A video analysis framework for the rugby league tackle

Hopkinson, M[1]., Bissas, A[6]., Nicholson, G[1]., Beggs, C[1]., Scantlebury, S[1,4]., Hendricks, S[1,2], Jones, B[1,2,3,4,5].

[1] Carnegie Applied Rugby Research (CARR) centre, Carnegie School of Sport, Leeds Beckett University, UK

[2] Division of Exercise Science and Sports Medicine, Department of Human Biology, Faculty of Health Sciences, the University of Cape Town and the Sports Science Institute of South Africa, Cape Town, South Africa

[3] Leeds Rhinos Rugby League club, Leeds, UK

[4] England Performance Unit, The Rugby Football League, Leeds, UK

[5] School of Science and Technology, University of New England, Armidale, NSW, Australia.

[6] Athletics Biomechanics, Leeds, UK

Corresponding author:

Michael Hopkinson

Cavendish Hall Room 103A, Leeds Beckett University, Carnegie School of Sport, Headingley Campus, Leeds, LS6 3QS, United Kingdom.

Abstract

Video analysis research into the rugby league tackle typically uses technical criteria from coaching cues or tackle variables from rugby union. As such, the content validity and relevance could be questioned. A video analysis framework which establishes appropriate variables for rugby league is therefore required. The aim of this study was to adopt a 5-stage process to establish a video analysis framework for the rugby league tackle, which was content valid, relevant and reliable. The 5-stage process included 1) creation of draft variable list (video analysis framework), using available rugby tackle research, 2) expert group recruitment and critique, 3) refinement of video analysis framework to establish content validity, 4) response process validity task and agreement within expert group, 5) intra- and inter-reliability testing using Kappa statistics.

The agreed video analysis framework comprised 6 phases including; tackle event, defensive start point, pre-contact, initial contact, post-contact and play the ball. Within the identified phases, 63 variables were established. The intra- and inter-reliability testing resulted in strong agreement (>0.81-1.0) within all phases. The 5-stage process allowed for the creation of a valid, relevant and reliable video analysis framework.

The video analysis framework can be used in rugby league tackle research, categorising complex tackle events such as injurious or optimal tackles, improving both player welfare and performance. Furthermore, the application of the video analysis framework to future rugby league research will increase the coherence and usefulness of research findings.

Keywords

Rugby league, tackle, variables, video analysis, injury, performance.

Introduction

Rugby league is a physically demanding contact sport, which involves frequent exposures to physical collisions and tackles (Gabbett and Domrow, 2005). Success is often dependent on the tackling ability and capacity to tolerate physical collisions (Gabbett and Ryan, 2010), as rugby league involves approximately 700 tackles per match for all ability levels (King, Hume and Clark, 2010). Within the tackle event, the tackler(s) (i.e., defender) attempts to reduce or stop the momentum of the ball carrier. In rugby league, during the tackle more injuries occur to the ball carrier than the tackler (Gabbett, 2000; Gabbett and Domrow, 2005; Fitzpatrick *et al.*, 2018).

Video analysis has been adopted by many sports as a tool to quantify performance (Hendricks *et al.*, 2014; Speranza *et al.*, 2017; Hendricks *et al.*, 2018) and identify mechanisms of injury (Hendricks *et al.*, 2015; Burger *et al.*, 2016, 2017; Davidow *et al.*, 2018). Detailing the exact moment of injurious events via video analysis is a key step within injury prevention. For example, the concurrent use of video analysis and injury surviellence data can be used to identify high(er) risk activities, e.g., the shoulder charge in RL (Cummins and Orr, 2015). In doing so, governing bodies can implement strategies to mitigate high risk activities. Within rugby union, using video analysis, the identification of higher technique proficiency in tackling has been associated with a lower risk of injury (Burger *et al.*, 2016; Hendricks *et al.*, 2016; Davidow *et al.*, 2018). This outlines the benefits of aligning video analysis within injury research.

Despite the continued use of video analysis research in rugby union determining the mechanisms of injury, the association between specific rugby league tackle variables and injury risk has yet to be investigated. This appears to be due to the lack of research validating rugby league tackle variables, and to date a comprehensive framework linking tackle type and execution with the outcome of the tackle does not exist for rugby league. Previously, performance-related research using video analysis methodologies (Gabbett and Ryan, 2010) have adapted a six variable criteria from a standardised one-on-one tackling drill designed by two experienced rugby league coaches. The relationship between tackling ability and player performance was investigated, showing that players who participated at a higher level performed better within the drill (Gabbett and Ryan, 2010). Additionally, significant relationships were observed between the criteria and proportion of missed and dominant tackles during a rugby league match. The associations of one-on-one

tackles during a training drill with match-play characteristics in rugby league players has previously been investigated (Speranza *et al*., 2017). Tackles during rugby league match play were coded using variables previously used in rugby union research (Quarrie and Hopkins, 2008; Hendricks *et al.*, 2014) which may be limited due to the inherent differences (Collins, 2006; Eaves and Evers, 2007). For example, in rugby league, the ball carrier is required to 'play the ball' following a tackle (Eaves and Evers, 2007). Whereas in rugby union the ball carrier is required to 'release the ball', consequentially each team competes for possession, forming a ruck. Therefore, the application of rugby union variables may not be appropriate to investigate a rugby league specific tackle event. Additionally, in rugby union research phases of the tackles have been identified (Burger *et al.*, 2016; Davidow *et al.*, 2018; Hendricks *et al.*, 2018; Tierney *et al.*, 2018), however, they may not cover all aspects of the rugby league tackle. Therefore content validity when using rugby union variables for rugby league may be inappropriate (ODonoghue, 2014).

The first video analysis framework in rugby union has recently been established (Hendricks *et al.*, 2020). Consequently, future video analysis based research in the population will be able to compare findings between studies (Hendricks *et al.*, 2020), which is not possible in rugby league at present. Therefore, a content valid, relevant and reliable video analysis framework is required in rugby league, to determine the appropriateness of phases and variables suitable for use in research (ODonoghue, 2014). This can then be used to establish mechanisms of injury or successful performance during a rugby league tackle. Therefore, the purpose of the study was to develop a video analysis framework with specific phases, variables, descriptors along with operational definitions which can be used within future injury or performance related research when investigating the rugby league tackle.

