

# The Effects of BungeeSkate™ Training on Measures of On-Ice Acceleration and Speed

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## ABSTRACT

Previous research has stated that dry land sled pulling trains first step quickness in hockey players. Further research has demonstrated that off-ice horizontal training (sled pull, parachute, etc.) relates well to on-ice acceleration and speed. However, there is limited literature pertaining to on-ice resistance training that aims to enhance speed and acceleration in hockey players. The purpose of the present study was to determine if on-ice BungeeSkate™ training will improve on-ice speed and acceleration in youth hockey players. Twenty-four Peewee and Bantam hockey players (ages 11-14) participated in this study. Pre- and post-testing consisted of an on-ice, 44.8m speed test, a 6.1m acceleration test and a 15.2m full speed test. The training protocol consisted of eight sessions over a 4-wk period. Training sessions included 12 minutes of on-ice BungeeSkate™ training. The results of this study show that speed and top speed were significantly increased ( $p < .05$ ) by 4.2% and 4.3%, respectively. Acceleration was also slightly improved but not significantly. Based on the results, it was concluded that a 4-wk BungeeSkate™ training intervention can improve acceleration and speed in Peewee and Bantam level hockey players.

**Key Words:** HOCKEY, RESISTANCE, YOUTH, INTERVAL TRAINING, TOP SPEED

## INTRODUCTION

- Hockey is a sport that encompasses short duration, highly intense bursts of energy. The metabolic demands require the hockey player to expend energy and develop muscular strength, muscular power, and anaerobic power
- Standard hockey shifts last for 30-80 seconds with 2-4 minutes of recovery. Therefore, the predominate energy system used is the glycolytic system.
- Youth hockey training has traditionally incorporated off-ice power and agility exercises such as weight training and plyometrics.
- Other alternatives to improve speed and power are parachutes and sled pulling to enhance a players skating performance.
- By implementing on-ice resisted sprinting activity, specificity may be improved to allow for greater muscular strength and power needed for the increased demand of hockey performance.



Frog Jumps



Back-wards Skating



Cross-over Start

## PURPOSE AND HYPOTHESIS

The purpose of the present study was to determine if on-ice BungeeSkate™ training twice a week for four weeks will improve on-ice speed and acceleration in Peewee and Bantam hockey players.

We hypothesize that on-ice speed and acceleration in Peewee and Bantam hockey players will improve through four weeks of on-ice BungeeSkate™ training.

## METHODS

### Subjects

- 20 Peewee and Bantam youth hockey players.
  - 3 Females (11-13 years)
  - 17 Males (11-14 years)
  - Mean weight:  $115.1 \pm 43.5$  lbs
- Subjects were recruited via word of mouth within the youth hockey association.
- Prior to participation, potential risks and benefits of study participation were fully explained before gathering written informed consent according to the guidelines of the Institutional Review Board at the University of Wisconsin – Eau Claire.
- Since the subjects in this study were minors, parents or legal guardian were required to provide consent for participation

### Screening and Testing Procedures.

- Age and weight were measured before testing.
- Pre and post-testing for acceleration, speed, and top-speed were conducted :

- 6.1m acceleration test (1)
- 44.8m speed test (2)
- 15.2m top-speed test (3)

