

in: *Stress and Tension Control*,
ed. by Joe Feinberg
with
Joe Donald Wallace
Plenum Press, NY, 1980

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HOW CHILDREN LEARN THE SKILL OF TENSION CONTROL

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Children should learn to relax for the same reason they learn the skills of reading, writing and arithmetic. Tension control is a basic skill. Is such a skill worthy of "Fourth R" status in the curriculum of basic education? Is it indeed presumptuous to claim that something called "relaxation," essentially a non-verbal skill, should be equated with the "Three Rs," the latter forming the essential verbal and symbolic foundation for literacy and technology? I believe the answer to such questions to be in the affirmative (Frederick, 1979).

There is no question about the relationship between tension-related disease and health (Jacobson, 1970; Selye, 1976). Individuals who are skilled at relaxation are less likely to become the victims of tension and stress. Tension control training is primarily conceived as an important aspect of preventative medicine. But beyond disease prevention, learning to relax provides the child with a wonderful introduction to the human organism and its possibilities when viewed as an instrument to be self-run. This is the basis of the "inner curriculum" (Gallwey, 1976).

Tension is always a function of the voluntary musculature. When we exert any effort inclusive of thinking, (Malcolm, 1978; Jacobson, 1973a), the muscles are involved, contracting in unique and measurable patterns. The technique of muscle relaxation, as contrasted with our general notion of "taking it easy," is psychomotor skill. Once mastered, tension signals from the proprioceptive (inner) environment are easily recognized. The application of such learning is the reduction of inappropriate muscular contraction associated with misplaced efforts of all kinds. Since muscular tension can have a dramatic effect on health, the early acquisition

of relaxation strategies in the general education of children should have the effect of reducing the incidence of tension-related disorders in adulthood.

Unfortunately, there exist only meager data to support such a contention. Singer's review of developmental factors and their influence on skill learning (Singer, 1968) and Scott's statement that "organization hampers reorganization" (Scott, 1962) support in general the present view that an early acquisition of the technical skill of relaxation creates the potential for ridding oneself of excessive muscular efforts (bracing) later in life. The cultivated habit of selective relaxation thus tends to replace the more primitive, habitual bracing response of modern, civilized living with new habit patterns.

The discovery that neuromuscular relaxation is a motor skill and is learned and practiced in much the same way as other skilled behavior, was first noted in this century by a persistent scientist named Edmund Jacobson. His early experiments on the startle response, measuring the experimental reaction to a sudden, loud noise (Jacobson, 1926), required that some of his subjects sit as quietly as possible. These investigations led him to study and measure the relaxed state in depth. He developed the method and technique he called progressive relaxation and as a physician he often taught his patients to relax. His methods for instructing individual patients is carefully worked out in his classic medical text, Progressive Relaxation (Jacobson, 1929). Later, he encouraged educators to apply the techniques he developed for purposes of group instruction and was instrumental in training Naval officers in his methods for group training at U.S. Navy air schools (Neufeld, 1951).

Progressive relaxation was first adapted for group instruction by Arthur Steinhaus and Jeanne Norris at the George Williams College in Chicago. Their adaptations of progressive relaxation for college students were validated in a study supported by the U.S. Office of Education (Steinhaus and Norris, 1964). Following the lead of Steinhaus and Norris, a Chicago physical educator, Cosmo Cosentino, assisted by Bernardine Lufkin, director of education for the Foundation for Scientific Relaxation began an extensive action research project in the Chicago Heights elementary schools with certain aspects having been pilot tested earlier at Beloit College (Jacobson and Lufkin, 1966). Lufkin's final report (1968) indicated the following results:

