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**Report: Year 5 & 6 Game
Pilot 2015**

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AUT



NETBALL
NEW ZEALAND

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Executive Summary

Six v Six is a modified Netball-like game involving smaller numbers on court, player rotation, and different zoning rules. These changes afford more space for players, more opportunities for involvement and an alternative learning context for the development of Netball skills.

This report details results from performance analyses and questionnaires. Data was collected in order to compare the player performance, team performance and player motivation information based upon the results of the pilot implementation of the 6v6 modified game in 2015. Where appropriate the results of the 2012 (Vball project) and 2013 (Modified Netball) are included for comparison. The results are contextualised around four main themes;

FAST: The first section evaluates the performance indicators of the 6v6 (2015) game in reference to previous Modified Netball (2013) data. The indicators measured were categorised as 'game flow', 'ball contacts', 'shooting opportunities', and 'spatial distribution'.

CHANGE: The report progresses to show the Team Performance Assessment Procedure which emphasises gaining possession and disposing the ball.

FOCUS: The third section analyses the players level of engagement or distraction.

MOTIVATION: the players perceived motivation (self-determination) comparing their 6v6 experiences with their 7v7 experiences. The questionnaire addresses their level of autonomy, competence and relatedness.

Analyses and triangulation of findings highlighted several potential benefits in terms of decision-making, playing speed, engagement, and motivation. Importantly, a modified game though simplified in some respects is not necessarily an inferior game; as modification allows emphasis of important developmental opportunities and the optimisation of challenge. These changes are underpinned by a more informal context and the opening up of opportunities for more exploratory play.

Recommendations support the role of 6v6 as a development game for Netball.

Headline findings

Players exposed to 6V6

1. Were exposed to more decision making opportunities and therefore more opportunities for game specific learning.
2. Experienced many opportunities to learn the skill of balancing the court
3. Had more active time – less whistle stoppage
- 4 Passing actions varied significantly by zone
5. Found the game to create more shooting opportunities.
6. Enjoyed greater involvement (TPAP)
7. Greater engagement in the game
8. Intrinsic motivation; specifically they experienced more opportunities for achievement, choices and support which contributed to their intrinsic motivation – though this varied by zone

General summary of findings

As a result of informal context and modified rules 6V6 is an excellent game for developing play, learning and motivation.

Context

Netball in New Zealand has been rightly identified as a game of national and cultural importance [1]. At international level New Zealand Netball continues as a major world force despite demographic limitations that see it pitched against nations many times larger than it.

The key to this success rests in part with a large participation base that sees three out of four young women participate in Netball at some level of other [2] and one in twenty continuing participation into adulthood [3]. This success is set against two particular challenges; global declines in physical activity worldwide [3, 4] and the increasing quality demanded of players at the highest levels [5]. Consequently Netball New Zealand (NNZ) confronts the need reconcile the sometimes conflicting demands of performance, development and motivation in young players.

Netball is classified as a high strategy sport (Abernathy et al., 1993), and 'high-strategy' beginners base their success on their understanding of the 'game situation' more than an assessment of the 'competency of their motor skills' (Bock – Jonathan, Venter and Bressan, 2007). Young players are required to develop a large repertoire of combined skills (technical proficiency) and need to understand 'when' and 'where' to apply these skills in game situations (tactical knowledge) (Thomas, 1994). So the design of the games they play during their development are important to aid the players to apply their skills and make better decisions during the game. By its nature Netball demands particular positional skills and attributes from players at an early age. For example taller players tend to be goal shooters and shorter ones wing attack. Zone rules reinforce particular skills and characteristics as they confine players to specialist roles around the court. Consequently a commonly seen tactic in youth games is to cluster tall players around the goal hoop. Unfortunately the taller twelve year old may not be the tallest adult. Precocity and non-linear development interact to in effect "force players out of position" as they grow. Similar problems arise for physically more mature and therefore faster players given mid-court roles earlier in their careers. Problems relating to precocity, age-effects and selection are being seen throughout sport and reflect an increasing demand for early specialisation [6]. Early specialisation has been argued to inhibit the potential development of the young players, as they may lack the cognitive and fundamental movement skills required for a different position once growth has slowed [5, 7]. Conflict rests then between winning games within a thriving, motivating league program and playing players out of logical position at early ages in order that they develop requisite skills for mature involvement. Mitigating these potential conflicts and related problems is the challenge of planning for skill, performance and motivation.

Part of the answer to the problem of developing skilled players rather than rewarding physically more mature ones may be found in the use of modified games in coaching. Modified games can be used by coaches to manipulate learning context so that desired skills may be developed [8]. When compared to drills or repetitive training in particular, modified games have been associated

with greater fitness [9, 10], better decision-making [11] improved skill [10] and greater motivation [12]. On the basis of evidence it seems likely that, modified games would be of benefit in helping to develop the next generation of netball players. New Zealand is fortunate in that modified netball games are being implemented by NNZ with established competition and support.

Six v Six is a modified version of netball, which has reduced team size (6 instead of 7) and modified rules (rotations, less restricted movement, increased opportunities to score, substitutions). The aim of these modifications is that each player will receive more individual time on varied tasks in a game and more opportunities to explore skills. A legitimate question that needs to be addressed here is whether modified games are in effect simplified games of limited long-term benefit to players. With a view to addressing this issue this report and associated research was undertaken in conjunction with NNZ.

In order to better understand potential benefits of disadvantages associated with playing modified games this research seeks to specifically compare key skill opportunities and game experiences for players exposed to 6v6 via performance analysis and questionnaires.

Key skill opportunities identified in conjunction with NNZ were:

- Player Spatial Distribution (player location every 30s) and player density
- Game Flow (transition & whistle use)
- Ball Contacts (pass complete & lost & direction high/wide)
- Shooting (successful, unsuccessful, possession retained/lost)
- Player Focus (engagement & distracted)
- Team Performance Assessment Procedure (gaining possession and dispossession of the ball)

Specific motivational differences were looked at via questionnaire.

The players were chosen through opportunity and because they are at an important stage of motor learning (SPARC 2006). SPARC (2006) suggested that at this age players are increasingly able to problem solve and make decisions though opportunities are limited by varying (and sometimes rapidly changing) physical attributes.

Results have been reported and contextualised around 4 key themes: Fast –Change –Engagement – Motivation

Performance Analysis – fast, change, engagement

Participants

The participants (N = 56) were from 5 zones (table 1) and competed in 14 matches of the Year 5 & 6 pilot study throughout 2015 (see appendix one). Each player was informed of the purpose of the study before data collection/filming commenced and gave their consent/assent to NNZ (table 1)

Table 1. Zone, area and video used in the study

Zone	Area	Number of Videos
Central	Hutt Valley	4
North	Auckland	8
	Hibiscus Coast	7
	Rodney	8
South	Invercargill	4
Waikato	Morrinsville	8
Mainland	Christchurch	7

Positions in the 6-a-side pilot netball game are two attackers, two centres, and two defenders.

Procedures

A five-minute period of play (N = 88) was analysed from each quarter of each game. The frequency of each key performance indicator was coded (Sportscore Elite™, Sports Tec, Australia) for 'attack', 'centre' or 'defence' position and by NNZ Zone. The data is presented as a total and by Zone (N=5) and position (N=3). Where available, previous comparable research results are shown to aid understanding:

- 2015
 - 6v6 full court
- 2013
 - 7v7 full court
 - 5v5 full court
 - 5v5 modified court
- 2012
 - 7v7 full court
 - Vball (5v5)

Fast

Introduction

“Few players in any sport are technically perfect and many who are fail to make any real impact at the top level - because pressure not only erodes technique but great technique can be undone by poor decision-making under duress.”

(Richardson, NZ Herald, 27 March , 2013)

At the simplest level decision making is about making game appropriate choices in good time. For attacking players this means knowing where and when to arrive in order to collect the ball and passing to players in emerging spaces. Defending players confront a similar problem with the goal of occupying or blocking spaces and making potential interceptions. Better players gain and make time through greater game-related anticipation and knowledge of reading the game. It is now understood that this ability to read the game emerges from practice that allows players to pick up on multiple interacting cues around them [13]. At the highest level this process requires little or no reflection and is robust under pressure. Perhaps counter to intuition, good decision making is driven by what surrounds the player and their ability to act on changes without thinking [13, 14]. Decision making skill emerges from learning contexts that include essential elements of the game, such as opposition, movement and real choices with real consequences [15]. Game like practice with repeated exposure to appropriately contingent choice underpins the development of expert decision makers.

Context

Suitably game-like play may be seen in terms of player density and likely interactions. Player density not only reflects real options but to some extent the likely pressure players will experience. Each additional player on a court increases the potential interactions available and equates greater tactical possibilities; reduction in player numbers also amounts to a reduction in available options and a potential speeding up of the game. Greater player density would equate with increased pressure and less time on the ball hence a further speeding up of the game. Experts have already developed the complex situation skills required to perform well in these scenarios, yet inexperienced developing youth players have not [16] therefore games that optimise challenges to player ability are most likely to get results. The key variable at this level is the number of respective choices made which may be indexed by the number of passes, contacts and transitions in an opposed game. Greater contact with the ball will also have an impact on involvement. The feeling of 'being involved' is highly motivating to any player in any sport. Research has shown that increasing the number of ball contacts should be an aim of youth sport development [17] as it leads to a positive feeling of participation and involvement and increased opportunity for player and team skill development [18]

So a fast game such as 6v6, if it can be characterised as possessing a high number of individual ball contacts, high frequency of ball transitions from end to end with an appropriate level task complexity could be of great benefit to the skill development of youth netballers.

To determine whether the game actually fulfills this belief 6v6 was analysed and compared with

previous data (5v5, 7v7) for the performance indicators of:

- Player density and potential interactions
- Game Flow: Frequency of transition (complete ball movement from defensive circle to shooting circle) and frequency of game stopped (whistle)
- Number of ball contacts per sport and player position

Density, potential interactions and spatial distribution

The 6v6 format is played on the same court size as the 7v7, Vball and 5v5 (full court), whilst the modified 5v5 was played on a smaller court area (table 2.)

The player density is 19.39m² in the end zone and 12.91 m² in the mid zone. Compared to the other formats, the 6v6 player has less time and space in the mid zones.

Table 2. Player density and potential interactions by game format.

Year	Format	Total Court Size (m ²)	Player Distribution (end-mid-end)	Player Density (space per player) (end-mid) (m ²)	Potential Interactions (total:end-mid)
2012	7v7	465.13	8 - 10 - 8	19.39 – 15.51	157: 56-45-56
2013	6v6	465.13	8 - 12 - 8	19.39 – 12.91	157: 56-45-56
2012	5v5 (vball court)	465.13	6 - 6	12.92 – 12.92*	60:30/30
2012	5v5 Full Court	465.13	6 - 10 - 6	25.88 – 15.52	136:48-40-48
2012	5v5 (modified court (2/3))	310.19	6 - 6	25.88 – 25.88*	60:30/30

