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# Relaxation training inhibits fear and arousal during in vivo exposure to phobia-cue stimuli

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## Abstract

Twenty carefully selected snake phobics were exposed to a caged snake for eight trials via a conveyor apparatus. During the first and eighth trials the subjects brought the snake toward themselves as closely as tolerable; records were kept of the end-of-trial distances remaining between the subject and the snake. For the six intervening trials the experimenter placed the snake a standard distance away; records were kept of the subjects' heart rates and skin-conductance levels before and during the exposures, and of their self-reported fear intensities after the exposures. Half of the subjects had received six sessions of progressive relaxation training before the exposures occurred. The results for subjects who had received relaxation training versus subjects who had not received relaxation training showed clearly that the training served to attenuate arousal and fear in the context of in vivo exposure. The results showed also that relaxation worked by lowering arousal throughout the course of exposure, not by hastening or facilitating arousal decrement during exposure. Some implications of the results are discussed. © 1999 Elsevier Science Ltd. All rights reserved.

*Keywords:* Exposure; Relaxation; Phobia

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From the beginning of the behavior-therapy movement until the middle 1970s the treatment of choice for phobic disorders was Wolpe's (1958, 1973) technique known as systematic desensitization based on relaxation. Systematic desensitization involved training the patient to relax using an abbreviated form of Jacobson's (1938) progressive muscle relaxation, and enabling the patient to remain relaxed while imagining

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increasingly fearsome phobia cues. According to the original explanatory theory (e.g. Wolpe, 1958) the parasympathetic neural substrate of muscular relaxation served to reciprocally inhibit (Sherrington, 1906) sympathetic arousal; the act of relaxing during imaginal exposure to fear cues rendered those cues conditioned inhibitors (Hull, 1943) of sympathetic activation.

During the late 1970s *in vivo* exposure (Marks, 1975, 1978) replaced systematic desensitization as the treatment of choice for phobic patients. *In vivo* exposure involves confronting the patient directly with phobia cues for as long as possible or until fear subsides. There are various post hoc theories that explain fear reduction from exposure (see Barlow, 1988).

One controversial question that emerged during the shift from systematic desensitization to exposure therapy is whether there is a place for relaxation training in treatment based on *in vivo* exposure. Wolpe argued steadfastly (1958, 1973, 1990) that reciprocal inhibition is necessary in successful anxiety treatment, and that muscular relaxation is an effective means of producing reciprocal inhibition. His argument rested on the clinical success of systematic desensitization based on relaxation, and on experimental results in which relaxation-trained subjects (Ss) showed lower arousal during fearsome imaging than did untrained Ss (e.g. Paul, 1969a, b; Wolpe & Flood, 1970). Marks (1976) argued to the contrary that there is no place for relaxation training in anxiety treatment based on *in vivo* exposure. His argument rests on a literature review about the clinical success of *in vivo* exposure (Marks, 1975) and on experimental results in which relaxation training did not influence imaginal fear reduction over and above effects from “imaginal exposure” (e.g. Waters, McDonald & Koresko, 1972).

There are two reports of experiments in which effects from *in vivo* exposure with and without relaxation training were compared. AuBuchon and Calhoun (1990) acquired passive-avoidance, self-report, and heart-rate measures of treated and untreated specific phobias before and after three variations of prolonged exposure *in vivo*: exposure alone, exposure after relaxation training, and exposure in the presence of a therapist. By contrast with subjects who received prolonged exposure alone, those who received relaxation training before exposure required fewer minutes of exposure to reach criterional fear reduction (defined as twice holding the feared stimulus without reports of undue fear). Relaxation-trained subjects also changed more than did subjects who received exposure alone on passive-avoidance and self-report measures of the generalization of treatment effects to untreated phobias.

McGlynn, Moore, Rose and Lazarte (1995) reported an experiment in which the effects of relaxation training on arousal and fear were monitored across repeated *in vivo* exposures. Eight yoked pairs of DSM-III-R (American Psychiatric Association, 1987) snake-phobic Ss were exposed to a caged snake while seated in front of a package-conveyor apparatus during eight 4-min trials. Heart rates and skin-conductance levels were recorded before and during each of the eight trials. Self-reports of fear were obtained after each trial. One subject in each yoked pair had received a regimen of group-administered progressive relaxation training beforehand. Subjects in each pair took turns controlling movement of the conveyor that presented

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