
## Grant Information Summary:

# Effects of Various Forms of Augmented Feedback on Peak Jump-Landing Forces

**Practical Significance:**

**The findings of this study reflect that self-directed learning may be as effective as extrinsic instruction when attempting to reduce peak impact landing forces.**

### Background

Numerous lower extremity injuries (e.g., ACL tears, patellar tendonitis, and ankle sprains) often occur during the landing phase of a jump. Various methods of augmented feedback (e.g., verbal instruction and videotape) have been traditionally used to instruct individuals how to perform a variety of athletic movement tasks. Previous educational studies have shown that augmented feedback and self-directed learning may be beneficial for acquiring knowledge, but minimal evidence exists for its effectiveness in reducing jump-landing forces.

### Objective

The purpose of this study was to evaluate the effects of different forms (verbal, visual, and a combination of verbal and visual) of traditional augmented feedback to instruct individuals how to decrease peak impact landing forces while performing a jump-landing task.

### Design and Setting

A four-experimental group, with pre- and post-training tests, design was used to compare the effects of three different forms (verbal, visual, and a combination of verbal and visual) of augment-

ed feedback and a non-feedback group on peak vertical ground reaction forces (PVGRF) during a jump-landing task in a biomechanics research laboratory.

## Subjects

Fifty college-aged recreational athletes (age = 19.98±0.19 yrs, ht = 1.73±0.09 cm, mass = 72.71±15.67 kg) were randomly placed into one of four groups: verbal, visual, verbal+visual, or non-feedback.

## Measurements

Subjects performed a countermovement vertical jump to a Vertec vane set at 80% of their maximal jump height onto two Bertec forceplates (60cm x 80cm landing zone) set at a sampling rate of 960 Hz. The mean of five jumping trials per session was assessed at four time intervals (baseline, same-day performance test, two-day retention test, and a one-week retention test). A repeated measures analysis of covariance with 1 between (group) and 1 within (test) was conducted on PVGRF mean scores expressed as Newtons of force. Subjects' weight and jump height were used as the covariates.

## Results

Significant main effect ($p<.05$) was found for test [$F_{(3,132)}= 5.26$, $P=.002$]. Group PVGRF means were significantly reduced across both performance and retention tests as compared to baseline scores, yet no significant TEST X GROUP interaction was found. All four groups showed improvement across the three follow-up testing sessions as compared to their initial baseline test, yet none of the groups improved greater than one another, signifying that each group's method of reducing jump-landing forces was similar.

## Conclusions

Recent investigations have demonstrated the benefits of instruction on reducing jump-landing forces, yet we found no difference between the different augmented feedback and non-feedback groups in our study. This suggests that self-directed learning may be as effective as supplemental instruction when attempting to reduce peak impact landing forces. A note of caution should be taken when evaluating these results since the strategies utilized to decrease the forces (i.e., movement kinematics) must be evaluated by knowledgeable movement educators (e.g., certified athletic trainers) who must provide guidance on the efficacy of the movement pattern. Certified Athletic Trainers may utilize these findings when designing injury prevention jump-landing programs by allowing a patient to actively seek solutions to learn how to perform a movement on their own.


Primary Investigator:

**James A. Onate, PhD, ATC**

Boston University
Sargent College of Health & Rehabilitation Sciences
Department of Rehabilitation Sciences
635 Commonwealth Avenue
Boston, MA 02215



**Publication and Presentation List:**

"*Effects of Various Forms of Augmented Feedback on Peak Jump-Landing Forces*". National Athletic Trainers' Association Annual Meeting and Clinical Symposium, June, 2003, St. Louis, Missouri

Supplement to the
*Journal of Athletic Training*
April-June 2000: 38 (2); S-19

**GIS Program Sponsor:**

NFL Charities

**Printing Provided By:**

Ellington Printery, Ellington, CT



2952 Stemmons • Dallas, TX 75247
214-637-6282


***Supporting and advancing the Athletic Training profession through research and education.***