

# Anxiety and Learning to Prepare Hauling Systems for Rope Rescue at Height

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## Introduction

Correct rope rescue techniques are critical for safe and rapid extraction from hostile environments both for victims and rescue crews. Many emergency personnel undergo rope rescue training, including both military and civilian search and rescue, and firefighters. From 2012 to 2015 eleven fatalities occurred in the United States during rope rescue training and in the line of duty. Clearly these tasks have risks that can be anxiety provoking for trainees. While there is a good understanding of how anxiety impacts skill performance, we understand less about how anxiety affects the learning process. **We attempted to create an anxious environment by having people practice the skill of preparing rope rescue hauling systems of various difficulties at height.**

## Methods

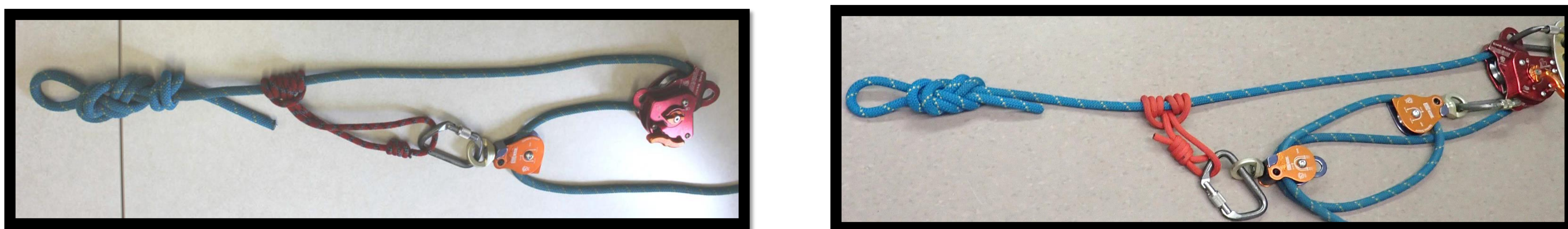
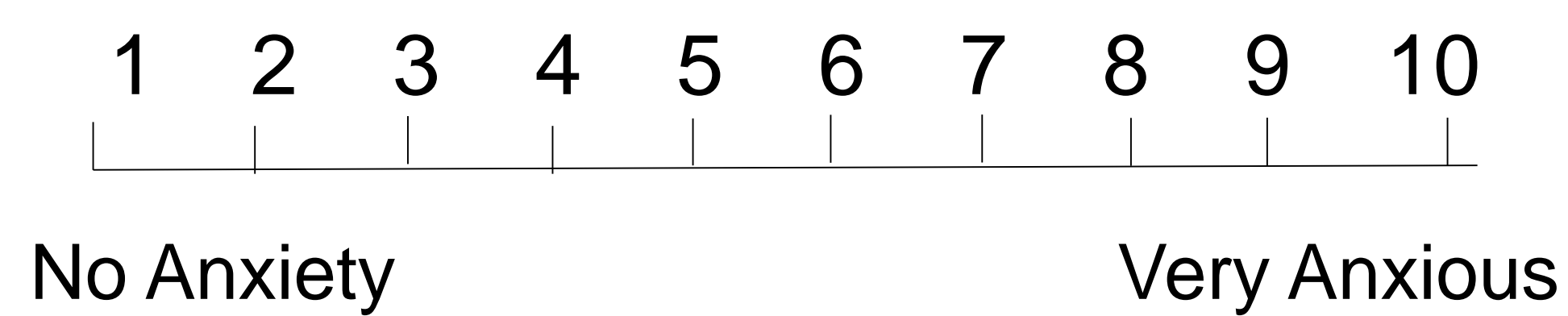


Figure 1. Photos of the 3:1 (low complexity) and 5:1 (high complexity) hauling systems that participants learned to prepare.



Figure 2. Schematic of the experimental design.

