# Leicester Tigers Sports Science

**Injury and Performance Prediction and Influence** 

**Andy Shelton – Head of Sports Science** 



#### Introduction

#### Background

- What is rugby union?
- Why do we need to monitor our players?
- What do we need to measure?

#### What are we doing?

- What data do we collect?
- How do we manage our data?
- How do we analyze our data?
- What do we report?

# What does the future hold?

- How do we move forwards?
- What else could we monitor?



# Background



#### What is rugby union?

2 teams of 15 players (with 8 substitutes)

Aim is to score points via putting the ball over the 'try line' or kicking the ball over the posts

Run with the ball, pass backwards or kick in attack

Tackle in defence

#### Running and collisions













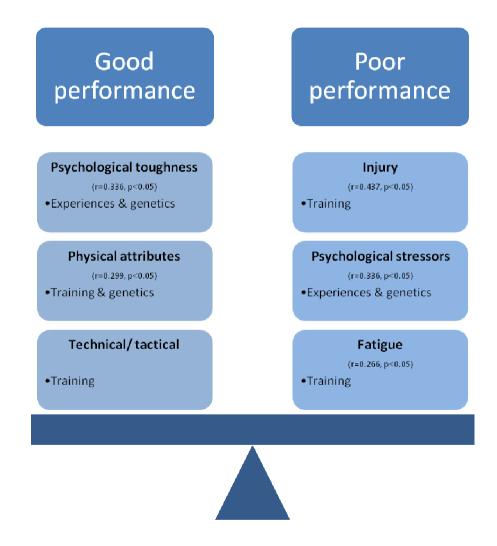


# What is rugby union?

Position	Working scrums	Working tackles	Working carries	Working rucks/mauls	Collisions	Total working collision elements	Total working collision elements per minute	Total working collision elements 14:R	Frequency of total working collision elements (s)	Total distance (m)	Distance < 3.6 m.s-1 (m)	Distance 3.6-5 m.s-1 (m)	Distance 5-6.7 m.s-1 (m)	Distance > 6.7 m.s-1 (m)	Total distance >3.6 m.s-1 (m)	Time spent > 3.6 m.s-1 (min)	Maximum 10 min running intersity (m.min-1)	Total running elements > 5.6 m.s1	Total running elements > 5.6 m.s-1 per minute	Total running elements > 5.6 m.s-1 W:R	Frequency of total running elements $>5.6\ m.s-1\ (s)$	Total working collision and running elements $>5.6$ m.s1	working collision and running elements > 5.6 m.s-1 per minute	Total working collision and running elements > 5.6 m.s-1 W:R pening	$\prime$ of total working collision and running elements $>5.6$ m.s-1 (s)	Mean recovery speed (m.s-1)	Decelerations from 3.6 m.s-1	Decelerations from 5 m.s-1	Decelerations from >5 m.s-1	Total Decelerations
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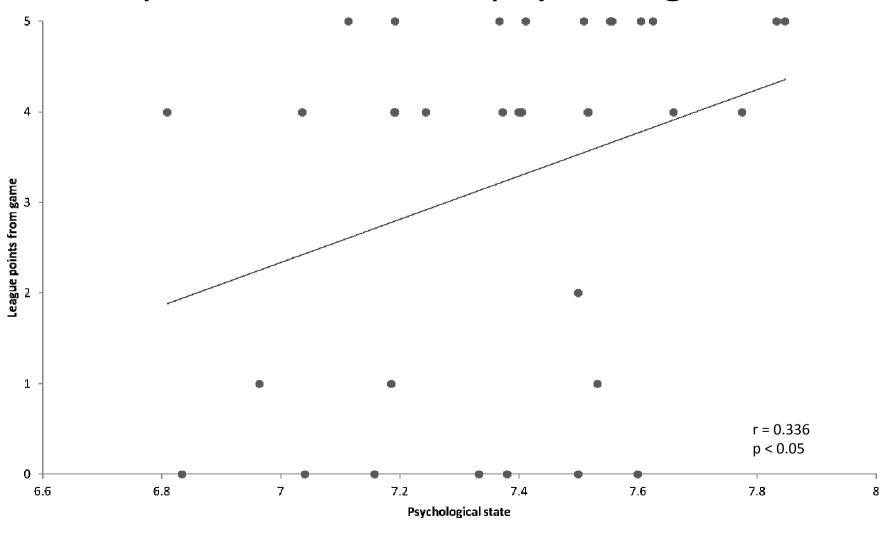


