Reinforced Practice and Reduction of Fear of Water in Children

Christine Manuge

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Abstract

Reinforced practice was used to treat children for fear of water. The primary measure of fear reduction was a behavioural task involving approach and entry to water. A comparison of pre- and post-test scores on the behavioural approach test for experimental and control subjects was used to determine the effectiveness of the procedure. The results showed a significant difference in the pre- and post-test scores for the two groups and thus the application of reinforced practice has been extended.

ACKNOWLEDGEMENT

I would like to thank Dr. W.T. Melnyk and Dr. Marcia Dilley for their assistance while completing this work. I also express my gratitude to Mr. Don Lynch, Director of Parks and Recreation for Dartmouth for allowing me to conduct the research through the aquatics program. I thank those who assisted in conducting the experimentation and also thank my sister, Annemarie for typing this manuscript.

Reinforced practice is a recently developed technique for the treatment of phobias. This technique involves several variables: (a) repeated gradual practice at approaching actual phobic stimuli and situations (Leitenberg, Agras, Edwards, Thomson and Wincze, 1970); (b) reinforcement of saml1 gains in performance (Leitenber, Agras, and Thomson, 1968; Agras, Leitenberg, and Barlow, 1968; Agras, Leitenberg, Barlow and Thomson, 1969; Agras, Leitenberg, Wincze, Butz and Callahan, 1970); (c) trial-by-trial feedback of precise measures of performance (Leitenberg, Agras, Thomson and Wright, 1968); and (d) the kinds of instructions and kinds of expectancies given to patients (Agras et al., 1969). These variables, when combined in a single treatment program termed "reinforced practice" and their effects compared to untreated control groups, indicated that reinforced practice substantially reduced fear in subjects displaying a wide variety of fears (Leitenberg and Callahan, 1973).

The variables were isolated in a series of studies with clinical phobias and other neurotic disorders. Leitenberg et al., (1970) used the individual case method to investigate the effect of repeated practice. In this study, the opportunity to practice was varied, while the other variables,

such as the amount of therapist attention and instructions designed to create expectancies for change were kept constant. The opportunity to practice nonphobic behaviour was introduced after a baseline phase. In the following phase, practice was not allowed and then in the final phase the opportunity to practice was reintroduced. Patients showed positive change on a specific behavioural measure during practice phases only. When practice was removed, performance either regressed or remained the same. When practice was reinstated, phobic avoidance behaviour began to decline again.

Similar case studies were conducted to determine the effect of the other variables during the treatment of clinical phobias. The separate roles of some of these variables, particularly those of repeated practice in approaching feared stimuli and therapeutic expectancies, have been studied under laboratory conditions where strong fear of snakes was the specific phobia. In a study by Barlow et al., (1969), the effect of systematic desensitiation was compared in two groups. In the first, relazation was paired with the imaginal scenes of the snake, and in the second, with a real snake. The second group improved

more in behavioural approach test and evidenced less anxiety, as measured by GSR, than the first group. The results of this study pointed to an inefficiency of the imaginative process, and the possibility that behavioural change is enhanced by contact with the feared object.

Oliveau et al., (1969), investigated the relative contributions of therapeutically oriented instructions and selective positive reinforcement to systematic desensitization. Thirty-two female college students with marked fear of snakes were divided into four groups for treatment. All subjects were given systematic desensitization. In addition to this therapy, Group 1 was given therapeutic instructions and praise; Group 2 was given instructions but no praise; Group 3 was given no therapeutic instructions but received praise; and Group 4 was given neither instructions nor praise. The results indicated that all four groups improved significantly in their ability to approach the snake, however, an analysis of variance indicated that only the instructions had a significant effect and in addition, the reinforcement and interaction factors were not significant. Agras et al., (1969), suggest reinforcement is in fact a

relevant variable. In this study, both reinforcement and instructions were observed to have separate and strong influences on neurotic behaviour. The specificity of effect of both instructions and reinforcement was notable. Instructions increased only the behaviour asked for. While removal of reinforcement affected only the behaviour upon which the reinforcement was contingent. Performance was always better with the reinforcing rather than the nonreinforcing therapist. Precise control over hysterical falling in one case and claustrophobia in another, was gained only in the presence of a well-defined therapist. Agras et al., (1968) had previously observed the importance of reinforcement in a controlled study with agoraphobia so the discrepancy between the results observed in the studies done by Agras et al. (1968, 1969) and Oliveau et al. (1969) was unexpected. A procedural variation, that is, immediacy of reinforcement, in the study conducted by Oliveau et al. may account for the discrepancy. In Oliveau's study, reinforcement for behaviour gains was not made immediately after performance but rather prior to starting the first trial of the next session. Thus, reinforcement may have been given for an irrelevant behaviour.

