

## Research Article

# Effects of Altering the Number of Players and the Dimensions of the Playing Area on the Possession Characteristics in Youth Australian Football

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This research compared the effects of altering the number of players and the dimensions of the playing area on the possession characteristics in youth (under-14) Australian football. A modified 'small sided game' (SSG) 12-a-side version was compared to the full field 'adult' 18-a-side game. Games were video recorded and the possession characteristics later coded using the Dartfish Easy Tag program. It was found that the additional players in the 18-a-side version led on average to more tagged events (technical actions) per 18 minute period of play; however, there was a decrease in the number of tagged events per player. It was also observed that there were more scoring actions in the SSG 12-a-side game play than in the 18-a-side. The SSG 12-a-side version provided more technical actions per player in each play period and so it is suggested that it constructs a better educational experience, and therefore game development, than the 18-a-side game recommended for Australian football from under-11.

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*Keywords:* Australian football, small sided, modified game, game interactions

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## Introduction

Adult format games may constrain game development as junior players are assigned positional responsibilities where the more physically mature students are placed in central positions where they can monopolise possession and gain a game development advantage over players in peripheral positions where the players are less likely to touch the ball. In contrast, some research suggests that time spent in less structured, modified and small-sided game (SSG) play where fun, improvisation and movement flexibility are encouraged enhances long term player development (Harris & O'Connor, 2012). In this paper investigated the modification of full rules 18-a-side Australian football (Af) as a 12-a-side format representative of the full rules game, SSG versions refers to games played on a reduced field size and involving fewer number of players than the common “full rules” sport.

Consistent with earlier findings (for instance, Hamson, Head & McDonald, 2008; Westerbeek & Smith, 2001), recent research specific to Af identified fun/enjoyment, success, and participation as the most important aspects for children's and youth participation (Drummond, Agnew, Pill & Dollman, 2013; Elliott & Drummond, 2011, 2013; Phillips & Wehner, 2012). Phillips & Wehner (2012) concluded that these aspects support the need to modify rules with children's and youth sport, such as reduced player numbers and play space. Reducing the number of players per team is a common strategy used by sport codes to make the game format more skill and physiologically appropriate in order to promote game development while retaining fidelity to the adult version of the game (McCormick et al., 2012).

Every additional player on a team adds to the number of potential interactions (tactical possibilities) and therefore, task complexity confronting players. The greater task complexity accompanying increasing number of players in a constrained space (such as exists in invasion field game like Af) requires players to demonstrate greater proficiency and accuracy in movement skill execution and to make those in less time. On the other hand, SSG versions of adult sport potentially reduce task complexity by creating more time and space for players to act while also providing more skill related activity (McCormick et al., 2012). Hence, a theorised benefit of SSG game versions as a development pathway to “full rules” adult sport.

SSG versions of Af have been suggested as beneficial for long term Af game development in the Australian Football League (AFL) Junior Football Match Guide (2013). The reality of this development ambition depends on game design (Hill-Hass, Dawson, Impellizzeri & Coutts, 2011). Game design

creates boundaries on player behaviour by task, environment and player constraints explained by the rules of the game. Evidence suggests that the game constraints related to playing area and number of players may promote higher levels of enjoyment and dedication to the game when constructed in a way that allows players more time in contact with the ball (Wall & Cote, 2007). It may be somewhat surprising then that 18-a-side full ground play is suggested from the under-11 age group in the AFL Junior Football Match Guide (2013).

In considering the player participation and game development benefits explained for SSG game versions, this study examined the effect of altering the number of players and the dimensions of the playing area on player possession characteristics of under-14 footballers participating in an Af Elite Development Program (EDP). To date, there has been no study investigating how altering player numbers and the field playing dimensions affect junior Af player possession characteristics. Consequently, there is relatively little information regarding how SSG versions of Af can be used to improve physical, technical and tactical capabilities or how they can be used to structure greater game engagement for enhanced game enjoyment or acquiring an educational experience from the game.

### **Small Sided Game Formats**

SSG versions of invasion sports can assist teaching players, improve training specialisation and quality through the embodiment of “real” game conditions, imitate the physical, tactical and technical characteristics of invasion games while permitting a greater volume of game engagement per player due to modifications in constraints such as field dimensions, rule changes and the number of participating players (Hill-Hass et al., 2011). For example, Grant, Williams, Dodd and Johnson (1999) found technical demands were higher and players were involved in more game activities with the ball in 8v8 SSG soccer games than 11v11 games, and that in 8v8 games players spent less time standing still. Small (2006) reported that in a 7v7 soccer SSG players touched the ball fifty percent more often than in “full team” 11v11 games regardless of position, touch the ball more often per minute, and that in the SSG there are more attacking plays, more passes attempted and more successful passes. Similarly, Whelan (2011) investigated SSG Rugby with players aged 10 – 14 years and found that players touched the ball more often and accrued more scoring attempts in 7v7 rugby on a reduced playing space than in 15v15 rugby. Whelan (2011) also found that players generally perceived greater enjoyment from the 7v7 format than the 15v15 game, and players also perceived no significant difference in competence between the 7v7 and 15v15 game. Furthermore, Pinar et al (2009) investigated 3-a-side SSG version of basketball on 15m x 10m courts and reported that

players participated more often per attack phase in the SSG. In contrast, games with more players on the team created fewer chances for players to possess the ball, thus limiting their learning from game involvement and acquisition of an educational experience.