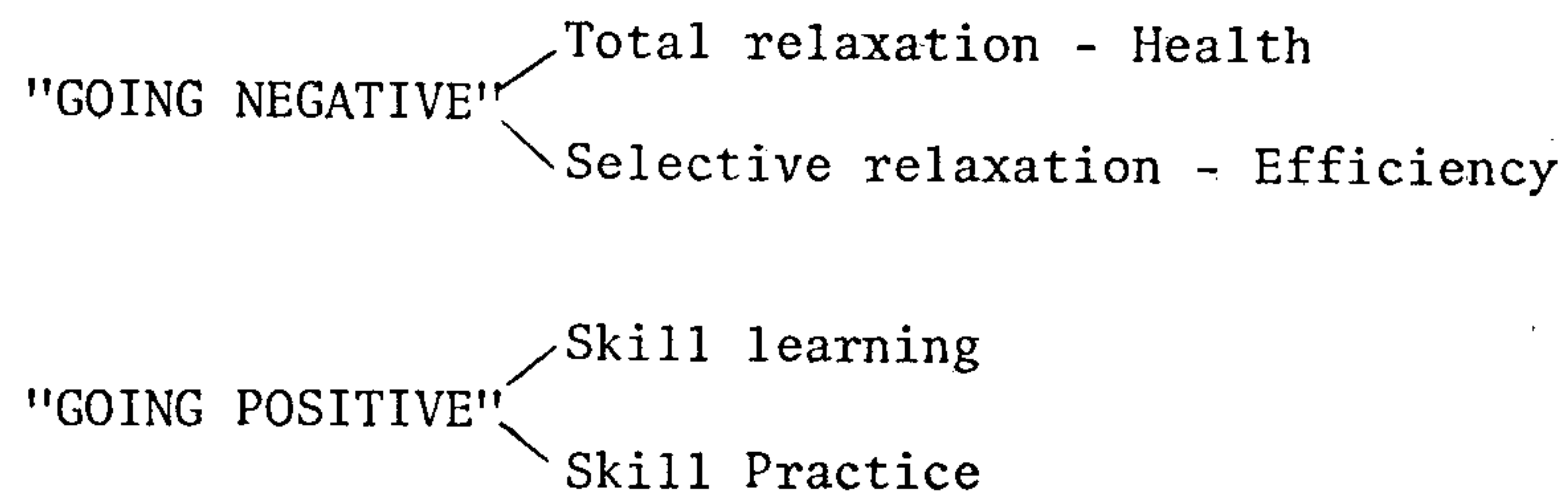
1. Methods should be adjusted to meet the varying capabilities of children.
2. Economic background seemed to be a factor in learning.
3. Periodic practice sessions of short duration but over the entire elementary school experience of the child

- were recommended.
4. Teachers in the project continued to teach relaxation techniques after the project was officially completed. They had been convinced of the value of such training.
 5. It was concluded that the school program in tension control must have the cooperation and support of all school personnel in order to be successful.

During the 1960's my own elementary school physical education classes were introduced to relaxation techniques. In addition to the methodology employed in the Chicago Heights Project, I introduced the elements of various dialogues which were an important feature of a newer, heuristic method of presentation (Frederick, 1967). Children were challenged with such questions as, "What makes your arm go up?" or "Can you show me a 'nothing' face?" As Jacobson had discovered some years earlier (Jacobson, 1973b), children enjoyed the challenge of "running themselves."

Two general methods of teaching tension control to children may be identified. Both methodologies are successfully combined by experienced teachers depending upon class member characteristics and experience. The first is identified as the Deterministic/Analytic Method which adapts the methods of Jacobson in a highly structured series of classes. Such a method has been outlined by Marshall and Beach (1976). The second method which is heuristic in nature and capitalizes on certain features of the process of learning. It might be described in general terms as the Method of Guided Discovery. Since less information is available on the themes of instruction associated with the latter methodology, I have elected to concentrate upon such themes in the present paper.

Teaching relaxation techniques to children from the point-of-view of guided discovery focuses upon the learning process. The thematic guidelines may be described as follows:



"Going negative" simply refers to the temporal aspect of the relaxed state. The task is either to achieve complete rest or to selectively relax those muscles which are not involved in the performance of tasks associated with one's daily routine. The ability to "go negative" can be tested with electromyographic (EMG) apparatus. The EMG measures the microvoltage present in the

neuromuscular system from moment to moment. A person trained to totally relax the musculature would show a gradual progression towards zero microvolts produced when connected to such apparatus. The EMG was employed in the validation strategy of Steinhaus and Norris (1964).

An individual who has learned to relax thoroughly will have gained a working concept of rest that matches the physician's instruction to "take it easy." Individuals who can relax in this sense are subject to fewer tension-related disorders. Observing children at rest often reveals a certain few who should be given training beyond that suggested here for general education. It is also important that children learn how to observe themselves and others at rest. In most cases, I have found that children are able to develop good observational skills.