The isolation of the variables that were subsequently combined into a single treatment program was of practical significance. It has been noted that phobias involve at least three components: a subjective inner state, observable behavioural reactions and the physiological changes known to accompany these. (Marks, 1969). The three components are usually congruent, but at times are not. Sometimes fear appears to be present in terms of behavioural reactions but its presence is denied by the individual. Or, fear may appear to be absent, that is, there is no outward behavioural reaction, but its presence is acknowledged by the individual (Lang, 1966). Physiological and behavioural aspects of neurotic behaviour do not always vary together. Further, physiologically defined anxiety need not always be inhibited before the desired behaviour change can occur during the treatment of phobias. It may be that physiological arousal is reduced as a consequence rather than a cause of behavioural change (Leitenberg et al., 1971).

Wolpe's systematic desensitization is based upon the assumption that anxiety (physiological arousal) must be inhibited before avoidance behavior can be reduced. "There

is reason to think that most neuroses are primarily conditioned habits of autonomic responses" (Wolpe, 1963). There is no direct evidence to support this hypothesis, but there is evidence to suggest it may be incorrect (Leitenberg et al., 1971). During the deconditioning of clincial phobias, parallel recordings of behaviour and heart rate in the feared situation were obtained on a trial-by-trial basis. A number of relationships were observed. In some cases heart rate increased as phobic avoidance behaviour decreased. In others there was a parallel decline and in still others heart rate decreased only after phobic behaviour declined. In some cases there was a decline in phobic avoidance behaviour without any overall change in heart rate.

Lang (1968), after failing to observe a correlation between self-rating and actual avoidance of harmless snake, concluded that "while the phenomenal experience of fear invites us to think of it as a unitary feeling and thus a correlated set of similarly determined responses, the measure of fear-relevant behaviour invites an opposite conclusion and . . . we should apply specific techniques to the different behavioural systems that we are trying to

change - verbal, overt-motor, and somatic . . .". The results observed by Leitenberg et al., (1971) also suggest that inhibition of physiologically defined anxiety in the treatment of neurotic disorders may not be a necessity in all cases. These authors suggest emphasis be placed on training an individual to engage in approach behavior even though physiological arousal may be experienced. They suggest that continued practice should lead to a reduction in physiological arousal.

In most instances, therapy is conducted in an office setting. Under these conditions, little, if any, attention can be paid to non-verbal behaviour in relevant natural settings. Wolpe (1963) has state, "there is almost invariable a one-to-one relationship between what the patient can imagine without anxiety and what he can experience in reality without anxiety". A number of studies however, have failed to support this statement. It has been observed that subjects who were successfully desensitized in imagination were unable to reach corresponding levels in the behavioural situation (Lang et al., 1965; Davison, 1968; and Agras, 1967). Barlow et al. (1969) observed anxiety in the form of avoidance behavior reduced

to real situations as well as imaginary scenes after systematic desensitization with the real object. This suggests that training with the real object transfers back to imagination and thus closes the gap between progress in the real situation and in imagination. This indicates the relative inefficiency of the imaginative process. This is supported by controlled studies with various clinical phobias (Leitenberg et al., 1970; Crowe et al., 1972).

Leitenberg and Callahan (1973) conducted their study to determine whether or not fears with different origins, course and chronicity could be reduced by a common treatment program. Thus the variables previously found to be important in the treatment of neurotic disorders were combined into a single treatment program termed "reinforced practice". Four experiemnts were conducted, each involved a different fear. Fear of heights, snakes and electric shock in adults and fear of darkness in children were studied. These authors emphasized approach behaviour, that is, in all four experiments the primary outcome measure was behavioural. The phrase "fear reduction" referred to the subject's increase in approach behaviour or willing-

ness to remain in a formerly feared situation for an increased length of time. The authors suggested that although fear is a complex construct with separable behaviour, attitudinal and physiological components, the behavioural measure is most pertinent if the intent is therapeutic. The results of the four experiments conducted by these authors showed that subjects who experienced the "reinforced practice" procedure improved their performance significantly as compared to untreated control subjects. It appears that energies are misplaced when directed at elimination of physiologically defined anxiety rather than at the development of gradually structured and measurable opportunities for practising approach behaviour (Leitenberg and Callahan, 1973).