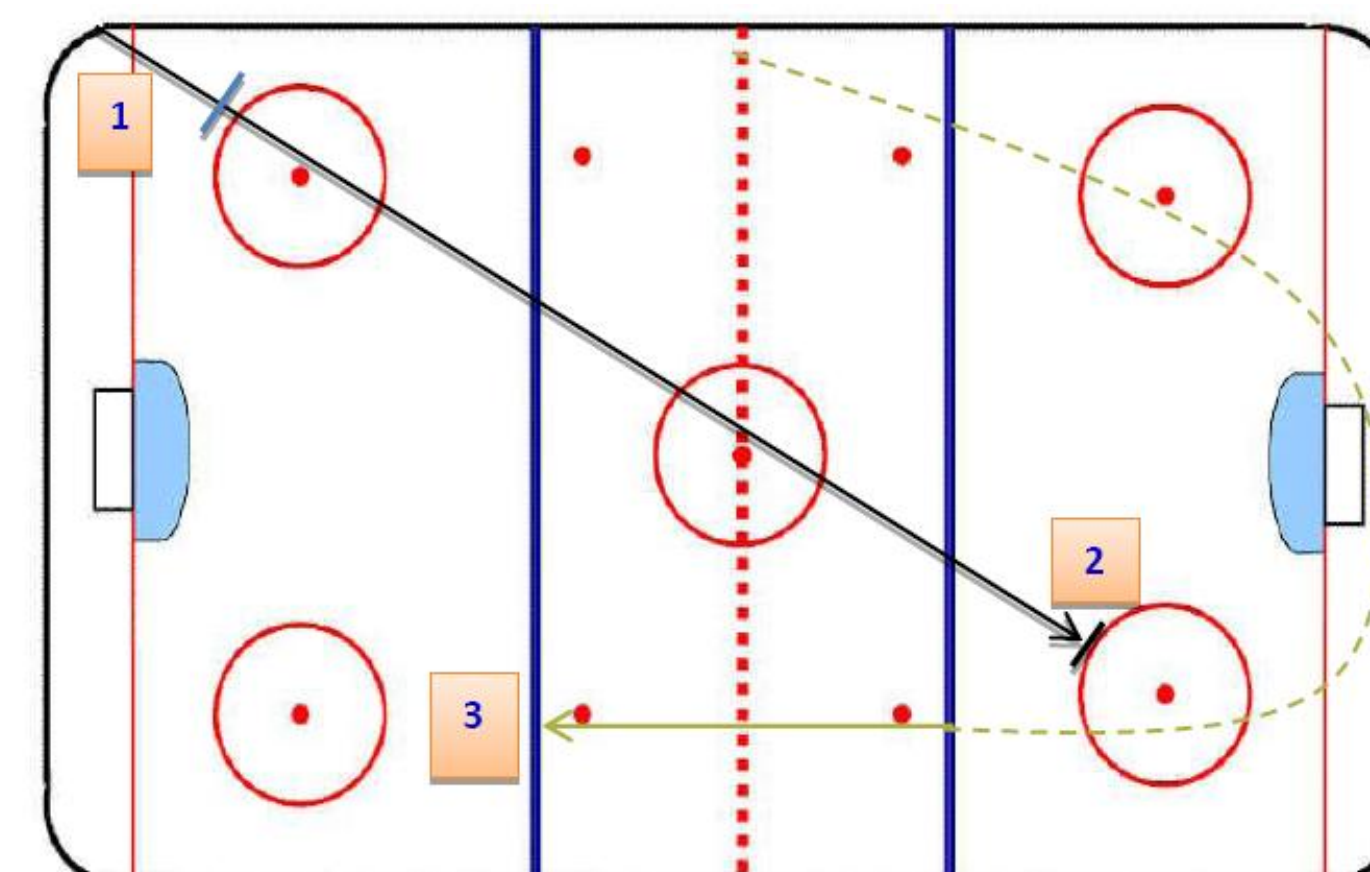


Fig. 1 Skating performance tests. Adapted from Bracko & George 2001

- Eight training sessions were conducted over 4 weeks with a minimum of 24 hours rest.
- Exercises were designed to mimic hockey specific skills
- Starting resistance for each player was set using general manufacturer recommendations (BungeeAthletics™) provided to the research team. These recommendations were based on the overall player's age, weight, and level of experience

Table 1. Training Protocol

Day One Training			Day Two Training		
Sets	Reps	Exercise	Sets	Reps	Exercise
1	5	V-Start	1	5	V-Start
1	5	Crossover Right into Forward Skate	1	5	Crossover Right into Forward Skate
1	5	Crossover Left into Forward Skate	1	5	Crossover Left into Forward Skate
3	5	High Knee Cross Over Right	3	5	Frog Jumps
3	5	High Knee Crossover Left	3	5	Backwards Skate C Start into Crossover

\* Rest periods were conducted with a 3:1 ratio in-between each set (30 seconds)