#### Why do we need to collect data on players?



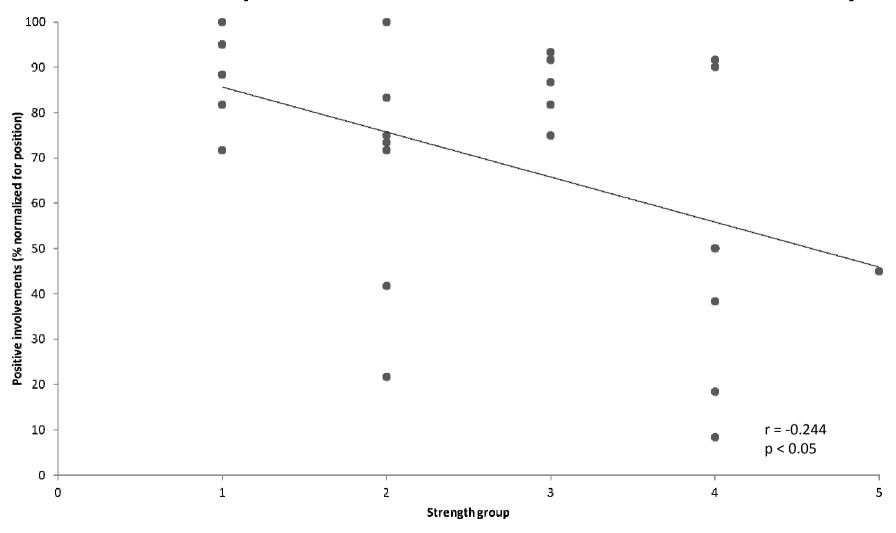


# Team performance and psychological state



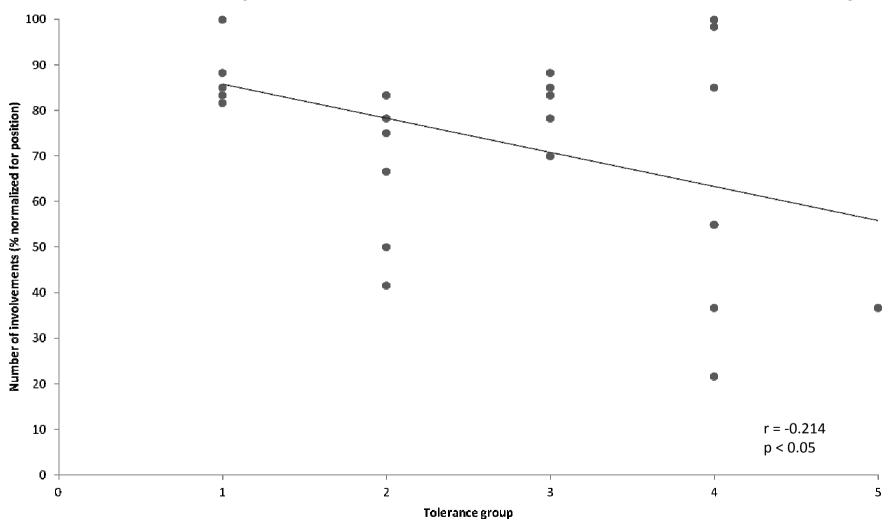


### Individual performance and athletic ability



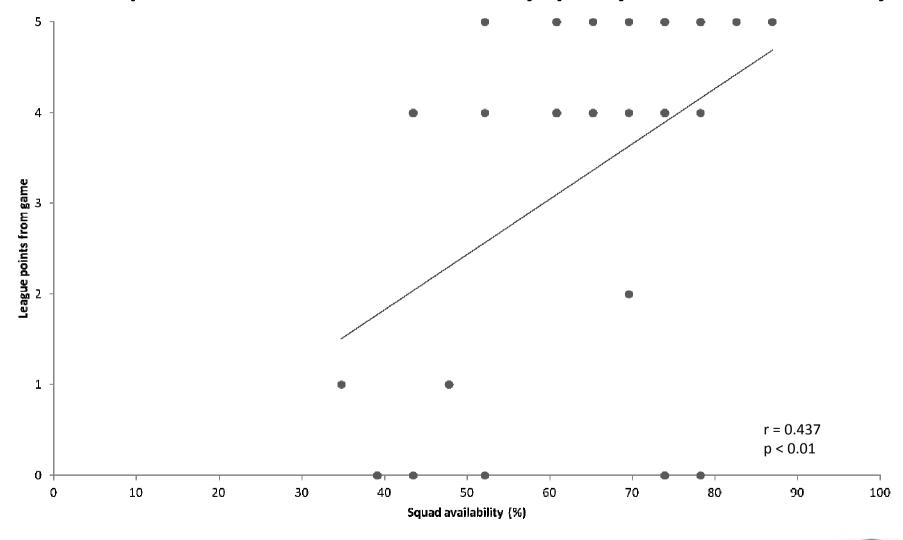


### Individual performance and athletic ability





# Team performance and key player availability





#### Matt Hampson Foundation

Matt Hampson is a former English rugby union prop who became paralysed from the neck down after a scrummaging practice accident for England under 21 on 15 March 2005.

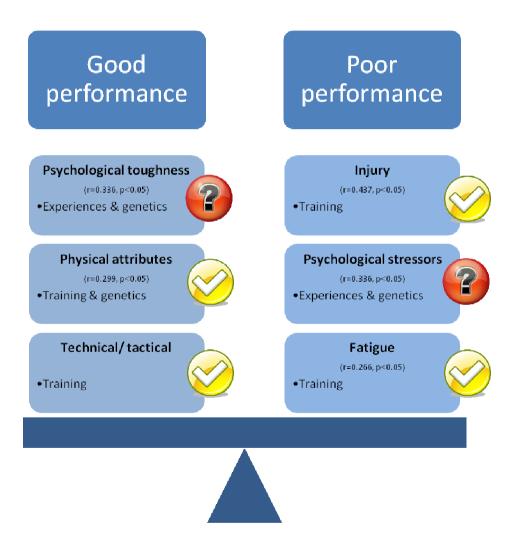


He founded the Matt Hampson Foundation in 2011 with the aim of providing advice, support, relief and/or treatment for anyone suffering serious injury or disability which has arisen from any cause, but in particular from participation in or training for any sport, sporting activity or other form of physical education or recreation.