Materials and methods

Design

A 5-stage process was undertaken (Figure 1) based upon previous recommendations to create a video analysis framework which has evidence of content, response process and internal structure validity (Cook and Beckman, 2006). During this process, the phases, variables, descriptors and definitions within the rugby league tackle event were established.

INSERT FIGURE 1 HERE

Figure 1. The process of phase, variable, descriptor and definition creation for the video analysis framework.

Stage 1 – Rapid Review of Literature and Creation of Draft Variable List.

Stage 1 included a rapid review of relevant online peer-reviewed literature using the electronic database PubMed and Web of Science. This was to capture the most common tackle phases, variables, descriptions and definitions used in literature (Grant and Booth, 2009). The time frame for inclusion was any study up until January 2018. Key search terms were used, including 'rugby', OR 'rugby league', in combination with 'tackling' OR 'tackle' OR 'variables'. Phases, variables and descriptors were only extracted from the literature if an appropriate definition was provided. The variables and their descriptions and defintions were extracted from a total of 13 articles (Deutsch, Kearney and Rehrer, 2007; Quarrie and Hopkins, 2008; Wheeler, Askew and Sayers, 2010; Fuller *et al.*, 2010; King, Hume and Clark, 2010, 2012; Hendricks *et al.*, 2014, 2015; Sewry *et al.*, 2015; Cummins and Orr, 2015; Burger *et al.*, 2016, 2017; Speranza *et al*., 2017) and a draft list of variables and descriptors with definitons was created, to be critiqued in stage 2. Based on literature, phases of the tackle were identified (Fuller *et al.*, 2010; Hendricks *et al.*, 2012) and the variables from the literature were aligned to the specific phase.

Stage 2 – Expert Group Recruitment and Critique.

Six experienced practitioners from relevant disciplines within rugby league were invited to participate, based on their specific expertise. The recruitment and formation of the expert focus group followed previous recommendations, regarding size and areas of expertise (Adams and Wieman, 2011). One practitioner declined, leaving five experienced practitioners. The participants were all familiar with each other prior to the formation of the expert group, which facilitated high levels of interaction (Gill *et al.*, 2008). The participants were informed of the overall purpose and had the opportunity to ask any questions regarding the scope of the study. The expert group consisted of an international coach (12 years experience as a full-time professional coach), an academy coach (4 years experience as a full-time professional coach), a performance analyst from a professional Super League club (9 years experience as a full-time professional analyst), and two elite level referees (3 and 17 years experience as full-time professional referees). The purpose of the expert group was to ensure a high level of content

validity by sense checking and discussing which phases, variables, descriptors and definitions accurately represent important information relating to the rugby league tackle. During the meeting, to introduce different topics of discussion, the researcher asked open-ended questions to facilitate open conversations which were not influenced through researcher bias (Adams and Wieman, 2011). Through the process the expert group refined the list of phases, variables, descriptor and definition and provided further recommendations. They also advised on any recent rule changes to ensure the outcome was relevant to the current tackle scenario.

The key objective of the first expert group meeting was to critique the phases (e.g., pre-contact phase), variables (e.g. upper body movement), descriptors (e.g. no upper body lean) and definitions (e.g. ball carrier displayed no body lean and was in a upright position) developed from the literature and identify any important missing elements. A video loop of different RL tackles was displayed during the meeting to ensure that the expert group were prompted of all possible components of the tackle. The video clips were selected by the research team to ensure a variety of tackle types and scenarios were considered. During the meeting, the draft video analysis framework was edited, annotated, and specific key themes were extracted. In addition, the meeting was recorded and referred to within Stage 3 in order to establish and extract further information (Adams and Wieman, 2011).

Stage 3 – Refinement of Phases, Variables, Descriptors and Definitions.

The updated phases, variables and descriptors and definitions developed in Stage 2 were refined by the research team to remove duplication or unclear information. The refined video analysis framework was then sent to the expert group to review independently prior to a secondary meeting.

Stage 4 – Second Expert Group Meeting, Response Process Task and Agreement.

A second meeting took place to raise any potential issues found when reviewing the video analysis framework. As a group, during the meeting they agreed that all relevant points within a rugby league tackle were clearly described. By the end of the meeting, all phases, variables, descriptors and definitions were established.

To ensure response process validity, the international coach, academy coach, performance analyst and one researcher then coded six tackles independently from pre-existing match footage using a paper copy of the finalised variable list. The aim of this was to allow the experts to go through the process of using the framework, to determine if anything was missing and check the definitions were clear. Once completed, results were compared and discussed between each coder. The experts were given the opportunity to discuss anything pertinent from the coding task. From this, the group agreed that no further changes to the video analysis framework were required.

Stage 5 – Establish Reliability and Finalise Video Analysis Framework.

The final stage was to establish internal structure validity through an acceptable level of reliability (Cook and Beckman, 2006). To test the overall reliability of the variable framework an intra and inter-coder reliability analysis was completed. For intra-coder reliability, 30 randomly selected tackles were coded by the lead author (3 years' experience coding RL matches) twice using SportsCode elite (version 6.5.1). Coding of the same 30 tackles was separated by seven days (Wheeler, Askew and Sayers, 2010). For inter-coder reliability, a second coder (5 years' experience coding RL matches) then coded the same tackles. Kappa statistics (κ) were used to evaluate intra- and inter-coder reliability for each randomly selected tackle (James, Taylor and Stanley, 2007). Kappa values between 0.90 and 0.99 show almost perfect agreement between repeated measures, values between 0.8 and 0.89 represent strong agreement, and 0.6 to 0.79 represent moderate agreement (ODonoghue, 2014).

Results

An overview and the descriptions of each phase are presented in Table 1. The tackle variables, descriptors, and definitions for each phase are presented in Tables 2-7. In total there were 6 phases, 63 variables and 241 categorical descriptors with 6 continuous (time) variables. The phases were categorised as *tackle event* (Table 2), *defensive start point* (Table 3), *pre-contact phase* (Table 4), *initial contact phase* (Table 5), *post-contact phase* (Table 6) and *play the ball phase* (Table 7). Where appropriate, example images are provided for the descriptors in the supplementary material.

INSERT TABLE 1 HERE

Table 1. Overview of tackle phase variables, descriptors and definitions.

INSERT TABLE 2 HERE

Table 2. Tackle event variables, desriptors and definitions.

INSERT TABLE 3 HERE

Table 3. Defensive start point variables, descriptors and definitions.

INSERT TABLE 4 HERE

Table 4. Pre-contact phase variables, descriptors and definitions.