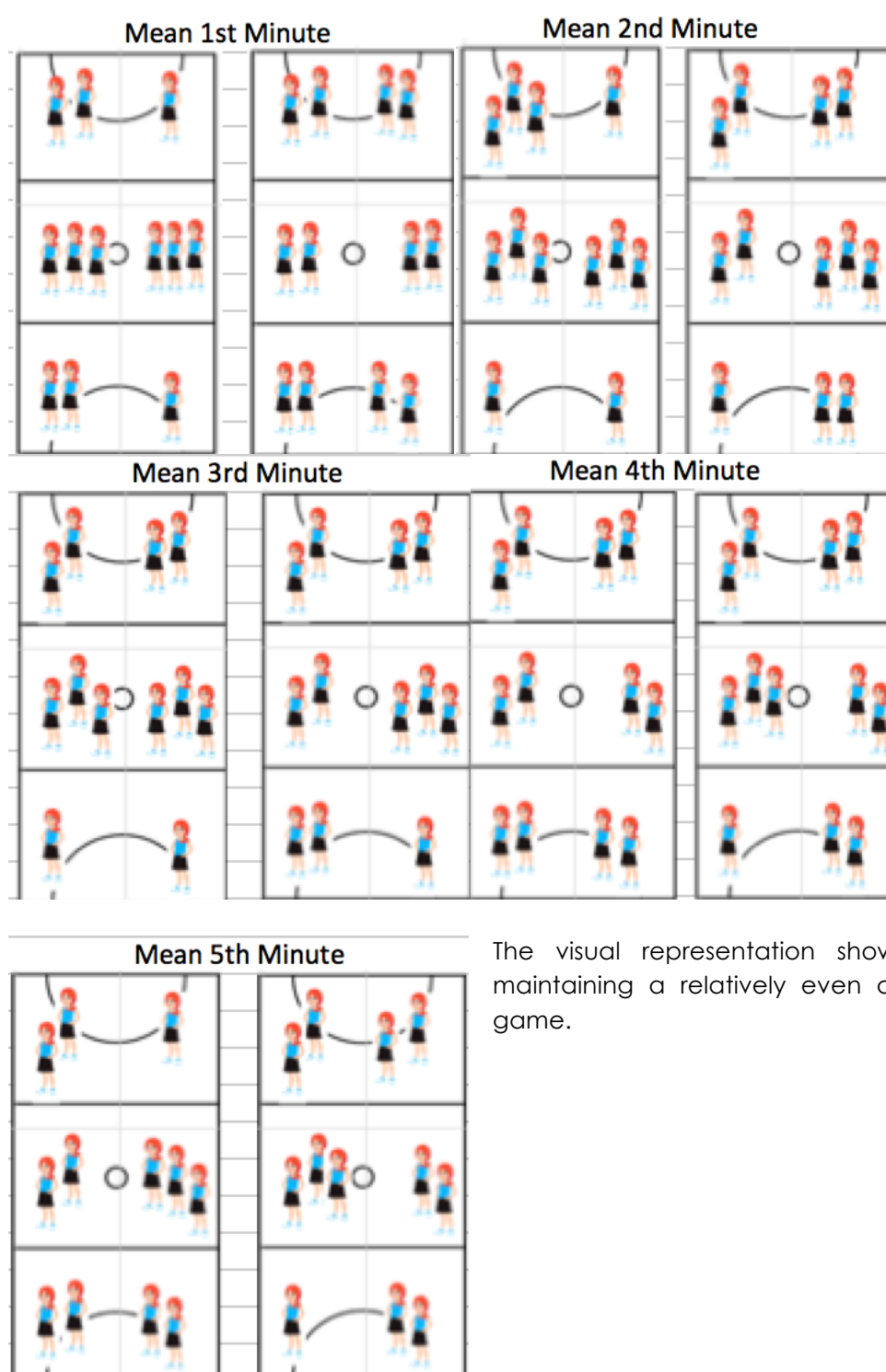
*Total Court area is two zones hence same PD

As player number increases so do the interactions and decision-making load. 6v6 has 157 potential interactions; 56 in each end zone and 45 in the centre zone. Netball has 157 similar potential interactions. The 5v5 full court has a high number due to the modification of movement areas. Tactical possibilities increase with the number of interactions as does task complexity.

Findings: while reducing player numbers may appear to simplify games significantly, a reduction in space and available options for respective players increases pressure and task difficulty for attackers. In this light 6v6 constitutes a more pressured game (less space) with fewer options and as such is more likely to develop higher order decision making skills.

Spatial Distribution

In order to understand the spatial distribution of the players in the 6v6 game a average snapshot of player position was calculated every 30s for a 5 minute period



The visual representation shows that the players are maintaining a relatively even distribution throughout the game.

Findings: The 6v6 game provides an environment for players to learn the skill of a balanced court.

Game Flow

The flow of the game can be influenced by the frequency that the whistle is blown to stop play. A way to understand the 'flow' of the game is to determine the frequency of the action eg on average a transition occurs in the 6v6 game every 106 seconds (table 3)

The Modified 6v6 game results in less frequent stoppages than the 7v7, yet has more frequent stoppages than the other modified forms of the game.

The benefit of the modified game is that reduced stoppage enables the players to create more fluidity in their movements in relation to eachothers actions. This flow is more representative of the adult game.

Table 3: Frequency of action per 'x' seconds

2015 6v6 format		
Zone	Transitions [#]	Whistle [*]
1.00	80	33
2.00	160	62
3.00	73	69
4.00	110	38
5.00	127	60
Mean Total 6v6	106	53
2013 Varied Format		
7v7 (full court)	50	50
5v5 (full Court)	61	61
5v5 Modified Court	94	94

the lower the number the more fluid the game

* the higher the number the more fluid the game

In the 6v6 format: Is the transition value between the zones significant?

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicted that the assumption of normality was supported for each of the five conditions. Levele's statistic was significant, $F(4,42) = 5.625, p = .001$ and thus the assumption of homogeneity of variance was violated.

A Kruskal- Wallis ANOVA indicated that there were no significantly statistical differences between the zones for the number of transitions, $p = 0.053$

Findings:

- ***There is a transition every 106s in the 6v6 game. This is less frequent than found in the previous 7v7 and 5v5 modifications of the game.***
- ***All the zones have a similar frequency of transition.***

In the 6v6 format: Does 'which zone' you play in influence stoppage time ?

A one-way between group analysis of variance (ANOVA) was used to investigate the impact that the zone had on the stoppage in play (whistle).

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was supported for each of the five conditions. Levene's statistic was non-significant, $F(4,42) = 2.071$, $p = .102$ and thus the assumption of homogeneity of variance was not violated.

The ANOVA was not statistically significant, indicating that the game stoppage was not influenced by Zone, $F(4, 42) = 1.161$, $p = .341$

Findings:

- There is a stoppage every 53s in the 6v6 game. This is more frequent than that found in the previous 5v5 modifications of the game, yet less frequent than the 7v7 game.
- There is no significant difference in the stoppage frequency for zone.

In the 6v6 format - Does position/zone have an influence on passing variables ?

Each player has more opportunity for practicing passing, intercepting and rebounding skills in the competitive Modified game compared to the same relative time spent when solely using the traditional game. This is particularly evident in the 6v6 modified game which has the greater frequency of actions for passes completed (table 4).

Table 4. Passing actions per 'x' seconds

2015 Zone	Pass Complete	Pass too high/wide	Pass intercepted	Pass direct to opposition	Pass to nowhere
1.00	6	200	20	0.00	200
2.00	7	160	36	0.00	240
3.00	6	600	41	2400	141
4.00	7	200	14	300	133
5.00	7	112	26	1700	202
Total 6v6	7	144	32	1282	247
2013 Varied Format					
7v7	10	n/d	160	n/d	n/d
5v5 (full Court)	9	n/d	52	n/d	n/d
5v5 Modified Court	12	n/d	64	n/d	n/d

Findings:

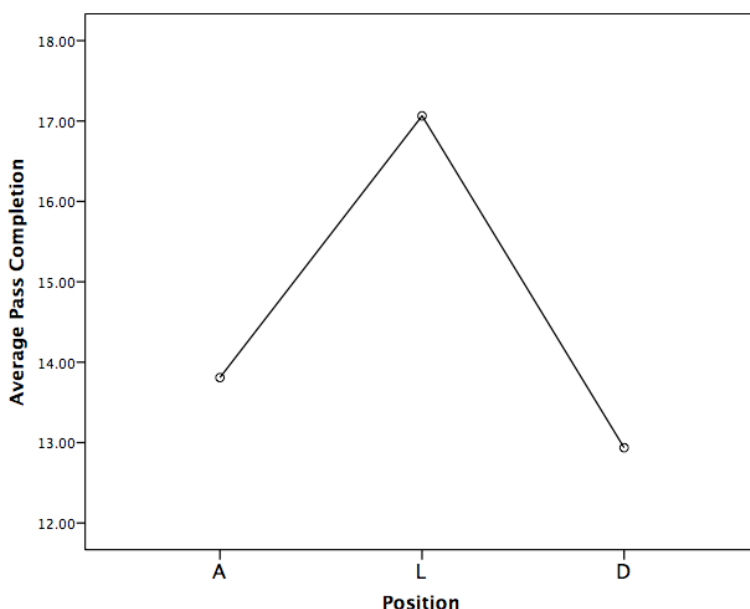
- There is a pass completion every 7s in the 6v6 game. This is more frequent than that found in the previous 7v7 and 5v5 modifications of the game = greater ball contact
- There is a pass 'too high/wide' every 144s in the 6v6 game.
- There is a pass intercepted every 32s in the 6v6 game. This is more frequent than that found in the previous 7v7 and 5v5 modifications of the game = greater ball contact
- There is a pass direct to opposition every 1282s in the 6v6 game.
- There is a pass to 'nowhere' every 247s in the 6v6 game.

The inclusion of the modified game for young netballers gives each participant an increased opportunity to learn and have more ball contacts and opportunities in an opposed environment. The skill of being able to use the appropriate ball contact for the specific situation is known to be an important part of developing the young netballer.

Player Position and Pass Completions:

A one-way between group analysis of variance (ANOVA) was used to investigate the impact that player position had on pass completion. Sharpiro-Wolk and Levene's tests were used to evaluate the assumptions of normality and homogeneity of variance respectively. Neither was violated.

The ANOVA was statistically significant, indicating that the pass completions were influenced by position $F(2, 138) = 8.321, p = 0.001, \eta^2 = .108$



The Centre players ($M = 17.06$) had a significantly greater number of pass completions than the attack ($M = 13.81$) and defence ($M = 12.94$) (fig 1.)

Fig 1. Mean pass completions and position

Findings: There is significant difference in the amount of 'completed passes' between player position. Centre players have significantly greater pass completions than attack or defence.

Zone and Pass Completions:

A one-way between group analysis of variance (ANOVA) was used to investigate the impact that player position had on pass completion. Sharpiro-Wolk and Levene's tests were used to evaluate the assumptions of normality and homogeneity of variance respectively. Neither was violated. The ANOVA was not statistically significant, indicating that the pass completions were not influenced by zone $F(4, 132) = 1.848, p = 0.123, \eta^2 = .052$

Findings: There is no significant difference in the amount of 'completed passes' between zones.

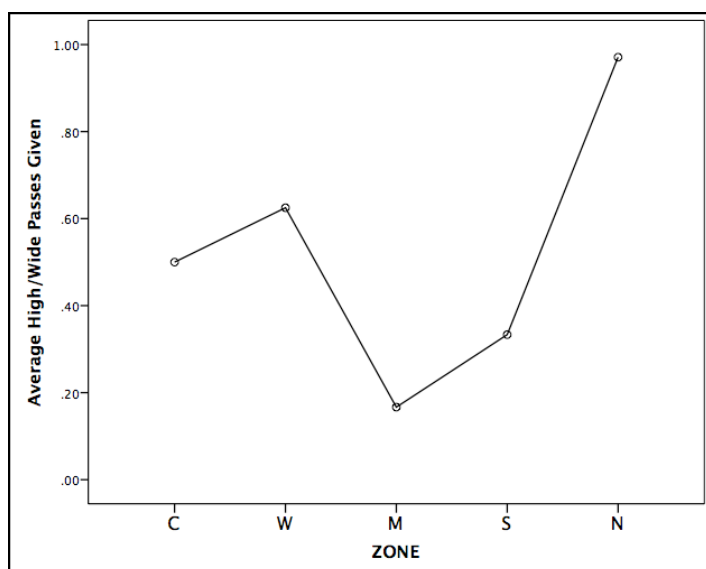
Player Position and Pass High/Wide

A one-way between group analysis of variance (ANOVA) was used to investigate the impact that player position had on pass high/wide. Sharpiro-Wolk and Levene's tests were used to evaluate the assumptions of normality and homogeneity of variance respectively. Neither was violated. The ANOVA was not statistically significant, indicating that the pass high/wide does not differ for position $F(2, 138) = 1.581, p = 0.209, \eta^2 = .022$

Findings: There is no significant difference in the amount of 'high/wide passes' between player position.

