

An evaluation of SALT (Suggestive-accelerative learning and teaching) techniques

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Outline of where you are going

So that you know the structure of this paper, and so that you may select particular sections of interest to you for careful reading, the sequence of sections and their contents is outlined below.

- Section 1: Introduction to the need for accelerative learning and the claims made about the system.
- Section 2: A description of the various techniques employed in Suggestopedia, SALT and Superlearning. The component parts are assessed in terms of the studies which have attempted to evaluate isolated components.
- Section 3: An analysis of the apparently extraneous factors which may influence the outcome of the studies.
- Section 4: Outline of the range of results reported in evaluating the techniques.
- Section 5: Review of the methodology of reported studies, in order to assess the validity of the results produced.
- Section 6: Brief outline of the methodology of the present study.
- Section 7: Description of the results of the present study.
- Section 8: Conclusion from the present study and the literature review.

1. Introduction

Advances in technology in recent years have led to an information expansion of unparalleled dimensions. The demand for students and business people to encode and retain information quickly and efficiently has increased proportionally with this expansion. Furthermore, growth in minority populations and international business contacts have made the acquisition of a second language highly desirable. Therefore, the introduction of a system which claims to provide the practical means of achieving these goals deserves careful evaluation, using rigorous, unbiased, scientific techniques.

Suggestopedia" is a system of suggestive-accelerative learning and teaching techniques professing such a claim. Developed by Georgi Lozanov, a Bulgarian educator and psychiatrist, Suggestopedia was originally introduced as an intensive, foreign language teaching program. In recent years, however, elements of Suggestopedia have been adopted for accelerated learning of a wide variety of subject material. Increasingly, Suggestopedia, and its North American adaptation SALT, an acronym for "System of accelerative learning and teaching", are being used in schools and colleges in Europe and North America (Scovel, 1979).

Lozanov claims that a 1,000% increase in learning is possible with Suggestopedia (Lozanov, 1978).

2. Accelerative Learning Techniques

Suggestopedia consists of many component parts: suggestion, authority (prestige), communication (verbal and non-verbal), intonation and rhythm of presentation, breathing synchronised with presentation, relaxation, mind-calming, mental imagery, subliminal stimuli and active role playing (Racle, 1976; Schuster and Gritten, 1986). Suggestopedia is based on the concept of suggestion, that much of what we learn is not by direct verbal instruction but by direct and indirect non-verbal cues. Lozanov emphasises the importance of the physical environment and the possible influence of subliminal messages which exist in every setting (Scovel, 1979). Non-verbal cues, such as body language, expressiveness, eyecontact and facial expressions are key elements in interactions between people. The ability to effectively utilise these cues is known to influence the level of communication (Baron and Byrne, 1984).

Each Suggestopedia lesson starts by creating an expectancy that learning will be easy and fun. Students are exposed to music, posters on the wall depicting scenes relevant to the task, given affirmations to do or reminded of how well they did last time. Students are never made to feel like failures, ridiculed or embarrassed at any time. In order to boost self-esteem, students learning a foreign language are often given another

identity and name. The teacher creates an atmosphere where learning expectancy is enhanced. The fact that teacher expectancy has a substantial impact on how well students learn is well established (Jacobson and Rosenthal, 1968). This is a form of "placebo" effect and something Lozanov (1978) actively utilised.

The material to be learned is presented in three forms: first, an active presentation in which the material is vividly presented by means of visual images, association cues and dynamic vocal intonation (three voice levels are used: loud/commanding, normal and soft/whispering). Second, a passive form in which students sit relaxed, with eyes closed and breathing synchronised with baroque music which plays in the background. The teacher reviews the lesson, again using oral intonation. In the third session, students enact a dramatic presentation of the lesson content and practice until some level of proficiency is achieved. A self-correcting quiz normally ends the lesson (Palmer, 1985).

Research into Suggestopedia, particularly in North America, has focused on isolating so called "critical" elements, in order that these elements may be implemented in the conventional classroom. This focus has been largely on relaxation training and music, although critics have claimed there is ample evidence already available to indicate these techniques, on their own, do not accelerate learning (Alexander, 1982). The first SALT technique to be examined will be relaxation, each major technique will be evaluated in turn.

2.1 Relaxation

An examination of the SALT literature revealed that in studies where relaxation is a major independent variable, rather than just one element of SALT or Suggestopedia, only one study indicated a clear improvement in performance for the experimental group over the control group (Johnson, 1982). However, one study also produced a negative effect. (See Table 1 for a summary of the relevant studies).

2.2 Music

Where music is a major independent variable in accelerated learning studies, the literature is again equivocal. Nine studies were examined, of these four achieved significant increases in performance (see Table 2). Three of the four experiments used control groups and random allocation of subjects. The uncontrolled studies (Schuster and Vincent, 1980; Alexander, 1982) do not deserve serious consideration.