INSERT TABLE 5 HERE

Table 5. Initial contact phase variables, descriptors and definitions.

INSERT TABLE 6 HERE

Table 6. Post-contact phase variables, descriptors and definitions.

INSERT TABLE 7 HERE

Table 7. Play the ball phase variables, descriptors and definitions.

Intra- and inter-coder reliability

Intra-coder reliability for the 30 tackles were: Match event variables κ = 0.95, defensive start point variables κ = 1, pre-contact variables κ = 0.94, initial contact variables κ = 0.89, post contact variables κ = 0.9, play the ball variables κ = 0.96. The inter-coder reliability was assessed using the same methods and were: Match event variables κ = 0.92, defensive start point variables κ = 0.85, pre-contact variables κ = 0.81, initial contact variables κ = 0.82, post-contact variables κ = 0.81, play the ball variables κ = 0.88. The specific kappa statistics for each variable is included in the supplementary material.

Discussion

The aim of the current study was to develop a valid video analysis framework which accurately reflects the complexity of the rugby league tackle through different phases, variables and descriptions. The variables were created for use in rugby league video analysis research to provide a better understanding of both injury and performance mechanisms during the tackle event.

The importance of video analysis for enhancing player and team performance is well documented (Hendricks *et al.*, 2020). In rugby league tackle research there are currently no video analysis frameworks of tackle related variables which can be used in future research. This has recently been undertaken in rugby union (Hendricks *et al.*, 2020). Without a well established rugby league video analysis framework, content validity may be questioned (ODonoghue, 2014). The current study provides further detail to that of Gabbett (2008) which described six rugby league tackle variables. Whilst the variables used within Gabbett (2008) described are relevant to rugby league, given they were developed by rugby league coaches, no defensive start point, pre-contact or play-the-ball variables were included. The current study created a video analysis framework which covers all aspects of a rugby league tackle. Therefore, future research can utilise all specific phases or individual variables described in the current study, and be confident of their content validity (ODonoghue, 2014).

The relevance of variables within the video analysis framework is important to ensure variable validity (O'Donoghue, 2009). Rugby league tackle-related research has previously used rugby union specific tackle variables, which may not represent the specific aspects of rugby league, thus findings may not directly translate. This results in potential issues of variable validity. Stage 1 of the current study was completed to provide a foundation for the video analysis framework and although only a rapid review was complete, instead of a more comprehensive systematic review, the variables captured at this stage allowed the expert group to successfully critique variables for relevancy, as well as content validity. Stages 2-4 ensures the variables are relevant through consultation with expert practioners within the field. This is an important process to undertake as rugby league and rugby union tackle events are disparate. For example, in rugby league the attacking team can only concede 6 tackles before a turnover (Gibbs, 1993), whereas rugby union has an unlimited number of tackles (Wheeler *et al.*, 2013). For that reason in rugby league it is important that the defending team reduces the chance of an offload during the tackle, in order to minimise territory gain of the attacker during the set of 6 tackles. To do this, the defending side frequently engage two or more tacklers in the tackle event (King, Hume and Clark, 2010). Consequentially, the behaviours of tacklers in rugby league and rugby union are likely different. Twenty of the 63 variables established in this study were also included within the rugby union video analysis framework (Hendricks *et al.*, 2020). This allows some comparison between rugby league and rugby union, but also ensures the framework is specific to rugby league. Therefore

rugby league research should adopt the rugby league specific variables within the video analysis framework to capture the most appropriate information.

An important methodological aspect for video analysis is to clearly describe and define actions and events to reduce bias and improve reliability (James, Taylor and Stanley, 2007). Therefore, the agreed descriptors of the variables were developed to be used as part of the video analysis framework and the reliability of each variable was established. The intra- and inter- reliability scores were 'strong' to 'almost perfect'. The variable list therefore shows comparable reliability to previous video analysis research using kappa statistics in rugby union (Hendricks *et al.*, 2016, 2018; Burger *et al.*, 2017; Tierney *et al.*, 2018) and rugby league (King, Hume and Clark, 2010). As a result, the rugby league video analysis framework demonstrates both strong reliability and strong relevancy to a rugby league tackle. Researchers can therefore be confident that the variables within the list are valid for research (ODonoghue, 2014). This is vital for the advancement of rugby league video analysis research, not only to better understand mechanisms of the tackle, but to have consistant measurements between studies.

Recommendations and future direction

The 5-stage process has guided the creation of the video analysis framework which is relevant, reliable and content valid. With the provision of in-depth definitions, supplementary images (supplementary material) and a familiarisation process, researchers can accurately and precisely code the tackle within video analysis investigations. Future studies can utilise appropriate variables which are relevant to the research question to analyse tackle events in rugby league. For example, research aiming to better understand the 'play-the-ball' can use variables within the post-contact and play-the-ball phase. The consistent use of the video analysis framework will allow appropriate comparisons within and between research to increase the coherence and usefulness of future research findings. In turn this will allow rugby league practitioners and governing bodies to make informed decisions for performance and injury prevention.

Disclosure of interest

The authors report no conflict of interest.

References

Adams, W. K. and Wieman, C. E. (2011) 'Development and validation of instruments to measure learning of expert-like thinking', *International Journal of Science Education*. doi: 10.1080/09500693.2010.512369.

Burger, N. *et al.* (2016) 'Tackle technique and tackle-related injuries in high-level South African Rugby Union under-18 players: Real-match video analysis', *British Journal of Sports Medicine*, 50(15), pp. 932–938. doi: 10.1136/bjsports-2015-095295.

Burger, N. *et al.* (2017) 'Mechanisms and Factors Associated with Tackle-Related Injuries in South African Youth Rugby Union Players', *American Journal of Sports Medicine*, 45(2). doi: 10.1177/0363546516677548.

Collins, T. (2006) *Rugby League in Twentieth Century Britain*.

Cook, D. A. and Beckman, T. J. (2006) 'Current concepts in validity and reliability for psychometric instruments: Theory and application', *American Journal of Medicine*. doi: 10.1016/j.amjmed.2005.10.036.

Cummins, C. and Orr, R. (2015) 'Collision characteristics of shoulder charge tackles in elite rugby league', *International Journal of Performance Analysis in Sport*, 15(3), pp. 1090–1101. doi: 10.1080/24748668.2015.11868853.