Zone and Pass High/Wide

A one-way between group analysis of variance (ANOVA) was used to investigate the impact that player position had on pass high/wide. Sharpiro-Wolk and Levene's tests were used to evaluate the assumptions of normality and homogeneity of variance respectively. Neither was violated. (fig. 2)



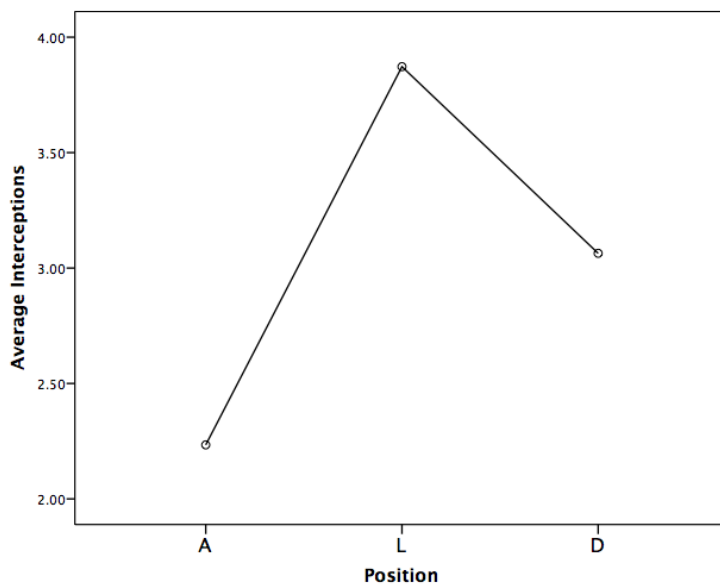
The ANOVA was statistically significant, indicating that the pass high/wide does vary for zone $F(4, 136) = 3.841, p = 0.005, \eta^2 = .101$.

Fig 2. Mean pass high/wide and zone

Findings: The North Zone ($M = .68 \pm .99$) has significantly greater number of high/wide passes than the Mainland Zone ($M = .17 \pm .38$)

Player Position and Pass Intercepted

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported. Kruskal-Wallis ANOVA indicated that there were statistically significant differences between the interceptions achieved by the 'attacker' (Mean Rank = 52.89), 'centre' (Mean Rank = 87.02) and 'defender' (Mean Rank = 73.09). H (corrected for ties) = 17.04, $df = 2$, $N = 141$, $p = .001$.



Pairwise Comparisons (adjusted $\alpha < .017$) indicated that the interceptions of centre ($U = -34.128$, $z = -4.105$, $p = .001$) and defence ($U = -20.191$, $z = -2.429$, $p = .015$) were significantly higher than those of attack (fig 3)

Fig 3. Mean pass interception and position

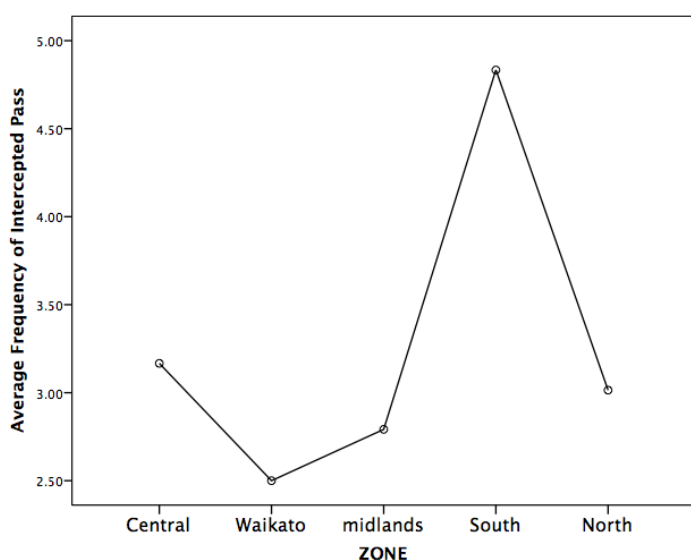
Findings:

There is a significant difference in the amount of 'pass interception' for player position. Centre players intercept significantly more than attack or defence.

Zone and Pass Intercepted

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported.

A Kruskal- Wallis ANOVA indicated that there were significant statistical differences between the zones for the number of passes intercepted, $p = 0.046$.



Pairwise comparisons (adjusted $\alpha < .005$) indicated that the interceptions of Waikato (Mean Rank = 59.77) were significantly less ($U = -42.229$, $z = -2.964$, $p = .003$) than those of South (Mean Rank = 102) (fig 4)

Fig 4. Mean pass interceptions and zone

Findings: There is a significant difference in the amount of 'pass interception' for Zone. South players intercept significantly more than Waikato players.

Player Position and 'Pass to nowhere'

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported.

A Kruskal- Wallis ANOVA indicated that there were no significant statistical differences between the zones for the number of 'passes to nowhere', $p = 0.859$

Findings: There is no significant difference in the amount of 'nowhere passes' between player position.

Zone and 'Pass to nowhere'

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were significant differences between the zones for the number of 'passes to nowhere', $p = 0.023$. Pairwise comparisons (adjusted $\alpha < .005$) indicated that the 'passes to nowhere' of North (Mean Rank = 62.61) were significantly less ($U = -23.641$, $z = 3.032$, $p = .002$) than those of South (Mean Rank = 86.25) (fig 5)

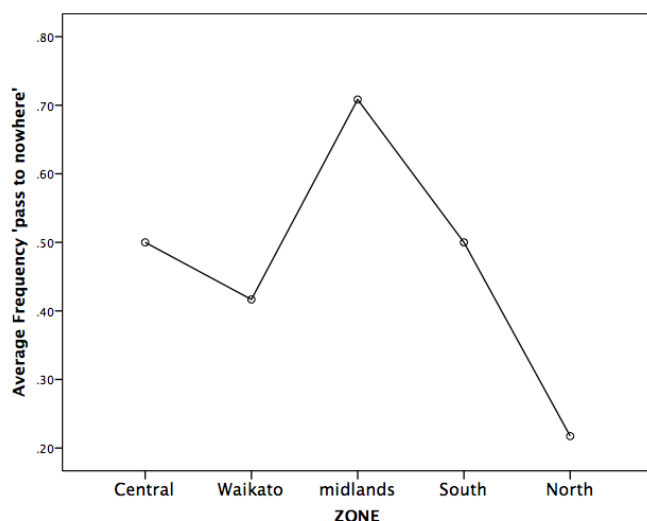


Fig 5. Mean pass 'to nowhere' and zone

Findings: There is a significant difference in the amount of 'pass to nowhere' for Zone. Mainlands players 'passed to nowhere' significantly more than North players

Comparison (2012) 5v5 and 7v7 Findings on Player Position and Ball Contact Frequency

In all positions 5v5 (V-ball) players enjoyed a significantly higher number of contacts with the ball than those playing netball. The ball contacts averaged 14 in V-ball ($SD = 3.72$), and 11 in netball ($SD = 4.50$) (table 5)

Position	n	Netball	V-ball
Defender	30	9	13*
Link	30	14	13*
Attack	30	10	16*

* $p < 0.01$

Table 5: Mean ball contacts by position and game played

Findings: In the modified game (5v5, 6v6) the player has more contacts with the ball than in the full 7v7 game. This emphasises the need to rotate players.

In the 6v6 format - Does position/zone have an influence on Shooting Opportunities?

The tendency to lose focus on the game at hand and succumb to other distractions occur in games when players feel they have periods where they are not able to have an influence on the game i.e. long periods of inactivity when the ball is outside their playing zone. The Modified game, particularly the 6v6, is 'faster' which means that players do not have so many situations where they are 'waiting' for an opportunity to 'get involved' i.e. more opportunities to shoot which means the ball has moved into their playing zone (table 6)

Table 6: Shooting actions per 'x' seconds

<i>Action per 'x' seconds 2015 6v6 format</i>		
Zone	Successful shot (SS)	Unsuccessful shots (US)
1.00	109	150
2.00	89	96
3.00	73	141
4.00	150	85
5.00	161	200
Mean	107	140
Total 6v6		
	<i>Successful shot</i>	<i>Unsuccessful Shot</i>
7v7	533	133
5v5 (full Court)	200	48
5v5 Modified Court	266	114

Findings:

- *There is a successful shot every 107s in the 6v6 game. This is more frequent than in the 7v7 and 5v5 formats = greater shooting opportunity = more involvement*
- *There is an unsuccessful shot every 140s. This is less frequent than either the 5v5 or 7v7 formats*

Successful Shooting and Zone

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicted that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were no significant statistically differences between the zones for the number of successful shots, $p = 0.938$

Findings: There is no significant difference in the amount of successful shots between zones.

Unsuccessful Shooting and Zone

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicted that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were no significant statistically differences between the zones for the number of unsuccessful shots, $p = 0.697$

Findings: There is no significant difference in the amount of unsuccessful shots between zones.

Application

Comments from coaches who use modified formats as a training game for youth development suggest that they feel it provides a fast game, with a high level of player involvement, which creates frequent opportunities for interaction in an environment which is as competitive yet less task complex than traditional netball. Six-a-side therefore satisfies their players' need for relatedness, autonomy and competence [19].

The analysis shows that 6v6 is a fast game, with a high frequency of ball contacts for all positions (defence, centre and attack). Previous research on the full game would suggest that those players in the ends (defence and attack) do not receive as much contact with the ball as the centre players. Over the course of time this may be detrimental to the learning opportunities available to those end players as frequency of ball contacts is known to be a factor in player development [20] due to its positive relationship with higher levels of player intrinsic motivation, player engagement and ultimately the subjective factor of player enjoyment. Thus V-ball can be a positive experience for the youth player. Every player should feel their role is more 'significant' in determining the team success or failure of the transition, the coaching point of 'imagine every pass is coming to you' becomes much more real for each player thus increasing the time spent focussed/engaged of each player on both team-mate movement and ball movement.

The use of the 6v6 game gives the coach a session, which incorporates a high frequency of turnover from defence to attack, yet importantly still with a high number of ball contacts per position. If the coach uses solely traditional netball then there is a danger that the 'end' players will have a reduced opportunity (compared to the centres) to develop their tactical and associated movement patterns simultaneously. In the transition from blocked practice to full game this concept of situational-tactical thinking i.e. the 'what ifs...' can be difficult for the youth players to grasp. It requires a lot of opportunities for 'forget' and 'recall' skills so that the youth players can enhance their problem-solving abilities [21].

Six-a-side appears to be beneficial at providing opportunities for frequently adapting practiced movement patterns to the varied, dynamic conditions of competition [22]. Ultimately six-a-side provides more context appropriate ball time, which will lead to more skillful decision makers

Change

Introduction

Decision making and the ability to make sound judgments in good time are known characteristics of the elite performer [23]. The expert is described as being able to make more consistent and appropriate responses for longer periods throughout a game [24]. So the opportunities for youth players to practice 'decision-making' through real-life stimuli in the performance context is therefore an essential 'athlete-need' in the development of each player if they are to be given the opportunity to reach their full potential [25]. Previous research [26] supports the effectiveness of small-sided games as a medium through which players gain greater opportunity within practice/match situations to develop skills.

Team Performance Assessment Procedure

For assessment to be integrated into coaching it needs to have contextual (ecological) relevance. The previous report evaluating Vball vs. Traditional netball (Oldham, Spencer, Clancy, Venables and Wilkie, 2013) considered player decision-making using the GPAI (Game Performance Assessment Instrument; Mitchell, Oslen and Griffin, 1995). The results from that study supported the concept of using a modified game to enhance player development opportunities through assessing the technical product and the tactical process. A criticism though was that it did not fully capture the integrated nature of player performance in its methodology.

The Team Performance Assessment Procedure (TPAP; Gréhaigne, Godbout and Bouthir, 1999) is designed to provide a *formative* tool to evaluate the motor and tactical skills of players specifically in the game context. It aims to account for the various facets (interaction of strategy efficiency, tactical efficiency, and specific perceptual and motor skills) that occur in the team sport environment i.e. it measures, (a) 'how a player gains possession of the ball (two variables) and (b) 'how a player disposes of the ball' (four variables) thereby accounting for the player integration in the game (see appendix for definitions and mean scores). From these measures two performance indexes and a final performance score are calculated.

Received Balls (RB): Involvement in the team's play (availability, accessibility to receive a pass).

Conquered Balls (CB): Information related to the defensive capacities

Offensive Balls (OB): capacity to make significant passes to his or her partners (offensive capacities)

Successful shots (SS): Information related to offensive capacities

Volume of Play (PB = RB + CB): General involvement in the game.