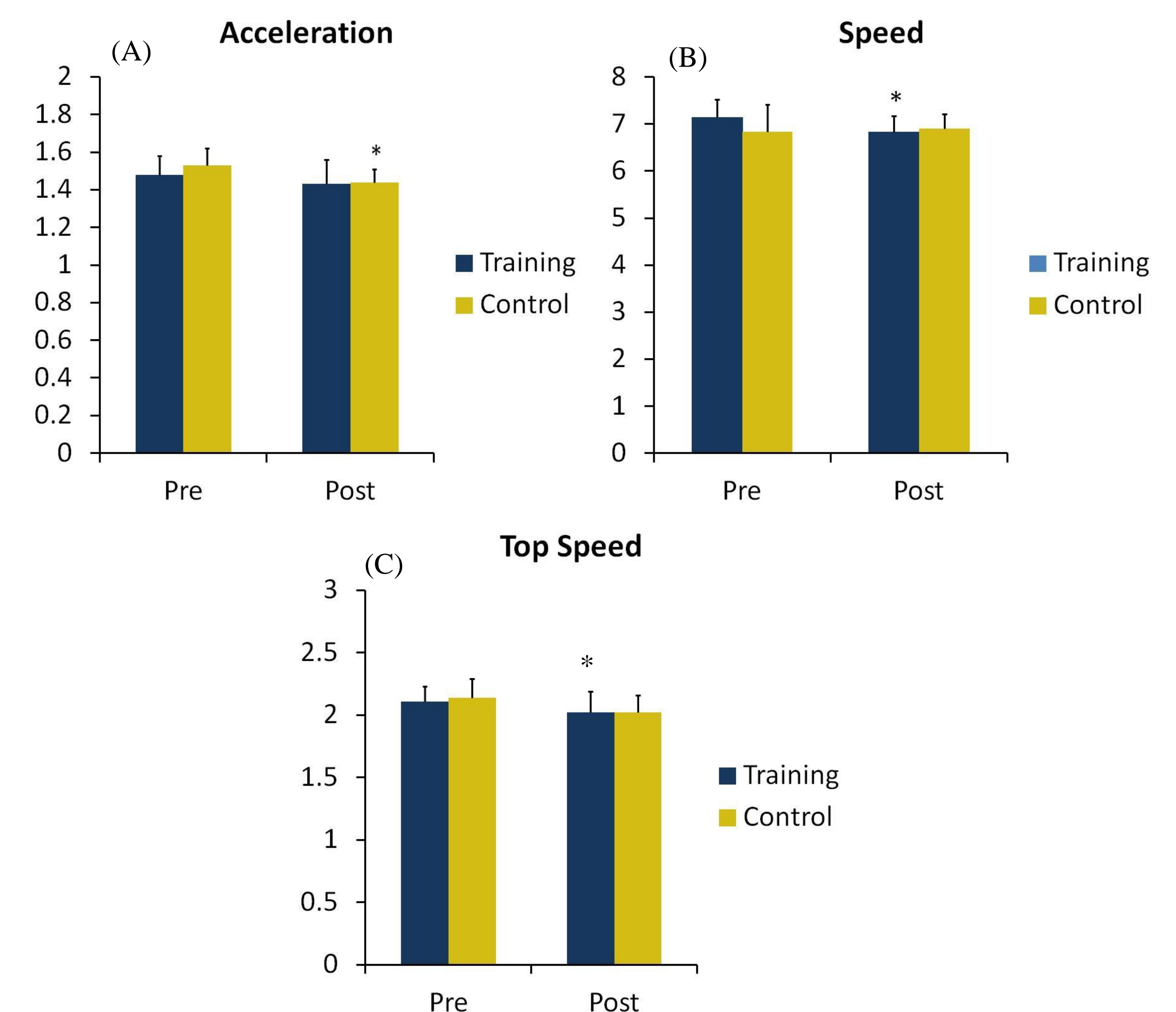
## STATISTICAL ANALYSIS

Descriptive statistics including mean and standard deviation were used to determine subject characteristics. A dependent t-test was used to analyze differences between pre and post-training on-ice performance tests. An alpha level was set at .05 to determine statistical significance.

## RESULTS

- The results of this present study indicated that both speed and acceleration may be improved through 4 weeks of BungeeSkate™ training.
  - Acceleration increased 3.4%
  - Speed increased 4.2% \*
  - Top Speed increased 4.2% \*
- Acceleration was slightly improved but not significantly ( $p > .05$ ) in the training group; however, it was significantly improved in the control group.
- Speed was improved significantly ( $p < .05$ ) with training and was not in the control group.
- Top Speed was also significantly ( $p < .05$ ) improved through BungeeSkate™ training and there was no significant gains in Top Speed in the control group.

Figure 2. Performance training values for training and control groups.



## SUMMARY AND CONCLUSIONS

- Our study provides data that suggests that speed and top speed can be improved using bungee cord training.
- Although not significant, acceleration slightly improved in the training group.
- It appears that the bungee training system is more successful at building speed on ice vs. acceleration from a stationery start.
- More research needs to be done to develop a training protocol that aims to enhance acceleration abilities on-ice.

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