Childhood phobias are focused at similar objects and situations as in adult phobias but the overall pattern appears to vary somewhat from adult phobias. In children, phobias are more numerous and transitory. Childhood fears are common and expected. They can arise with no apparent cause and subside again with as little reason. Because of the intensity of chilhood fears, it is even more difficult to differentiate between the normal and abnormal fears of

children (Marks, 1969). Studies with children so far have generally not distinguished between mild fears and severe phobias. This adds confusion to a situation that is already complicated by the high frequency of fears in young children and the change in the frequency and nature of feared objects as children grow older. It appears from the literature that handicapping phobias in children are uncommon. There are, however, certain fears that apparently occur more frequently than others. These are fears of animals, and of natural phenomena such as darkness, storms and thunder.

Hagman's study (1932) of pre-school children determined the most common fears were of dogs, doctors, storms and thunder. Jersild et al. (1935) reported that all ages, children reported fear of dangers, most of which had never actually threatened them. Children can come to fear objects or situations without exposure to them. This occurs through social learning. Many of the fears expressed by children in surveys appear to be the cultural stereotypes which they have acquired (Marks, 1969).

The present author has observed fear of water to be a relatively frequent phenomenom. This fear can lead to an

inability to engage in a variety of behaviours directly related to water. Though no experimental research has been conducted, it is suggested that the severity of the fear increases with age. In some cases, these fears are a result of a prior traumatic experience (near drowning, boating accident etc.), however, in many cases the cause is unknown. To date the research to determine an effective treatment for this fear has been lacking. Of the five studies reported in the literature, two were conducted with a single individual.

Sherman (1972) investigated the relevance of concomitant real life experience as it affected the treatment of systematic desensitization. He employed a 2 x 3 factorial design with two levels of systematic desensitization and three levels of exposure. The pre-treatment measures included gradual water exposure, subjective ratings and investigators ratings during the interview. The post-treatment measures were identical. Follow-up was conducted when the subjects were mid-way through a compulsory swimming course. All subjects had been assigned to the swimming course in the second semester at the request of the experimenter as treatment was to conclude at the end of the first

semester. The measures used for the follow-up included those administered in the pre- and post-test as well as subjective improvement ratings. The results indicated significant subjective and behavioural improvement associated with the repeated exposure treatment. Reduction of anxiety to the imagined stimuli in systematic desensitization showed little transfer to the real life situation when there was no gradual exposure given.

Lewis (1974) investigated the relative effects of modeling and participation and a combination of the two in reducing the avoidance behaviour of children toward water activities. Lewis was temporally separating the components of Bandura's participant modeling technique. This procedure has been found superior to other treatments with snake phobia in both adults and children (Bandura, Blanchard and Ritter, 1969; Blanchard, 1970; Ritter, 1968). Sherman (1972) used a participation procedure with no modeling component and found a significant reduction in avoidance of swimming activities in college-aged females.

Lewis selected subjects from a boy's summer camp. All were selected on the first day of camp when they displayed fear of water during preliminary swimming tests. The

preintervention assessment was administered the following day. This consisted of the administration of a behaviour rating scale (BRS) to measure the strength of the avoidance behaviour. The 16 swimming-related items on the BRS were presented in order of increasing difficulty. The BRS assessment of each child was made independently by two raters having no knowledge of the experiment. Final selection for intervention was based on the BRS score. Those children who scored 50 or less were assigned to one of four intervention condtions. The groups were equated on the basis of age and mean BRS score. Subjects were exposed to intervention conditions on the day after preintervention assessment. The conditions were Modeling plus participation (MoP); Modeling (Mo); Participation (P) and Control.

In the MoP condition subjects were shown the modeling film by a white female experimenter. (All forty subjects were black males). The film depicted three black males performing tasks in a pool similar to those on the BRS. All were coping models, somewhat frightened and hesitant at first but becoming more competent as the more difficult items were completed. After the film, a second white female

experimenter carried out the participation phase by spending ten minutes in the pool with the subject encouraging him to try the items on the BRS. Social reinforcement was given for any activities attempted and completed by the subject. In the Mo condition, subjects viewed the film and immediately after played a 10 minute game of checkers with experimenter 2 on a platform beside the pool. The game was played according to the subject's rules and was always won by the subject. Those in the participation group were shown an 8 minute neutral film by experimenter 1. "Neutrality" was defined as the absence of any elements relating to water activity. Immediately after the film the subjects were taken to the pool for participation which was the same as in the MoP condition. In the control condition the subjects were shown the neutral film by experimenter and then participated in a checker game which was conducted as in the Mo condition.