Lost Ball (LB): A small number reflects a good adaptation to the game

The computation of performance indexes and performance score:

Efficiency Index: $(CB + OB + SS) / (10 + LB)$ [higher number = more efficient]

Volume of play: $CB + RB$ [higher number = greater involvement in play]

Performance Score = (volume of play/2) + (efficiency index x 10) [higher number = better performance]

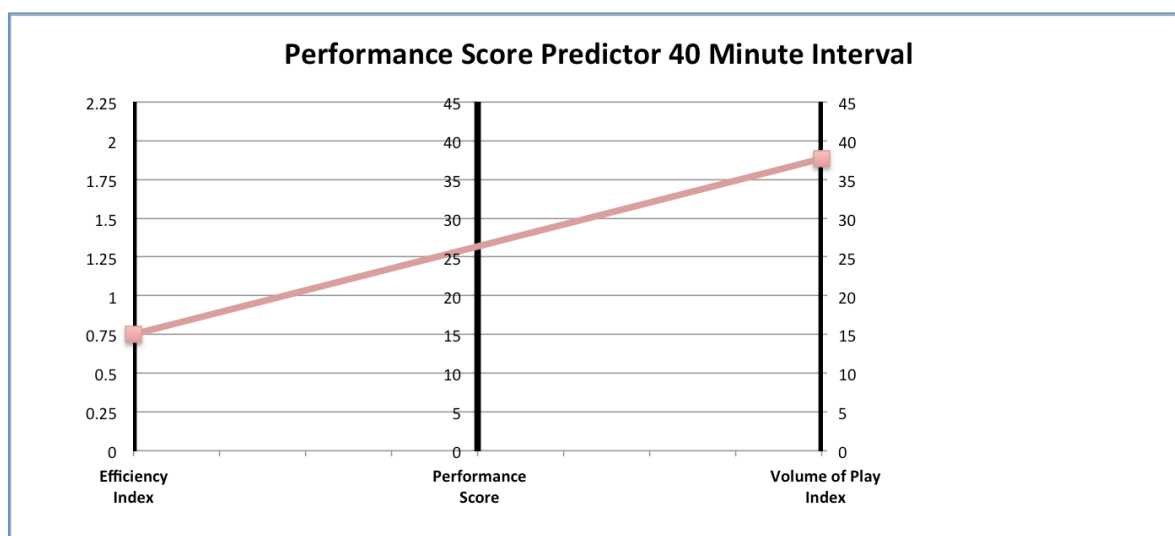


Fig 6: TPAP Performance, Efficiency and Volume of Play - Average Scores Per Player per 40mins of Game Play (2015, 6v6)

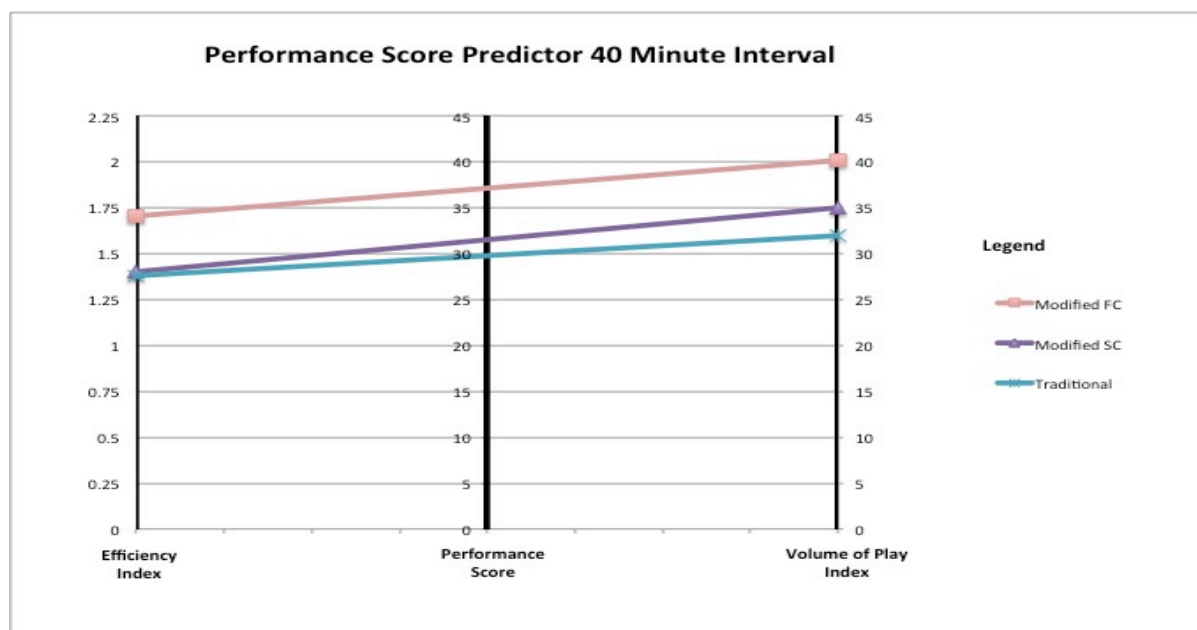


Fig 7: 2013 TPAP Performance, Efficiency and Volume of Play - Average Scores Per Player per 40mins of Game Play (short court 5v5, full court 5v5, fullcourt 7v7)

The TPAP suggests that when playing the 6v6 format of the game the players have a greater involvement. Each player has more opportunities for practicing passing, shooting and intercepting (i.e. learning to make the appropriate action decision) in the competitive V-ball training game compared to the same relative time spent when practicing solely using the traditional game format. The inclusion of 6v6 as a development game gives the participant an increased opportunity to learn, initially the player has more tries to just 'make a decision', and then has more touches and

opportunities to takes this a step further to 'making decisions appropriate for each specific tactical situation'. This skill of making the 'appropriate decision for the specific situation' has been shown to be a really important step on the road to developing player excellence. V-ball is a positive format for the development of excellence it incorporates more frequent occurrences of advanced game like skills that directly translate into the full netball game, though they are little less efficienct and have a lower performance score. The 5v5 game in the full court scores highly on all aspects of the assessment.

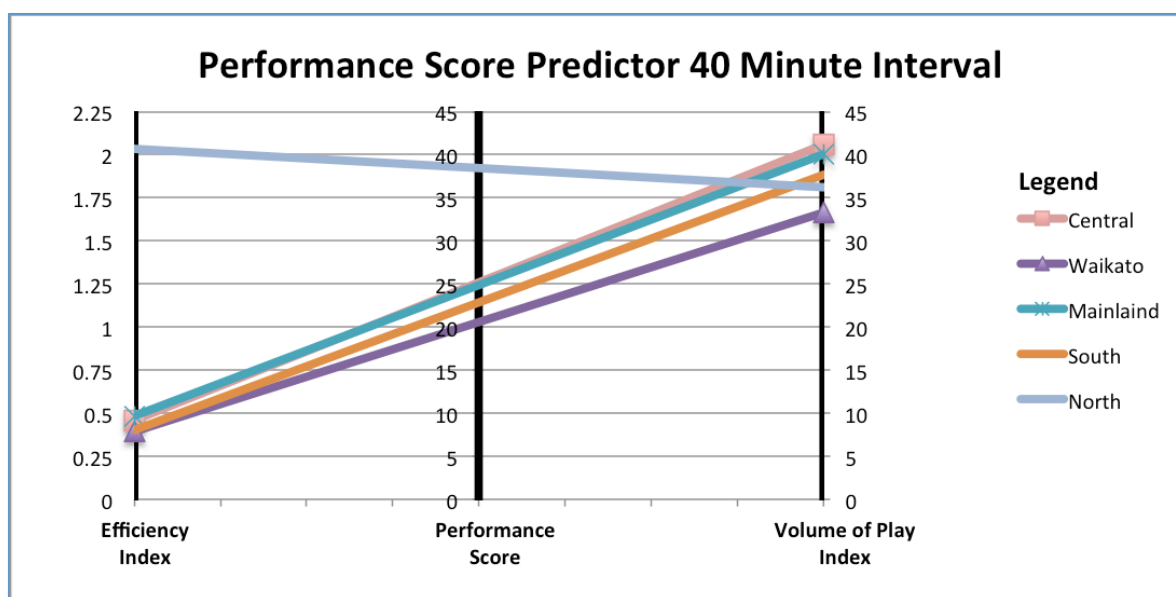


Fig 8: TPAP Performance, Efficiency and Volume of Play - Average Scores Per Player per 40mins of Game Play by Zone (2015, 6v6)

When we look at the variations among the zones, those players in the North score more highly on all categories of the index.

Focus

Engagement

Effective learning is related to two factors; appropriate focus of attention [27, 28] and resulting mental effort [29]. Broadly speaking this implies that watching and thinking about the game at all stages of play will enhance skill development. In broad terms this fits with the deliberate practice model of Ericson in that expertise is the product of many hours of deliberate, task appropriate practice [30], which may be facilitated by watching as well as doing [27]. A general term for this is engagement, which at the most basic can be assessed in terms of time spent actually watching play. Interestingly engagement may also be seen as an index of task related motivation, in so far as attention is only directed to those activities that are of interest and therefore motivating. Ultimately the player who spends more time watching a game will be develop more quickly and is probably more motivated.

Better player development will be underpinned by games where youths are involved with netball activity that maximises their duration of engagement. The tendency to lose focus on the game at hand and succumb to other distractions (e.g. swinging on the post) occurs when players feel that there are periods of play that do not involve them i.e. there may be long periods of inactivity when the ball is outside their playing zone.

Time on task:

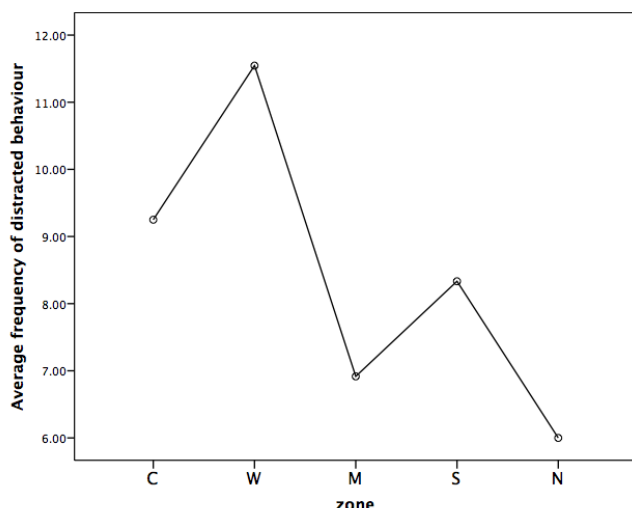
Engaged = watching the ball or other players

Distracted = watching parents, other games, swinging on the post, playing with own hair

In the 6v6 format - Does position/zone have an influence on player focus?

Zone and Distracted Focus

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicted that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were significant differences between the zones for the frequency of distracted behaviour, $p = 0.02$.



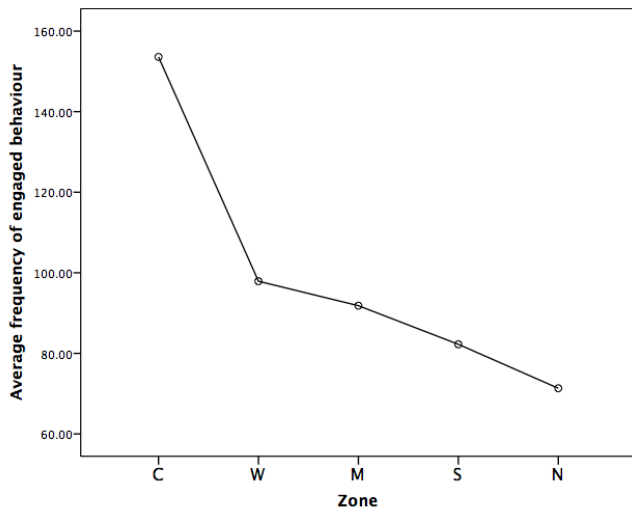
Pairwise comparisons (adjusted $\alpha < .005$) indicated that the frequency of 'player distraction' in the Waikato Zone (Mean Rank = 39.41) was significantly greater ($U = 21.409$, $z = 2.998$, $p = .003$) than 'player distraction in the North (Mean Rank = 18.00)

Fig 9 Mean distracted behavior by zone

Findings: Player distraction level is influenced by zone. Players in the Waikato zone are significantly more distracted.