Going negative can also be a selective process. This means that the individual should be able to move more efficiently as a result of training. Movement education has become an important curricular feature of elementary school physical education. Such programs can easily accommodate tension control methodology. Indeed, the physical education of children is seriously deficient when relaxation is completely ignored. In calling for a new image for physical education, Steinhaus (1963) refers to the "the full activity spectrum" meaning that "going negative" or "zero activity" is the complement of the more common exercise/activity program.

"Going negative" can be differentially applied. This means very simply that one should use only those muscular efforts that are necessary to accomplish a specific task efficiently. All too often, relaxation is equated only with rest. Laban (1963), whose theories form the foundation of movement education, has pointed out the differences as well as the complimentary nature of effort and relaxation in movement.

"Going positive," indicating a calculated use of tension, is central to the method of guided discovery employed by a majority of those who teach Jacobson's progressive relaxation. The use of brief efforts during relaxation training must be explained since such a technique seems to run counter to the objectives of tension control. Jacobson (1978) states quite properly that "an effort to relax is always failure to relax." He has frequently repeated this point to illustrate the difference between technical relaxation and relaxation inferred by programs requiring concentration, the repetition of phrases or sounds, other imaginative activity or autosuggestive methods to produce a "relaxed state." A person who has been trained to relax in the technical, Jacobsonian sense simply "goes negative" to achieve either rest or selective muscle tension reduction without the need for any special preparatory effort.

"Going positive" is my own elaboration of special features of the training procedure per se. It refers specifically to the pedagogy of tension control. Minimal effort in the form of brief and slight contractions of specific muscle groups are commonly employed in instruction. Once induced, such tension is used to train the learner in self-observation. If tension is to be recognized, it must first be produced. The recognition process proceeds with progressively decreasing tension induction.

To better understand the pedagogical technique I call "going positive," imagine a learner practicing self-observation while seated in a comfortable chair with padded arms. The learner raises the forearm of the left upper limb as illustrated in Figure 1. While it is raised, the learner attempts to identify specific signals of tension arising from the muscle groups involved. During such practice, the learner may report one of three types of observations:

1. The learner is unable to discriminate between muscle groups which are active and those which are, in general, at rest. Such an inability to report sensations arising directly from the central regions of the primary contracting muscle (the biceps), indicated by the shaded area in Figure 1, is common among beginning students.

2. The learner may report sensations of stretch or strain located near the joint (in the present example near the elbow). Stretching skin is also sometimes mistaken for the elusive signal from the muscle proper.

3. The learner accurately reports the sensation of contraction arising in the biceps muscle (shaded region in Figure 1). Jacobson calls such an ability the discrimination of the "Bell sense" (attributed to Sir Charles Bell who was the first to suggest that the muscles possessed a sensory function sometimes referred to as