Davidow, D. *et al.* (2018) 'Tackle technique of rugby union players during head impact tackles compared to injury free tackles', *Journal of Science and Medicine in Sport*, 21(10), pp. 1025–1031. doi: 10.1016/j.jsams.2018.04.003.

Deutsch, M. U., Kearney, G. A. and Rehrer, N. J. (2007) 'Time-motion analysis of professional rugby union players during match-play', *Journal of Sports Sciences*, 25(4), pp. 461–472. doi: 10.1080/02640410600631298.

Eaves, J. S. and Evers, L. A. (2007) 'The relationship between the "play the ball" time, post-ruck action and the occurrence of perturbations in professional rugby league football', *International Journal of Performance Analysis in Sport*. doi: 10.1080/24748668.2007.11868406.

Fitzpatrick, A. C. *et al.* (2018) 'A three-year epidemiological prospective cohort study of rugby league match injuries from the European Super League', *Journal of Science and Medicine in Sport*, 21(2), pp. 160–165. doi: 10.1016/j.jsams.2017.08.012.

Fuller, C. W. *et al.* (2010) 'Injury risks associated with tackling in rugby union', *British Journal of Sports Medicine*, 44(3), pp. 159–167. doi: 10.1136/bjsm.2008.050864.

Gabbett, T. J. (2000) 'Incidence, site, and nature of injuries in amateur rugby league over three consecutive seasons', *British Journal of Sports Medicine*, 34(2), pp. 98–103. doi: 10.1136/bjsm.34.2.98.

Gabbett, T. J. and Domrow, N. (2005) 'Risk Factors for Injury in Subelite Rugby League Players', *The American Journal of Sports Medicine*, 33(3), pp. 428–434. doi: 10.1177/0363546504268407.

Gabbett, T. and Ryan, P. (2010) 'Tackling Technique, Injury Risk, and Playing Performance in High-Performance Collision Sport Athletes', *International Journal of Sports Science and Coaching*, 4(4), pp. 521–533. doi: 10.1260/174795409790291402.

Gibbs, N. (1993) 'Injuries in professional rugby league. A three-year prospective study of the South Sydney Professional Rugby League Football Club.', *The American journal of sports medicine*. doi: 10.1177/036354659302100510.

Gill, P. *et al.* (2008) 'Methods of data collection in qualitative research: Interviews and focus groups', *British Dental Journal*. doi: 10.1038/bdj.2008.192.

Grant, M. J. and Booth, A. (2009) 'A typology of reviews: An analysis of 14 review types and associated methodologies', *Health Information and Libraries Journal*. doi: 10.1111/j.1471-1842.2009.00848.x.

Hendricks, S. *et al.* (2012) 'Velocity and acceleration before contact in the tackle during rugby union matches', *Journal of Sports Sciences*. doi: 10.1080/02640414.2012.707328.

Hendricks, S. *et al.* (2014) 'Tackler characteristics associated with tackle performance in rugby union', *European Journal of Sport Science*, 14(8), pp. 753–762. doi: 10.1080/17461391.2014.905982.

Hendricks, S. *et al.* (2015) 'Contact technique and concussions in the South African under-18 Coca-Cola craven week rugby tournament', *European Journal of Sport Science*, 15(6), pp. 557–564. doi: 10.1080/17461391.2015.1046192.

Hendricks, S. *et al.* (2016) 'Video analysis of concussion injury mechanism in under-18 rugby', *BMJ Open Sport & Exercise Medicine*, 2(1), pp. 1–11. doi: 10.1136/bmjsem-2015-000053.

Hendricks, S. *et al.* (2018) 'Technical determinants of tackle and ruck performance in International rugby union', *Journal of Sports Sciences*, 36(5). doi: 10.1080/02640414.2017.1322216.

Hendricks, S. *et al.* (2020) 'Consensus on a video analysis framework of descriptors and definitions by the Rugby Union Video Analysis Consensus group', *British Journal of Sports Medicine*. doi: 10.1136/bjsports-2019-101293.

James, N., Taylor, J. and Stanley, S. (2007) 'Reliability procedures for categorical data in Performance Analysis', *International Journal of Performance Analysis in Sport*, 7(1), pp. 1–11. doi: 10.1080/24748668.2007.11868382.

King, D., Hume, P. A. and Clark, T. (2012) 'Nature of tackles that result in injury in professional rugby league', *Research in Sports Medicine*, 20(2), pp. 86–104. doi: 10.1080/15438627.2012.660824.

King, D., Hume, P. and Clark, T. (2010) 'Video analysis of tackles in professional rugby league matches by player position, tackle height and tackle location.', *International Journal of Performance Analysis in Sport*, 10, pp. 241–254.

O'Donoghue, P. (2009) *Research methods for sports performance analysis*, *Research Methods for Sports Performance Analysis*. doi: 10.4324/9780203878309.

ODonoghue, P. (2014) *Research Methods for Sports Performance Analysis*, *International Journal of Performance Analysis in Sport*. doi: 10.4324/9780203878309.

Quarrie, K. L. and Hopkins, W. G. (2008) 'Tackle Injuries in Professional Rugby Union', *The American Journal of Sports Medicine*, 36(9), pp. 1705–1716. doi: 10.1177/0363546508316768.

Sewry, N. *et al.* (2015) 'The Relationship Between Playing Situation, Defence and Tackle Technique in Rugby Union', *International Journal of Sports Science & Coaching*, 10(6), pp. 1115–1128. doi: 10.1260/1747-9541.10.6.1115.

Speranza, M. J. A., Gabbett, T. J., Greene, D. A., Johnston, R. D. and Sheppard, J. M. (2017) 'Changes in rugby league tackling ability during a competitive season: The relationship with strength and power qualities', *Journal of Strength and Conditioning Research*, 31(12), pp. 3311–3318. doi: 10.1519/JSC.0000000000001540.

Speranza, M. J. A., Gabbett, T. J., Greene, D. A., Johnston, R. D. and Townshend, A. D. (2017) 'Tackle characteristics and outcomes in match-play rugby league: the relationship with tackle ability and physical qualities', *Science and Medicine in Football*. doi: 10.1080/24733938.2017.1361041.

Tierney, G. J. *et al.* (2018) 'Does player time-in-game affect tackle technique in elite level rugby union?', *Journal of Science and Medicine in Sport*. doi: 10.1016/j.jsams.2017.06.023.

Wheeler, K. *et al.* (2013) 'Effective defensive strategies at the ruck contest in rugby union', *International Journal of Sports Science and Coaching*. doi: 10.1260/1747-9541.8.3.481.