On the day after intervention each subject was administered the BRS in a manner identical to the preintervention assessment procedure. Follow-up was conducted after five consecutive days of swimming instruction which began the day after postintervention. This consisted of the adminis-

tration of the BRS and the completion of an instructor's rating scale (IRS). The IRS was a five-item questionnaire designed to assess performance in swimming class. The items concerned the subjects': (1) level of swimming skill; (2) improvement in swimming skill; (3) fear of swimming; (4) avoidance of swimming and (5) class attendance. The first four items were assessed on a scale from one to ten (one-poor, ten excellent). The results indicated that those in the MoP condition reduced avoidance behaviour more than those in either the Mo or P condition. Some reduction of avoidance behaviour was observed in all subjects but those in the control group.

From the studies cited it appears that exposure to water is useful in reducing avoidance behaviour of water. The acquisition of swimming skills was enhanced following real life exposure to water in the subjects who had previously displayed avoidance behaviour of water. Prior research has been conducted employing real-life exposure on a short term basis and independent of the swimming skill instruction.

In the present study, reinforced practice was used to treat children for fear of water. For this particular fear it was considered appropriate to place the emphasis on

actual approach behaviour in a natural setting. Thus the primary fear measure was a behavioural measure as in Leitenberg and Callahan's study (1973). The effectiveness of this procedure in treating fear of water was evaluated by a comparison of the pre- and post-test scores on the behavioural test for a treated experimental and untreated control group. The procedure involved was primarily concerned with orientation to water. Thus this procedure was integrated with the Red Cross Pre-beginner program to provide the opportunity for the acquisition of basic swimming skills under the reinforced practice conditions.

Method

Subjects: 23 children were recruited on the basis of parental response to an advertisement for special classes for children who were afraid of water and water-related activities at the Dartmouth Parks and Recreation Department Learn-to-Swim registration. The children were randomly assigned to the two special classes. Three subjects from the experimental group were dropped after the pre-test as they made the highest possible score on the behavioural

approach test. The experimental group consisted of: 10 subjects with a mean age of 6.5 years. The control group consisted of 10 subjects and the man age was 6.0 years.

Procedure: The special classes were held on Saturday mornings. The children enrolled in the first class (9:00 a.m.) were the experimental group and those enrolled in the second class (10:20 a.m.) were the control subjects. This information was given to the Recreation Director prior to registration. The experimenter was not involved in the registration for the learn-to-swim program. The exact procedure for the study was known only by the Recreation Director.

The pool at the Nova Scotia Hospital, Dartmouth, Nova Scotia was used as the experimental setting. The pool is 25 metres long and 15 metres wide. At the shallow end the pool is 3.0 feet deep and this depth remains constant for 5.0 metres gradually increasing to a depth of 5.0 feet and remaining at this depth until the 15.0 metre mark. From this point the depth increases gradually to 9.0 feet at the deep end of the pool. The pool has wide concrete steps. Thus it is possible to enter the pool using the steps in a gradual

fashion. The water temperature is approximately 80.0 degrees Farenheit.

Pre-test Measures: All parents who expressed a desire to enroll their child in the "special" classes for timid swimmers were asked a series of questions related to the child's overall reactions to water activity (see Appendix A).

The subjects were interviewed individually at the experimental setting prior to the administration of the behavioural approach test. The subjects were asked a series of questions (see Appendix B) some of which had been asked of the parents. This series of questions was designed to provide a subjective measure of the subjects' overall fear of water activities. The series of questions asked of the parents provided an objective measure of the subjects' overall fear of water. A behavioural test (see Appendix C) was administered to each subject. The subjects were told to do only what they wanted to do as the purpose of the session was to find out what they could do. They were instructed to stop any time they felt uncomfortable. Two raters made independent observations of each subjects' performance on each of the eleven items on the behavioural approach test. The range of possible scores for the behavioural approach test was from zero to eleven.

After each test item was attempted, the experimenter verbally presented the subjective rating choices in which subjects were to rate each behavioural approach item on a five-point scale. A score of one denoted the absence of anxiety and five the most anxiety. This procedure was altered due to subjects' responses. A three-point scale was used with the response range adjusted appropriately.