2.3 Suggestion

There are difficulties in the short-term studies in creating the conditions required by many of the more subtle components of Suggestopedia. SALT research has tended to focus more on the mechanical aspects of accelerated learning, such as music, relaxation and mental imagery which are easily

Table 1: The results of eight studies utilising relaxation as a main independent variable.

Author	Year	Major I.V.s	Control Group/ Random Allocation	Results
Biggers and Stricherz	1976	Relaxation	YES/YES	Neg. Effect
Martin and Schuster	1977	Relaxation and Tension Induction	YES/YES	No Sig. Diff
Alexander	1982	Relaxation, Music	NO/NO	No Sig. Diff
Gamble et al.	1982	Relaxation, Music	YES/YES	Limited Support
Johnson	1982	Relaxation	YES/YES	Sig. Diff
Wagner and Tilney	1983	Relaxation, Music Mind-calming	YES/YES	No Sig. Diff
Render, Hall and Moon	1984	Relaxation, Music	YES/YES	No Sig. Diff
Zeiss	1984	Relaxation, Music Oral Intonation	YES/YES	Limited support

understood and implemented. Other aspects such as suggestion, subliminal stimuli, and non-verbal cues are often neglected. Given the emphasis Lozanov places on suggestion, it is particularly strange that very few studies have utilised this variable. There are only two studies available in which suggestion is used as an independent variable (Schuster and Mouzon, 1982; and Schuster and Martin, 1980).

Schuster and Miller, (1979) commented that they had not utilised suggestion because it takes time to produce change in belief systems and attitudes. Despite this, Schuster and Mouzon (1982) introduced suggestion in the form of a printed, two sentence paragraph. Subjects in this study performed better when given the suggestion that the material was hard to learn, than when told it was easy to learn. The opposite effect to that which the authors and Lozanov's position had predicted. It may be that subjects, given the suggestion the material would be easy to learn, who find in reality it is difficult, feel frustrated and spend more time attending to non-relevant cues than to actually learning the material. In contrast, subjects to are told the material is hard to learn have no fear of failure, they may see it as a challenge and try their hardest. If this is an appropriate interpretation it would seem to be an inevitable risk in Lozanov's view that we should suggest to learners that the task is easy.

In the Schuster and Martin (1980) experiment, a more sophisticated form of suggestion was used: "early pleasant learning restimulation" (EPLR), a Gestalt reintegrative technique that focuses on the bodily feelings, sensations, emotions and thoughts associated with an early pleasant experience. Subjects given no suggestion and a difficult task performed better than the group given EPLR and a difficult task. With no suggestion and an easy task, the difference between the two groups was insignificant. Thus, again the results do not support Lozanov's position.

2.4 Visualisation

While visualisation is not regarded as an individual element in SALT as music and relaxation are, it nevertheless plays an important role. Visualisation is commonly used in two forms. First, in mind-calming exercises subjects are given guided fantasy journeys to reduce psychological anxiety. Second, visualization is used to create mental images associating the material to be learned.

Table 2: The results of nine studies utilising music as a major independent variable

Author	Year	Major I.V.s	Control Group/ Random Allocation	Results
Bordon and Schuster	1976	Music, Breathing, Suggest. Positive Atmosphere	YES/YES	Sig. Diff
Schuster and Vincent	1980	Music, Imagery	NO/NO	Sig. Diff
Alexander	1982	Music, Relaxation	NO/NO	No Sig. Diff
Gamble et al	1982	Music, Relaxation	YES/YES	No Sig Diff
Schuster and Mouzon	1982	Music, Suggestion	YES/YES	Sig. Diff
Stein, Hardy and Totten	1982	Music, Imagery	YES/YES	Sig. Diff
Wagner and Tilney	1983	Music, Relaxation, Mind-calming	YES/YES	No Sig. Diff
Render, Hall and Moon	1984	Music, Relaxation	YES/YES	No Sig. Diff
Zeiss	1984	Music, Relaxation, Oral Intonation	YES/YES	No Sig. Diff

There is extensive evidence on mental imagery (cf Paivio, 1971), usually with paired associate words, where subjects learn an association between a stimulus word and a response word and then attempt to recall the response when cued with the stimulus. Mental imagery, in which images are created by the subjects of the stimulus and response words interacting in some manner, have been shown to increase recall between 1.5-3 times (Bowers in Gregg, 1972; Paivio, 1971). No validated study using SALT or Suggestopedia, short or longterm known to the present authors, has reported increases in performance greater than 300%, despite Lozanov's (1978) claim that tenfold increases in performance are possible. Therefore mental imagery alone could account for the improvements sometimes seen in Suggestopedia since it appears to result in increases of similar magnitude.

2.5 Synchronised breathing

Shaffer (1979) offered the argument that deep breathing was the critical factor in accelerated learning and the reason why so many studies had failed to achieve hypermnesia (exact memory). The claim is supported by evidence that in Lozanov's early work, before the government clamped down on information, breathing techniques figured prominently. In recent years, rhythmic breathing has received little attention.