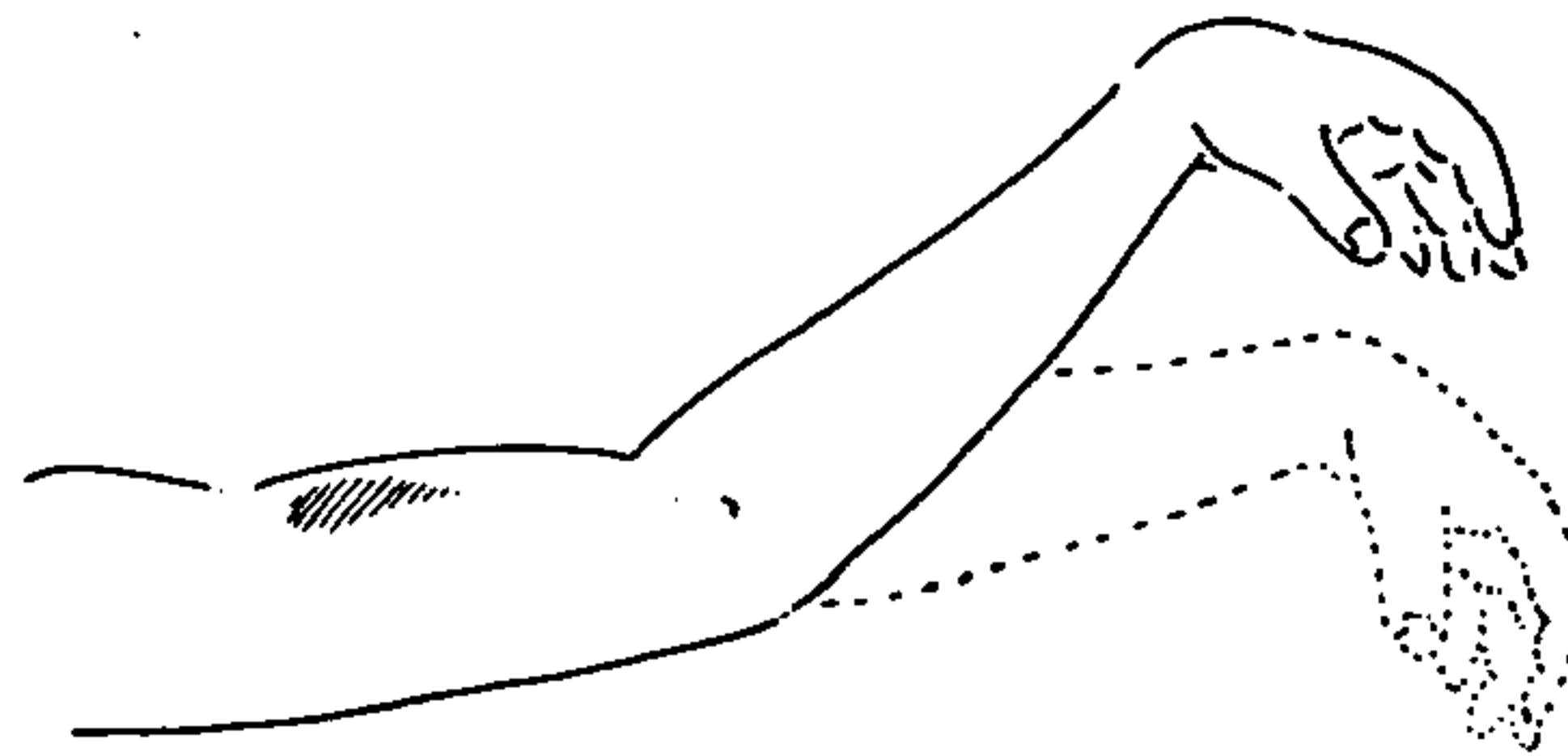


Fig. 1 "Going positive" with the elbow flexors.

"muscle sense"). When accurate observations are forthcoming, the learner is encouraged to attempt to identify the presence of contraction when less tension is induced for example, by only slightly raising the forearm (see dotted illustration in Figure 1). Finally, the learner may be asked simply to imagine lifting the forearm to further test the observation of the signal in the presence of only a miniscule contraction of the biceps. The presence of such contractions during imagined movements was shown conclusively by Jacobson a half century ago (Jacobson, 1930).

"Going positive" also has implications for skill learning associated with the normal spectrum of activity in sport and physical education. The learner might be encouraged to contract certain muscle groups isometrically in preparation for the performance of a new movement with novel characteristics. For example, I have employed such techniques rather effectively during gymnastic training sessions. This procedure is mentioned only in passing since it is not specifically related to relaxation instruction per se but might well be considered in the full range of experience in tension control. It would seem therefore that basic training in tension control techniques inclusive of relaxation should have a positive effect on athletic performance.

GUIDED DISCOVERY: A DIALOGUE WITH FOURTH GRADERS

I have selected one example of the type of dialogue that typifies the method of guided discovery in the introduction of tension control techniques to children. The objective of the interaction which follows was to have children discover some information about "doing nothing" (going negative):

1. To understand that there are bodily functions that we control directly while others are not.
2. To learn that "doing nothing" is not as simple to do as one might believe.

The children (S) participating in taped sessions were fourth graders. The teacher (T) conducting the lesson was the writer. The class was based upon six years of experience teaching children tension control techniques inclusive of those adapted directly from Jacobson's progressive relaxation (Jacobson, 1938), class notes and tape recorded sessions with children. The following dialogue is extracted from one of several introductory lessons one might use with children in Grades 4 to 6.

T - "Today we will have a brief lesson on 'how to do nothing'."

S - Laughter.

T - "Is it possible to do nothing?"

S - Negative responses; e.g. "You'd be dead!"

Note: The array of responses at this point gets some response from most children. They are quick to point out that the heart must beat, the blood flows, eyes blink and we breathe. Occasionally, children mention that the brain is always "thinking" or like comment, which can be dealt with during this dialogue or another which follows.

T - "Can you make your heart stop beating?"

S - After some discussion including imaginative ideas about self-inflicted wounds which are rejected... "No."

T - "Can you stop breathing for an hour?"