3:1			
Skill	Correct	Error (Critical)	Error (Non-Critical)
Figure 8		1	Overlapping lines .5
			Size of loop .5
			Long tail (2inches) .5
Prusik Triple wrap		1	Knot offset .5
			Missing one (double) 1
			Looping wrong end 1
			Putting on wrong line 1
MPD		1	Lines crossed .5
			Upside down 1
			Directionality 1
Pulleys		1	Miss a section 1
			Wrong Pulley 1
Comments:			



**“How do you feel after completing this trial? Please state or point to a number on the perceived anxiety scale.”**

Figure 3. Configuration performance score checklist, movement time, and perceived anxiety were measured.

## Results

### Practice

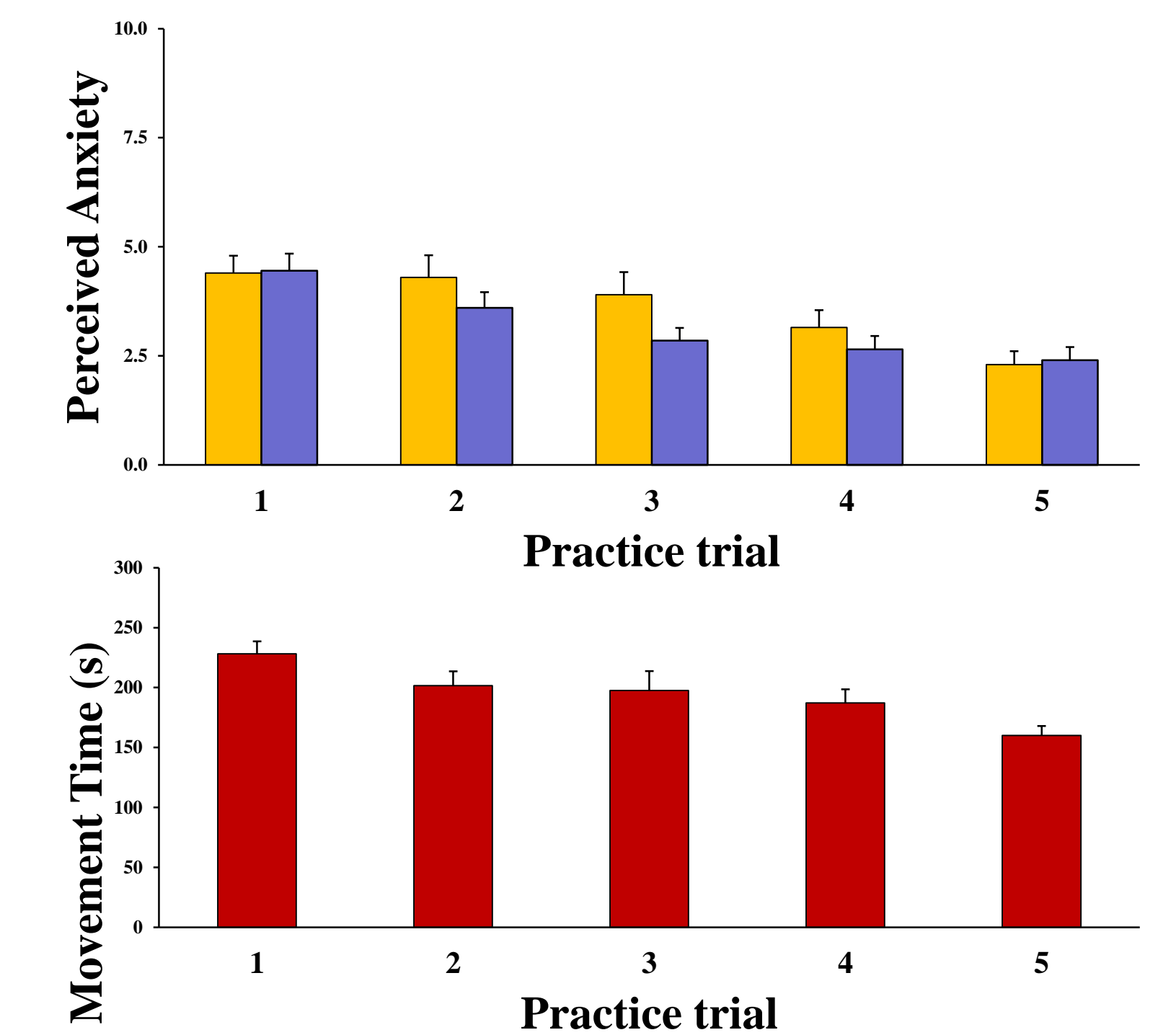
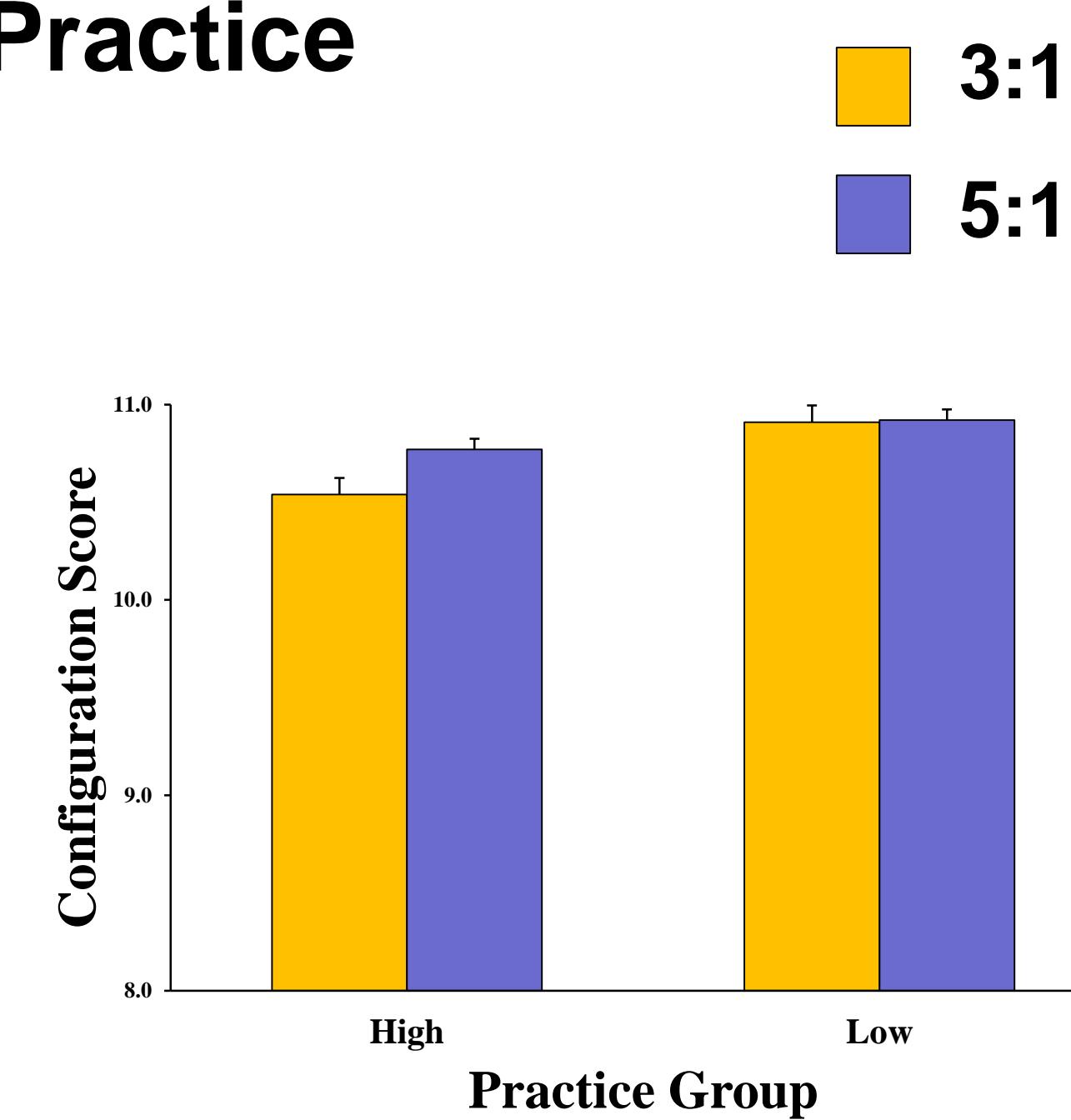


Figure 4. Configuration performance during practice was lower for the High practice group compared to the Low practice group. Perceived anxiety and movement time decreased with practice.