Wheeler, K. and Sayers, M. (2009) 'Contact Skills Predicting Tackle-Breaks in Rugby Union', *International Journal of Sports Science & Coaching*. doi: 10.1260/174795409790291420.

Wheeler, K. W., Askew, C. D. and Sayers, M. G. (2010) ‘Effective attacking strategies in rugby union’, *European Journal of Sport Science*, 10(4), pp. 237–242. doi: 10.1080/17461391.2010.482595.

	PHASES
AGREED PHASE	**DEFINITIONS**
1. Tackle Event	**Variables which describe the overall scenario of which the tackle has occurred.**
2. Defensive start point	**Variables which describe where defensive players were positioned between the end of the play the ball to initial contact.**
3. Pre-contact phase	**Variables which occur from 0.5 seconds before contact to initial contact for both tackler(s) and ball carrier** (Fuller *et al.*, 2010)
4. Initial contact phase	**Variables which occur immediately at first point of contact between ball carrier and tackler(s).**
5. Post-contact phase	**Variables which occur between initial contact and the tackle end, which is either by grounding of the tackler or called by the referee.**
6. Play the ball phase	**Variables which occur from when the tackle ends to when the ball carrier has played the ball under their foot.**

Table 1. Overview of tackle phase variables, descriptors and definitions.

	TACKLE EVENT
VARIABLES AND DESCRIPTORS	**DEFINITIONS**
1. Number of tacklers	**How many tacklers were involved in the tackle scenario?** (King, Hume and Clark, 2010)
X	X tackler(s) were involved in purposeful, deliberate contact with the ball carrier.
2. Tackle outcomes	**What was the outcome of the tackle?** (Hendricks *et al.*, 2014)
Dominant tackle	The tackler(s) reduced the territory gained towards their try line during the contact phases.
Passive tackle	The tackler(s) failed to stop the gain of territory towards their try line during the contact phases.
Neutral tackle	During the tackle, there was neither a reduction or gain of ground towards the defenders try line since initial contact.
Tackle break	The ball carrier successfully penetrated the attempted tackle and continues to advance towards opposition try line.
Offload	The ball carrier was able to pass the ball out of the tackle in an attempt to find a team mate.

Try scored	The tackler made contact with the ball carrier but a try was scored.
Tackled out of play	The ball carrier was tackled out of play, either by being grounded or pushed out.
Ball dropped	The ball was dropped during the collision due to the impact of the tackle.
Illegal tackle	The tackle was deemed illegal by the referee.

3. Pitch area	Where did the tackle occur on the pitch?
TA-10A	****INSERT IMAGE 4 HERE****
TB-10B	
TC-10C	
10A-30A	
10A-30B	
10A-30C	
30A-50A	
30B-50B	
30C-50C	
50A-70A	
50B-70B	
50C-70C	
70A-90A	
70B-90B	
70C-90C	
90A-TA	
90B-TB	
90C-TC	
4. Time of game	**At what time did the tackle take place?**
	The time of the tackle event to the nearest minute.
5. Tackle number	**What was the tackle count when the tackle event occurred?** (King, Hume and Clark, 2010)
X	The attacking team had conceded X tackles before the tackle event occurred.
6. Tackle number on reset	**If the previous tackle set resulted in a reset, what was the tackle count at that point?**
No reset	There was no reset on the previous set of tackles.

X	The attacking team had conceded X tackles before the set was reset by the referee.
7. Tackler(s) which ended the tackle	**Which tackler or tacklers actively brought the ball carrier to the ground?**
X	Tackler X actively brought the ball carrier to the ground.
8. Time from initial contact to tackle complete	**How long did it take to end the tackle event after the initial contact of the first tackler?**
	The time between the initial contact of the first tackler to the end of the tackle event in seconds.
9. Previous play the ball speed	**How long was the previous tackle event's play the ball phase?**
	The time between the end of previous tackle event's post contact to end of the play the ball in seconds.
10. Duration between tackler 1 & 2 contact	**What was the duration of time between tackler 1 and 2 making initial contact with the ball carrier?**
	The time between tackle 1 initial contact and tackler 2 initial contact in seconds.
11. Duration between tackler 2 & 3 contact	**What was the duration of time between tackler 2 and 3 making initial contact with the ball carrier? (if applicable)**
	The time between tackle 2 initial contact and tackler 3 initial contact in seconds.
12. Duration between tackler 3 & 4 contact	**What was the duration of time between tackler 3 and 4 making initial contact with the ball carrier? (if applicable)**
	The time between tackle 3 initial contact and tackler 4 initial contact in seconds.

Table 2. Tackle event variables, descriptors and definitions.

DEFENSIVE START POINT (END OF PREVIOUS PLAY THE BALL - INITIAL CONTACT)	
TACKLER (S)	
VARIABLES AND DESCRIPTORS	**DEFINITIONS**
1. Position at start of play	**Was the tackler in an onside or offside position at the end of the play the ball?**
Onside	The tackler was in an onside position at the start of play the ball.
Offside	The tackler was deemed in an offside position at the start of play the ball by the referee.
Offside but no call	The tackler was not deemed offside at the start of the play the ball by the referee, but was in fact offside.

2. Tackler's travelled distance prior to initial contact	How far did the tackler travel to make contact with ball carrier from the end of the previous play the ball?
0-5 meters	The tackler travelled 0-5 meters before making contact with the ball carrier.
5-10 meters	The tackler travelled 5-10 meters before making contact with the ball carrier.
10-15 meters	The tackler travelled 10-15 meters before making contact with the ball carrier.
15-20 meters	The tackler travelled 15-20 meters before making contact with the ball carrier.
20+ meters	The tackler travelled 20+ meters before making contact with the ball carrier.
3. Distance of tackler when ball carrier received ball	**How far away was the tackler from the ball carrier when the ball carrier received the ball?** (Sewry *et al.*, 2015)
Close	The ball carrier receives ball within 2 meters of tackler.
Moderate	The ball carrier receives ball between 2-5 meters of tackler.
Distant	The ball carrier receives ball more than 5 meters from the tackler.

Table 3. Defensive start point variables, descriptors and definitions.