Treatment Phase: (Experimental group) Following the pre-test, the experimental group was given therapeutic instructions. The instructions were that during the swimming lessons many skills would be demonstrated and each subject would be expected to try certain skills. The skills would not be the same for all subjects. The subjects were told if they attempted the skills and continued practising them, improvement would occur. The importance of paying attention and practice was repeated at the beginning of each treatment phase.

Treatment consisted of 40 minute weekly sessions for eight weeks with feedback and contingent praise. The treatment consisted of the use of reinforced practice with the behavioural approach items as well as the items from the Red Cross pre-beginner program. The progressions of the

pre-beginner program were introduced gradually as the items on the behavioural approach test were mastered and the progessions became useful in the treatment of each subjects' fear.

The Red Cross pre-beginner program consists of a series of suggested progressions designed to introduce various water positions and a series of evaluation items designed to assess an individual's competence in the fundamentals of swimming. The purpose of the pre-beginner program is to familiarize an individual with the fundamentals of swimming and water safety through sound orientation and adjustment by exploration. The progressions outlined by Red Cross Water Safety are vague to allow for variation. (see Appendix F). The progressions suggested for use in this program assume an individual acquires confidence in the water quickly. Completion of this program requires an individual to demonstrate his ability to swim. Thus the program involves more then mere orientation to water.

Each session consisted of five trials. A trial involved a single item from either the behavioural approach test or the pre-beginner program. For example, upon completion of

the first eight items from the behavioural approach test, breath control by bobbing (progression e) was introduced from the pre-beginner program. As other pre-beginner progressions became pertinent they were introduced. The item was first explained and demonstrated by the experimenter and secondly the subject attempted the item, after which the experimenter provided feedback and contingent praise.

For session one, the original criterion point was determined from the behavioural pre-test. It was one step below the final step completed during the pre-test. For example, a subject who had completed the first three items on the pre-test, would begin treatment with item two. If a subject completed a specific item successfully on two consecutive trials, the next item was introduced. For some subjects it was necessary to break down an item into finer steps. For example, entering the pool using the steps was in some instances broken down into the first three steps, then four and finally five steps so that the subject was standing on the bottom of the pool.

The experimenter worked with the subjects on a one-to-one basis for the five treatment trials. The remaining class

time was spent practising skills outlined by the experimenter for each subject.

Treatment Phase: (Control group) The control group was exposed to the Red Cross pre-beginner program. This exposure was provided by following the progressions outlined by Red Cross.(see Appendix F). The subjects were not required to practice the items from the behavioural approach test and did so only when the same item appeared in the pre-beginner program. The same experimenter conducted the classes for the control subjects and experimental subjects. The subjects of the control group received forty minute weekly sessions for a period of eight weeks. Control subjects were encouraged to participate in the class but if a subject did not want to try a specific skill no intervention was attempted. The experimenter demonstrated specific skills and provided individual help with the skills but there was no set number of trials for any individual subject in a particular session. The subjects were exposed to the pre-beginner program as a class. That is, any specific skill was demonstrated to the entire class and all subjects were given the opportunity to try the skill. When one subject successfully completed a skill the next step in the pro-

gression was introduced.

Post-test Measures: These consisted of the administration of the behavioural approach test, the subjective ratings of each item on the behavioural approach test and the series of questions concerning the overall fear of water activities. These measures were administered in the same way as the pre-test measures. The raters made independent observations without knowledge of the experimental conditions to which the subjects had been assigned.

Progress reports were written for each subject. Parents were informed of the experimental nature of the course in which their child had participated and the condition to which their child had been assigned. Parents were told that contact would be made in order to complete some follow-up information.

Follow-up Measures: Subjects were given the same measures as in the pre- and post-test in the same manner as on the previous occasions. This was conducted ten weeks after the post-test.

Results

The performance on the behavioural approach test before and after treatment is summarized in Table 1. The mean score

Table 1

Mean Score on the Behavioural Approach Test

	Pre-test (n=16)	Post-test (n=16)	Follow-up (n=9)
Experimental Group	5.50	10.62	11.00
Control Group	4.50	6.12	5.25

Note. 11.00 was the highest possible score that could be given.

on the pre-test for the experimental and control groups was not significantly different. On the post-test, the two groups differed significantly on performance ($t=3.46$, $14df$, $p=0.01$).