Lozanov found that to achieve the appropriate combination of relaxation, concentration, slow pulse rate and alpha state in which accelerated learning was possible, yogic exercises and breathing were required (Bancroft, 1976). Hyperventilation, according to Shaffer (1979), lowers the carbon dioxide concentration of the blood and raises the pH (alkaline concentration) of the blood and body fluids, thereby increasing the excitability of the nerve cells. Experiments in altered learning through carbon dioxide-induced disruption show that this compound acts upon short term memory (STM) rather than long term memory (LTM) (Waterlaine, 1970; Rigter, van Eys and Leonard, 1975, in Shaffer, 1979). Voluntary hyperventilation through rhythmic breathing reduces carbon dioxide levels, thus enhancing STM, allowing more information to be moved into LTM (Shaffer, 1979). Although Shaffer claims to have achieved accelerated learning on a par with that of Lozanov, data substantiating this claim do not appear to have been published to date.

Rhythmic breathing, like many other component parts of Suggestopedia, has not been used, or tested, in isolation.

2.6 Active presentation

It is well established that material which is presented vividly is more likely to be remembered (baron and Byrne, 1984). Suggestopedia utilises this fact by playing active, lively classical music, using oral intonation such that one moment the teacher is loudly speaking the material, the next softly

whispering it so that students have to listen carefully. Mental imagery is utilised to create vivid pictures and associations. For example in learning German, the German word and its meaning can be associated by interacting objects. The mnemonic keyword method employs a keyword which links a foreign word to its English translation by mental imagery. This method has improved performance from 46% to 72% (Atkinson and Raugh, 1975).

2.7 Passive review

In the passive music review subjects sit relaxed, with eyes closed. Soft baroque music plays in the background. The music is specifically chosen for its 40-60 beats per minute. This is hypothesized to lower heartbeat and blood pressure and induce an alpha state in which learning is accelerated (Ostrander and Schroeder, 1979). The material is presented for four seconds, then there is a pause for four seconds. Subjects hold their breath while the material is presented and breathe out and in during the pause. The teacher presents the same material, once again using oral intonation. Students are encouraged to recall the visualisations and associations they made in the active presentation.

2.8 Dramatic enactment

In the third and last session, students enact a dramatic presentation of the material. In foreign language learning students commonly form groups and role play the material. Once students have reached the required level of proficiency or at the lesson end, students complete a self-correcting quiz in order to assess how much they have learned. This normally concludes a Suggestopedia class.

2.9 "Superlearning" techniques

Superlearning techniques utilise many of the elements outlined above. Schuster and Gritton (1986) have criticised Superlearning on the basis that it is not Suggestopedia, and that failures of Superlearning should not reflect on Lozanov's system. This argument seems illogical since Superlearning is based on Lozanov's methods, as are SALT methods. In fact the Superlearning format of accelerative learning techniques follows Lozanov's system more closely than many of the SALT experiments. Applegate (1983) used Superlearning techniques with great success, as Schuster and Gritton (1986) were quick to note. If failure of Superlearning should not reflect on Suggestopedia, then neither should success.

Three studies were examined which utilised Superlearning techniques (Wagner and Tilney, 1983; Applegate, 1983; and Zeiss, 1984). While significant results were sometimes reported, fatal methodological flaws exist in two of the three studies.

The Applegate (1983) study was a two year long project which utilised Superlearning techniques to learn reading, math, spelling and writing. Students ranged from learning disabled to gifted and talented. The experimental groups achieved a significant increase over the control groups averaging 13.5% (in Schuster and Gritton, 1986). Unfortunately methodological problems are apparent even from Schuster and Gritton's review. In the experimental group each teacher had an average of 27 students per class. In the control group each teacher had an average of 43 students. Clearly then, students in the experimental group could be given more individual tuition and management and control of the smaller classes would be much easier.

Wagner and Tilney (1983) did not equate the experimental and control groups for relaxation time in the experiment.

Zeiss (1984) reported results suggestive of improved learning under one combination of superlearning procedures. However, the extent of the improvement is uncertain due to a "ceiling" effect (a number of subjects reached 100% performance).

3.1 Duration of study

SALT studies and Suggestopedia programs vary in length from 14 minute experiments (Stein, Hardy and Toten, 1982) to two year projects (Applegate, 1983). There is no datum on the effects of intensive, continuous use of Suggestopedic methods other than Lozanov's data and these are incomplete (Scovel, 1979). An examination of the SALT literature may provide an indication of the effect length of study has on results. The relevant studies are summarised in Table 3.

The results in Table 3 suggest that these methods are effective with longer term use. As students acclimatise to SALT methods and teachers become more proficient in their use, there is an overall increase in subject performance. Alternatively, these results may reflect the conviction/commitment to the method and the study required by both teacher and student. Such conviction is likely to produce substantial experimenter demand characteristics which could by themselves produce the results observed. The difficulty is in separating out these demand effects which Lozanov intentionally utilised (and which could be used without Suggestopedia) from the effects of the "mechanical" aspects of SALT, i.e. music, relaxation, oral intonation and so on.

