INTRODUCTION
The protective benefit of ankle braces is thought to be provided by their ability to restrict range of motion (ROM) and possibly by influencing activity of the protective evertor muscles. However, these mechanisms have only been studied under static conditions with results showing that the effectiveness of braces is time-dependent.

AIMS & OBJECTIVES
This study aimed to assess the effect of different braces on inversion ROM, angular velocity and peroneus longus activity during dynamic motion.

METHODS & MATERIALS
Subjects carried out multiple slalom trials to create lateral cutting movements (Figure 1A). Data was captured by a 12 Camera Vicon® Motion Analysis system at 100Hz and 2 Trigno Wireless EMG sensors at 1000Hz. Three braced conditions were tested: control, elastic (Ultimate Performance Compression; Figure 1B) and semi-rigid (Aircast A60®; Figure 1C). Data for 17 participants (age = 21.6 ± 2.0) were analysed, using a Custom Inversion Bodymodel, combined with manually defined events to isolate the duration of inversion.

RESULTS
Results showed a significant reduction in mean angular velocity (21%; p = 0.003) and ROM (16%; p = 0.009) during inversion for the semi-rigid brace (Figures 2 & 3). Reduction was also seen in the elastic brace, but not to a significant level. Neither ankle brace displayed a significant effect on maximum amplitude of the peroneus longus (Figure 4).

DISCUSSION
Unfortunately, due to poor marker tracking, data could only be analysed for the non-dominant leg. This data is equally applicable to the dominant side, however, as numerous epidemiological studies1 show no difference in injury incidence between the two legs.

This study found the semi-rigid brace to possess restrictive and force attenuating properties, during dynamic movement, therefore offering protection against inversion injury. It is suggested that the elastic brace may possess these properties, but further study is required before this can be confirmed.

Importantly, these results were demonstrated in a true dynamic environment, for which there is very little existing evidence. The dynamic nature makes it directly relatable to a sporting environment, especially a hard court surface which is the highest risk surface for lateral ankle sprain2.

ACKNOWLEDGEMENTS
The authors would like to thank Mr Sadiq Nasir and Mr Calum MacDonald for their invaluable assistance with data collection and also Mr Ian Christie for the high quality diagrams created for this project.

REFERENCES

CONCLUSIONS
This study clearly displays the effectiveness of semi-rigid braces in the prevention of lateral ankle sprain. The elastic brace may also possess these same properties. Recommendations, which include improved motion analysis set up and increasing inversion angle, are proposed to help future studies elicit these results.

Considerable disagreement exists within the field on the effect of ankle braces on peroneus longus activity. This study provides additional evidence to those who suggest that ankle braces play no role3, and importantly, delivers new insight due to the dynamic nature of the research.
INVESTIGATION INTO THE EFFECT OF ANKLE BRACES ON RANGE OF MOTION AND PERONEUS LONGUS ACTIVITY

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INTRODUCTION

The protective benefit of ankles braces is thought to be provided by their ability to restrict range of motion and possibly, through influencing the activity of protective evertor muscles. These mechanisms have only been studied under static conditions, however, with results showing that the effectiveness of braces is time-dependent.

AIMS AND OBJECTIVES

This study aimed to assess the effect of different braces on inversion range of motion, angular velocity and peroneus longus activity, during dynamic motion.

METHODS AND MATERIALS

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RESULTS

Results showed a significant reduction in mean angular velocity (21%; \( p = 0.003 \)) and range of motion (16%; \( p = 0.009 \)) during inversion for the semi-rigid brace (Figure 4 & 5). Reduction was also seen in the elastic brace, but not to a significant level. Neither ankle brace displayed a significant effect on maximum amplitude of the peroneus longus (Figure 6).

DISCUSSION

Unfortunately, due to poor marker tracking, data could only be analysed for the non-dominant leg. This data is equally applicable to the dominant side, however, as numerous epidemiological studies\(^1\) show no difference in injury incidence between the two legs.

This study found the semi-rigid brace to possess restrictive and force attenuating properties, during dynamic movement, therefore offering protection against inversion injury. It is suggested that the elastic brace may possess these properties, but further study is required before this can be confirmed.

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Considerable disagreement exists within the field on the effect of ankle braces on peroneus longus activity. This study provides additional evidence to those who suggest ankle braces play no role\(^3\), and importantly, delivers new insight due to its dynamic nature.

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