

Can a single bout of aerobic exercise reduce anxiety sensitivity?

A randomized controlled trial

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Introduction

- ◆ Aerobic exercise has recently garnered attention as a simple and effective means to reduce anxiety sensitivity; in fact, research has shown great potential for its role in treating anxiety-related disorders characterized by higher than average anxiety sensitivity, including generalized anxiety disorder, social anxiety disorder, panic disorder, agoraphobia, PTSD, and obsessive-compulsive disorder (Asmundson et al., 2013).
- ◆ Despite initial evidence supporting the effectiveness of aerobic exercise for reducing anxiety sensitivity, several aspects of this association remain unexplored. Research comparing aerobic exercise to placebo controls is lacking and no study to date has investigated acute reductions in anxiety sensitivity in aerobic exercise paradigms lasting less than 2 weeks.
- ◆ Our trial was designed to add to knowledge on the dose-response relationship between aerobic exercise and anxiety sensitivity by (a) quantifying the effect of a single session of aerobic exercise on anxiety sensitivity and (b) utilizing a randomized controlled trial design comprising an aerobic exercise group and a placebo exercise (i.e., stretching) control group.

Methods

- ◆ 41 individuals completed a single session of aerobic exercise or a placebo stretching control. Anxiety sensitivity was measured at baseline, post-intervention, and at approximately 3-day and 7-day follow-up using the Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007).
- ◆ The aerobic exercise paradigm consisted of a 5-minute warm up, 20 minutes of stationary cycling at 60-80% age-adjusted maximum heart rate reserve, and a 5-minute cool down
- ◆ The control paradigm consisted of 36 stretches held for 45 seconds, including 3 minutes for transitioning between poses, at or below 50% age-adjusted maximum heart rate reserve.
- ◆ Hierarchical linear modelling was used to quantify changes in ASI-3 total as well as Cognitive, Social, and Physical Concerns scores following the intervention. Models tested the effects of group, time, and group-by-time interaction. All models controlled for between-groups sex differences, included a random effect of intercept, and were bootstrapped using 1000 samples to provide robust confidence intervals.

Table 1. Participant Characteristics at Baseline

Variable	Aerobic exercise group (<i>n</i> = 21)		Control group (<i>n</i> = 19)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	35.33	13.3	30.95	11.68
ASI-3				
Total	17.52	13.03	13.47	12.82
Cognitive Concerns	3.57	4.64	3.53	4.59
Social Concerns	8.71	5.83	6.58	5.7
Physical Concerns	5.23	5.3	3.37	3.8
	<i>n</i>	%	<i>n</i>	%
Sex				
Male	10	47.6	6	31.6
Female	11	52.4	13	68.4