3.2 Instructor experience

It is often difficult to gauge the experience of the teacher or experimenter from the literature. Early evaluations of Lozanov's data stressed the importance of instructor experience and strict application of the methods. However, SALT studies have since sometimes demonstrated that music

and imagery can increase learning even when subjects read printed material with no instructor involvement (Stein, Hardy and Totten, 1982). Schuster and Mouzon (1982) used music as the main independent variable and achieved 24% higher performance on acquisition and 26% higher on retention. According to the literature, Mouzon was inexperienced with SALT methods and was carrying out the experiment under Schuster's supervision. There is then evidence that inexperienced experimenters, using easily applicable techniques such as music, can achieve accelerated learning.

When more complex techniques are involved, however, it is suggested that experimenter experience appears to become an important variable. An example of this is offered by Schuster and Miller (1979). In this controlled, laboratory experiment, Schuster, a highly experienced pioneer in SALT methods, and Miller, an inexperienced student, each ran half the subjects. Miller was apparently naive as to previous SALT literature and sceptical as to the experimental outcome (Schuster and Miller, 1979). With active presentation versus no active presentation, Schuster's male subjects performed significantly better, while Miller's performed significantly worse. Female subjects showed no significant difference with active presentation. With music review, where subjects hear the material a second time accompanied by baroque music, versus no music review and practising alone or in pairs, Miller's male subjects who were practising alone performed significantly worse, while Schuster's performed significantly better. Schuster's female subjects again showed no significant difference in contrast to Miller's female subjects who performed significantly worse in pairs and significantly better alone. (Of course, differences between Miller and Schuster other than experience may account for these results. For example, Schuster's conviction may create more experimental demand than Miller's scepticism.)

While Schuster and Miller used "experimenter" as an independent variable, there appears great reluctance within the study to accept the results of this variable. Rather than granting that experimenter inexperience (or conviction) contributed to results contrary to expectation, the authors comment that, though active presentation for males was significantly lower for one experimenter, this effect was felt to be minor. The same comment follows the results of music review, with the additional reflection that music review was generally hypothesized to be superior. Yet the data simply did not substantiate this assertion.

There were no significant differences between subjects given music review and subjects given no music review, whether male or female. In fact, the overall mean for subjects with music review was lower than for subjects without music review. However, the authors do acknowledge that "subtle demand characteristics of the two experimenters may be responsible for these differences" (Schuster and Miller, 1979, p.45).

Table 3: Study duration/instructor experience: the results of ten studies

SHORT TERM					
Author	Year	Study Length	SALT Experience	Control Gr/ Random Alloc	Result
Schuster and Miller	1979	70 mins	YES/NO	YES/YES	No Sig. Diff
Schuster and Mouzon	1982	81 mins	NO	YES/YES	Sig. Diff
Stein, Hardy and Totten	1982	14 mins	NO	YES/YES	Sig. Diff
Alexander	1982	30 mins	NO	YES/YES	No Sig. Diff
Render, Hall and Moon	1984	60 mins	NO	YES/YES	No Sig. Diff
MEDIUM TERM					
Bordon and Schuster	1976	6 wks	YES	YES/YES	Sig. Diff
Gamble et al	1982	6 wks	YES	YES/YES	Sig. Diff
Johnson	1982	4 wks	NO	YES/YES	Sig. Diff
Wagner and Tilney	1983	5 wks	NO	YES/YES	No Sig. Diff
Zeiss	1984	3 wks	NO	YES/YES	Sig. Diff
LONG TERM					
Schuster and Vincent	1980	1 yr	YES	NO/NO	Sig. Diff
Applegate	1983	2 ys	YES	YES/YES	Sig. Diff
Gassner-Roberts and Brislan	1984	1 yr	YES	YES/YES	Sig. Diff

An examination of available individual studies revealed that in five studies where the instructor is known to be experienced in SALT methods, all achieved significant gains in performance for the treatment group (see Table 3). However, this may reflect experimenter demand or methodological flaws (see later discussion).

3.3 Anxiety

Two studies have focused on the effects of anxiety on performance in relation to Suggestopedia (Martin and Schuster, 1977 and Schuster and Martin, 1980). Since the 1977 study acted as a pilot study for the more comprehensive 1980 experiment, the focus will be on the latter. Schuster and Martin (1980) found that subjects high in trait anxiety performed best when tensed in the learning situation, while subjects low in trait anxiety

performed best when relaxed. Thus trait-state matching occurred. This is contrary to the bulk of the literature which indicates that high anxiety is the least conducive state for learning (Ferguson, 1976). This would seem to suggest that relaxation would not benefit all subjects equally and may in fact impair the performance of high anxiety subjects.