All members of the experimental group but one achieved the highest possible score of 11, being able to attempt a handstand or a somersault by the time of the post-test. Only one subject in the control group reached this level of achievement. The mean improvement for the experimental group was approximately 5 items. This increase was significant ($t=9.72$, $7df$, $p=0.01$). The mean difference score for the control subjects on the pre- and post-test was not significant. The mean improvement was approximately one item for the control group.

Follow-up data were obtained for five of the subjects from the experimental group and from four of the subjects in the control group. All subjects in the experimental group for whom follow-up data was obtained achieved the highest possible score of 11. Four of the five experimental subjects had achieved this score on the post-test so a ceiling effect was observed on the follow-up. The mean score for the control group on the behaviour approach test at follow-

up showed a decrease in performance from the post-test. Of the four subjects, one achieved a higher score than at the time of the post-test. The remaining subjects scored lower than their post-test performance. The mean difference score for the two groups was significant (t=11.50, 7df, p-0.01).

The subjective ratings on each item of the behavioural approach test are summarized in Table 2. The ratings were converted to a three point scale because the five point scale had been disregarded in responding. Most subjects had responded with one of the following responses for any particular item: "I'm not afraid"; "I'm a bit scared"; or, "I don't want to because I'm scared". The two groups did not differ significantly at the time of pre-test, however, the post-test ratings for the two groups were significantly different (t=4.51, 14df, p-0.01). The experimental group decreased subjective fear ratings from 22.50 at pre-test to 13.62 at post-test. The control group dropped their fear ratings from 23.75 at pre-test to 20.00 at post-test. The follow-up ratings for the two groups were significantly different (t=7.48, 7df, p-0.01).

Table 2

Mean Subjective Fear Rating Scores of
Behavioural Approach Test Items

	Pre-test (n=16)	Post-test (n=16)	Follow-up (n=9)
Experimental Group	22.50	13.62	12.00
Control Group	23.75	20.00	19.75

Note. 11.00 the lowest possible fear rating score
33.00 the highest possible fear rating score

The responses on the interview scales are summarized in Tables 3 and 4. Table 3 contains the responses of the parents of both groups of subjects. Of the parents of the control subjects, 5 described their child as having a slight fear of water, 1 as being moderately afraid of water and 2 children were described as being extremely fearful of water at the time of the pre-test. At post-test the parents responses had changed; 5 children were described as having a favourable reaction to water and 3 were described as slightly fearful of water. Of the parents of experimental subjects, 4 attributed moderate fear to their child and 4 were described as being extremely fearful of water. At post-test, 6 were described as having favourable reactions and 2 as having slight fear of water. At follow-up, 7 parents of control subjects described their child as being slightly fearful of water and 1 parent described her child as having a positive attitude toward water. All parents of the experimental subjects expressed feeling that their children had positive attitudes toward water. The subjects response to item 4 (how do you feel about coming to swimming lessons) were as follows: at pre-test, 7 control subjects had favourable reactions and 1 was

Table 3

Parental Interview Responses:

Number of parents responding to each question

Questions	Experimental Group				Control Group			
	1.	2.	3.	4.	1.	2.	3.	4.
Responses (Pre-test) n=16								
yes	3		1		5		2	
no	3		7		3		6	
no reaction/favourable		5				6		
slightly fearful		2				2		5
moderately fearful		1		4				1
extremely fearful				4				2

Questions	Experimental Group				Control Group			
	1.	2.	3.	4.	1.	2.	3.	4.
Responses (Post-test) n=16								
yes	5		1		5		2	
no	3		7		3		6	
no reaction/favourable		7		6		8		5
slightly fearful		1		2				3
moderately fearful								
extremely fearful								
Responses (Follow-up) n=16								
yes	8		1		8		2	
no			7				6	
no reaction/favourable		8		8		8		1
slightly fearful								7
moderately fearful								
extremely fearful								

Table 4

Subject Interview Responses:
Number of subjects responding to each question

Questions	Experimental Group				Control Group			
	1.	2.	3.	4.	1.	2.	3.	4.
Responses (Pre-test) n=16								
yes	5		1		5		2	
no	3		7		3		6	
no reaction/favourable		5		6		7		7
slightly fearful		2		2		1		1
moderately fearful		1						
extremely fearful								

Questions	Experimental Group				Control Group			
	1.	2.	3.	4.	1.	2.	3.	4.
Responses (Post-test) n=16								
yes	5		1		5		2	
no	3		7		3		6	
no reaction/favourable		7		8		8		8
slightly fearful		1						
extremely fearful								
Responses (Follow-up) n-9								
yes	5		1		4		2	
no			4				2	
no reaction/favourable		5		5		4		4
slightly fearful								
moderately fearful								
extremely fearful								

slightly negative about attending swimming classes. At this time, 6 experimental subjects indicated they favoured attending class and 2 were slightly negative about coming to the swimming class. At post-test, all 16 subjects expressed favourable attitudes toward class attendance. Follow-up data on the 5 experimental and 4 control subjects indicated that all subjects were in favour of attending swimming instruction.