PRE-CONTACT PHASE (0.5 SECONDS PRIOR TO CONTACT - CONTACT)	
BALL CARRIER	
VARIABLES AND DESCRIPTORS	**DEFINITIONS**
1. Movement performed by ball carrier to evade first tackler	**What movement did the ball carrier perform before making contact?** (Wheeler, Askew and Sayers, 2010; Hendricks *et al.*, 2014)
Straight at defender (A)	The ball carrier ran straight at the tackler.
Straight, moving away from defender (B)	The ball carrier ran straight, away from the tackler, i.e. a gap in defensive line.
Side step towards defender (C)	The ball carrier performed an evasive step initiated by either leg which was directed at tackler.
Side step away defender (D)	The ball carrier performed an evasive step initiated by either leg which was directed away from tackler.
Arcing run (E)	The ball carrier performed an arcing run, rather than straight.
No obvious movement	The ball carrier made contact with the tackler without making any significant movement.
2. Speed of ball carrier	**How fast was the ball carrier travelling prior to contact?** (Deutsch, Kearney and Rehrer, 2007)
Fast (Maximal)	The ball carrier was moving with maximal effort for the movement performed.
Moderate (Non-Maximal)	The ball carrier was moving and non-maximal effort for the movement performed.

Slow (Not Running)	The ball carrier was stationary or walking – no visible foot movement.
3. Deceleration	**Did the ball carrier decelerate at any point prior to making contact?** (Burger *et al.*, 2016)
Present	The ball carrier shortened their steps before contact.
Absent	The ball carrier did not shorten their steps before contact.
4. Upper body movement	**What was the body position of the ball carrier prior to contact?** (Burger *et al.*, 2017)
No upper body lean (Upright) (A)	The ball carrier displayed no hip flexion and was in an upright position.
Moderate upper body lean (Medium) (B)	The ball carrier displayed moderate hip flexion (above parallel of hips).
Large upper body lean (Low) (C)	The ball carrier showed large hip flexion (level or below parallel of hips).
Upright to low	The ball carrier moves from upright position to low upper body position.
Upright to medium	The ball carrier moves from an upright position to medium position.
Medium to upright	The ball carrier moves from a medium to an upright body position.
Medium to low	The ball carrier moves from a medium to a low body position.
Low to upright	The ball carrier moves from a low to an upright body position.
Low to medium	The ball carrier moves from a low to a medium body position.
5. Ball carrier awareness	**Was the ball carrier aware of the incoming tackle?** (Burger *et al.*, 2017)
Awareness absent	The ball carrier was not aware of the tackler.
Apparent awareness	The ball carrier was aware of the tackler.

TACKLER(S)	
1. Orientation of tackler in relation to ball carrier	**What was the orientation of the tackler when approaching the ball carrier?** (Fuller *et al.*, 2010; Hendricks *et al.*, 2014)
Front (A)	The tackler and ball-carrier were moving straight towards each other.
Side (B)	The tackler was moving in from the ball-carrier's side.
Oblique (C)	The tackler was moving into the ball-carrier at an angle.
Behind	The tackler was chasing the ball-carrier towards own try-line.
2. Speed of tackler	**How fast was the tackler travelling towards the ball carrier?** (Deutsch, Kearney and Rehrer, 2007)
High (Maximal)	The tackler was moving with maximal effort for the movement performed.
Low (Sub-Maximal)	The tackler was moving with sub-maximal effort for the movement performed.
Static	The tackler was stationary or walking – no visible foot movement.
3. Deceleration	**Does the player decelerate (shorten steps) before making contact?** (Burger *et al.*, 2016)
Present	The tackler did shorten their steps and decelerate before contact.
Absent	The tackle did not shorten their steps and decelerate before contact.

4. Body position of tackler	**What was the body position of the tackler before making contact?** (Burger *et al.*, 2016)
No upper body lean (Upright) (A)	The tackler displayed no hip flexion and was in an upright position.
Moderate upper body lean (Medium) (B)	The tackler displayed moderate hip flexion (above parallel of the hips).
Large upper body lean (Low) (C)	The tackler showed large hip flexion (level of below parallel of the hips).
Upright to low	The tackler moves from an upright to a low position.
Upright to medium	The tackler moves from an upright to medium position.
Medium to upright	The tackler moves from a medium to an upright position.
Medium to low	The tackler moves from a medium to a low position.
Low to upright	The tackler moves from a low to an upright position.
Low to medium	The tackler moves from a low to a medium position.
5. Stance	**What was the tackler's last stance before making initial contact?**
Flat footed, wide stance	The tackler was standing square with feet aligned, flat on the ground with feet outside shoulder width.
Flat footed, narrow stance	The tackler was standing square with feet aligned, flat on the ground with feet inside shoulder width.
Back foot	The tackler stepping backwards as the ball carrier approaches.
Split forward (A)	The tackler stood with a staggered stance (leading foot forward).
No stance (B)	The tackler dove or slid into contact.
6. Straight back	**Did the tackler have a straight back prior to contact?** (Burger *et al.*, 2016)
Present (A)	The tackler did have a straight back prior to contact.
Absent (B)	The tackler did not have a straight back prior to contact.
7. Arm position	**How were the tackler's arms positioned prior to contact? (The tackler should be coded from the point immediately before contact)**
Hands dropped (A)	The tackler's hands were dropped in an extended position.
Hands above shoulders (B)	The tackler's hands were level or above the height of their shoulders.
Active position (C)	The tackler's arms were below shoulder level and the elbows were flexed.

Table 4. Pre-contact phase variables, descriptors and definitions.

INITIAL CONTACT PHASE	
BALL CARRIER	
VARIABLES AND DESCRIPTORS	**DEFINITIONS**
1. Chin position	**Where was the ball carrier's chin position on initial contact?**
Low	The chin of the ball carrier was low (neck flexion).
Neutral	The chin of the ball carrier was in a neutral position.
High	The chin of the ball carrier was high (neck extension).
2. Head turned from contact	**Did the ball carrier turn their head away from contact before or initially at contact?**
Present	The ball carrier turned their head from contact.
Absent	The ball carrier did not turn their head from contact.
3. Leading arm	**Which arm did the ball carrier lead with?**
Ball carrying arm	The arm the ball was in made initial contact with tackler.
Non-ball carrying arm	The arm the ball wasn't in made initial contact with tackler.
No obvious leading arm	There was no obvious leading arm.
4. Upper body positions	**What position was the ball carrier's upper body in at initial contact?**
Leading arm low (A)	The leading arm was in a low position upon contact (dip of the shoulder).
Leading arm normal (B)	There was no obvious change in the leading arm position.
Leading arm elevated (C)	The leading arm was in a elevated or fending opposition.
In 'bump position' (D)	Both the ball carrier's arms were wrapped around the ball and tucked into the chest.
5. Fending on initial contact	**How did the ball carrier fend the tackler?** (Sewry *et al.*, 2015; Burger *et al.*, 2017)
Absent	The ball carrier provided no fend.
Moderate	The ball carrier provided a light to moderate fend (swat or slap technique).
Strong	The ball carrier provided a strong fend (e.g push technique).