The main effect of chronic anxiety on learning in the Schuster and Martin (1980) study was that low anxiety subjects performed best, followed by high anxiety subjects. Medium anxiety subjects performed worst of all. When this result was broken down into hard and easy tasks and with subjects in four conditions of relaxation and induced tension, the results produce a complex pattern further complicated by the use of all combinations of relaxation or tension prior to learning and relaxation or tension at the time of learning.

Overall, the results may be summarised as follows. Relaxation impairs the performance of high anxiety subjects (contrary to the Yerkes-Dodson Law) but has little effect when the task is easy. Relaxation has little effect on low anxiety subjects regardless of task difficulty. The effect on medium anxiety subjects is that relaxation facilitated recall on a hard task and impaired it on an easy task (as predicted by the Yerkes-Dodson Law).

Assuming that anxiety is normally distributed, the majority of subjects will be of medium anxiety. In which case relaxation will facilitate recall on hard tasks for most subjects, since it also has no effect on low anxiety individuals. Relaxation will only impair the performance of high anxiety subjects on a difficult task. When the task is easy, relaxation has little effect on high anxiety and low anxiety subjects but impairs the performance of medium anxiety subjects. This means that in order to maximise the effects of relaxation it should only be used when task difficulty is high. SALT studies which have found no significant improvement in performance where relaxation is used may not have used a sufficiently difficult or complex task.

4. Overview of reported results

As can be seen from Section 2, many studies report no significant superiority of various parts of the Suggestopedic method. Some studies report impairment, some improvement. However, for practical purposes the magnitude of the improvements observed must be considered.

Even when enhanced learning or retention is reported the differences are often meagre: 9% (Glasner-Roberts and Brislan, 1984); 13.5% (see Schuster and Gritton, 1986). However, differences as large as 250% have been reported (Bordon and Schuster, 1976). Such differences could be accounted for purely in terms of the imagery part of the technique, since imagery has

been shown to produce improvements of 150-300% (Powers, in Gregg, 1972 and Paivio, 1971) The data do not remotely support Lozanovs claimed 1000% improvement (Scovel, 1979). Furthermore, many studies reporting significant effects contain critical methodological problems, as reviewed in the next section.

5. Methodology

Many of the studies examined lacked control groups and did not randomly allocate subjects (Alexander, 1982; Schuster and Vincent, 1980). Pre- and Post-tests were the only method used to measure progress (e.g. Schuster and Vincent, 1980). This is unsatisfactory since the amount of progress under a different technique is not known. The generally poor methodology is highlighted by Palmer's (1985) review. Of the 42 SALT experiments reviewed by Palmer (1985), 25 studies had no control group, five gave only anecdotal progress reports, three were case studies, and in two studies where a control group was used, subjects were not randomly assigned. Of the ten experimental groups which were methodologically sound, five resulted in no significant difference between control and experimental groups (Held, 1976; Caskey, 1976; Schulz, 1978; Lee, 1981; Hales, 1983). In the five other studies the experimental group performed significantly better than the control group (Schuster and Ginn, 1978; Schuster and Pritchard, 1978; Pritchard, Schuster and Walker, 1979; Nelson, 1979; Galyean, 1980). The invalidity of the methodology in many of the studies renders their conclusions suspect. Only through exacting scientific methods can an unbiased evaluation of SALT techniques be reached. The various ways in which studies can fail to achieve the required scientific rigour are reviewed below.

5.1 Allocation of the subjects

An analysis of a one year evaluative study undertaken at the University of Adelaide, which used Suggestopedia to teach German to first year students, illustrates the difficulty in separating cause from effect (Gassner-Roberts and Brislan, 1984). A review of this study by Schuster and Gritton (1986) concluded that the considerable data available confirmed the superiority of Suggestopedia over conventional learning and teaching methods. A close examination of the study, however, calls this conclusion into question.

The study employed three groups, an experimental group (EG), and two control groups, one a day class (CG-D), the other an evening class (CG-E). Flaws in allocation of students and the arrangements made for the three groups are apparent. From the pool of 46 students enrolled in the course, 22 were day students. This constituted the CG-D. The other 24 students were evening students and subjects were allocated at random to the EG and CG-E.

There are a number of problems with these arrangements. First, the CG-D consisted of 22 students compared to the 12 students in both the CG-E and the EG. It is possible that students in the smaller groups received more individual tuition than the CG-D students. Second, the experience of students, both in German and other languages, was not taken into account in the allocation of subjects. Six students in both CG-E and EG had studied another language and in the EG four students had previously studied German. In the CG-E, one student had matriculated in German and another had lived in Germany for two years. Four others had undertaken previous German language studies. Third, many differences may exist between day and evening students. Under the circumstances, matched allocation would have been superior.