Progress in the Red Cross pre-beginner program was substantially greater for those in the experimental group than those in the control group. Two subjects in the experimental group successfully completed this program and are presently enrolled in the next level of the Red Cross learn-to-swim program. One subject from the control group completed the program and has enrolled in the next level of the learn-to-swim program. He has been placed back in the pre-beginner program as he expressed fear of deep water and was unable to attempt to perform the skills of this level.

Discussion

The results indicate the experimental group significantly reduced their fear of water. The reinforced practice

procedure was effective in producing a substantial improvement in the ability of the subjects to perform the items on the behavioural approach test. The subjects in the no-treatment control group (with one exception) failed to show such improvement.

In this study, as in Leitenberg and Callahan's (1973), the primary outcome measure was behavioural and thus fear reduction refers to the subjects engaging in approach behaviour that was formerly avoided. Significant effects were obtained on the subjective fear ratings of the behavioural items for the experimental and control subjects. These ratings indicated that the treated subjects reported greater decreases in fear than the control subjects at post-test and follow-up. However, the interview scale question concerning class attendance yielded results that indicated all subjects (experimental and control) had positive attitudes toward attending swimming class. This discrepancy may merely reflect the lack of exposure of the control subjects to the behavioural approach test items. However, the discrepancy also points out the need to determine the validity and reliability of self-reported fear ratings of children.

The findings of this study are in accordance with prior published research. For example, Sherman, (1972) found that real-life exposure plus systematic desensitization was effective in treating fear of water in college-aged females. The utility of systematic desensitization alone as a treatment for fear of water is questionable. Sherman observed that the reduction of anxiety to the imagined stimuli in systematic desensitization showed little transfer to the real-life situation when there was no gradual exposure given. Lewis (1974) observed a modeling plus participation procedure to be an effective treatment in reducing avoidance behaviour of water in children. Her procedure was employed for a brief period of time with apparent success. It seems probably that the subjects involved in her study exhibited only very mild fear of water. Lewis' findings indicated that participation alone produced a greater reduction in avoidance than modeling alone. Ritter (1969) suggested that modeling variables might play a more significant role in the treatment of animal phobias than of territorial phobias, which require more physical involvement on the part of the subjects. Bandura (1971) emphasized the importance of overt practice in performance that contain many motor components.

These findings are supported by the results of the present study.

The results of the present study provide support for many of the findings from the large scale interview and observation studies on children's fears reported by Hagman (1932) and Jersild and Holmes (1935). These authors concluded that most childrens' fears decline as the child is gradually exposed to the feared situation and becomes accustomed to it. These conclusions were not based on the results of controlled experimentation but on the basis of mothers' reports and nursery school observations. Hagman (1932) interviewed mothers of pre-school children to determine the methods, if any, parents employed to try and reduce their childrens' fears and which were most successful. He found that parents used explanation most often (52 percent). Procedures in which the parents intentionally confronted the child with the feared situation were employed only 18 percent of the time. When exposure to the feared object was employed, 68 percent of the fears were eliminated. When explanation and reassurance were employed only 18 percent of the fears were successfully reduced and not treatment led to only 8 percent elimination. Parents generally tend to rely on

explanation to allay their child's fears even though it is relatively ineffective.

In the present study, the children were tested individually. During testing the other subjects were seated with their backs to the water and engaged in conversation with the other subjects. It is possible that the subjects conversation included discussion of the performance of the behavioural approach test items and in fact some subjects may have observed others performing the test items. Thus it is possible that the conversation and observations led to a social comparison and subsequently influenced subjects performance on the approach test. That is, the conversation and observation may have reinforced the subjects in the experimental group and thus a ripple effect may have occurred in the performance of the behavioural approach test items. The opposite ripple effect may account for the lack of improvement observed in the performance of the control subjects.

