PILOT STUDY AND APPARAISAL OF CURRENT REFEREE COMMUNICATION

LEVEL 111 REFEREE COACH ASSIGMNENT

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INTRODUCTION

Many referees and referee coaches consider both verbal and non-verbal communication as vital skills necessary for managing the modern game of rugby. In other continuous action team sports it is recognised that good communication by the match official assists in keeping the game flowing and at the same time allows the players to perform to their best. This style of game management is often referred to as preventative refereeing. Secondarily, spectators at the ground and the ever increasing television audience expect the match officials to have well developed communication skills if only so they may know the official's reason why a particular decision was arrived at. This is an important consideration in a technical game such as rugby. Good, clear communication enhances the enjoyment of players and spectators alike.

To date most studies in communication have been derived from signal communication theory which primarily deals with signal transmission and reception. This signal transmission theory, developed from commercial telegraphic communication systems of the late 19th and early 20th centuries, has found its way into the business world and forms the backbone of most business communication. Ideas generated in the myriad of texts for this field have infiltrated into the sporting arena and are used as the basis for what is considered good communication. A majority of this theory has direct application to verbal communication and is generally the type of communication that can be conducted when there is no face to face contact. Little account has been accorded to gestural nuance which often synergistically enhances most face to face verbal communication.

As coaches we have been inculcated with these ideas and subsequent advice given to referees has been to keep the message directed, specific, short and delivered without repetition. For example the standard "Blue six roll away" type of command is a common example of what is considered good verbal communication practise at the tackle. Standard advice to referees from their coaches regarding communication would be "Less is best", "Don't babble", "Don't repeat yourself", "Be specific" and ensure "What you say is relevant to the play". Further advice would insist "If you're not there you can't manage the game". To date there have been few attempts to test these assumptions and formalise this aspect of communication. The aim of this pilot

study is to test these ideas and form some basis for development of a stratagem to enable coaching of this complex area to be further advanced.

METHOD

As the tackle/ruck is the most dynamic, frequent and difficult area of play to referee, this phase of play was selected for this study. Because of the lack of formal structure, as opposed to a scrum for example, it was felt that compliance at the tackle/ruck would be largely determined by the referee's management skills. Tapes of games were viewed and data such as where the referee was positioned, what he said and how he gestured were recorded. If the ball was cleared, or freely available to be cleared, quickly (< 3 secs) from a tackle/ruck occuring the communication was rated effective; longer than this was scored negatively. This criteria, although perhaps not ideal, was selected because it was a parameter that could be readily viewed on the standard production video tape of the game. A tackle/ruck was counted as one unit despite the number of players involved in the phase.

Due to the close focus of television cameras only the following elements were used in the data collection:

i. Behaviour of the tackler
ii. Behaviour of the ball carrier
iii. Behaviour of arriving players
iv. Behaviour of non-participant players close to the tackle

In the case of rugby league the compliance criteria was if the players were onside at the play the ball when the player's foot contacted the ball. A number of referees across 18 games were used to gauge the overall result. As it was necessary to listen to what the referee said the games selected were either Super 12 or Test matches. These games spanned the last five years and were tapes that were in my possession at the time and were not specially selected. They were sorted to give a spread of referees.

The referees sighted were:

1. Paddy O'Brien (POB)
2. Andrew Cole (AC)
3. Scott Young (SY)
4. Stuart Dickenson (SD)
5. Chris White (CW)
6. Tony Spreadbury (TS)

7. Tim Mander (Rugby League)

These referees were selected because Paddy O'Brien and Stuart Dickenson use a large repertoire of gestures and have expressive facial features, Scott Young and Andrew Cole because they are less animated and Chris White and Tony Spreadbury because they tend to chat and smile a lot. Tim Mander from rugby league was selected because it was felt that rugby league referees tend to talk almost non-stop and at a personal level to the players during the game and this would be an interesting contrast.

The behaviour of the referee with the highest compliance was analysed using Markov chain analysis to ascertain if it followed a defined sequence of events. The behaviour of the other referees was compared to this sequence to see if there was significant difference in their behaviour. Due to time constraints only three behaviours making up one behavioural sequence were able to be recorded. These were arrival (A), synchronicity with play (B) and talk (C). Synchronisation with play was derived from where the talk started in the tackle/ruck sequence. Speed of play often dictated this event. Data was collected on occasions where there all behaviours were clearly evident. For the purposes of this study 80 events were recorded.