Research into SSG training formats in soccer suggests that changes in playing rules can influence physiological, perceptual and time-motion characteristics in young elite players, and so care needs to be taken in designing SSG versions (Hill-Hass, Coutts, Dawson & Rowsell, 2010). Research in the field of soccer training has also suggested that when compared to larger sized games, SSG versions induce higher heart rate responses, but that this is moderated by the relative size of the playing field for the number of players (Hill-Hass et al., 2011). Further, Owen, Twist and Ford (2004) found that irrespective of field size, the addition of players generally leads to an increase in the number of technical actions performed; however, there is a decrease in the number of technical actions performed per player. Dellal et al (2012) also examined the technical and physical demands of small and large sided games in elite soccer. They revealed that total distance covered per minute of play, high-intensity running activities (sprinting and high-intensity runs), total numbers of duels and lost ball possessions were significantly greater within SSG versions for all playing positions.

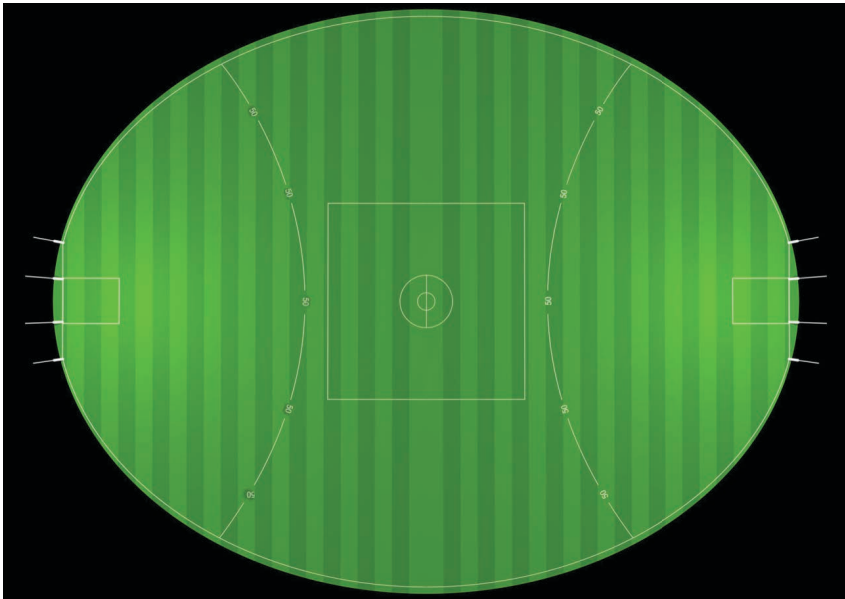
It was noted in the Introduction to this paper that in the youth Af setting, research shows that children find enjoyment in gaining possessions (touching the football), kicking goals, and playing with friends. In particular, the capacity to kick goals is significant given that it is associated with skill efficiency and physical activity. A study by Sullivan et al. (2014) found that when scoreboard margins are close, skill proficiency is increased. This, along with skill involvements (i.e. passages of play) is enhanced when a team achieves success at the end of the quarter (establishing a lead). Research in soccer indicates that on smaller fields players hold the ball for longer on average than in 11v11 games on a full pitch because pitch size impacts on length of kick, an important consideration given the relative leg strength of children and youth players compared to adult players. The size of field should therefore “fit” player age and development (Snow, 2004; Snow, 2012).

The 2012 “Examining the AFL Junior Match Policy for Recruitment and Retention Report” (Phillips & Wehner, 2012) recommended further research in the use of modified rules in Af. Specific to the context of this research with a youth EDP, it has been suggested that SSG versions that retain a close association to the competitive demands of match-play may assist the talent development process (Jones & Drust, 2007).

## Study Design

The research was conducted during a four day EDP for under-14 Australian footballers zoned to a state league club. To be eligible for the program, players were recommended to the program by their local community club as they were deemed by the club to be the best players for the local community team. University ethics approval, including approval from the state league club for the research and permission from parents to film players, was gained prior to data collection commencing.

The oval used for the full field 18-a-side measured 170metres long by 125metres wide. The 12-a-side play space was determined by the dimensions of the ground and the requirement to play two games at one time (Diagram 1) in order to expiate the project in the time allowed for the EDP. This created fields for the 12-a-side games measuring 114metres long by 75metres wide.



