

**AN APPLICATION OF SYSTEMATIC DESENSITIZATION  
IN THE TREATMENT TO A PHOBIA OF WATER WITH  
AN UPPER ELEMENTARY SCHOOL AGE CHILD**

**BY**

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AN APPLICATION OF SYSTEMATIC DESENSITIZATION IN THE  
TREATMENT TO A PHOBIA OF WATER WITH AN  
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A Research Paper

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In Partial Fulfillment  
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Master of Arts  
in Education

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by  
Carol June Brow

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To the Graduate Council:

I am submitting herewith a Research Paper written by Carol June Brow entitled "An Application of Systematic Desensitization in the Treatment to a Phobia of Water with an Upper Elementary School Age Child." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts in Education with a major in Guidance and Counseling.

Garland E. Blair

Major Professor

Accepted for the Council:

Wayne E. Blum

Dean of the Graduate School



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## Introduction

Until recently, elementary school children with problems were left to grow into adulthood without the benefits of being helped with their difficulties by a counseling and guidance program. When the problems interfered with the normal functioning of the adolescent or adult it then seemed to have a better opportunity to be recognized and treated.

After it had been recognized that many adolescent and adult problems could have been avoided if they were recognized and treated at the elementary level, the surge for guidance programs in the elementary school began.

Just as the idea of a guidance program for high schools and junior high schools has gradually sifted down to the elementary level, the application of new techniques and methods in psychology have gradually or are in the process of working their way down to the elementary level also.

One technique which is in the initial stage of being used with children is the technique of systematic desensitization.

The fears many adults have today are fears which were formed in childhood. How much more pleasant their lives could have been if these fears were eliminated while growing up. There is a need for helping children eliminate unnecessary anxiety from their lives.

There is also a need for research in the area of applying techniques, which have proven successful with adults, to children.



## Review of the Literature

Systematic desensitization is a therapy designed by Wolpe (1958) for the treatment of phobic reactions and anxiety. This approach is based on the learning theory principle of reciprocal inhibition which states that if a response inhibitory of anxiety can be made to occur in the presence of anxiety-evoking stimuli, it will weaken the bond between these stimuli and the anxiety. The response which is usually used to counter-condition fear is deep muscle relaxation. The method of deep muscle relaxation was developed by Jacobson (1938). The use of muscle relaxation to counter-condition fear is based on the theory that one can not be relaxed and anxious simultaneously; the two responses reciprocally inhibit each other.

Systematic desensitization can be defined as the substituting of muscular relaxation responses for the tension responses of anxiety. The technique of systematic desensitization involves these three sets of separate operations: training in deep muscle relaxation, the construction of anxiety hierarchies, and counter-posing relaxation and anxiety-evoking stimuli from the hierarchies. Training the patient in deep muscle relaxation usually takes from five to six, thirty minute sessions, and the subject is asked to practice for two, fifteen minute periods a day, while at home (Wolpe, 1958).

Constructing a hierarchy involves ranking a list of stimuli, on a common theme, in descending order according to the amount of anxiety they evoke. The patient need not have experienced the actual situation to have it included in the hierarchy. Hierarchy construction and relaxation training usually begin at about the same time. The data gathering for the hierarchy is done through ordinary conversation and not under relaxation. The client's usual responses are necessary, not the client's relaxed responses. The hierarchy may be changed or added to at any time (Wolpe, 1958).

The procedure of counter-posing relaxation and anxiety-evoking stimuli begins with having the patient relax. In this physiological state which is inhibitory of anxiety, the client is exposed to a stimulus, in the form of an imagined scene, which evokes no anxiety. The client is then exposed to a weak anxiety arousing stimulus. The client is instructed to stop the scene and relax; the procedure is then repeated until the stimulus loses its anxiety-evoking ability. Then stronger stimuli are exposed to the client until the top item on the hierarchy has been reached. One scene is usually presented three or four times, but more may be necessary. The duration of a scene is usually five to seven seconds, varied according to the client. The interval between scenes is usually between ten and twenty seconds. The

total number of scenes presented in each session is mainly limited by the endurance of the client. The number of desensitization sessions depends on the number of scene presentations necessary to complete the client's hierarchy (Wolpe, 1958).