Further study is needed to determine the effect of having all subjects present for the testing session. As previously stated prior research has suggested that modeling alone is not always as powerful a treatment as are other

treatments of phobias that combine other procedures with modeling (Lewis, 1974; Ritter, 1968, 1969; Bandura, 1969). Riter (1968) in a study on the group desensitization of children's snake phobia demonstrated that physical contact with the object and/or physical contact with fearless models produced greater results than those obtained by vicarious desensitization alone.

The results of the present study indicate that water orientation is important in overcoming fear of water. The procedure used for the present study involved the use of reinforced practice with the items on the behavioural approach test as well as the progressions from the Red Cross pre-beginner program as they became relevant to a subjects' progress. The behavioural approach test and the pre-beginner program has some overlap as both are concerned with water orientation. The behavioural approach test however, stresses only water orientation and is structured more gradually than the orientation progressions of the pre-beginner program. It appears from the present results that the more gradual the exposure to water is then the progress will be greater in the acquisition of a sense of security in the water. It appears that this sense of security is necessary

to acquire the more complex skills of learn-to-swim programs. Thus the present results suggest that swimming skills may be more readily acquired by children with fear of water if there is exposure to water orientation skills. These skills can quite simply be integrated into the existing pre-beginner program.

In conclusion, it appears that reinforced practice is an effective treatment for fear of water. More research is needed to replicate the reported results and to test the effects of variations in the testing procedure.

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Appendix "A"

Interview Scale for Parents

1. Has your child previously attended swimming classes?
2. How does your child react to baths, showers, etc.?
3. Does your child engage in other water-related activities (such as paddling or boating)?
4. How much fear do you think your child exhibits?

Appendix "B"

Interview Scale for Children

1. Have you ever taken swimming lessons before?
2. How do you feel about taking showers, baths, etc.?
3. Do you take part in any activities around the water such as paddling or boating?
4. How do you feel about coming to swimming lessons?

Appendix "C"

Behavioural Approach Test

1. Enter the pool area
2. Sit on the edge of the pool
3. Enter the pool using the steps
4. Stand in the pool holding onto the side at the shallow end
5. Stand in chest deep water
6. Move around in chest deep water
7. Water level covers shoulders
8. Face in the water eyes closed
9. Face in the water with eyes open
10. Body submerged
11. Attempt handstand, somersault, etc.

Appendix "D"

Subjective Ratings for Behavioural Test Items

1. It doesn't bother me at all.
2. I'm a bit scared
3. I'll do it but I don't like it
4. I won't do it because I don't want to
5. I won't do it because it would terrify me

Appendix "E"

Rating Sheet used for Pre-, post-test and follow-up measures

Name:

1. Enter the pool area yes__ no__
   1. 2. 3. 4. 5.

2. Sit on the side of pool yes__ no__
   1. 2. 3. 4. 5.

3. Enter the pool using steps yes__ no__
   1. 2. 3. 4. 5.

4. Stand in the pool holding onto side at shallow end yes__ no__
   1. 2. 3. 4. 5.

5. Stand in chest deep water yes__ no__
   1. 2. 3. 4. 5.

6. Move around in chest deep water yes__ no__
   1. 2. 3. 4. 5.

7. Water level covers shoulders yes__ no__
   1. 2. 3. 4. 5.

8. Face in the water yes__ no__
   1. 2. 3. 4. 5.

9. Face in water with eyes open yes__ no__
   1. 2. 3. 4. 5.

10. Body submerged yes__ no__

1. 2. 3. 4. 5.

11. Attempt handstand, somersault, etc. yes__ no__

1. 2. 3. 4. 5.

Note: 1. It doesn't bother me at all
2. I'm a bit scared
3. I'll do it but I don't like to
4. I won't do it because I don't want to
5. I won't do it because it would terrify me

Appendix "F"

Progressions from the Red Cross Pre-Beginner Program

Suggested progressions:

a) move in various depths of water

b) transfer weight to hands in shallow water

c) submerge and hold breath for various lengths of time

d) demonstrate ability to turn in various ways (e.g. forward roll, shoulder roll and backward roll)

e) develop breath control by bobbing

f) float face down in a star shape and streamlined body position

g) front and back glide

Evaluation Items

1. Water Safety Knowledge
2. Body movement in chest deep water
3. Jump into chest deep water unassisted
4. Swim 5 metres
5. Surface survival for 30 seconds

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*Reference: Red Cross Instructors Guide and Manual Revised Ed. Canadian Red Cross Society, 1974

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