*Diagram 1.* Two 12-a-side ovals (blue outline) on the full oval

The game time variable was controlled in that the 12-a-side and 18-a-side games were both played for 18 minute game periods. The 18 minute time period is the common length of “quarters” for under-14 games across the junior Af leagues from which the players for the EDP were drawn<sup>1</sup>. During the EDP,

players participated in eight 18 minute 12-a-side game play and eight 18 minute full field 18-a-side game play.

The games were filmed using iPads. The vision was subsequently coded by the authors to tally selected game events. The game events selected for tagging and the definition of the events are summarised in Table 1. An 18 minute game was initially tagged by both researchers to ensure consistent understanding of the definition of events. One of the researchers then watched the vision of all games and called the events while the other researcher tallied on another computer using a matrix pre-composed in the DartFish Easy tag application. Having one researcher call the events for all games was presumed to aid the consistency of interpretation of the events and thus the reliability of the results. The summary of this coding is presented in Table 2 and 3.

Table 1

*Tagged game events and event definitions - Definitions based on the 'AFL Laws of the game', freely accessible from the internet.*

Skill	Description
Kick in from behind	Following the recording of a behind (where 1 point is awarded), the football is kicked back into play by any player of the defending team within a reasonable time.
Contested kick	A player makes contact with the football with any part of the player's leg below the knee, as a result of a contest between two or more players.
Uncontested kick	A player makes contact with the football with any part of the player's leg below the knee, without contestation from one or more players.
Contested handball	A player holds the football in one hand and disposes of the football by hitting it with the clenched fist of the other hand, as a result of a contest between two or more players.
Uncontested handball	A player holds the football in one hand and disposes of the football by hitting it with the clenched fist of the other hand, without contestation from one or more players.
Contested mark to body	A contested mark to the body is taken if a player catches or takes control of the football within the playing surface, after it has been kicked by another player a distance of at least 15 metres, and which has not touched the ground or been touched by another player during the period when the football was kicked until it was caught or controlled by the player to the body, in a contest with one or more players.

Table 1 (continued)

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Uncontested mark to body	An uncontested mark to the body is taken if a player catches or takes control of the football within the playing surface, after it has been kicked by another player a distance of at least 15 metres, and which has not touched the ground or been touched by another player during the period when the football was kicked until it was caught or controlled by the player to the body, without contestation from one or more players.
Contested mark in hands	A contested mark in the hands only is taken if a player catches or takes control of the football within the playing surface, after it has been kicked by another player a distance of at least 15 metres, and which has not touched the ground or been touched by another player during the period when the football was kicked until it was caught or controlled by the player in the hands, in a contest with one or more players.
Uncontested marks in hands	An uncontested mark to the body is taken if a player catches or takes control of the football within the playing surface, after it has been kicked by another player a distance of at least 15 metres, and which has not touched the ground or been touched by another player during the period when the football was kicked until it was caught or controlled by the player in the hands, without contestation from one or more players.
Scoring plays	Recording of either 1 or 6 points, under any of the following conditions: (1) when the football is kicked completely over the goal line by a player of the attacking team without being touched by any other player, even if the ball first touches the ground; (2) the football passes completely over the behind line; (3) a player of the attacking team kicks the football over the goal line but before passing over the goal line, the ball is touched by another player; or (4) the football passes touches or passes over the goal post or touches the padding or any other attachment to the goal post.
Goals scored	Recording of 6 points, when the football is kicked completely over the goal line by a player of the attacking team without being touched by any other player, even if the ball first touches the ground.
Tackles	The grabbing of an opposition player in possession of the ball, in order to impede progress or force disposal of the ball quickly.
Hit outs	A player taps or hits the ball with their hand or fist from a Ball up or Throw in.
Ball out of bounds	The football passes completely over the boundary line or touches a behind post or touches padding or any other attachment to the behind post but before doing so, touches the ground or is touched by a player.

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Table 1 (continued)

Free kick	Giving possession of the football to a player on the occasions where high contact has been made, illegal holding off the ball and/or player, or where a player breaches a rule governing play.
Dropped marks	An incomplete attempt to catch or take control of the football within the playing surface, after it has been kicked by another player a distance of at least 15 metres, and which has not touched the ground or been touched by another player during the period when the football was kicked until it was caught or controlled by the player.
Bumps	Body contact between two or more players using the hip and/or shoulder.
Throw ins	Where the football shall be thrown in toward the centre of the playing surface by the boundary umpire to recommence play.
Ball ups	The act of the field umpire putting the ball back into play, either by throwing it vertically upwards into the air, or by bouncing the ball in such a way that it mimics the throwing action. A ball-up is required at the start of each quarter, after a goal is scored or to restart the game from neutral situations in the field of play.
Run and bounce	The act of a player bouncing the football on the ground and back to himself while running, which must be done once every fifteen metres.
Ground ball pick ups	A player taking possession of the ball while in dispute, off the ground.
Smothers	The act of a player stopping a kick immediately after it leaves the boot. Generally undertaken with the hands or body.
Spoils	A player punches or slaps of the ball, hindering another player from taking a mark.
Play on from mark	A player who has been awarded a mark chooses to continue the play by taking the advantage.
Play on from a free	A player who has been awarded a free kick chooses to continue the play by taking the advantage.
Kick off ground	In relation to disposing of the football by making contact with the football with any part of the players leg below the knee without possessing the ball by hand during the action.