S - "No." (Some of the children will know about the world's record, however - twelve minutes approximately.)

T - "Are there other things you must do in order to stay alive?"

S - "You have to think." (In this particular dialogue the thinking theme is followed but I would ordinarily not introduce this independently.)

T - "Do you have to think?"

S - Mixed responses...e.g. "When you're trying to stop thinking you're still thinking about not thinking." (Later on the word "trying" will be associated with other action words indicating "doing.")

T - (At this point, the teacher displays a relaxed face for the students. The eyes have a unfocused appearance, the jaw is relatively limp, and no emotion or attitude is displayed. Jacobson uses his own face as an example in "Progressive Relaxation," Second Edition, 1938, p.93) "Please look at my face."

S - Laughter. (This has always been the first response.)

T - "Was I thinking?"

S - "Maybe." (Other mixed responses.)

- T - "Look again very carefully."
- S - Children follow directions with less laughter.
- T - "Was I thinking?"
- S - "No." (But accompanying remarks reveal that children are not confident about their answer.)
- T - "What would you have seen if I were thinking?"
- S - Children indicate uncertainty.
- T - Teacher then displays a number of facial expressions for the children to identify. "What about this?" etc.
- S - Children identify such things as fear, eye movements, happiness, inner speech etc.
- T - (Displaying relaxed face once again) "Look at my face."
- S - Children observe carefully.
- T - "Was I thinking?"
- S - "We couldn't tell." (This is probably the best answer. The children may believe that thinking is occurring but they do not detect it by observation.)
- T - "Then it is possible to stop doing those things that provide others with clues about our thoughts?"
- S - "Yes."
- T - "What did my face tell you when it was relaxed?"
- S - "Nothing." (This response is often accompanied with insightful statements about "doing nothing.")
- T - "Can you make a 'nothing' face?"
- S - Children are given some time to replicate the teacher's relaxed face but usually cannot control the eyes and very often smile or laugh audibly. Two or three trials follow with approximately the same result.
- T - "Why can't you show me a 'nothing' face?"
- S - "It's too hard!"

Note that at this point, the teacher will have made good progress towards accomplishing the objectives of the lesson noted on preceding page. There needs to be some follow-up on the difference between autonomic and voluntary functions of the human organism. For example, when told to do something upon hearing a signal, children will perform a variety of movements. They realize that such performances are different from those ongoing functions such as the heart beat which they cannot willfully start or stop.

A dialogue can be designed that will lead them to the discovery that it is their muscles that are primarily responsible for willed movements of all kinds and that the muscles play an active role in thinking as well.

CONCLUSION

In his novel, "Island," Huxley (1962) provides an enlightening perspective about the basics of education in a utopian society on the isle of Pala. The Under-Secretary of Palanese Education asks a visitor, "In the organic hierarchy, which takes precedence (in a child's education) - his gut, his muscles or his nervous system?" The reader discovers that the Palanese attempt to educate their children by combining Western, scientific symbolism with the raw, mystical experience of the East; an integration of verbal and non-verbal education.

For more than a decade, American education has wrestled with three sets of educational objectives which are often regarded, in true Western tradition, as mutually exclusive. Called taxonomies of educational objectives, elements from the cognitive, affective and psychomotor domains are examined (Bloom, 1956, Krathwohl, 1964 and Harrow, 1972). Because of tradition and the need to develop adequate tests of intellectual abilities and skills, the cognitive domain ("nervous system," symbolism, the "Three Rs" etc.) is given preeminence. The affective domain ("gut," organic system, emotion etc.) is given lip service and the psychomotor domain ("muscle," exercise, physical education etc.) is often neglected altogether.

Although a "Fourth R" (relaxation) has been proposed in this paper which could result in the development of the very useful and desirable goals of tension reduction and tension control, there is the more important consideration of the development of an integrated taxonomy of educational objectives. Such a taxonomy would focus our attention on the interrelationships of "gut, muscle and nerve." The "action pattern" domain suggested by Loree (1965) and the conclusions about the dominance of our "presumptuous brain" forwarded by Simeons (1962) would strongly favor a "Fourth R" for education.

As we examine the "Fourth R" in this latter sense, it is

apparent that our "nervous education" is at least part responsible for our "nervous society." A tension control program in this, more universal sense would help to balance the emphasis on "nerves" by granting appropriate time in the curriculum for "gut" and "muscle."

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