Systematic desensitization has been used successfully in treatment of adults for several anxieties and phobias. It has been used to help adults overcome problems such as these: homosexuality (Piccolo, 1971), anger (Rimm, 1971), obsessive cancer fear (Gentry, 1970), fear of snakes, rats, spiders, speaking, tests, and several other anxieties and phobias. But, there is a lack of research in the area of applying systematic desensitization to children. Feasible reasons for this may be that counselors think children are unable to imagine scenes vividly enough or that they do not have long enough attention spans.

A few cases of applying systematic desensitization to children have been reported. Wolpe (1969) reported using systematic desensitization with thirty-nine of his clients. Only one of the clients was a child of elementary school age. The client was a boy of eleven years old and was treated for the fear of authority figures. His anxiety-response habits were eliminated after treatment in six sessions.

Wolpe (1958) also described the treatment of another elementary school age child. An eleven year old boy,



suffering from interpersonal anxiety and tic-like movements, showed marked improvement after eight sessions.

Children with phobias have been successfully treated using systematic desensitization with the addition of weaving the child's hero image into the hierarchial scenes (Lazarus & Abramovitz, 1962).

Lazarus (1960) employed systematic desensitization in the successful treatment of an eight year old boy who had developed a fear of moving vehicles. This treatment involved rewarding the boy with chocolates for every positive remark or action.

Kravertz and Forness (1971) treated a six and one half year old boy who had been hospitalized for medical and psychiatric evaluations because of a severe speech anxiety. But, their techniques combined desensitization with reinforcement and emotive imagery. In six weeks the boy had reached the last step on his hierarchy and could function well in a normal public classroom.

Research in the area of applying systematic desensitization to children is lacking and lacking even more is the area of using systematic desensitization with children where the only anxiety-inhibiting state is relaxation. A precise statement of the problem, which needs to be investigated is will systematic desensitization, using relaxation as the anxiety-inhibiting state, be effective in the treatment of a phobia with an elementary school age child?

## Method

### The Present Study

The client who participated in this study was a nine year old boy, in the fourth grade. The client had an intense fear of water which had not improved over several years. He appeared to be a good subject for treatment with systematic desensitization because he had a fairly long attention span and he had a vivid imagination. The ability to imagine vividly is important in this method of treatment.

The steps taken in the actual application of treatment were these: initial interview, pretreatment behavioral evaluation, hierarchy construction, pretreatment self-evaluation, pretreatment bio sensor evaluation, relaxation training, systematic desensitization, post-treatment self-evaluation, posttreatment bio sensor evaluation, and posttreatment behavioral evaluation.

Counseling was given in eighteen sessions; each session lasted approximately thirty to forty-five minutes. The time span, from the initial interview to the final session, covered a period of twenty-three days. The evening sessions were conducted in the client's home.

### Initial Interview

The initial interview was a get acquainted period for the counselor and client. The client expressed a great desire to overcome his fear of water and stated he wished



he could have fun in the water and not be afraid. Time was spent discussing that a person could not be two things at once; he could not be afraid and relaxed at the same time. The client understood that being afraid caused his body to be tense, and that a tense, fearful body could not learn to swim. The bio sensor machine, made by Biofeedback Instruments, Inc., was introduced and the client became familiar with it and basically understood that it measured how tense or relaxed his body was. The procedure of systematic desensitization was not introduced at this time. The importance of learning how to relax the body through exercises was emphasized. The client agreed to think about what things frightened him about the water and to make a list of those things for the next session.

### Measurement

A phobia is defined as an intense irrational fear. A phobic reaction can be defined as a reaction characterized by an excessive fear of some specific object or place in the absence of any real danger.

Fear is associated with three measurable behaviors: verbal, motor, and somatic behaviors (Wolpe, Salter, & Reyna, 1964).

A verbal measure of fear is indicated by the client's statements such as, "I am afraid". Fear can also be detected when there are disturbances of the speech pattern or verbal recall.

Distress can be detected through the motor behaviors. If the client uses physical avoidance or displays sudden failures of coordination when attempting to do those things listed on his hierarchy, he can be evaluated as being fearful.

The third way fear can be measured is through somatic responses. Fear is indicated by alterations in respiration, cardiac rate, blood pressure, decrease in skin resistance, and increase in electromyographic levels.

A GSR "galavanic skin resistance" bio sensor machine was used to measure the client's responses in this study. The electrical resistance of the skin was measured between the client's two fingertips. The GSR results reflected the activity from the client's sweat glands. The sweat glands are under the control of the sympathetic nervous system. When a person becomes frightened or disturbed, the sympathetic nervous system activates physical and chemical mechanisms through the body, including the sweat glands.