## Results

Following data collection, basic descriptive statistics (means, medians, standard deviations, frequency counts) were calculated. The following section outlines a preliminary statistical analysis based on basic indices recorded in Tables 2 and 3.

Table 2

*Summary of tagged events for 12-a-side*

12 a side										
Possession characteristic	Game 1	Game 2	Game 3	Game 4	Game 5	Game 6	Game 7	Game 8	Totals	Game Avg
Kick in from behind	2	6	6	2	7	5	4	10	42	5.3
Contested kick	35	25	34	41	38	34	31	31	269	33.6
Uncontested kick	55	51	36	49	58	50	38	49	386	48.3
Contested handball	27	22	19	22	18	18	17	28	171	21.4
Uncontested handball	7	9	4	9	9	9	3	9	59	7.4
Contested mark to body	3	3	2	4	2	1	1	4	20	2.5
Uncontested mark to body	12	5	5	8	14	10	11	12	77	9.6
Contested mark in hands	3	6	5	9	4	5	7	8	47	5.9
Uncontested marks in hands	19	10	4	14	21	17	13	15	113	14.1
Scoring plays	11	15	13	10	13	12	12	15	101	12.6
Goals scored	9	9	7	8	6	7	8	5	59	7.4
Tackles	21	25	25	18	14	8	24	15	150	18.8
Hit outs	17	13	15	13	11	11	19	9	108	13.5
Ball out of bounds	6	4	7	5	3	1	2	0	28	3.5
Free kicks	4	3	9	5	2	6	4	1	34	4.3
Dropped marks	15	26	16	15	16	15	11	14	128	16.0
Bumps	1	1	0	1	1	4	2	0	10	1.3
Throw ins	4	3	6	2	2	1	2	0	20	2.5
Ball ups	13	10	10	12	8	10	16	9	88	11.0
Run and bounce	3	1	0	5	12	3	2	12	38	4.8
Ground ball pick ups	48	65	52	59	51	52	49	51	427	53.4
Smothers	1	2	2	1	1	3	1	1	12	1.5
Spoils	0	2	1	1	0	8	2	3	17	2.1
Play on from mark	2	4	2	5	10	8	14	12	57	7.1
Play on from a free	0	0	1	0	2	1	0	1	5	0.6
Kick off ground	0	0	0	2	0	2	7	2	13	1.6
<b>Total tagged events</b>	<b>318</b>	<b>320</b>	<b>281</b>	<b>320</b>	<b>323</b>	<b>301</b>	<b>300</b>	<b>316</b>	<b>2479</b>	<b>309.9</b>

Across eight game-play periods of 12-a-side Af, an average of 309.9 sport-specific skills or 'events' were tagged. The highest number of total tagged events was 323 per game period while the lowest number of tagged events was 281. Taken across all eight game periods, the most tagged events were the ground ball pick up, uncontested kicks, contested kicks and contested handballs. Conversely, events such as play on from a free kick, smothers and kick off the ground were least prominent.

In contrast, an average of 351 events was tagged following the analysis of eight game-play periods of 18-a-side Af. Taken across all eight 18-a-side game-play periods the most frequently tagged events were the ground ball pick up, uncontested kicks, contested kicks and tackles. Comparatively, the least tagged events were the play-on from a free kick, kick-in from behind, and smother. The average of tagged events in the 18-a-side full field "adult version" game-play period was greater than in the SSG 12-a-side version (351 vs. 309.9).

It can be seen from this comparison of game formats that the additional players in the 18-a-side game version added to the play complexity through the added player coordination dynamics possible in attacker and defender relationships in the "full game" version as the average number of tagged events was greater than in the 12-a-side SSG version. This result that the addition of extra players led to an increase in the number of tagged events is consistent with previous research on invasion game play where soccer was the sport studied, finding that the addition of players generally leads to an increase in technical game actions (Owen et al., 2004).