The data collected was used to test the following hypotheses.

1. The number of tackle/rucks in a game is not influenced by the referee.
2. Instruction to the players should only be when necessary.
3. Instructions are enhanced by nonverbal gestures.
4. The position of the referee to the play influences player compliance.
5. Good communication frequently involves determinate behavioural sequences.

RESULTS

Tackle/Ruck Independent of Referee

A total of 18 games were viewed and the number of tackles in each game was recorded. The results are shown in Table 1 below. Before any further analysis was carried out the data was analysed to test the assumption that the referee was independent of the number of tackles that occurred in a game of rugby.

Nbr	**Referee**	**Game 1**	**Game 2**	**Game 3**	**Game 4**	**Total**	**ŝ**	**μ**
1	POB	121	129	136	-	385	7.51	128.67
2	AC	103	121	127	130	481	12.09	120.25
3	SY	96	127	-	-	223	21.92	111.50
4	SD	94	118	138	126	476	18.58	119.00
5	CW	127	121	119	-	367	4.16	122.33
6	TS	110	131	-	-	241	14.85	120.50

Table 1: Number of tackles recorded in 18 games.

Due to the small number of games (18) the samples were pooled by country of origin namely Australia, New Zealand & Great Britain and the resulting data was analysed using a nonparametric F-Max test.

Australia New Zealand: F calc = 4.077 and tabular F = 5.71. As tabular F value for 95% confidence level is 5.71 is larger than F calculated (4.077) we can conclude that there is no significant difference between the two.

New Zealand Great Britain F calc = 1.15 and tabular F =10.65. As tabular F value for 95% confidence level is 10.65 is larger than F calculated (1.15) we can conclude that there is no significant difference between the two.

From this result we can conclude that the referee does not influence the number of tackle/rucks that occur in a rugby game.

Effect of Talking

Further data were collected to test the assumption that talking only when necessary results in greater compliance; the expectation being that greater compliance will be

achieved when the ratio between talking and not talking is highest for the test group. No account was taken of what the content of the instructions were. The data is presented below in Table 2 and Figure 1.

Nbr	Referee	Talk	No Talk	Compliance	Ratio
1	POB	273	112	335 (87%)	41.03
2	AC	298	183	452 (94%)	61.41
3	SY	147	76	198 (89%)	51.70
4	SD	347	129	433 (91%)	37.18
5	CW	316	51	290 (79%)	16.14
6	TS	234	7	176 (73%)	2.99

Table 2: Compliance Data

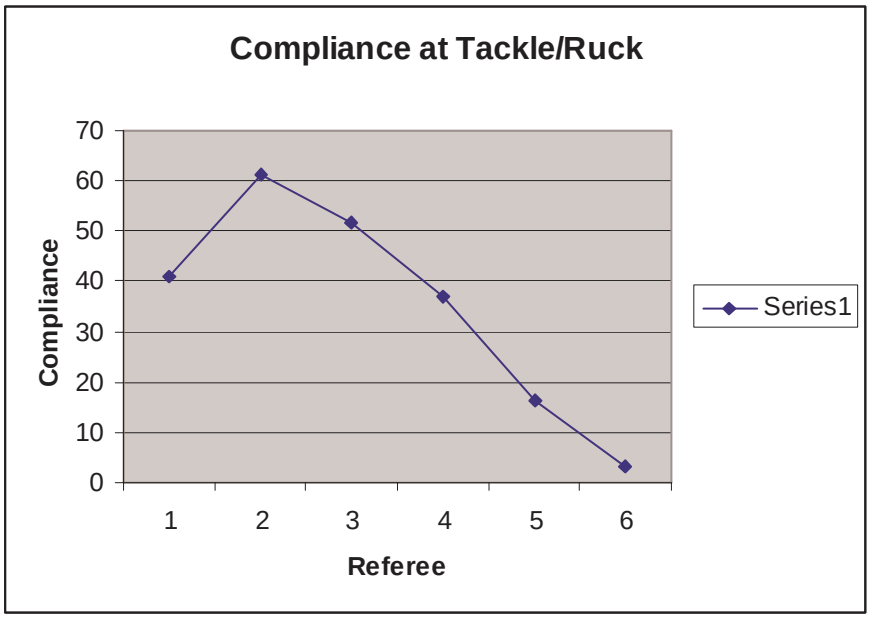

Figure 1 Compliance Achieved by Referee

The data is highly suggestive that compliance increases as the ratio between talking and not talking increases.