TACKLER(S)	
1. Type of tackle	**What type of tackle did the tackler perform?** (Burger *et al.*, 2017; Speranza *et al*., 2017)
Arm tackle (A)	The tackler impedes the ball-carrier with the arm(s).
Collision tackle (B)	The tackler impedes the ball-carrier without the use of arm(s).
Shirt grab (C)	The tackler holds the ball carrier's shirt before impeding the ball-carrier with the upper limbs.
Shoulder tackle (D)	The tackler makes contact with their shoulder as the first point of contact.
Smother tackle (E)	The tackler uses their chest and wraps both arms around ball-carrier.
Tap tackle (F)	The tackler trips the ball-carrier with the hand on the lower limb below the knee.
2. Direction of tackle	**What direction did the tackle occur in relation to the ball carrier?** (Burger *et al.*, 2017)
Infront (A)	The tackler made initial contact at the ball carrier's front.
Side (B)	The tackler made initial contact at the ball carrier's side.
Behind (C)	The tackler made initial contact at the ball carrier's behind.
3. Chin Position	**What was the tackler's chin position on contact?**
Low (A)	The chin of the tackler was low (neck flexion).
Neutral (B)	The chin of the tackler was in a normal position.
High (C)	The chin of the tackler was high (neck extension).
4. Head turned from contact	**Did the tackler turn their head away from contact at before or initially at contact?**
Present	The tackler turned their head from contact.
Absent	The tackler did not turn their head from contact.
5. Body region of ball carrier struck during initial contact	**Where did the tackler strike the ball carrier on initial contact?** (Sewry *et al.*, 2015; Speranza *et al.,* 2017)
Head and neck	The tackler initially struck the area above the shoulder with any connection with the head/neck.
Shoulder	The tackler initially struck any area from the ball carrier's arm pit level to the shoulder level, including the arm.
Upper torso	The tackler initially struck the area above the ball carrier's rib cage to arm pit.
Lower torso	The tackler initially struck the area below the ball carrier's rib cage to hips.
Upper legs	The tackler initially struck the area between the ball carrier's knees and hips.

Direct knee contact	The tackler initially struck the knee directly.
Lower legs	The tackler initially struck the area between ball carrier's knees and toes.
Ball	The tackler struck the ball initially.
6. Head collision	**Did the tackler and ball carrier collide heads on initial contact?**
Present	The tackler and ball carrier did collide heads.
Absent	The tackler and ball carrier did not collide heads.
7. Head placement	**Where was the tackler's head placed on initial contact?** (Sewry *et al.*, 2015)
Above (A)	The tackler's head was higher than the ball-carrier's torso during contact.
Beside (B)	The tackler's head was to the side of the ball carrier's torso during contact.
Behind (C)	The tackler's head was in behind the ball carrier's torso during contact.
In front (D)	The tackler's head was in front of the ball carrier's torso during contact.
8. Lower body explosiveness into contact	**Was there an extension of hips on initial contact?** (Burger *et al.*, 2016)
Present	There was an extension of the hips causing explosiveness during initial contact with ball carrier.
Absent	There was no extension of the hips causing explosiveness during initial contact with ball carrier.
9. Upper body explosiveness into contact	**Was there a rotation of the upper body on initial contact?**
Present	The tackler produced rotation of the upper body causing explosiveness on impact.
Absent	The tackler did not produce rotation of the upper body which would cause explosiveness on impact.

Table 5. Initial contact phase variables, descriptors and definitions.

POST-CONTACT PHASE (AFTER INITIAL CONTACT - PRIOR TO TACKLE END)	
BALL CARRIER	
VARIABLES AND DESCRIPTORS	**DEFINITIONS**
1. Leg drive by ball carrier upon contact	**Was there obvious leg drive by the ball carrier?** (Wheeler and Sayers, 2009; Sewry *et al.*, 2015; Burger *et al.*, 2017)

Absent	There was no leg drive by the ball carrier after initial contact.
Moderate	There was moderate knee movement, with no high lift by the ball carrier after initial contact.
Strong	There was high, rapid knee lift by the ball carrier after initial contact.
2. Orientation of ball carrier at initial landing	**Where was the ball carrier facing at landing?**
Head towards own try line	The ball carrier landed on the ground with their head facing their own try line.
Head towards side lines	The ball carrier landed on the ground with their head facing the side line.
Head towards opposition try line	The ball carrier landed on the ground with their head facing towards the opposition try line.
Head towards corners	The ball carrier landed on the ground with their head facing the corner flag (diagonally across pitch).
Ball carrier was not grounded	The ball carrier was held, offloaded, dropped the ball or broke the tackle and therefore was not grounded.
3. Body region ball carrier landed on	**What body region did the ball carrier land on first?**
Head	The ball carrier initially landed on their head.
Shoulder	The ball carrier initially landed on their shoulder.
Arm	The ball carrier initially landed on any area between shoulder and hand.
Torso	The ball carrier initially landed on any area between shoulder and hips, not including arms.
Mid-region	The ball carrier initially landed on any area between the upper pelvis and upper legs.
Legs	The ball carrier initially landed on any area between hips and toes.

TACKLER(S)	
1. Proceeding body region held during post contact	**Where was the tackler holding the ball carrier after initial contact?**
Head and neck (A)	The tackler made contact with the head/neck after initial contact.
Shoulder	The tackler made contact with any area from the ball carrier's arm pit level to the shoulder level, including the arm.

