specific language or learning disabilities or low intellectual abilities play a part in the low level of skills demonstrated by this population.

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TRANSCENDENTAL MEDITATION AND PROGRESSIVE RELAXATION: THEIR PHYSIOLOGICAL EFFECTS

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Measured oxygen consumption, tidal volume, respiration rate, heart rate, systolic and diastolic blood pressure before the Ss (N = 39) learned Transcendental Meditation (TM: N = 21) or Jacobson's Progressive Relaxation (PR: N = 18). Ss were tested immediately after learning either technique and again 5, 10, and 15 weeks later. While there were no significant differences between groups for any of the physiological variables at pretest, the TM group displayed more significant decreases during meditation and during activity than did the PR group. Both groups displayed significantly lowered metabolic rates during TM or PR. The generally more significant and comprehensive results for meditators were explained primarily in terms of the greater amount of time the TM group spent on their technique, plus the differences in the two techniques themselves. Several avenues for future research are discussed.

With the influx of Eastern philosophies and meditation techniques into the western world in the last few decades, increasing public attention, and more belatedly, scientific scrutiny has been focused on the claims made by serious practitioners of Yoga and related disciplines. With the advent of growing popularity has come some research evidence to substantiate in part claims of physiological benefits received by regular practitioners of meditation.

While the thrust of research evidence on Transcendental Meditation (TM) superficially indicates benefits over a broad spectrum of physiological variables, the current state of the research precludes any definitive statement of its effects, for two reasons: (1) Methodological problems in the research; and (2) a significant proportion of studies demonstrate conflicting results.

In the haste to demonstrate beneficial results from TM, many studies have controlled inadequately for many confounding variables.

The following studies have demonstrated significant effects in: (1) Heart rate (Wallace, 1970; Wallace & Benson, 1972; Wallace, Benson, & Wilson, 1971);