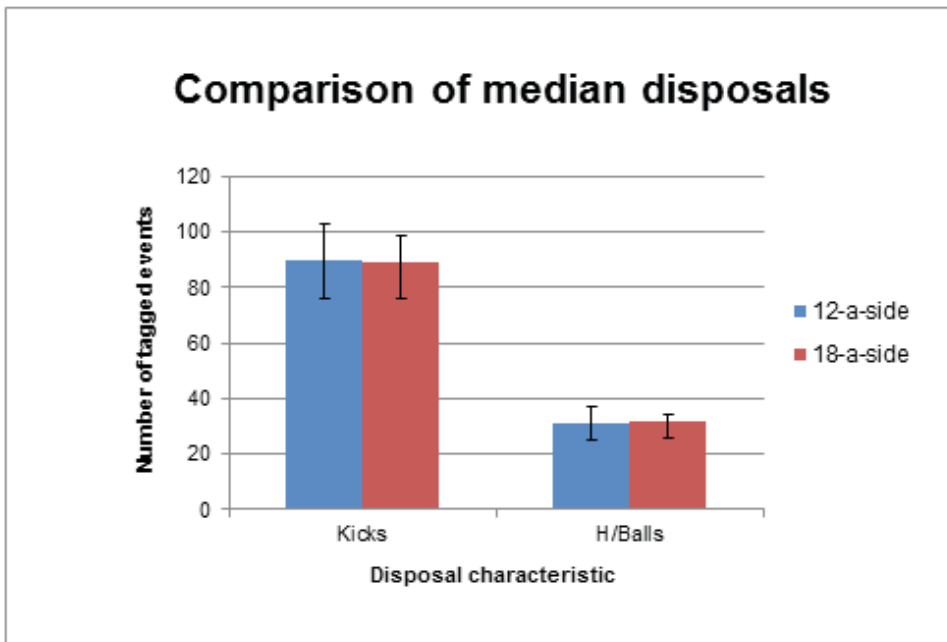
Table 3

*Summary of tagged events for 18-a-side*

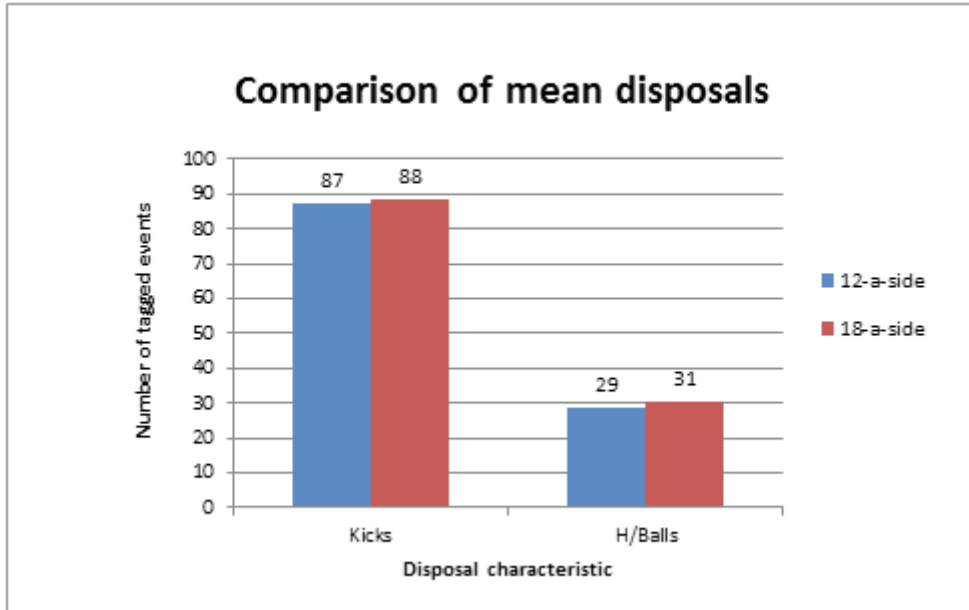
18 a side										
Possession characteristic	Game 1	Game 2	Game 3	Game 4	Game 5	Game 6	Game 7	Game 8	Totals	Game Avg
Kick in from behind	2	0	1	2	2	0	1	2	10	1.3
Contested kick	36	41	26	28	32	45	29	33	270	33.8
Uncontested kick	51	58	50	61	53	53	46	54	426	53.3
Contested handball	23	20	23	25	23	26	24	25	189	23.6
Uncontested handball	3	10	9	9	3	6	7	9	56	7.0
Contested mark to body	2	2	2	2	1	4	5	3	21	2.6
Uncontested mark to body	11	20	13	11	12	20	8	10	105	13.1
Contested mark in hands	6	4	6	10	8	4	8	11	57	7.1
Uncontested marks in hands	13	12	12	10	10	10	11	9	87	10.9
Scoring plays	6	4	8	5	4	4	8	5	44	5.5
Goals scored	2	4	7	3	2	4	7	3	32	4.0
Tackles	30	34	40	32	32	29	37	32	266	33.3
Hit outs	18	14	19	14	18	14	16	14	127	15.9
Ball out of bounds	6	3	1	6	6	2	1	6	31	3.9
Free kicks	7	6	7	4	7	6	7	5	49	6.1
Dropped marks	26	21	8	13	24	24	12	20	148	18.5
Bumps	2	4	6	10	3	5	5	7	42	5.3
Throw ins	5	3	1	4	5	2	1	4	25	3.1
Ball ups	13	13	18	10	14	12	16	11	107	13.4
Run and bounce	5	1	0	15	6	6	1	18	52	6.5
Ground ball pick ups	59	66	51	59	66	68	55	63	487	60.9
Smothers	0	1	2	4	1	3	3	5	19	2.4
Spoils	10	10	9	9	12	5	5	7	67	8.4
Play on from mark	9	12	5	11	10	7	4	9	67	8.4
Play on from a free	0	0	1	0	0	0	1	0	2	0.3
Kick off ground	4	3	1	3	3	4	1	3	22	2.8
<b>Total tagged events</b>	<b>349</b>	<b>366</b>	<b>326</b>	<b>360</b>	<b>357</b>	<b>363</b>	<b>319</b>	<b>368</b>	<b>2808</b>	<b>351.0</b>