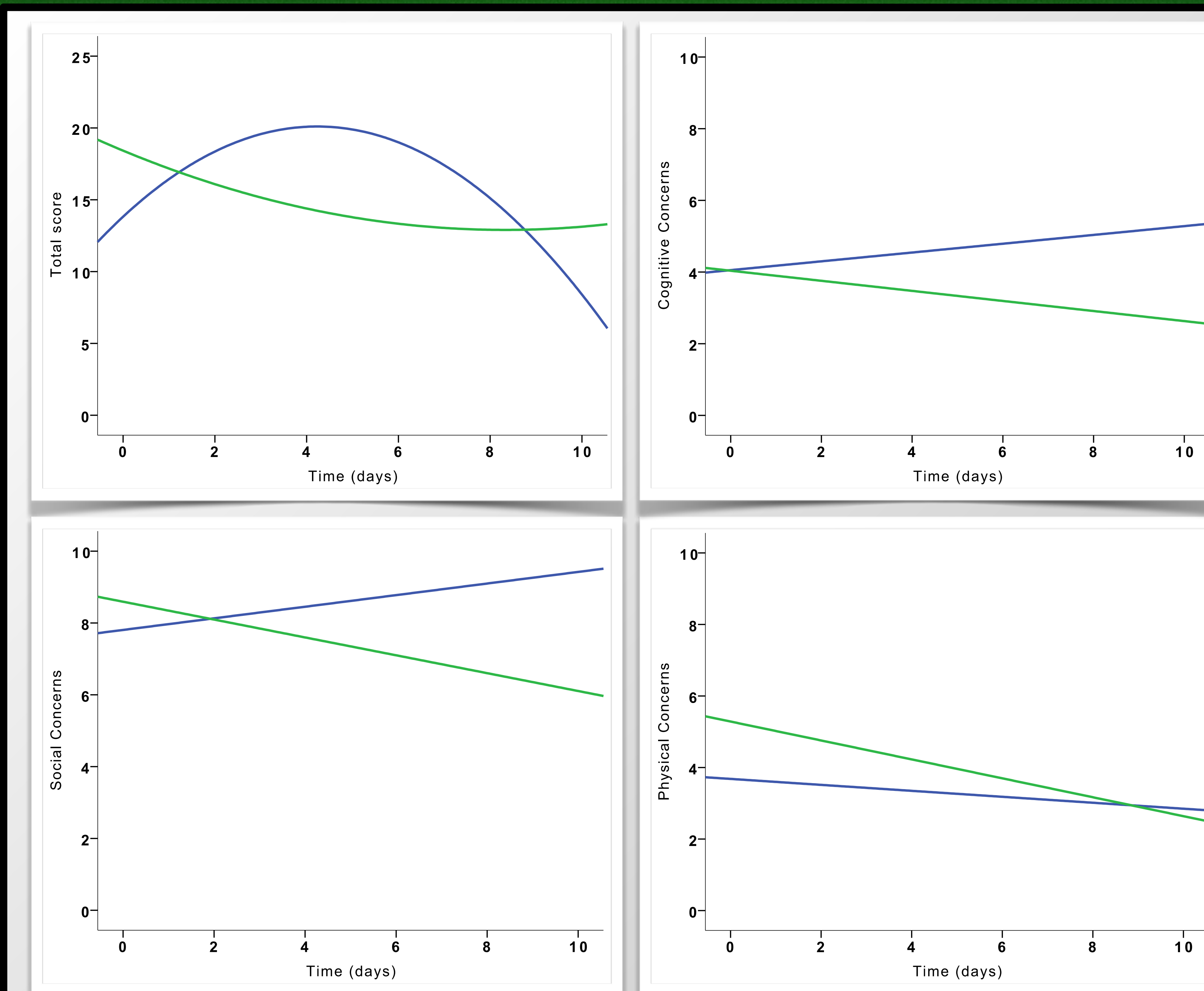


Figure 1. Estimated trajectories for ASI-3 total and subscale scores at baseline (0), post-intervention (1), and over the following days. Green lines represent the aerobic exercise group, while blue lines represent the control group. All slopes for the aerobic exercise group, but not the control group, are statistically significant.

Results

- ◆ There was a main effect of group on ASI-3 total ($b = 3.28, p = .031$) and Physical Concerns scores ($b = 1.53, p = .004$). No main effect of time was observed for any of the anxiety sensitivity dimensions (all $ps \geq .055$).
- ◆ There were significant group-by-time interactions ASI-3 total ($b = -2.82, p = .011$), as well as Cognitive ($b = -0.37, p = .019$), Social ($b = -0.52, p = .002$), and Physical Concerns ($b = -0.26, p = .035$), suggesting that the aerobic exercise group had greater declines in anxiety sensitivity compared to the control group. Additionally, analyses revealed a significant quadratic group-by-time interaction for ASI-3 total scores ($b = 0.21, p = .047$).
- ◆ Separate group analyses suggested that the effect of time for ASI-3 total and subscale scores was significant for the aerobic exercise group ($ps \leq .031$) but not for any of these variables in the control group ($ps \geq .097$; see Figure 1).
- ◆ The magnitude of change in scores in the aerobic exercise group compared to the control group represented medium effect sizes for ASI-3 Physical ($d = -0.44$), Cognitive ($d = -0.64$), total ($d = -0.70$), and Social scores ($d = -0.72$).

Discussion

- ◆ A single bout of aerobic exercise is effective in reducing all dimensions of anxiety sensitivity over the course of a week, compared to a stretching control.
- ◆ As predicted, individuals in the aerobic exercise group, but not those in the control group, experienced reductions in anxiety sensitivity. This finding rules out increased social engagement or other nonspecific factors as mechanisms of anxiety sensitivity reduction.
- ◆ The results bolster support for aerobic exercise as a simple and effective method to effect short-term reductions in anxiety sensitivity, even at a dose much lower than is typically recommended to reap health benefits. The results also suggest that stretching could be effectively used as an active control condition in future studies.
- ◆ The rapid and significant effects of aerobic exercise are promising and could be used coach individuals to become physically active in order to quickly alleviate anxiety-related symptoms and ultimately reap other mental and physical health benefits.