Zone and Engaged Focus

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were significant differences between the zones for the frequency of distracted behaviour, $p = 0.028$.



Pairwise comparisons (adjusted $\alpha < .005$) indicated that the frequency of 'player engagement' in the Central Zone (Mean Rank = 40.04) was significantly greater ($U = 20.50$, $z = 2.926$, $p = .003$) than 'player distraction in the North (Mean Rank = 19.54)

Fig 10. Mean engaged behavior by zone

Findings: Player engagement level is influenced by zone. Players in the Central zone are significantly more engaged.

Player and Distracted Focus

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were no significant differences between the positions for the distracted behaviour, $p = 0.431$

Findings: There is no significant positional difference for frequency of distracted behaviour

Player and Engaged Focus

Inspection of the skewness, kurtosis and Shapiro-Wilk statistics indicated that the assumption of normality was not supported. A Kruskal- Wallis ANOVA indicated that there were no significant differences between the positions for the distracted behaviour, $p = 0.365$

Findings: There is no significant positional difference for frequency of engaged behaviour

Application

The findings suggest that the 6v6 players had a greater period of time when they were engaged in the game and less time distracted 'waiting' for an opportunity to 'get involved'. Though within the 6v6 the level of focus varies with zone.

Elite netball is strategic in nature and players need to be able to understand and apply tactical formations in a varied, dynamic environment. It is important that player attention is allocated to both the ball and the diverse movements of the opposition. So coaches who are developing players who wish to become 'expert', require their players to engage with the on court action even when the ball is in a different zone. Expert players are described as being more proficient at making decisions, more able to predict events and outcomes, more accurate in decision-making and more accurate at anticipating opponents' intentions [16].

The players had a greater duration of engagement so the game has a positive effect on player development as it enhances opportunities to develop these elite decision-making and anticipatory characteristics, i.e. movement and decision actions relate to anticipating what will evolve in the game and planning their own appropriate movements in response to their team mates actions as the ball approaches.

The use of 6v6 as a developmental game means the coaches can create an environment where their players will more quickly learn what information is relevant and irrelevant to the task. Players may also be able to prioritise the effectiveness of the various movement patterns inherent in the game as they are exposed to these patterns more frequently than by playing netball alone. A greater level of engagement is more likely to make the developing player more effective and less likely to commit fundamental errors. With more engagement comes more motivation and faster learning (Kornikova, *The Listener*, 2013, p18).

Motivation

Introduction

At the most basic level motivation can be classified as either extrinsic or intrinsic: Extrinsic motivation comes from outside the individual in the form of coaches, parents, prizes and punishments for example. Extrinsic motivation though effective, is viewed as unsustainable in that when the motivation is removed resulting activity declines or ceases. An example of this is the player who only works hard when she/he feels the coach is watching. Intrinsic motivation is captured in personally valued goals, ownership and persistence. This form of motivation is seen as sustainable in that effort is internally controlled and therefore results in spontaneous activity. An example of this is the player who will seek out every and any opportunity to practice or play [19, 31]. Intrinsic motivation is understood to be underpinned by the satisfaction of three personal needs: Autonomy – choice, Competence – achievement and Relatedness – support [32, 33]. Access to these needs can be optimised at a moment to moment level coaching but also a contextual game-driven level [19]. Motivation far from being a trait is something that can be coached at several levels.

Context

Six-a-side is a game designed to increase decision making, contact, engagement and involvement. It is also a less formal game which has meaningful influence on coach behaviour [34-36]. Increased decision making should reflect greater choice and therefore autonomy. More appropriate decisions and contact may enhance competence. Informality and coach support should result in greater relatedness. Consequently more intrinsic motivation may arise as a consequence of playing 6v6. However it needs to be acknowledged that the positional changes and team instability may not be to the liking of all players. Player's views were elicited via questionnaires with a view to examining any differences between zones for motivational needs.

A t Test was performed on the basic motivational needs of all the players. This looked at differences solely between the format of 6v6 and 7v7.

Results revealed no difference in perception of intrinsic motivation for game format (table 7)

Table 7. Mean Motivation Scores by game format

SDT	Game Format			
	6v6		7v7	
	(N = 228)		(N = 222)	
	M	SD	M	SD
Competence	33.05	5.97	32.70	6.49
Autonomy	33.07	6.12	32.41	7.31
Relatedness	46.43	7.96	46.20	9.46

Findings: There is no difference in the level intrinsic motivation of those players of 6v6 netball and 7v7 netball

When this same analysis is applied to the motivation among the zones statistical differences occur (table 8).

Table 8. Mean Motivation Scores 6v6 zone and 7v7 zone

Formats	Zones									
	North		Central		Mainland		Waikato		South	
	(N = 36)		(N = 86)		(N = 54)		(N = 27)		(N = 25)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Competence (6v6)	36.81	3.58	33.56	5.51	29.77	7.40	31.19	4.57	34.96[#]	3.65
Competence (7v7)	36.81	3.58	33.56	5.51	29.77	7.40	31.19	4.57	29.73[#]	6.38
Autonomy (6v6)	36.17	6.36	32.21[*]	5.45	31.28	7.26	34.37[*]	5.65	34.08[#]	3.46
Autonomy (7v7)	37.86	4.22	34.62[*]	6.44	29.04	6.71	27.69[*]	6.45	28.96[#]	7.78
Relatedness (6v6)	49.81	4.26	48.61	6.94	41.22	9.78	44.01	7.72	47.92[#]	4.79
Relatedness (7v7)	50.02	6.78	49.68	7.81	44.10	8.41	41.31	9.38	39.08[#]	12.06

* significant at $p < .05$; # significant at $p < .01$

These results suggest that those playing 6V6 in the South Zone enjoyed across the board increases in motivational need satisfaction and were therefore more likely to enjoy higher levels of intrinsic motivation.

Players in the Central zone found greater level of autonomy (choice) in the traditional format of the game, which contrasts with the perspective of the players from the Waikato zone.

Findings: The results support that the level of intrinsic motivation varies between zones

Conclusions/Recommendations

Taken together these results support the view that six-a-side as a modified game can provide a viable supplement to Netball. Modifications such as re-zoning and reducing the number of players on court on the one hand simplify the game, but on another speed it up, forcing greater engagement and creating more opportunities to practice key decision making skills. The increase in speed, pressure and decision making demands appear to be consistent with desired aspects of the game at the higher level. That this can be achieved in a more motivating context is something of a bonus not to be overlooked. Regardless of whether six-a-side is adopted nationwide, this issue in particular warrants the attention of NNZ coaching in the future. With this in mind strategies to promote mass participation may be necessary before asking coaches to find time to devote to this form of sport. This point is made with respect to the need to maintain informality and approachability with this or any similar game. Six-a-side is not a perfect developmental game; Passing and engagement data would suggest that it favours the improvement of centre players. Consequently variations or rule changes maybe necessary to address this. To ensure all players are provided equal opportunities it is recommended that players rotate positions, therefore providing all players the opportunity to have high levels of engagement. An option may be to introduce some form of "powerplay" or interception bonus that rewards or promotes the defensive side of the game. The broad body of this research emphasises the value in modifying games for the benefit of developing players. This is not a goal exclusive to six-a-side but rather it is a concept that merits greater emphasis in the development of coaches at all levels.

Appendices

1. NZ Document Future ferns 6v6
2. Video data used in the study
3. Key Performance Indicators - Performance Analysis
4. Intra-rater reliability
5. Findings - Raw data – Means
6. TPAP definitions and mean tables
7. Procedures performance analysis
8. Procedures Motivation and basic Needs Satisfaction Scale and analysis

Appendix 1. NZ Netball Document for Pilot Study 2015 Year 5&6

Background

Junior Netball (Year 1 - 8) in New Zealand represents almost fifty percent of our registered Netball players and is run by a dedicated army of volunteers, ensuring a positive experience for children in one of our favourite games.

In 2012, Netball New Zealand undertook a review of Junior Netball to assess the delivery and development pathways of the junior game throughout the country.

It highlighted that while netball is still very popular, differences in delivery varied, creating the need for clearer guidelines and improved support for coaching and umpiring.

Fun and playing with friends are key drivers for children's participation. Learning the game of Netball is enhanced through small sided games with modified rules which are run alongside skills sessions, ensuring children are more engaged.

The Review reminded us that children are not mini adults and that their sport should be modified accordingly.

Throughout 2013, fourteen Netball Centres piloted changes to the Year 1 – 4 Junior Netball programme with great success. As a result, the new **ANZ futureFERNs** Year 1 & 2 and Year 3 & 4 programmes were rolled out.

During 2015, possible modifications to the Year 5 & 6 game will be piloted in a number of Centres throughout New Zealand. It is critical that we provide the players in this age group with a game that meets their physical and cognitive attributes as well as meeting their social needs.

The pilot stage is a collaborative process and throughout that time Netball New Zealand and the Zones (led by the Zone Community Netball Managers) will support the pilot centres and ensure that they have all the necessary resources and support required.

A comprehensive evaluation plan will include one of the key focus areas will be the views of the children who are taking part in the new modified versions of the game. Parents, coaches, umpires, staff and volunteers will be encouraged to provide feedback throughout the pilot phase. Also NNZ will work with their research partner AUT to provide some quantitative data to assist in deciding which game is best for this age group.

Considerable research has occurred around a 5 v 5 game for Year 5 & 6 players in 2013 and 2014 therefore this information will be used then evaluating the Year 5 & 6 game.

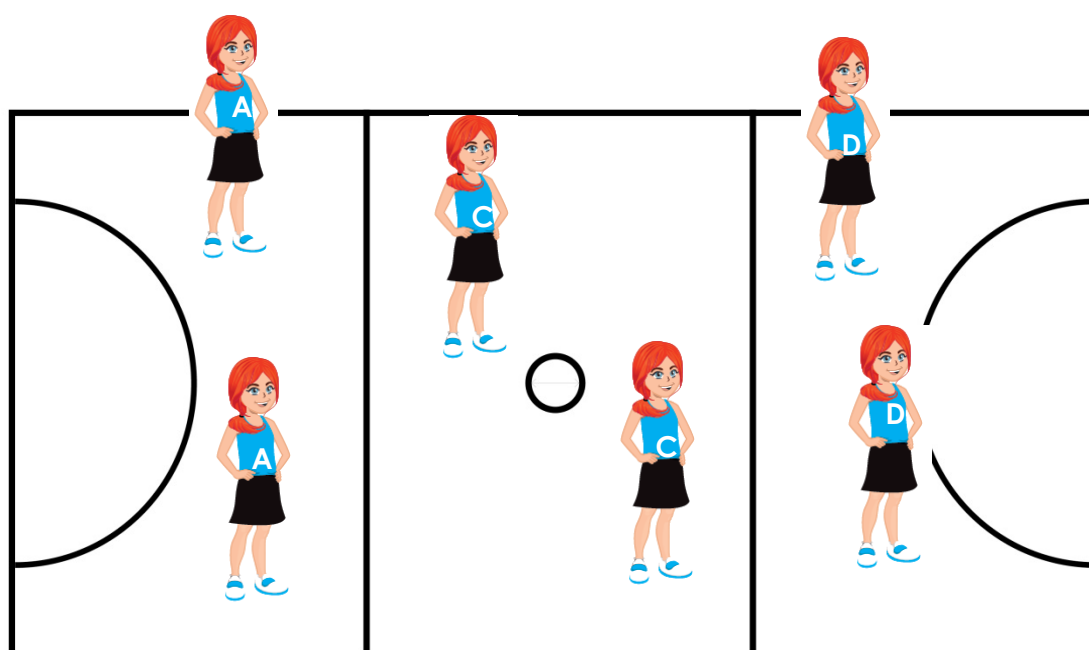
NNZ will roll out the changes to the Year 5 – 8 games for the 2016 season.