Frequency of Instructions

Further data were collected as to how many instructions were given during a game. Episodes were counted only when the ball was in play and talk in stoppages was not included. The results are summarised in Table 3.

Nbr	Referee	Nbr of Events	Nbr of Games	Instructions per Minute
1	POB	1447	3	6.03 (6.0)
2	AC	1277	4	3.99 (4.0)
3	SY	570	2	3.56 (3.6)
4	SD	1931	4	6.03 (6.0)
5	CW	1948	3	8.08 (8.1)
6	TS	1614	2	10.09 (10.1)

Table 3 Talking Frequency while Ball in Play

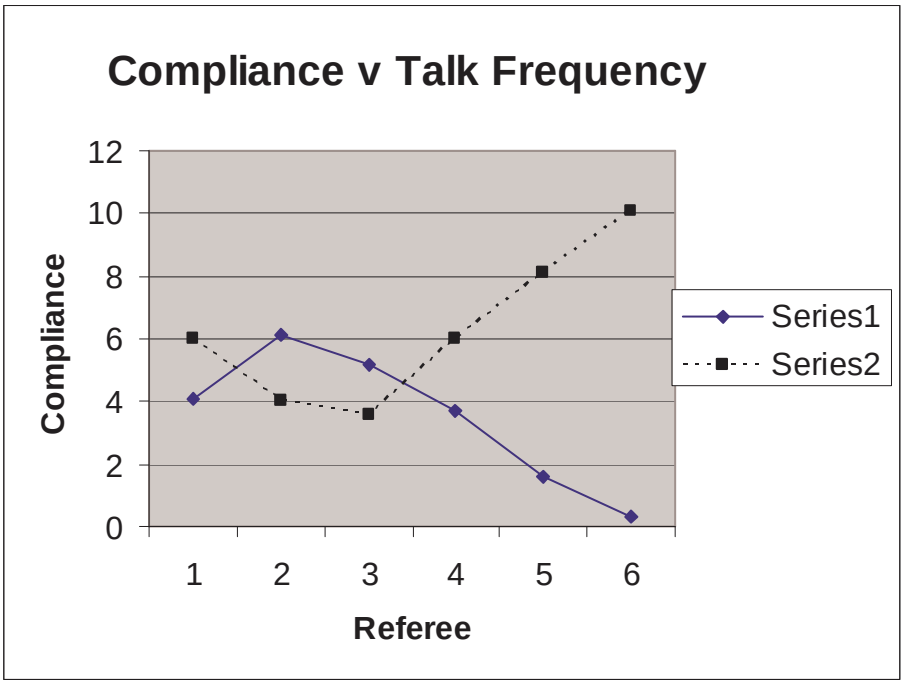

Figure 2 Compliance & Number of Instructions

Series 1 = Referee v Compliance Ratio

Series 2 = Referee v Instructions per Minute

This data reinforces the notion that compliance decreases with an increase in the number of verbal instructions. Referee 5 and 6 achieved poor compliance although they kept up a high instruction rate. Better compliance was associated with fewer verbal instructions.

Referee Position

The data were scored with the referee position to see if this made any difference to the result. The distances were judged from the video and as a result lack precision but

despite this limitation useful data can be collected. The distances, close, near and far, were selected based on usual coaching advice given to referees and what could be readily detected from the match videotape. Table 4 summarizes the data.

Position	Compliance	Non-Compliance	Totals
Close (< 2 metres)	603	69	**672**
Near (2 to 5 metres)	1074	153	**1227**
Far (> 5 metres)	207	67	**274**
Totals	**1884**	**289**	**2173**

Table 4 Position from the Tackle/Ruck

The 95% CI chi squared value X^2 from the contingency table analysis calculated = 23.23 which is larger than tabulated X^2 of 5.99 indicating that position is a significant issue in achieving compliance. Further the value of the X^2 calculated = 3.73 is smaller than tabulated X^2 of 3.84 indicating there is no difference in compliance performance when the referee is close to the breakdown.

The data were treated as independent events, pooled and analysed to test the hypothesis that compliance would increase if non-verbal gestures were added to the instructions to the players. The nonverbal gestures were restricted to hand gestures and facial expressions as these were the only elements easily seen on video taped games. The most frequent and easiest facial expression to see was the arched eyebrows and the furrowed brow. This latter gesture was easier to see with Paddy O'Brien due to his baldness. However Andrew Cole and Stuart Dickinson are frequent users of these gestures. The data is summarised in Table 5.