5.2 Group arrangements/subject expectancy

There are other difficulties arising out of the arrangements made for the EG. While the control groups met in an ordinary classroom, the EG met in the teacher's staff room, "where relaxed seating could be arranged and an informal atmosphere achieved as recommended" (Gassner-Roberts and Brislan, 1984, p.212). In addition, the EG were informed in their first class that they would be taught using Suggestopedic methods, and no-one decided to drop out. Although the authors state that a questionnaire answered by the students revealed no knowledge of Suggestopedia, it is suggested that knowledge of the alleged superiority of these techniques was freely available on campus. Gassner-Roberts publicly stated that students fought to get into her class because she had no failures or passes, only credits and above (Macquarie University, 1984). The expectancy created by this, and the teacher's expectations, may have resulted in a self-fulfilling prophecy (Biggs and Telfer, 1987) and the special arrangements in a Hawthorne effect. (This is the phenomenon where any "special" procedure given to a selected group results in an improvement in performance -- Turney and Robb, 1971.)

5.3 Drop-out rate

Two other factors may also have affected the experimental outcome. One is the large drop-out rate from the CG-D. Of the 22 students who started the course, only eight students finished. It is unclear whether this reflects differences between day and evening students, the already existing impact of demand characteristics, or students estimating their progress. Nonetheless, it is indicative of inequality and potential bias.

5.4 Material: Presentation, format and amount

The other factor which may have affected experimental outcome was the weekly, unannounced, self-correcting quizzes given to the EG throughout the year. This meant that EG students had the material presented to them again, in a different format and had to retrieve the information from memory. The EG consistently received more material, presented in various

forms: reading, discussions, and singing. The presentation of additional material is indicative of teacher expectations (Good and Brophy, 1980). Students, told they are being given additional material to learn because they have already covered the course material, have expectations too. The increase in self-esteem, and ego-involvement could result in increased motivation. Those factors, rather than Suggestopedic techniques per se, may be responsible for the difference in performance between the EG and the control groups.

Despite the implementation of a full Suggestopedia program and a teacher trained and experienced in its application, the experimental group increased their performance over the control groups by only 9%, well below the tenfold increase claimed by Lozanov (1978). The Hawthorne effect and the self-fulfilling prophecy could readily account for an increase of that size.

5.5 Unmatched experimental time

A number of studies fail to match experimental time for control and experimental groups (Schuster and Martin, 1980; Gamble, Gamble, Parr and Caskey, 1982; Wagner and Tilney, 1983). In the Gamble et al. study, the dependent variable was creativity. The experimental group was asked to practise relaxation at home each day. During the relaxation it is possible subjects would think about the task and generate ideas. This may have disadvantaged the control group.

Experimental subjects in the Wagner and Tilney (1983) study received a taped relaxation procedure which lasted 15 minutes. The control group were asked to sit and relax for five minutes. The rationale for not matching experimental time for all three groups was that previous studies had shown that without directed relaxation, subjects found the procedure tedious. It would perhaps have been more appropriate to have given the control subjects a filler task so that experimental time was matched.

In the Schuster and Manin (1980) study, experimental time was not matched across subjects. Those given suggestion underwent a Gestalt disintegration procedure, while subjects given no suggestion went straight into the next phase. This happened eight times during the experiment and, while the exact length of the Gestalt procedure is not given, it must have resulted in a substantial increase in experimental time for these subjects.

6. Present study

6.1 Rationale

The numerous previous studies have produced inconsistent results. It appears likely that variable, poor methodology and variations in subject anxiety are two major contributors to the variability of reported results.

Consequently the first aim of the present study was to evaluate the relevant techniques while avoiding the methodological flaws identified in the literature.

The second aim was to examine the roles of anxiety and task difficulty. There are two reasons for this aim. First, Schuster and Martin (1980) have shown that task difficulty and anxiety interact in unusual ways with SALT procedures. However, their study did not resolve the issue since they employed combinations of relaxation and tension prior to and at the time of learning, rather than simply examining relaxation in the SALT procedures. Furthermore, they did not include a group of subjects given no mood manipulation. Thus, the baseline is not known and so the direction of the changes observed is unclear. Second, the Yerkes-Dodson Law (which is well supported by experimental evidence) would suggest that relaxation would help highly anxious subjects on difficult tasks, but impair low anxiety subjects on easy tasks. This may explain some of the observed inter-study variability.

Rather than focus, as most other studies do, on only one or two elements of SALT, such as music and relaxation, this study utilised a number of accelerated learning techniques as outlined in "Superlearning" (Ostrander and Schroeder, 1979). The format used in "Superlearning" was chosen for two reasons. First, it appears to be the most detailed and concise articulation of accelerated learning techniques available; and second, it has been used successfully in the past (Zeiss, 1984; Applegate, 1983 in Schuster and Gritton, 1986).

6.2 Subjects

Subjects were 48 undergraduate students enrolled in a first year psychology course. Credit was given for participation. No attempt was made to control for gender, since previous studies had indicated no gender differences (Schuster and Mouzon, 1982).

6.3 Instruments

The test instrument consisted of 75 paired associate nouns drawn from a list of 925 nouns (scaled on relevant variables by Paivio et al. (1968)). Easy and difficult tasks were created by selecting words known to be easy or difficult to recall.