The bio sensor instrument serves as a measure of sympathetic nervous system activity. The bio sensor instrument monitors the client's emotional state. The GSR instrument dial indicated numbers from negative four through positive four. When the client is calm and relaxed, the skin resistance increases causing the needle indicator to move toward negative four. When the client is

aroused or tense, the skin resistance drops, causing the needle to move toward positive four (Payne, 1972).

All three measurable behaviors, verbal, motor (behavioral), and somatic, were evaluated in this study.

### Pretreatment Behavioral Evaluation

The pretreatment behavioral evaluation was obtained from the client's mother. The mother described the client's reaction to the water to be very fearful in swimming situations. He would never duck his head under the water; he would never go into the water deeper than his waist, and if he slipped or got his face wet, he would get out of the water and not return. The mother also stated the client was afraid to put his head under the bathtub faucet to wash his hair. The client's fearful behavior was exhibited by body rigidity, gasping, avoidance, withdrawal, and verbal exclamations.

### Hierarchy Construction

One session was devoted to the hierarchy construction (see Table 1). The situation the client feared most was numbered one, at the top of the list. The items were listed in descending order, according to the amount of anxiety they evoked. The last item on the list was a completely neutral scene for the client; it caused no feelings of anxiety.

The client did not wish to include any items on his hierarchy which did not concern swimming in a pool. He



wanted nothing about bathtubs, rivers, or lakes on the hierarchy. The client decided that eight items was all he felt he could handle. He expressed that if he could do all the things on his list and not be afraid, he would be happy and pleased with himself.

#### Pretreatment Self-evaluation

The pretreatment self-evaluation involved the client reporting his subjective feelings about each item of his hierarchy on a fear thermometer. The client had these five ratings to choose from: 1. I am not afraid at all, 2. I am a little afraid, 3. I am afraid, but I can still do it, 4. I am afraid and cannot do it, 5. I am as scared as I have ever been and I would never consider doing it. The client rated the items on his hierarchy with two "I am not afraid", three "I am a little afraid", two "I am afraid, but I can still do it", and two "I am afraid and cannot do it" responses.

#### Pretreatment Bio Sensor Evaluation

The pretreatment bio sensor evaluation was conducted simultaneously with the pretreatment self-evaluation. As the client's responses on the fear thermometer were recorded, the needle indicator number on the bio sensor machine was also recorded. The more relaxed the subject became, the more the needle fell toward negative four. Negative four indicated the most relaxed state. A positive four indicated the most amount of body tension and fear.

The needle was adjusted at the beginning of each session to the zero point. This adjustment was made after the client had settled down, lying on his back in a comfortable manner, facing away from the counselor. Each item on the hierarchy was read to the client and he responded according to how he rated it on the fear thermometer. When the client was giving his response, the number indicated on the bio sensor instrument was also recorded. Except for the neutral scene and one other, the bio sensor machine registered the amount of fear for all scenes. The bio sensor data indicated that the client was experiencing a great deal more anxiety than he verbalized through the fear thermometer (see Table 1).

### Relaxation Training

Training the subject in deep muscle relaxation took six, thirty minute sessions. The relaxation training method was derived from the formats of relaxation training employed by other therapists (Krumboltz, 1969; Lazarus, 1970; Wolpe & Lazarus, 1966). The training consisted of tensing and relaxing these muscle groups, in the same sequence each session: fists, forearms, biceps, forehead, eyes, face, jaws, shoulders, back, stomach, thighs, calves, and total, whole body relaxation.

At the start of each session the needle on the bio sensor instrument was set at zero. Whenever the client tensed a muscle group, the instrument would register



positive four. The degree to which the client was able to relax was recorded after each muscle group tensing. Relaxation training was viewed as successful when the client measured a majority of negative fours on relaxing. The client was able to learn deep muscle relaxation very quickly and without difficulty.

A tape recording of the counselor's voice, proceeding through the whole relaxation training session, was made and given to the client. The client practiced with the tape recording one evening each week when the counselor was attending an evening class and was unable to conduct the session.

#### Systematic Desensitization

The client was relaxed before each scene presentation. He was exposed to an average of two scenes each session, being allowed to imagine each presented scene for a duration of twenty seconds. Each scene was presented at least three times. The time span between presentations ranged from two minutes to five minutes, depending on the ability of the client to again become relaxed. The client thought of his neutral scene between stimuli presentations. The client reached the top item on the hierarchy in seven sessions. The last session of systematic desensitization showed the client to be experiencing no more than a negative three and one half anxiety level as indicated by the bio sensor machine.

