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## Effects of aerobic exercise on anxiety sensitivity

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### Abstract

Anxiety sensitivity is a known precursor to panic attacks and panic disorder, and involves the misinterpretation of anxiety-related sensations. Aerobic exercise has been shown to reduce generalized anxiety, and may also reduce anxiety sensitivity through exposure to feared physiological sensations. Accordingly, 54 participants with elevated anxiety sensitivity scores completed six 20-min treadmill exercise sessions at either a high-intensity aerobic ( $n = 29$ ) or low-intensity ( $n = 25$ ) level. Self-ratings of anxiety sensitivity, fear of physiological sensations associated with anxiety, and generalized anxiety were obtained at pre-treatment, post-treatment, and one-week follow-up. Results indicated that both high- and low-intensity exercise reduced anxiety sensitivity. However, high-intensity exercise caused more rapid reductions in a global measure of anxiety sensitivity and produced more treatment responders than low-intensity exercise. Only high-intensity exercise reduced fear of anxiety-related bodily sensations. The implications of these findings are discussed.

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### 1. Introduction

A growing body of evidence indicates that aerobic exercise is an effective and cost-efficient treatment alternative for a variety of anxiety and mood disorders, including panic disorder (for a review, see [Salmon, 2001](#)). However, researchers have not examined whether exercise affects

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anxiety sensitivity, a known precursor of panic attacks and panic disorder (Ehlers, 1995). Anxiety sensitivity is conceptualized as an enduring fear of anxiety and anxiety-related sensations, brought about from the belief that these sensations can have harmful physical, psychological, or social consequences (Reiss & McNally, 1985; Taylor, 1999). Individuals who are high in anxiety sensitivity have a tendency to misinterpret and catastrophize anxiety-related physiological sensations, which may contribute to or exacerbate the experience of panic (Clark, 1986; Reiss & McNally, 1985). Accordingly, interventions that reduce anxiety sensitivity have the potential to reduce the likelihood that individuals will experience panic attacks or develop panic disorder.

Significant reductions in anxiety sensitivity following ten to twelve sessions of cognitive-behavioral therapy (CBT) have been reported (McNally & Lorenz, 1987; Telch et al., 1993). CBT treatment packages generally include exposure to feared somatic sensations, arousal reduction, and cognitive-restructuring techniques. Aerobic exercise is believed to reduce anxiety and panic symptoms through similar processes. Specifically, aerobic exercise produces many of the same bodily sensations that often elicit anxiety reactions, such as increases in heart rate, respiration, and perspiration. Repeated exposures to anxiety-related interoceptive stimuli through exercise may therefore extinguish fear responses, accompanied by changes in how these stimuli are interpreted (de Coverley Veale, 1987). Furthermore, aerobic exercise reduces generalized arousal, including resting heart rate and muscle tension (Abadie, 1988). Based on the functional similarities between aerobic exercise and CBT, it is not surprising that some studies have found no differences in the efficacy of CBT and aerobic exercise in the reduction of anxiety (Fremont & Craighead, 1987; McEntee & Halgin, 1999).

In contrast to general anxiety, virtually no attention has been paid to the relation between exercise and anxiety sensitivity. One recent non-experimental study found an inverse relation between exercise frequency and anxiety sensitivity (McWilliams & Asmundson, 2001). The authors attributed this finding to the notion that exercise produces physiological sensations similar to those feared by individuals with high anxiety sensitivity (e.g., elevated heart rate), and is thus avoided. An alternative interpretation for these findings is that a lack of exposure to these sensations resulting from physical inactivity promotes increased anxiety sensitivity. Regardless, consistent with the literature on general anxiety, it is reasonable to posit that repeated exposure to anxiety-related bodily sensations in the context of aerobic exercise should lead to a reduction in anxiety sensitivity. However, no published experimental study has examined this possibility.

The purpose of the present study was to investigate the effects of aerobic exercise-induced physiological arousal on anxiety sensitivity. Individuals were pre-selected for high anxiety sensitivity, and assigned to six 20-min sessions of high-intensity aerobic exercise (60–90% of predicted maximal heart rate) or low-intensity walking (one mile per hour). Measures of anxiety sensitivity, fear of anxiety-related physiological sensations, and state and trait anxiety were obtained at pre-treatment, post-treatment, and one-week follow-up. Previous research has shown that both high-intensity aerobic and light walking exercise programs reduce generalized anxiety (Sexton, Maere, & Dahl, 1989). Accordingly, we hypothesized that participants in the high- and low-intensity exercise conditions would both show improvement on all anxiety measures from pre- to post-treatment, and gains would be maintained at follow-up. However, it was expected that the high-intensity exercise group would show significantly more improvement on these measures in comparison with the low-intensity comparison group.

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