6.4 Procedure

Initially 83 subjects of both sexes were given the State-Trait Anxiety Inventory (Spielberger et al., 1968), Form V, under normal classroom conditions. The 24 subjects recording the highest level of state anxiety were selected and randomly assigned to either the control group or

experimental group. The same procedure was followed for the 24 subjects recording the lowest level of state anxiety. The state scale was used since Johnson and Spielberger (1968) had indicated that trait anxiety was impervious to relaxation instructions. In addition, it was hypothesized that since test anxiety is an instance of state anxiety, subjects exhibiting high or low levels of anxiety in the questionnaire would manifest similar levels during the experimental procedure.

Four groups were used, two experimental (one given the difficult, one given the easy task) and two control (difficult and easy). Each group consisted of six high anxiety subjects and six low anxiety subjects, such that each group comprised 12 subjects. (Gender was not specifically controlled, but was randomly assigned. The control groups comprised six males and 18 females, the experimental groups, four males and 20 females.)

Subjects were required to learn 75 paired associate nouns which were presented to them in two lists. A total of 15 minutes were given to learn the word associates then subjects were given a 10 minute test in which they were cued with the stimulus word and had to supply the response word. Order of presentation of word pairs in the cued test differed from order of presentation in the learning situation.

All sessions lasted 40 minutes and started with both groups receiving the same instructions as to the nature of the experiment and what was required of them. The control groups then had a six minute, self-relaxation period with soft, melodious music playing in the background. Lights in the room were dimmed and subjects were told to close their eyes and sit back and relax. Following this period, subjects were given a brief, two minute filler task (to equate for time in the situation) after which they were informed they had five minutes to begin learning the list of 75 word pairs in any way they wished. At the end of that time another two minute filler task (to equate for time) followed in which subjects were asked to record the method(s) which they were using to learn the material. Subjects then had a further ten minutes in which to complete the learning task.

The experimental groups were asked to follow a six minute guided, deep muscle relaxation procedure, as outlined by Ostrander and Schroeder (1979, p.98). This is similar in format to the progressive relaxation methods of Jacobson (1938). The relaxation ended with subjects being given the suggestion that learning was easy, that they could not help but learn using this method. Subjects were then given examples of how mental imagery could be used to connect word pairs. Subjects were also informed of the value of constructing a sentence containing both words and asked to use these techniques to learn the material.

For the experimental group all 75 paired associate words had been recorded on a tape and these were spoken, with oral intonation, at four second intervals. Classical music by Tchaikovsky (Winter Dreams) played in the background. Subjects had been given two printed lists containing the 75 word pairs, and they read along silently with the recording. This session comprised the "active presentation". In order not to cause confusion instructions on breathing techniques were only given after this session. Once subjects had been given instructions on how to synchronise their breath with the presentation of the music, the "passive review began. Each word pair was presented over four seconds, followed by a four second pause. During the presentation subjects were requested to hold their breath and only breathe out and in during the pause. The recorded material then played for another ten minutes, the voice again using oral intonation, during which baroque music (Vivaldi's Four Seasons) played in the background. In this presentation subjects sat relaxed, with eyes closed and listened to the recording. Instructions had been given to remember the visualisations or sentences made during the active presentation of the material. Individuals are capable of constructing visualisations in four seconds (Bugelski, Kidd and Segman, 1968). Both groups then took a ten minute, cued, immediate recall test. This test was repeated, for all subjects, 7-8 days later to test retention.

7. Results

7.1 Overview

The experimental design included 5 factors: between subjects factors of teaching method (SALT vs control) and anxiety level (high vs low) and three within subject factors of task difficulty (easy/concrete vs difficult/abstract nouns), seven blocks of five words, and time (immediate vs delayed test). A way analysis of variance (MANOVA in SPSSX) was employed in analysis.

7.2 Summary of results

The results of the present study indicate that:

1. On both acquisition and retention, conventional teaching methods are superior to SALT methods ($F = 4.57$, ($F = 1,44$, $p < .038$; see Figure 1).
2. Subjects in a high anxiety state performed better than subjects in a low anxiety state ($F = 4.42$, ($F = 1,44$, $p < .041$, see Figure 2).
3. As expected, more nouns were recalled on the immediate than on the delayed test (means = 42.6 and 13.93, $F = 239.4$, ($F = 1,44$, $p < .0005$).

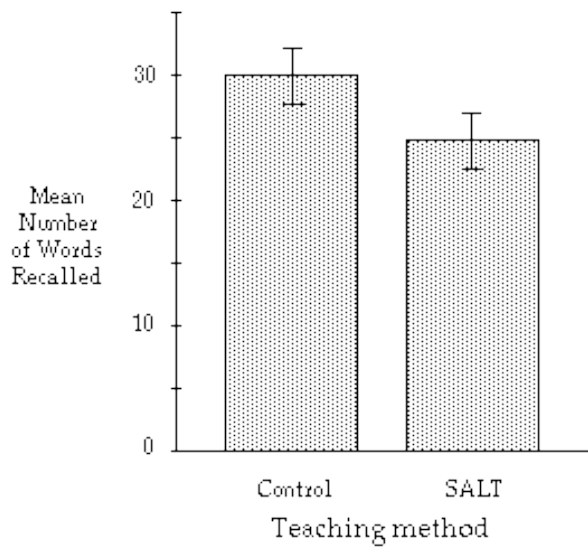


Figure 1: The effect of teaching method on the learning of paired associate nouns(including Standard Error of the Mean).