THE PILOT 6 V 6 GAME

All the research that relates to children up to Year 6 highlights that sport for this game group needs to be modified as children are not mini adults and the game needs to meet the children's cognitive, social and physical attributes. We are also very aware that other sports and other netball playing nations also modify the game for this age group.



6 v 6



Game Format	6 v 6
Game day format	4 x 8 minute quarters

Positions	2 x A, 2 x D and 2 X C
Areas of Play A	Centre third and Attacking Goal third including the Goal Circle
Areas of Play C	All thirds except in the Goal Circles
Areas of Play D	Centre third and Defence Goal third including the Goal Circle
Rotations	Players to rotate to ensure equal opportunity in all positions
Modified Equipment	

The equipment modifications are applicable in this age group due to the physical attributes of the players.

Modified Equipment	
Goal height	2.6m
Ball size	Size 4
Court size	Full Court

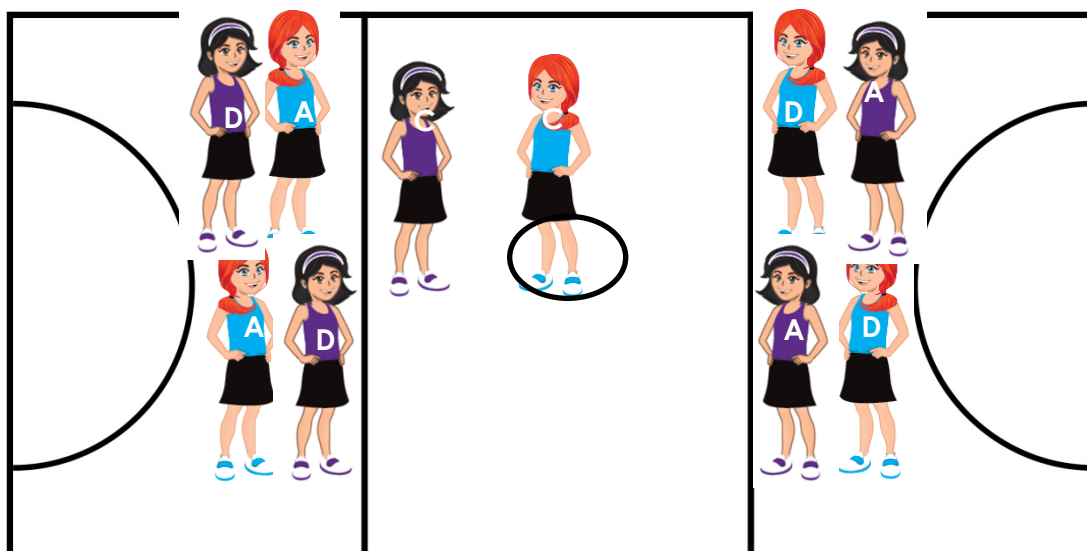
6 v 6 Rules

The following table details the rule modifications that have been made to meet the needs of the players and accommodate a 6 v 6 modified Netball game. A full description of the Rules can be found on pages 8-10.

Modified Rules	
Rules of play: Time with ball	<ul style="list-style-type: none"> Ball held for up to five seconds
Footwork	<ul style="list-style-type: none"> Encourage players to stop and land balanced, application of the footwork rule
Defending the ball	<ul style="list-style-type: none"> Enforce 1m distance to allow player space to pass
Restart of Play	<ul style="list-style-type: none"> Play shall be restarted after every goal by a Centre from the non-scoring team

Centre Pass	<ul style="list-style-type: none"> One Centre in possession of the ball shall stand wholly within the centre circle and the opposing Centre standing within the centre third. The other Centres stand on the side line in the Centre Third The Centres in each team take alternative centre passes
Positioning of players for the start of play	<ul style="list-style-type: none"> The other Centre shall stand in the attacking third but may not receive the centre pass. One of the opposing Centres will also stand in the goal third and isn't allowed to be involved in play until the first pass has been received.
Throw In	<ul style="list-style-type: none"> Players take turns e.g if it is a defence throw in in the goal third – one defenders throws in and then the other defender takes the next throw in

Start of Play



Coach Support

NNZ will conduct a workshop one to two weeks prior to the commencement of the 6 v 6 Game pilot competition.

At this workshop the following topics will be covered:

1. The philosophy and understanding behind the need for modified sport for Year 5 & 6 players
2. The modified game – key differences and how best to cope/work with these modifications
3. The evaluation process

Coach Development from 2016

The 2016 season will see the introduction of a Year 5 & 6 Coach workshop which will relate to whatever game is established to be the best for these players. NNZ envisages a coaching resource will also be available for coaches to support their development and build their knowledge and confidence.

The Year 5 & 6 Game Pilot Evaluation Process

Objective

To provide a game for the Year 5 & 6 players that meets many goals. The game needs to meet the players' desires, provide quality learning experiences and develop competencies for continued participation in Netball. The game also needs to meet the players' cognitive, physical and social needs.

Desired Outcome

Establish reliable and valid data to assist NNZ in their decision making about what is the best game for Year 5 & 6 players.

The Evaluation Process will involve 4 steps:

1. A thematic analysis from 2014 6 v 6 test drives of the modified game
2. Measure performance indicators through video analysis
3. Participation satisfaction survey – will be available on-line via [www.ANZfutureFERNs.co.nz/feedback from July 2015](http://www.ANZfutureFERNs.co.nz/feedback%20from%20July%202015)
4. Player Perceptions – AUT lead

Filming of Games for Analysis

AUT will provide all Netball Centres with guidelines to ensure the footage can be accurately coded. AUT/NNZ will provide Netball Centres with consent form relating the filming of the games and the purpose for the analysis.

Centres will record a set number of games – to be advised once playing numbers established.

Films will be sent to AUT for coding.

6 v 6 Rules – Full Explanation

SECTION I – ORGANISATION OF THE GAME

Rule 1: Equipment

1.1 Court

1.1.1 The court shall have a firm surface and be 30.5m long and 15.25m wide. The longer sides shall be called side lines and the shorter sides goal lines.

1.1.2 The court shall be divided into three equal parts – a Centre Third and two Goal Thirds – by two transverse lines drawn parallel to the Goal Lines.

1.1.3 A semi-circle with a radius of 4.9m and with its centre at the mid-point of the Goal Lines shall be drawn in each Goal Third. This shall be called the goal circle.

1.1.4 A circle, 0.9m in diameter shall mark the centre of the Court. This shall be called the Centre Circle.

1.2 Goal Posts

Goal Posts shall be vertical and 2.6m high placed at the mid-point of each Goal Line.

It is preferable that nets are fitted on the goalposts and padding if possible.

1.3 Ball

The ball shall be a Netball, size 4. The ball should be safe and made of leather, rubber or similar material.

1.4 Players

1.4.1 Suitable sports footwear may be worn. Spiked soles are not allowed.

1.4.2 Uniforms are not essential. Please refer to your Netball Centre rules.

1.4.3 No item of jewellery, except a medical alert bracelet, shall be worn. If worn, this shall be covered up with tape.

1.4.5 Fingernails shall be short and smooth

Rule 2: Duration of Game

Each game should be made up of 4 x 8-minute quarters, with an interval of three minutes between the first-second and third-fourth quarter. The half time interval shall be a maximum of five minutes.

Teams shall change ends at each interval but if too confusing, change ends at half time only.

Rule 3: Officials

3.1 Umpires

There shall be two umpires who control the game and shall umpire according to the Rules outlined in this document for modified 6 v 6 Netball.

An umpire's whistle shall start and stop the game, signal the end of the quarter or half of the game, signal when an infringement is penalised, signal when a goal is scored and signal to the time keeper to hold time for stoppages.

Each umpire shall control and give decisions only in one half of the court.

Rule 4: The Team

4.1 The game may be played by mixed or single sex teams.

4.2 There shall be three playing positions of which each team shall have two of each namely:

Attack (A) x 2

Centre (C) x 2

Defence (D) x 2

4.3 Six players are allowed on the court at any one time and a maximum of nine players per team is recommended.

Rule 5: Late Arrivals

At the beginning of the game, both teams must have five players on court. There are no penalties for late arrivals providing this requirement is met. Late players shall be checked by an umpire before entering the court after a goal is scored taking a vacant position on court.

Rule 6: Substitution and Team Changes

Teams are allowed to use rolling substitutions to ensure equal playing time. Players can be swapped at any time during the game, with players meeting at the sideline and tagging (high-fiving), so one player comes off and another goes on.

There is no limit to the number of substitutions which can be made by a team provided that the players used do not exceed nine players.

Rule 7: Stoppages

Stoppages will not occur unless there is:

- Injury or illness – play may stop if any player on court sustains injury or illness. The player can be replaced by any other player on the same team. The extent of the injury/illness will determine the amount of time given, determined by the umpires. Play will continue from where it was originally stopped at.
- Blood – The umpires are required to stop play if any player on court is bleeding. The player must be removed from the court while being attended to, but may go back on after the wound has been covered adequately. The ball must be cleaned if necessary.
- Emergencies – Stoppage of the game can occur if there is an emergency that could result in harm to any of the players or spectators. This could include:
 - Equipment
 - The court
 - The weather
 - Injury/illness of an umpire
 - Spectator aggression

It is up to the umpires to decide whether stoppage needs to occur and to analyse the extent of the situation. The coach will determine the length of time the game stops for.

SECTION II – AREAS OF PLAY

Rule 8: Playing Areas

8.1 The playing area for each player is listed below:

- | | |
|-------------|---------------------------------------|
| Attack (A) | Attacking Goal Third and Centre Third |
| Centre (C) | All thirds excluding the Goal Circles |
| Defence (D) | Defensive Goal Third and Centre Third |

8.2 Lines bounding each area are part of that area.

Rule 9: Off side

9.1 A player is off side if they enter an area other than the playing area for that designated position.

9.2 A player may reach and take the ball from an offside area or may lean on the ball in an offside area.

Rule 10: Out of Court

10.1 The ball is deemed out of court when it, or a player touching it, touches the ground or any object out of the playing court. A throw-in is awarded to the opposing team. The line counts as part of the court. If the ball hits the goalpost but bounces into court, it is still in play.

10.2 The throw-in is taken from where the ball crossed the line. The pass must be made within

5 seconds and can be taken by any player on court. The player must stand behind but as close to the line as possible.

SECTION III – CONDUCT OF THE GAME

Rule 11: Positioning of Players for Start of Play

- 11.1 The Centre in possession of the ball shall stand wholly within the Centre Circle. The other Centre shall stand in the side line in the Centre Third.
- 11.2 One of the opposing Centres shall stand in the Centre Third and the other opposing Centre will stand on the side line in the Centre Third.
- 11.3 All other players shall be in the Goal Third which is part of their playing area and free to move, but none of these players are allowed in the Centre Third until the whistle has been blown to start or restart play.

Rule 12: Start of Play

- 12.1 Team captains use Paper, Scissors, Rock to determine which team has the first pass.
- 12.2 The umpire shall blow the whistle to start and restart play.
- 12.3 Play shall be started and restarted after every goal scored, by a Centre from the non- scoring team. Each team's Centres take alternate Centre passes.
- 12.4 After a goal is scored, play is recommenced from the centre of the court (halfway) by the opposing team.

Rule 13: Playing the Ball

- 13.1 A player must:
 - Pass or shoot within 5 seconds
 - Obey the footwork rule.
- 13.2 A player may not:
 - Deliberately kick the ball
 - Place their hands on a ball held by an opponent
 - Throw the ball while sitting/lying on the ground
 - Throw the ball over a third without it being touched or caught by another player.

Rule 14: Footwork

A player may receive the ball with one foot grounded and then step with the other foot in any direction, lift the grounded foot and throw and shoot before this foot is regrounded, or step with other foot in any direction any number of times, pivoting on the landing foot.

A player in possession of the ball may not:

- Drag or slide the landing foot
- Hop on either foot
- Jump from both feet and land on both feet unless the ball has been released before landing.
-

Rule 15: Scoring a Goal

- 15.1 A goal is scored when the ball is thrown or batted over and completely through the ring by an Attack (A) from any point in the goal circle including the lines bounding the goal circle.
- 15.2 If another player throws the ball through the ring, no goal is scored and play continues.

Rule 16: Obstruction

Players must be at least 1 metre away from the player with the ball, to allow space for the player with the ball to see the passing options and release the ball.