### Posttreatment Self-evaluation

The final session consisted of the client responding to the scenes on the hierarchy according to the fear thermometer. The client rated his feelings concerning the hierarchy items as being "not afraid at all" five times, "a little afraid" on two items, and "a little afraid, but I can still do it" on three items (see Table 1).

### Posttreatment Bio Sensor Evaluation

The posttreatment self-evaluation and the posttreatment bio sensor evaluation were conducted simultaneously. The client measured negative two and one half or below on each hierarchy item (see Table 1).

### Posttreatment Behavioral Evaluation

The posttreatment behavioral evaluation was conducted by the counselor. The client was taken to an indoor pool to perform the things listed on his hierarchy. The client had not been to a pool since the summer before treatment. The only form of actual experience or reinforcement the client received during counseling was through his own experimenting in the bathtub. Toward the end of the counseling sessions, the client's mother reported he was practicing putting his head under water.

In the pool, the client proceeded through the hierarchy with no abnormal fear reactions. The client was able to perform all of the items on the hierarchy and

attempted several other beginning swimmer exercises and skills. The counselor was an experienced swimming instructor and evaluated the client as having no fear of water.

TABLE 1  
Hierarchy, Pre- and Posttreatment Fear Thermometer  
Rating, and Pre- and Posttreatment Bio Sensor Rating

Hierarchy	Pre-FTR	Po-FTR	Pre-BR	Po-BR
1. Pick up an object under the water.	4	3	4	-2½
2. Open up eyes under the water.	4	3	4	-3
3. Sit on the bottom of the pool with face in the water.	3	2	4	-3½
4. Sit on the bottom of the pool with head out of the water.	3	2	4	-3½
5. Put whole head under the water with eyes closed.	2	1	4	-3½
6. Put face in the water and blow bubbles.	2	1	4	-4
7. Put face in the water with eyes closed.	2	1	4	-4
8. Stand in water up to the chin.	1	1	3	-4
9. Watch television at home.	1	1	0	-4

Pre-FTR = Pretreatment Fear Thermometer Rating

Po-FTR = Posttreatment Fear Thermometer Rating

Pre-BR = Pretreatment Bio Sensor Rating

Po-BR = Posttreatment Bio Sensor Rating

## Results

The evaluation of all three measurable behaviors of fear, verbal, motor (behavioral), and somatic proved the application of systematic desensitization in the treatment of the client's phobia of water to be successful.

The two measures that showed the most amount of change between the pre- and posttests were the bio sensor rating and the behavioral evaluation.

Many authorities are of the opinion that clients who have experienced much anxiety tend to be excellent raters of their own fear level. In this study, the counselor felt that the client rated himself up on the pretest fear thermometer rating to appear in a more favorable light. The bio sensor evaluation, which was conducted simultaneously with the fear thermometer rating, proved the client to be feeling much more anxiety than was verbalized.



## Discussion

The most valuable instrument of measure in this study was the bio sensor machine. Its use proved as an objective pre- and posttest evaluation.

The use of the bio sensor machine greatly aided the counselor in deciding at what point in counseling the client had learned deep muscle relaxation. The instrument also proved valuable by indicating to the counselor the best, most relaxed, time to present a scene. It was also extremely helpful in indicating when an imagined scene should be stopped and the client instructed to think of his neutral scene. The instrument proved useful in determining the length of time the client needed to relax between scenes.

Without the aid of the bio sensor machine, the counselor would possibly not be able to identify what was wrong in the event counseling was proving ineffective. With the help of a bio sensor machine, the counselor can tell if the ineffectiveness of counseling is due to the client not being able to learn relaxation. The bio sensor machine could also indicate if a client was unable to imagine vividly. After an imagined scene had been presented to a client who actually had a phobia, and the bio sensor machine did not register fear, the counselor could surmise that the client did not have adequate imaginative powers for systematic desensitization. The bio sensor

machine can also detect when the steps in the client's hierarchy are not increasing in small enough increments of anxiety level.

If the counselor wishes to be aware of the exact responses of his client during counseling, the bio sensor machine is a necessary instrument in the use of applying systematic desensitization. It is especially useful in working with children.

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