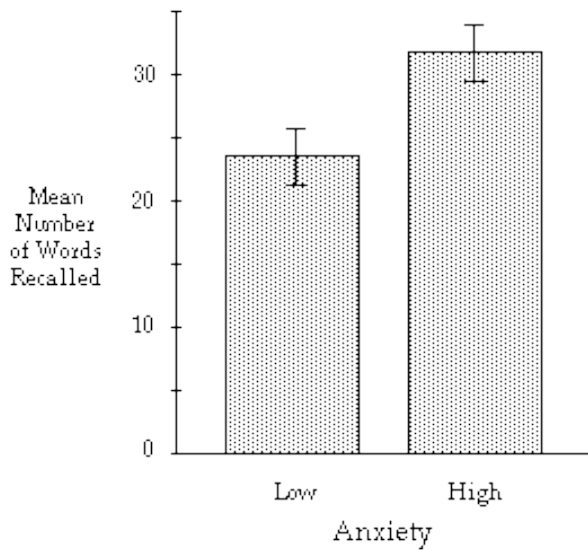


Figure 2: The effect of anxiety on the learning of paired associate nouns(including Standard Error of the Mean).

4. As expected, concrete nouns are easier to learn and recall than abstract nouns ($F = 86.1$, $df = 1,44$, $p < .0005$).
5. It is noteworthy that there was no significant interaction between anxiety and task difficulty ($F = .017$).
6. The SALT method did not cause significant superiority in either high or low anxiety subjects (means are actually in the other direction).
7. Subjects in the SALT group did not improve their performance in relation to the control group over the period of the test. The performance of both groups progressively declined ($F = 7.91$, ($F = 6,264$, $p < .0005$).

8. Conclusions

1. The present study confirmed the common failure to observe any significant improvement with SALT methods, even when a number of recommended techniques were combined.
2. SALT techniques were not differentially effective on high or low anxiety subjects.
3. Certain disadvantages of the SALT methods were identifiable:
 - a. Some subjects found the method unfamiliar and distracting. Experience may help with this, as may the use of more familiar music to the particular learners/subjects employed. However, lengthy experience often has the effect of selecting those subjects who are doing well or like the method, thus creating bias.
 - b. The regulated timing has the disadvantage of lack of control which means that subjects cannot skip over material they already know and spend more time on difficult items.
4. The literature evaluating SALT, Suggestopedia and superlearning techniques is generally methodologically flawed.
5. When improvements are reported it is generally possible to account for them in terms of the known effects of placebo, experimenter demand characteristics and the established effects of imagery. There is no compelling evidence for effects due to music, relaxation, vocal intonation and so on

6. The literature is suspiciously cult-like in a number of aspects:
 - a. There are a lot of escape chutes available: the study was not long enough; the situation was not relaxing; the teacher was not experienced enough, etc.
 - b. There is a lot of money / prestige at stake.
 - c. There appears to be an indoctrination in terminology with attempts at artificial separations between groups (SALT vs Superlearning).
 - d. The most obvious place for publication of relevant studies is the *Journal of the Society for Accelerated Learning and Teaching*. Even if this journal attempts to maintain objective review it would seem to be less likely to attract the submission of negative results than positive results. Furthermore, even with attempted objectivity negative results are less likely to be published in general (See Furedy, 1978).
 - e. The reluctance of the Bulgarian government to release full details engenders suspicion.

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Please cite as: Dipamo, B. and Job, R. F. S. (1990). An evaluation of SALT (Suggestive-accelerative learning and teaching) techniques. *Australian Journal of Educational Technology*, 6(1), 36-55.
<http://www.ascilite.org.au/ajet/ajet6/dipamo.html>

Editorial note: This article was published in AJET 6(1) in 1990, but it should not be cited, as it appears to have been superseded by revised and corrected articles published in AJET 7(2) in 1991, namely:

Dipamo, B. and Job, R. F. S. (1991). A methodological review of studies of SALT (Suggestive-accelerative learning and teaching) techniques. *Australian Journal of Educational Technology*, 7(2), 127-143.
<http://www.ascilite.org.au/ajet/ajet7/dipamo.html>

Job, R. F. S. and Dipamo, B. (1991). Examination of the effects of subject anxiety and task difficulty on the outcome of SALT (Suggestive Accelerative Learning and Teaching) techniques. *Australian Journal of Educational Technology*, 7(2), 144-152.
<http://www.ascilite.org.au/ajet/ajet7/job.html>