Jumping up and down in front of a player is not permitted. Jumping to intercept a pass or shot is permitted if the defender is at least 1 metre away.

Rule 17: Contact

No player may push, trip, knock, bump or hold an opponent, whether the move is deliberate or accidental, in such a way that interferes with the play of the opponent.

A penalty pass shall be awarded if contact occurs with the offending player standing beside and out of play.

SECTION IV – PENALTIES

Rule 18: Awarding Penalties

18.1 A free pass is awarded for all rule infringements, e.g. offside, footwork, centre pass not received in the Centre Third.

18.2 A penalty pass is awarded for contact or obstruction.

Appendix 2. Video Data used in the study

Table x. Zone, area and video used in the study

Zone	Area	Number of Videos
Central	Hutt Valley	4
North	Auckland	8
	Hibiscus Coast	7
	Rodney	8
South	Invercargill	4
Waikato		8
Mainland		8

Appendix 3. Performance Analysis Definitions

Key Performance Indicators;

1. Game Flow (transition & whistle use)
 - **Frequency of transitions** – i.e. complete ball movement without interception from either a centre pass or the defensive circle to the shooting circle
 - **Frequency of play stopped by umpire whistle** – i.e. play stopped by umpire's whistle for any type of foul/infringement
2. Ball Contacts (pass complete & lost & direction high/wide)
 - **Frequency of ball contacts** – pass complete = pass caught by intended receiver i.e. same team; intercept = pass caught by opposition; pass to nowhere = pass was thrown into empty space and not caught; pass too high/too wide = pass was thrown high or wide but still caught by same team
3. Shooting (successful, unsuccessful, possession retained/lost)

- **Frequency of shots** – successful = goal scored; missed shot possession kept = attempted shot and attacking team keeps possession; missed shot possession lost = attempted shot and defending team gains possession
4. Player Focus (engagement & distracted)
 - **Time in engagement** – i.e. player focused or distracted (engaged = watching the ball/game, actually playing; distracted = talking to opposition, looking at parents/other games, doing handstands, playing with hair)
 5. Player Spatial Distribution
 - Player court location every 30s shown on a schematic

Appendix 4. Intra-rater Reliability

Intraclass correlation coefficient and coefficient of variation were both performed on the results to gain a reliability report for each of the variables. An ICC of 1.00 represents a perfect agreement and a very small variation, whereas an ICC of less than 0.67 represents a high variability and absolutely no agreement (McGraw & Wong, 1996). A coefficient of variation which is less than 10% is considered small (Bennell, Crossley, Wrigley, & Nitschke, 1999), therefore a very good reliability result would be an ICC >0.67 and a CV <10%.

Time in engagement

A high degree of reliability was found between the times in engagement measurements. The average measure ICC was .97 with a 95% confidence interval from .91 to .99. The average CV was 8.6%, which is noted as small.

Frequency of shots

A very high degree of reliability was found between the frequencies of shots measurements. The average measure ICC was 1.00, meaning that there was no difference between the two trials. The average CV was 1%, which is considered extremely small.

Frequency of transitions

A very high degree of reliability was found between the frequencies of transitions measurements. The average measure ICC was 1.00, meaning that there was no difference between the two trials. The average CV was 0.3%, which is considered extremely small.

Frequency of ball contacts

A very high degree of reliability was found between the frequencies of ball contacts measurements. The average measure ICC was 1.00, meaning that there was no difference between the two trials. The average CV was 1.02%, which is noted as small.

Frequency of play stopped by whistle

A high degree of reliability was found between the frequencies of play stopped by the whistle measurements. The average measure ICC was .94 with a 95% confidence interval from .67 to .99. The average CV was 1.01%, which is noted as small.

TPAP

A very high degree of reliability was found between the frequencies of TPAP measurements. The average measure ICC was 1.00, meaning that there was no difference between the two trials. The average CV was 1.2%, which is considered small.

Spatial Awareness

A very high degree of reliability was found between the frequencies of spatial awareness measurements. The average measure ICC was 1.00, meaning that there was no difference between the two trials.

	CV Trial 2-1	ICC Trial 2-1
Time in engagement	8.6% (6.6-13.0)	0.97 (0.91-0.99)
Frequency of shots	1% (0.6-22.4)	1.00 (1.00-1.00)
Frequency of transitions	0.3% (0.2-0.6)	1.00 (1.00-1.00)
Frequency of ball contacts	1.02% (1.01-1.05)	1.00 (1.00-1.00)
Frequency of play stopped by whistle	1.01% (1.01-1.02)	0.94 (0.67-0.99)
TPAP	1.2% (0.8-2.8)	1.00 (1.00-1.00)
Spatial Awareness		1.00 (1.00-1.00)

Appendix 5. Raw Data Spatial Distribution

	30s						60s						90s					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
A1Q1	0	2	6	4	0	0	2	2	2	2	2	2	2	2	0	2	3	3
A1Q2	3	0	5	3	0	0	0	0	1	3	4	4	0	0	2	1	5	3
A1Q3	0	0	3	8	1	0	0	0	5	2	0	4	4	4	0	4	0	0
A1Q4	4	4	2	2	0	0	3	5	0	4	0	0	4	4	0	4	0	0
A2Q1	6	2	1	3	0	0	1	2	5	3	1	0	0	0	6	4	0	0
A2Q2	0	0	2	2	1	7	2	2	4	2	1	1	0	8	0	2	2	0
A2Q3	0	0	0	2	0	8	0	8	2	0	0	0	0	1	0	2	4	4
A2Q4	0	0	0	2	5	4	0	0	1	0	2	6	7	1	2	2	0	0
H1Q1	0	0	12	0	0	0	0	0	9	3	0	0	6	0	6	0	0	0
H1Q2	3	1	2	2	0	0	0	8	1	1	1	1	0	0	9	0	3	0
H1Q3	0	7	2	3	0	0	0	0	0	11	1	0	0	8	0	4	0	0
H1Q4	1	0	6	5	0	0	0	9	0	3	0	0	4	5	3	0	0	3
H2Q2	0	0	12	0	0	0	0	7	0	5	0	0	1	3	1	7	0	0
H2Q3	4	0	4	0	4	0	0	6	0	6	0	0	4	4	2	2	0	0
H2Q4	0	0	7	4	1	0	0	4	4	0	0	0	6	3	3	0	0	0
R1Q1	1	7	2	2	0	0	2	2	2	2	2	2	0	0	2	3	3	4
R1Q2	0	0	0	7	0	5	0	0	0	4	4	4	5	1	6	0	0	0
R1Q3	0	1	7	2	1	0	0	0	2	1	6	3	0	0	0	12	0	0
R1Q4	6	0	3	3	0	0	8	0	4	0	0	0	1	0	8	2	1	0
R2Q1	0	0	4	0	8	0	8	0	4	0	0	0	7	1	4	0	0	0
R2Q2	8	0	4	0	0	0	2	2	1	1	2	2	2	0	4	5	0	0
R2Q3	0	0	7	5	0	0	8	0	2	2	0	0	4	4	2	2	0	0
R2Q4	5	3	3	1	0	0	0	0	7	0	5	0	0	0	1	3	0	8

120s						150s						180s					
1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
2	2	1	1	2	2	0	0	2	2	4	4	2	2	1	1	2	2
0	0	4	0	4	4	0	0	4	0	8	0	2	2	2	0	3	1
0	1	2	1	0	8	5	2	1	2	1	1	0	0	2	2	4	4
0	0	10	2	0	0	8	0	3	1	0	0	0	1	8	2	0	0
6	2	2	1	1	0	5	2	4	1	0	0	0	8	2	2	0	0
0	0	2	2	2	6	4	4	0	0	0	2	0	0	0	2	8	0
0	0	2	2	0	8	0	0	0	0	2	6	6	2	0	2	0	0
1	1	3	7	0	0	1	1	0	4	1	5	3	5	2	2	0	0
0	0	1	10	0	1	2	2	3	1	2	2	0	0	0	4	0	8
2	2	2	6	0	0	5	3	2	0	0	2	0	0	2	4	4	2
4	0	4	0	2	2	2	6	2	2	0	0	3	0	7	2	0	0
5	3	1	0	0	0	0	0	1	3	0	8	3	3	0	4	0	0
0	0	2	2	3	5	0	0	4	0	1	7	0	0	4	8	0	0
0	0	2	2	5	3	0	0	12	0	0	0	8	0	2	2	0	0
0	2	0	3	7	0	0	0	1	8	3	0	0	0	0	4	2	6
2	2	2	2	2	2	0	0	3	1	5	3	0	8	0	4	0	0
0	1	0	11	0	0	0	0	3	1	5	3	0	0	4	0	6	2
2	6	0	4	0	0	0	7	0	5	0	0	4	4	0	4	0	0
0	0	4	8	0	0	4	4	1	3	0	0	1	7	1	1	0	2
8	0	4	0	0	0	5	3	2	2	0	0	2	6	2	2	0	0
0	0	4	0	8	0	0	8	0	4	0	0	5	3	1	3	0	0
2	6	2	2	0	0	0	0	4	7	1	0	8	0	3	1	0	0
2	2	2	2	2	2	0	0	1	3	4	4	0	0	0	4	2	6

210s						240s					
1	2	3	4	5	6	1	2	3	4	5	6
2	2	2	3	1	0	2	2	2	0	1	2
6	2	4	0	0	0	0	0	4	0	8	0
4	4	2	2	0	0	0	0	2	2	1	7
0	2	2	7	0	1	0	0	5	5	1	0
1	7	2	2	0	0	2	6	2	2	0	0
4	4	0	2	2	0	6	2	2	0	1	1
0	1	0	2	6	2	0	0	3	1	8	0
2	2	3	1	2	2	0	8	1	2	1	0
9	0	1	2	0	0	0	0	0	2	2	8
4	2	2	2	2	0	7	0	3	1	0	1
0	0	10	2	0	0	3	5	2	2	0	0
4	0	3	2	1	2	8	0	4	0	0	0
1	0	9	2	0	0	8	0	4	0	0	0
0	0	7	4	1	0	8	0	3	1	0	0
0	0	2	2	2	6	3	5	1	3	0	0
7	2	3	0	0	0	2	5	1	3	0	0
0	2	0	10	0	0	4	4	0	4	0	0
0	7	0	5	0	0	3	5	0	4	0	0
0	0	2	2	1	7	0	0	10	0	2	0
1	2	4	5	0	0	1	7	1	3	0	0
0	0	4	0	7	1	8	0	2	2	0	0
2	6	1	3	0	0	0	0	7	0	5	0
0	0	6	0	4	2	6	2	4	0	0	0

270s						300s					
1	2	3	4	5	6	1	2	3	4	5	6
0	0	1	3	4	4	6	2	4	0	0	0
2	2	1	1	2	2	3	4	2	1	0	2
1	4	2	5	0	0	0	0	6	6	0	0
4	4	2	2	0	0	0	0	2	1	4	4
0	8	0	4	0	0	1	7	2	2	0	0
0	0	2	2	2	6	0	0	0	2	3	5
1	0	3	5	1	2	1	0	5	4	0	0
6	0	2	2	2	0	0	1	5	0	4	0
2	2	4	1	1	2	0	0	8	3	1	0
0	5	1	6	0	0	4	4	2	2	0	0
0	0	8	0	2	2	0	0	3	2	5	2
6	2	1	2	1	0	1	4	3	2	0	0
4	0	2	2	2	2	6	3	0	3	0	0
7	1	3	1	0	0	2	0	6	2	1	1
0	1	0	3	5	3	3	0	9	0	0	0
3	5	0	4	0	0	0	1	3	0	0	8
0	6	0	6	0	0	5	3	4	0	0	0
8	0	0	4	0	0	8	0	1	3	0	0
0	0	4	0	3	5	0	0	2	2	1	7
3	5	2	2	0	0	2	2	1	1	2	2
0	0	2	2	6	2	0	0	3	1	7	1
2	3	0	7	0	0	7	0	4	1	0	0
0	0	0	4	2	6	0	0	2	2	8	0