### Statistical Analysis

Graph 1 compares the median number of disposals over the eight game-play periods (contested and uncontested kicks and handballs) between 12-a-side and 18-a-side Af. The 12-a-side version of Af yielded a median frequency of 89.5 kicks and 31 handballs in comparison to 18-a-side which yielded 89 kicks and 32 handballs per game. Similar trajectories were evident in the mean data for disposals. Graph 2 reveals that an average of 87 kicks and 29 handballs were tagged in 12-a-side games, compared to 88 kicks and 31 handballs in 18-a-side.

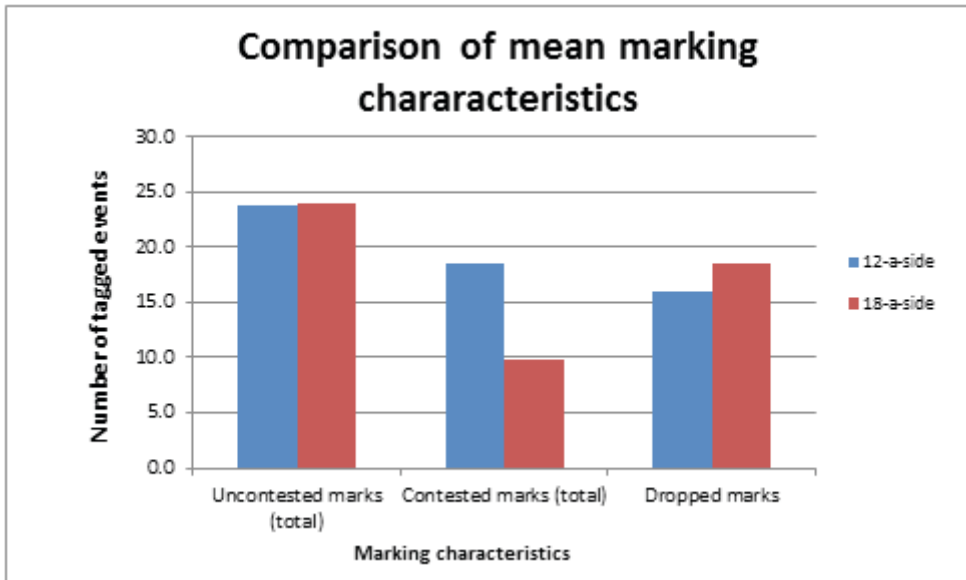


Graph 1. Comparison of median disposals



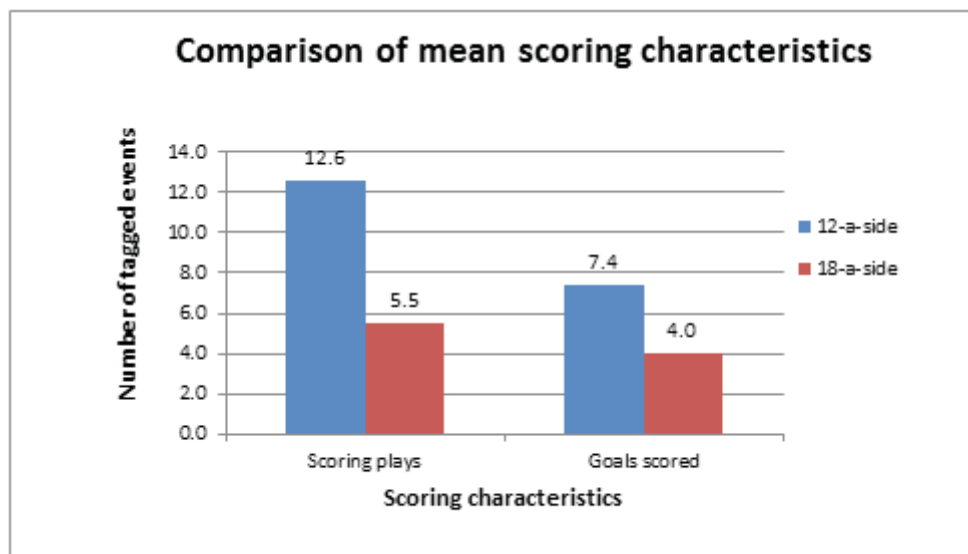
*Graph 2.* Comparison of mean disposals

Graph 3 represents the average marking characteristics per game. The results suggest that while the number of uncontested marks is similar when comparing 12-a-side and 18-a-side Af, 12-a-side appears to result in a greater frequency of contested marks (in the hands and to the chest). The results also indicate that the frequency of dropped marks is greater in the 18-a-side iteration of Af. When the marking characteristics are considered with the frequency of the event 'groundball pick-ups', the vision reveals an association between the numbers of dropped marks, the ball consequently being on the ground and the player having to take possession by picking the ball up from the ground.



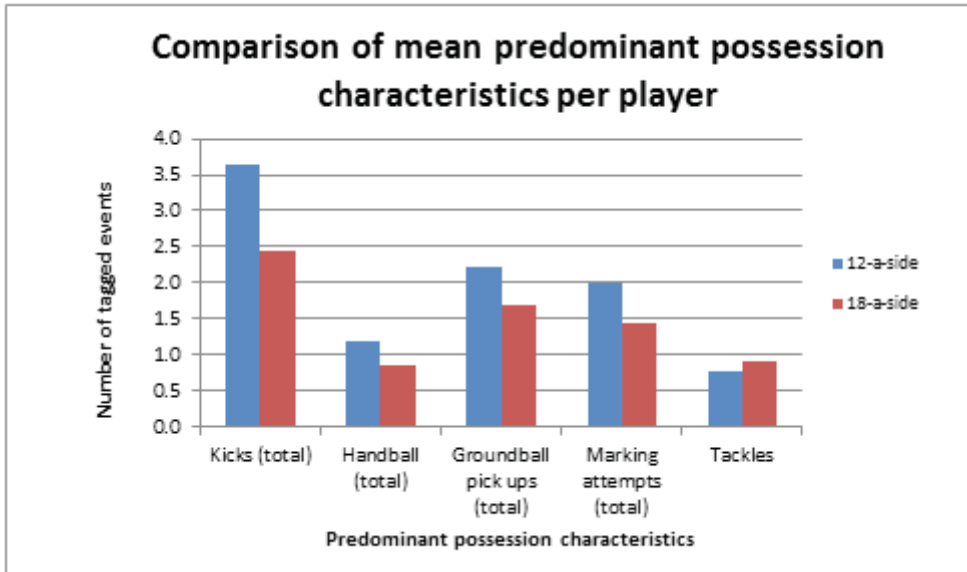
Graph 3. Comparison of mean marking characteristics

Graph 4 outlines the mean scoring characteristics comparing 12 and 18-a-side game-play periods. A significant difference was observed in both scoring plays and goals scored. In the 12-a-side game version, an average of 12.6 scoring plays and 5.5 goals per game were recorded. In comparison, 5.5 scoring plays and 4.0 goals scored were recorded in 18-a-side game-play periods. This data reveals superior scoring efficiency (73%) in 18-a-side play compared to 12-a-side play (44%). However, more opportunities to score manifest in the SSG version.



*Graph 4.* Comparison of mean scoring characteristics

