



The Influence of the Phases of Match-Play on the Physical, Technical and Tactical Profiles of Professional Australian Football

by

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Michael Rennie declare that this thesis, is submitted in fulfillment of the requirements for the award of Doctor of Philosophy, in the Faculty of Health at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise reference or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Date

PREFACE

This thesis is written as per the requirements of the degree, Doctor of Philosophy and published according to the “Thesis presentation and submission” guidelines. The manuscripts included in this thesis are logically progressive in nature and form a body of work that encompasses the investigation of the phases of match-play in professional Australian Football.

The data collected during this candidature and associated research methodology has resulted in one manuscript being accepted for publication while a further three manuscripts are currently being reviewed by peer-reviewed journals. The Introduction section provides a brief background of the literature, defines the research problem and outlines the aim and purpose of each study. The Literature Review provides a synopsis of the current available literature describing the physical, technical and tactical demands of Australian Football. The next four chapters encompass the manuscripts which are presented in a logical sequence that specifically address the research problems outlined in the Introduction. The figures, tables and referencing format remains according to the peer-review journal guidelines. Each manuscript in Chapter Three to Chapter Six outlines an introduction to the specific research problem, individual methodology, results and discussion. Next, a General Discussion chapter provides a synopsis of the findings from the various manuscripts. Practical recommendations are provided to exemplify the real-world relevance for coaches, sport scientists and performance analysts. The limitations and delimitations of the current work is also discussed. The final chapter, Summary & Recommendations offers an interpretation of the collective findings resulting from the thesis. Finally, suggestions of future research are provided in light of the findings in this thesis. The APA 6th reference style has been used throughout the document and the reference list is located at the end of thesis.

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ABSTRACT

Australian Football is a team sport involving periods of ball possession, contested play (where both teams compete for possession) and stoppages of varying durations. The physical element of the game is characterised by intermittent high-speed running along with frequent collisions, tackles and changes of direction. Players also require technical skill qualities depending on specific scenarios arising during match-play along with tactical strategies designed by coaching staff that consider various contextual factors to maximise the likelihood of success. Performance is dependent on the interaction of these constructs which are closely associated to the phases of match-play. Accordingly, this thesis comprises of four progressive studies that investigated the influence of the phases of match-play on the physical, technical and tactical profiles of professional Australian Football.

Study One described the mean duration and frequencies of the phases of Australian Football match-play. Six operational definitions were created for offence, defence, contested play, umpire stoppages, set shots and goal resets. This study examined the coding methodology central to the three subsequent studies. A test-retest design assessed the precision of coding the phases of play. There were ~500 changes in the phases of play per Australian Football match, highlighting the intermittent nature of match-play. The intra-coder reliability assessment demonstrated that a trained researcher can code the phases of play with high precision. These findings permitted the use of these phases of match-play for the proceeding studies. *Study Two* analysed the distribution of physical and technical performance during the phases of Australian Football match-play. The physical and technical demands varied significantly depending on the phase of match-play. Additionally, average and 'worst-case scenario' activity and recovery cycles provided practical information for coaches to design match-specific training. *Study Three* examined the influence of player position and game quarter on running during the phases of match-play. Nomadic and key position players shared similar match-running profiles during the phases of play, however, nomadic players performed higher volumes and intensity of movement. The data demonstrated that reductions in match intensity occur

during active periods of match-play, but not during stoppages. These findings have applications for informing training practices for different positions and suggest that metabolic power estimates may be useful for analysing specific elements of competition where spatial constraints limit opportunities for high-speed running. *Study Four* examined differences in physical and technical performance measures during the phases of match-play whilst considering contextual factors including quarter success, calibre of opposition and playing away from home. The contested element of match-play increased when the quarter was lost and when competing against high calibre opposition. The findings have applications for informing training practices to increase the likelihood of match success and mitigate the effects of playing against high calibre opposition and away from home. Collectively, the series of studies showed that the phases of match-play contribute to the intense nature of competition and should be considered when interpreting match profiles. The physical and technical demands of the phases of match-play are also influenced by player position, match-induced fatigue, match success, opposition calibre and match location.