Whistle Means and SD by zone

WHISTLE

	ZONE					
	1.00	2.00	3.00	4.00	5.00	Total
Mean	5.7500	4.8750	4.3750	8.0000	4.9130	5.1489
N	4	8	8	4	23	47
Std. Deviation	1.89297	3.79614	2.13391	1.63299	3.13214	2.97803

Transition by Zone Means and SD

TRANSITIONS

	ZONE					
	1.00	2.00	3.00	4.00	5.00	Total
Mean	3.7500	1.8750	4.1250	3.0000	2.2609	2.7021
N	4	8	8	4	23	47
Std. Deviation	.95743	.83452	2.53194	.81650	1.25109	1.61400

Pass completion by POSITION

position	Mean	N	Std. Deviation
Attack	13.8085	47	5.44394
Centre	17.0638	47	4.98434
Defence	12.9362	47	5.07082
Total	14.6028	141	5.43386

Pass high/wide

position	Mean	N	Std. Deviation
Attack	.7021	47	.88256
Centre	.8511	47	1.25072
Defence	.4894	47	.77662
Total	.6809	141	.99512

Pass Interception

position	Mean	N	Std. Deviation
Attack	2.2340	47	2.02391
Centre	3.8723	47	2.18311
Defence	3.0638	47	1.73712
Total	3.0567	141	2.08660

Pass to Nowhere

position	Mean	N	Std. Deviation
Attack	.3404	47	.59988
Centre	.3617	47	.67326
Defence	.4468	47	.71653
Total	.3830	141	.66181

Zone and Shooting
Successful shot

ZONE	Mean	N	Std. Deviation
Central	.9167	12	1.44338
Waikato	1.1250	24	2.40131
Mainlands	1.3750	24	2.46387
South	.6667	12	1.07309
North	.7681	69	1.48666
Total	.9362	141	1.82527

Unsuccessful shot

ZONE	Mean	N	Std. Deviation
Central	.7500	12	1.21543
Waikato	.4167	24	.97431
Mainlands	.9583	24	1.75646
South	.9167	12	1.44338
North	.8116	69	1.46805

Total	.7730	141	1.42111
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Zone and Pass completions

ZONE	Mean	N	Std. Deviation
Central	16.6667	12	4.77367
Waikato	13.2500	24	5.67412
Mainlands	16.5833	24	6.24094
South	14.6667	12	3.70094
North	14.0145	69	5.26222
Total	14.6028	141	5.43386

Zone and pass intercepted

ZONE	Mean	N	Std. Deviation
Central	3.1667	12	1.26730
Waikato	2.5000	24	2.10589
Mainlands	2.7917	24	1.93321
South	4.8333	12	2.28963
North	3.0145	69	2.09687
Total	3.0567	141	2.08660

Appendix 6. TPAP definitions and mean tables

Conquered Ball (CB) A player is considered having conquered the ball if he/she intercepted it, stole it from an opponent, or recaptured it after an unsuccessful shot on goal or near loss from the other team.

Received Ball (RB): The player receives the ball from a partner and does not immediately lose control of it.

Lost Ball (LB): A player is considered having lost the ball when he/she loses control of it without having scored a goal or having completed a pass to a partner.

Neutral Ball (NB): A routine pass to a partner which does not truly put pressure on the other team.

Offensive Ball (OB): An offensive ball is a pass to a partner that contributes to the displacement of the ball towards the opposing team's goal.

Successful Shot on Goal (SS): A shot is considered successful when it scores or possession of the ball is retained by one's team.

The Relationship between Observational Items and Types of Information Collected

Received Balls (RB): Involvement in the team's play (availability, accessibility to receive a pass).

Conquered Balls (CB): Information related to the defensive capacities

Offensive Balls (OB): capacity to make significant passes to his or her partners (offensive capacities)

Successful shots (SS): Information related to offensive capacities

Volume of Play (PB = RB + CB): General involvement in the game.

Lost Ball (LB): A small number reflects a good adaptation to the game.

Table 7: Team Performance Assessment Variables - Average Scores per 40mins of Game Play (2015 & 2013)

2015	<i>Gaining Possession of Ball</i>		<i>Disposing of Ball</i>			
	CB	RB	LB	NB	OB	SS
Central	448	1528	528	56	1472	88
Waikato	276	1320	340	56	1264	108
Mainland	160	800	162	14	782	66
South	400	1408	688	56	1360	64
North	664	2677	757	133	2608	147
Total	390	1547	495	63	1497	95

2013	<i>Gaining Ball</i>	<i>Possession</i>	<i>Disposing of the Ball</i>			
	Conquered Ball	Received Ball	Lost Ball	Neutral Ball	Offensive Ball	Successful Shot
Modified Full Court	328	1280	456	208	1072	56
Modified Small Court	664	2128	960	472	1656	144
Traditional Game	416	1376	624	288	1088	128

Appendix 7 Procedures. Performance Analysis

PARTICIPANTS:

All the players filmed were in Year 5 & 6, and from teams within the five constituting zones; Central, Northern, South, Waikato and Mainland. Each team consisted of 6 players on the court at any one time, with extras for rolling substitutes. Positions in the 6-a-side game of netball consist of two attackers, two centres, and two defenders. For the purpose of analysis in this study C was classified as a centre player.

Consent was given by the parents of each player for the filming of the matches, and assent was given by the players, which came through NNZ. Ethical approval was also certified through NNZ.

METHOD

The participants (N = 56) were from 5 zones and competed in 22 matches of Year 5& 6 pilot study, 2015 (see appendix One for details)

A five minute segment

A five-minute period of play was selected from each video clip and the following variables of each player was coded using Sportscode Elite™ software;

- Time in engagement – i.e. player focused or distracted

(engaged = watching the ball/game, actually playing; distracted = talking to opposition, looking at parents/other games, doing handstands, playing with hair)

- Frequency of transitions – i.e. complete ball movement without interception from either a centre pass or the defensive circle to the shooting circle
- Frequency of shots – successful = goal scored; missed shot possession kept = attempted shot and attacking team keeps possession; missed shot possession lost = attempted shot and defending team gains possession
- Frequency of ball contacts – pass complete = pass caught by intended receiver i.e. same team; intercept = pass caught by opposition; pass to nowhere = pass was thrown into empty space and not caught; pass too high/too wide = pass was thrown high or wide but still caught by same team
- Frequency of play stopped by umpire whistle – i.e. play stopped by umpire's whistle for any type of foul/infringement
- GPAI –Game Performance Analysis Instrument - i.e. gaining possession and disposing the ball
 - CB = conquered ball (turnover due to an action from opponent e.g. interception)
 - RB = received ball
 - LB = lost ball (turnover due to players own fault e.g. thrown out of bounds)
 - NB = neutral ball
 - OB = offensive ball (attacking with possession)

- SS = successful shot
- o Spatial Awareness – i.e. the court is split up in 6 sections (each third in half), and every 30 seconds counted how many players were in each area

PROCEDURE

All matches were filmed during 2015 throughout several weeks. Each player completed a letter of informed consent before the data collection/filming commenced. Each game consisted of four lots of eight minute quarters and during this time players rotated to allow for equal playing time and opportunity. The modified 6-a-side game is made up of different rules in comparison to the normal full-sided game of netball. During the game if a goal has been scored, the next centre pass would go to the non-scoring team. The ball can be held for up to five seconds during play, and during the centre pass, one centre from each team stands on the side line within the centre third.

Appendix 8.Procedures Motivation

Method

Participants

Two hundred and twenty eight players (228 6v6 and 222 7v7; age range = 10 - 11 years, year 5&6 school) participated in this study. Players were enrolled at Netball New Zealand Future Ferns Coaching/Competition. All players were involved in team sports. The sample was made up of from the five netball zones (fig 1). Players participated in a ??? week Future Fern 6v6 netball competition

BNSS Participants

Count

		FORMAT		
		6v6	7v7	Total
Zone	North	36	38	74
	Central	86	81	167
	Mainland	54	48	102
	Waikato	27	29	56
	South	25	26	51
Total		228	222	450

Fig. Players BNSS response by zone.

Measures

The BNSS is a tool that allows us to measure an individuals level of motivation (self-determination). The Scale was used to measure athletes' feelings of autonomy, competence, and relatedness. This instrument is composed of three subscales assessing these three perceptions. There are five items per

subscale (i.e., a total of fifteen items). The response scale has a Likert format ranging from 1 (not at all true) to 7 (very true). Recently, Gillet and his colleagues (under revision) have provided evidence for the factorial structure, the construct validity and the internal consistency of this questionnaire. In the present investigation, all Cronbach alpha coefficients were above the minimum criterion of .70 (Nunnally, 1978). The internal consistency values were .71 for competence, .82 for autonomy, and .81 for relatedness.

Procedures

Participation in this investigation was voluntary. After obtaining informed assent & consent, all of the athletes completed a series of questionnaires individually at the beginning of a training session. The athletes were informed that there were no right or wrong replies. They were also assured that their answers would remain anonymous and confidential.

Basic Needs Satisfaction Questionnaire

Basic Need Satisfaction playing netball 7 v 7/ netball future ferns 6v6*

(*please circle the game you are playing)

When I am playing netball 7 v 7/ netball future ferns 6v6

The following questions concern your feelings about playing netball 7 v 7/ netball future ferns 6v6 during the year. Please indicate how true each of the following statement is for you given your experiences in this sport. Remember that your coach will never know how you responded to the questions. Please use the following scale in responding to the items.

1	2	3	4	5	6	7
not at all true		maybe true				very true

1. I feel like I can make a lot of inputs to deciding how to play netball 7 v 7/ netball future ferns 6v6
2. I really like the people I play netball 7 v 7/ netball future ferns 6v6 with.
3. I do not feel very competent when I am playing netball 7 v 7/ netball future ferns 6v6.
4. Other players tell me I am good at netball 7 v 7/ netball future ferns 6v6.
5. I feel pressured playing netball 7 v 7/ netball future ferns 6v6.
6. I get along with people at netball 7 v 7/ netball future ferns 6v6.
7. I pretty much keep to myself when I am playing netball 7 v 7/ netball future ferns 6v6.
8. I am free to express my ideas and opinions playing netball 7 v 7/ netball future ferns 6v6.
9. I consider the people I play netball 7 v 7/ netball future ferns 6v6 with to be my friends.
10. I have been able to learn interesting new skills playing netball 7 v 7/ netball future ferns 6v6.
11. When I am playing netball 7 v 7/ netball future ferns 6v6, I have to do what I am told.
12. Most days I feel a sense of accomplishment from playing netball 7 v 7/ netball future ferns 6v6.

13. My feelings are taken into consideration at playing netball 7 v 7/ netball future ferns 6v6.
14. Playing netball 7 v 7/ netball future ferns 6v6 I do not get much of a chance to show how good I am.
15. People at netball 7 v 7/ netball future ferns 6v6 care about me.
16. There are not many people at netball 7 v 7/ netball future ferns 6v6 that I am close to.
17. I feel like I can pretty much be myself playing netball 7 v 7/ netball future ferns 6v6.
18. The people I play netball 7 v 7/ netball future ferns 6v6 with do not seem to like me much.
19. When I am playing netball 7 v 7/ netball future ferns 6v6 I often do not feel very capable.
20. There is not much opportunity for me to decide for myself how to go about playing netball 7 v 7/ netball future ferns 6v6.
21. People at netball 7 v 7/ netball future ferns 6v6 are pretty friendly towards me.

Scoring Information. Form three subscale scores by averaging item responses for each subscale after reverse scoring the items that were worded in the negative direction. Specifically, any item that has (R) after it in the code below should be reverse scored by subtracting the person's response from 8. The subscales are:

Autonomy: 1, 5(R), 8, 11(R), 13, 17, 20(R)
Competence: 3(R), 4, 10, 12, 14(R), 19(R)
Relatedness: 2, 6, 7(R), 9, 15, 16(R), 18(R), 21

Statistical analysis: independent t test

Central autonomy $t = -2.625$ $df = 165$ $p = 0.009$
Waikato autonomy $t = 4.108$ $df = 54$ $p = .001$
South autonomy $t = 3.06$ $df = 34.94$ $p = .004$
South competence $t = 3.58$ $df = 40.056$ $p = .001$
South relatedness $t = 3.466$ $df = 32.941$ $p = .001$

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