### Retention

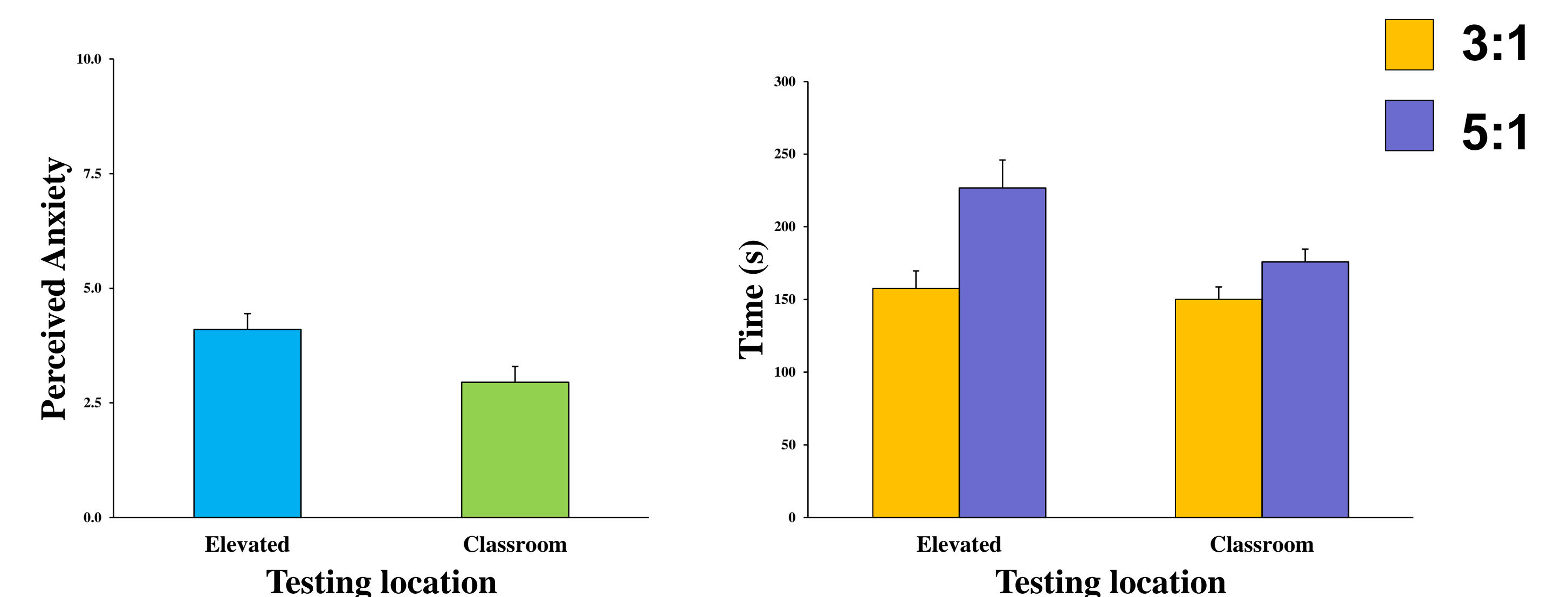


Figure 5. Perceived anxiety was higher for the elevated testing location compared to the classroom testing location. Training group had no effect on anxiety during retention testing. MT was longest when there was a cognitive challenge (the difficulty of completing the 5:1 system) and testing was elevated.

## Discussion

Based on our findings it is recommended that training at height is not necessary for transfer to performing at height conditions. It is important that learners get training on complex hauling systems because we showed that practicing and performing more complex hauling systems, contributed to cognitive anxiety related to performing at height. It is anticipated that these findings could benefit rope rescue training standards.