Inspiring and supporting young people seriously injured through sport.



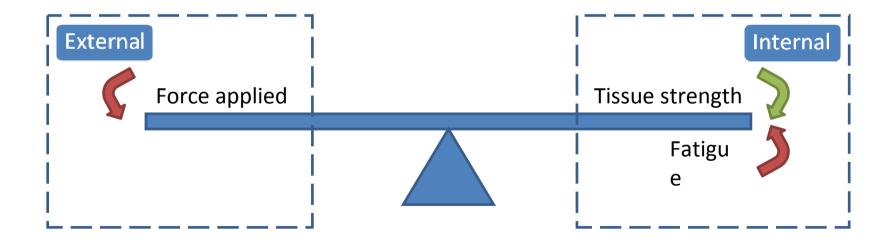
#### What can we affect?





#### When does an injury occur?

When force exerted on a tissue is greater than that which it can withstand.

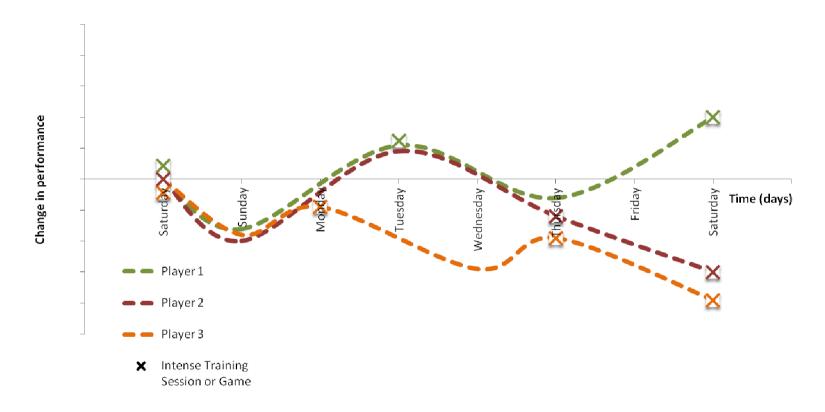


#### How can we affect strength and fatigue?

The purpose of any training program is to provide a stimulus for sports-specific adaptation resulting in improved skill and/ or athletic performance.



#### How do we adapt to the stimulus?



**Figure 1** Schematic demonstrating player 1 (green) who trains at the right time, resulting in increased performance; and players 2 (red) and 3 (orange) who leave too long, and not enough time between training sessions respectively, both resulting in decreased performance.