Upper torso (B)	The tackler made contact with the area above the ball carrier's rib cage to arm pit.
Lower torso	The tackler made contact with the area below the ball carrier's rib cage to hips.
Upper legs (C)	The tackler made contact with the area between the ball carrier's hips and knees.
Direct knee contact	The tackler made contact with the knee directly.
Lower legs	The tackler made contact with the area between ball carrier's knees and toes.
Ball (D)	The tackler made contact with the ball initially.
Tackle break/missed	The tackler missed the attempted tackle on the ball carrier.
2. Re-joining the tackle	**Did the tackler re-join any point during the tackle event?**
Space after first initial hit	In making contact, the ball carrier initially bounced off tackler, the tackle was then completed in an immediate second contact by the tackler.
Tackler re-joined the tackle	The tackler made initial contact but did not stop ball carrier, the ball carrier made progress but was stopped by other tacklers, the tackler in question then re-joined the tackle.
3. Control of ball carrier	**Did the tackler have control of the ball carrier throughout the tackle?**
Present	The tacklers had obvious control of the ball carrier after initial contact until the play the ball.
Absent	The tacklers did not have obvious control of the ball carrier after initial contact until the play the ball.
4. Control of body weight	**Did the tackler have control of their own body weight during the tackle?**
Present	The tackler was in control of their own body weight.
Absent	The tackler was out of control of their own body weight.
5. Arm usage	**Did the tackler use the arm(s) during the post contact phase?** (Sewry *et al.*, 2015; Burger *et al.*, 2016)
Pulling	The tackler uses the arm(s) after initial contact in attempt to pull the ball carrier towards him.
Wrap the ball carrier	The tackler uses the arm(s) in attempt to enclose the region between themselves and the ball carrier's body.
Wrap the ball	The tackler uses the arm(s) in attempt to wrap around the ball.

No arm usage	The tackler did not use their arm(s) during contact with the ball carrier.
6. Leg drive by tackler upon contact	**Did the tackler drive with the legs during contact with ball carrier?** (Hendricks *et al.*, 2014; Sewry *et al.*, 2015)
Absent	The tackler had no leg drive during contact.
Moderate	The tackler had moderate, low knee movement during contact.
Strong	The tackler had high, rapid knee movement during contact.
7. Lift	**Did the tackler lift the ball carrier?** (Sewry *et al.*, 2015)
Present	Lifting of the ball carrier was present.
Absent	Lifting of the ball carrier was not present.
8. Twisting of ball carriers hips or legs	**Was there any twisting motion after initial contact with the ball carrier?**
Present when legs planted on ground	The tackler twisted the ball carrier hips or legs after initial contact whilst they were planted on the ground.
Present when legs not planted	The tackler twisted the ball carriers hips or legs after the tackle, however their legs were not planted on the ground.
Absent	The tackler did not twist the ball carrier hips or legs after initial contact.
9. Ending of tackle	**What did the tackler do to end the tackle?**
Ground the ball carrier	The tackle ended with the tackler grounding the ball carrier.
Hold the ball carrier	The tackler ended with the tackler held up the ball carrier, meaning the referee indicated the end of the tackle.
Release ball carrier and retreat	Before the ball carrier was grounded or held up, the tackler released and retreated.
Ball was offloaded or dropped	The ball was release out of the tackle by the ball carrier before the tackle ended.
10. Grounding of the ball carrier	**How did the tackler ground the ball carrier?** (Burger *et al.*, 2017)
Pulling with arms	The tackler pulled the ball carrier to ground using the arms.
Leg drive/push to ground	The tackler drove their legs and/or pushed with the arms to ground the ball carrier.
Use of own body weight	The tackler lifted their own legs off the ground and used their own body weight to bring the ball carrier to ground.

Use of ball carriers momentum	The tackler impeded (i.e., squeeze the legs) the ball carrier and the momentum grounded the ball carrier.

Table 6. Post-contact phase variables, descriptors and definitions.

PLAY THE BALL PHASE (AFTER TACKLE END - PRIOR TO PLAY THE BALL)	
BALL CARRIER	
VARIABLES AND DESCRIPTORS	**DEFINITIONS**
1. Landing order	**How did the ball carrier land on the ground?**
Ball carrier landed on top of tackler	The ball carrier initially landed on top of the ball carrier.
Tackler landed on top of ball carrier	The tackler initially landed on top of the ball carrier.
2. Tackled position of ball carrier	**What was the position of the ball carrier when the tackle was complete?** (Burger *et al.*, 2016; Speranza *et al.*, 2017)
Back	The tackle was completed with the ball-carrier on their back.
Front	The tackle was completed with the ball-carrier on their front.
Side	The tackle was completed with the ball-carrier on their side.
Kneeling	The tackle was completed with the ball-carrier on their knees.
Standing	The tackle was completed with the ball-carrier standing.
3. Fighting for play the ball	**Is the ball carrier fighting for a quick play the ball?**
Actively	Maximum effort was made by the ball carrier to get to their feet quickly and play the ball.
Passively	Submaximal effort was made by the ball carrier to get to their feet quickly and play the ball.
Absent	The ball carrier did not fight to get to their feet as quickly as possible to play the ball.
4. Moving off ground	**How did the ball carrier move off the ground?**
Lower body	The ball carrier used only the legs to get to their feet.
Both upper and lower body	The ball carrier used the arms and legs to get to their feet.
5. Tackler in contact	**Is the tackler still in contact as ball carrier moves off ground?**
Present	The tackler was still in contact with ball carrier as they moved off ground.

Absent	The tackler was not in contact with the ball carrier as they moved off ground.
6. Move off mark	**Does the ball carrier move off the mark where they were tackled?**
Present	The ball carrier moves off their mark from where they were tackled.
Absent	The ball carrier does not move off their mark from where they were tackled.

TACKLER(S)	
1. Ball carrier body region held	**What body region of the ball carrier was held?**
Head and/or neck	The tackler held any body part above the shoulder.
Shoulder	The tackler held any body part from the ball carrier's arm pit level to the shoulder level, including the arm.
Upper torso	The tackler held any body part above the ball carrier's rib cage to arm pit.
Lower torso	The tackler held any body part below the ball carrier's rib cage to hips.
Upper legs	The tackler held any body part between ball carrier's hips and knees.
Lower legs	The tackler held any body part between ball carrier's knees and toes.
Tackler let go	The tackler let go as the ball carrier was held by other tacklers.
Contact only with other tackler(s)	The tackler is not holding the ball carrier and is in contact with other tacklers.
2. Release ball carrier	**Does the tackler release the ball carrier after the tackle end phase?**
Present	The tackler releases the ball carrier.
Absent	The tackler does not release the ball carrier.
3. Set	**Does the tackler get set before the end of the play the ball?**
Present	The tackler does get in set position before the end of play the ball.
Absent	The tackler does not get in set position before the end of play the ball.

Table 7. Play the ball phase variables, descriptors and definitions.