Graph 5 shows the mean predominant possession characteristics per player across an 18 minute game-play period (contested and uncontested kicks and handballs, the groundball pick up, marking attempts and tackling). The results indicate that players accumulate an average of 4.8 disposals (3.4 kicks and 1.2 handballs) per 18 minutes of game play in the 12-a-side game version consisting of 24 players on the field. In contrast, players accumulated 3.4 disposals (2.4 kicks and <1 handball) per 18 minutes of game play in the 18-a-side format consisting of 36 players on the field. Players also average more successful groundball pick-ups and marking attempts in 12-a-side games per 18 minutes of play. The only caveat to this trend is tackling which occur with slightly more frequency in 18-a-side games.



Graph 5. Comparison of predominant possession characteristics per player

## Discussion

The findings suggest that by altering the number of players and the dimensions of the playing area in youth Af certain aspects of player development can be constrained or enhanced. The predominant possession characteristics of kicking and handballing did not show a major difference in the 12-a-side compared to 18-a-side football. However, with respect to the average possession characteristics per player, the results suggest that the 12-a-side Af SSG version used in this study provided players with the opportunity to obtain a higher volume of possession and therefore greater on-the-ball game play engagement. This finding is potentially significant for coaches and game designers who are invested in accelerating the development of players in youth Af. It is also promising for player's game development as the game becomes an enhanced educational experience. The AFL Junior Football Match Guide (AFL, 2013) suggests 15-18 side game formats on full grounds from the Under-11 age group. The findings from this research suggest that Af SSG versions comprising reduced play space and smaller player numbers be considered at Under-11 through to Under-14 level, not just as a training tool for enhanced player development, but to enhance the game day format as an educational experience.



The results from this study also suggest that by decreasing the size of the playing area and the number of players on the field, contested marking may be more frequent. Although uncontested marks did not vary greatly between 12 and 18-a-side formats, players recorded nearly double the amount of contested marks than uncontested marks in the 12-a-side version compared to the full ground 18-a-side game. This may be because the 12-a-side game constraints exacerbate player accountability and involvement in the game, and the reduced play space per player in the 12-a-side format used in this study compared with the full ground 18-a-side play resulted in players being in closer proximity to each other and the opportunity for more contested marking opportunities in the sequences of play.

A comparison of the mean scoring characteristics (Graph 4) indicates that there are more scoring plays and goals scored when contrasting the 12- and 18-a-side football versions in this study. One of the most elusive challenges for Af is improving goal kicking accuracy, with commentators expressing this is the one aspect of the game that has not substantially improved over time (Mitchell, 2014; O'Connell, 2014). The findings from this study suggest that players benefit from engaging in significantly more offensive scoring plays and goal scoring opportunities by employing the SSG version. Based on the results shown in Graph 4 it seems logical for coaches and game designers to consider employing reduced space and number of players in games to increase the volume of scoring characteristics that emerge in play as a strategy to develop goal kicking. Furthermore, while it is beyond the scope of this paper, it is also plausible that greater forward scoring involvements may have promising implications for developing complimentary defensive skills in game situations. Research investigating the development of goal kicking skill and defensive skills as complimentary pairs using Af SSG's is recommended.

Lee (1993) suggested that the football field size should be designed according to the age and size of the players as a tool for developing accuracy in their kicking ability. In this study, the number of players involved does not seem to be a crucial determinant in the demands of match-play. The results show that similar volumes of total kicks and handballs (the two predominant technical demands of Af) were accumulated in 12- and 18-a-side game forms. This observation is in contrast to more technically related actions that are significantly influenced by player number in other studies (Jones & Drust, 2007).

Another unexpected finding of this study was the frequency of the event – groundball pick-ups – in both 12 and 18-a-side game versions. Observation of the video suggests that a player's ability to kick the ball so that the trajectory of the ball made a marking attempt by the intended receiver of the kick possible

was somewhat problematic. This is surprising given the players in this study were talent identified as the best players of their age in the state league club's zone. The implication for junior and youth Af coaching is that more time needs to be spent in these formative years teaching kicking, including (and perhaps, especially) in representative game situations so that kicking skills are developed in practice that are transferable to the complexity and dynamics of the competitive Af game play. The authors intend a secondary analysis of the vision with focussed attention on the cause of the ball to be on the ground, the time the ball spends on the ground, as well as a comparison of the time the ball is in-play in the two game formats.

Consistent with previous findings by Owen et al (2004) this study found that in the full field 18-a-side game version there was an increased number of tagged events compared with the 12-a-side SSG version; however, there was also a decrease in the number of technical actions per player accompanying the additional player numbers in the 18-a-side version. Further research considering whether this observation holds irrespective of field size used in Af game formats is recommended. Research consideration of the total distance covered per minute of play, high intensity running activities, time in possession, contested possession and lost ball possession in various Af game versions, such as 6-a-side, 9-a-side and 12-a-side and 15-a-side SSG versions and 16 vs. 18 a-side full ground versions, is also suggested to better understand the construction of Af modified games as an educational experience as well as for long term player development and enjoyment of the game.

## Conclusion

The results suggest a 12-a-side SSG game version using a modified smaller ground provides a higher stimulus for technical actions than 18-a-side Af played on a full field. The 12-a-side Af format used in this study will possibly provide the players with more time in possession of the ball and more technical actions, therefore more decision making will be required. This will aid skill acquisition and game development over the course of a season.

As a result of this study it is evident that the development of suitable SSG Af game formats as a systematic form of game development for players from child-beginning players through to full rules adult competition is an area that needs researching more thoroughly to create an evidence base through which to formulate a junior football match guide with coherent complexity from simple to progressively more complex game formats. The 18-a-side Af full ground format suggested as appropriate from the under-11 age group (AFL, 2013) is an adult game devised by adults for adults. The game development of players

under-16 and younger may be enhanced by SSG versions that provide a more deliberate progression into the adult 18-a-side game. Further research is required to determine what environment, player and task constraints create playing formats designed to elicit optimal technical demands and ball contacts for ideal game development and the game as educational experience. It was noted in the Introduction to this paper that in the youth Af setting, research shows that children find enjoyment in gaining possessions (touching the football), kicking goals, and playing with friends. We suggest the concurrent benefit may well be enhanced player enjoyment as game participation is greater in the SSG format for junior and youth players, enhancing youth player retention.

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## **(Endnotes)**

1 A game of Australian football is commonly conducted over four periods of play, with players having a break at the end of each period. The play periods are referred to as 'quarters' as each period is one-fourth of the game.

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