Code	Behaviour	Compliance	Non-Compliance	Total
1	Talking no Gesture	462	164	**663**
2	Talking + Gesture	1008	12	**983**
3	No Talk + Gesture	75	47	**122**
4	No Talk or Gesture	339	66	**405**
	Totals	**1884**	**289**	**2173**

Table 5 Behaviour V Compliance

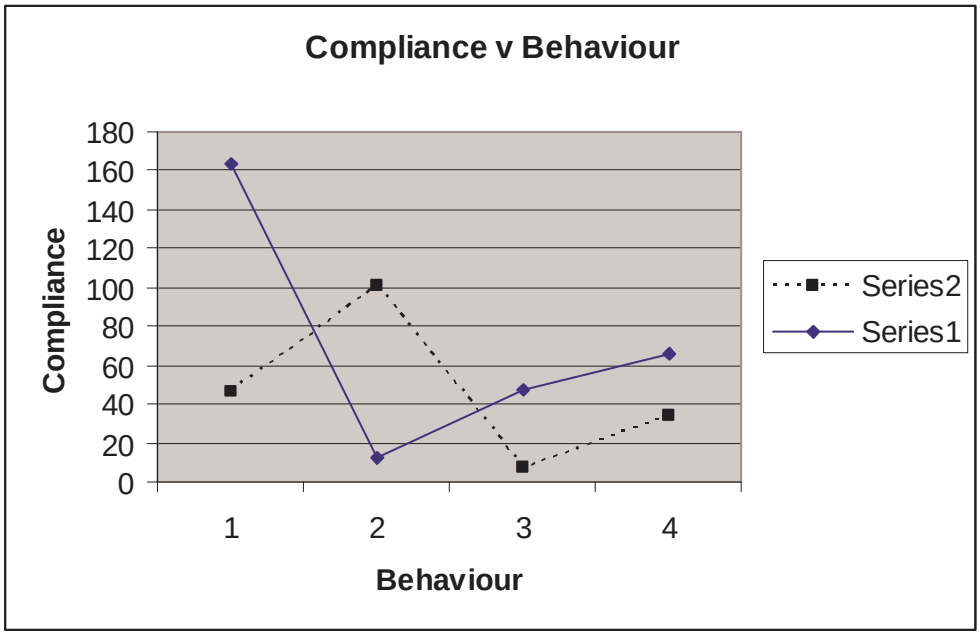

Figure 3 Series 1 Compliance v Behaviour.

Series 2 Compliance v Instruction + Gesture

There is a strong relationship between combining a gesture with talk and minimising the number of non-compliant events. See behaviour 2 in Figure 3.

Comparison to Rugby League Referee

Data was collected from watching a live game of rugby league and scoring player compliance at play the ball and recording the referee talk. A live game was necessary as the video rarely has the referee or defending players in sight. The referee is frequently 10 metres back from the play the ball area. The results are summarised below in Table 6.

Number of Events	Compliance	Non Compliance	Ratio	Instructions per Minute
267	222 (193,29) 72.3%	45	15.03	11.4

Table 6

This result correlates with the rugby group where compliance is low when the instruction rate is high and the talk ratio is low.

Sequencing of Behaviour

Andrew Cole was selected as he scored highly both with compliance and talk/no talk ratio. No attempt was made to ensure stationarity as it was assumed that behaviour could and would change over time. The data is presented in Table 6 below in the form of a transition matrix which is compared to a random model.

		Following Behaviour (Expected Values)			**Totals**
		A	**B**	**C**	
Preceding Behaviour	**A**	10 (15.3)	20 (11.4)	5 (8.3)	35
	B	15 (10.9)	4 (8.1)	6 (6.0)	25
	C	10 (8.8)	2 (6.5)	8 (4.7)	20
Totals		35	26	19	80

Table 6 Observed Occurrences of Behaviour in Transition Matrix. Expected Values Bracketed.

From the transition matrix in Table 6 the observed values of 20 and 8 are much larger than their expected values (11.4) and (4.7) suggesting that a second order Markov Chain may be present; *i.e.* the probability of a particular behaviour is dependant on the two immediately preceding behaviours having occurred. Investigations of the behaviour of other referees displayed similarities with the exception of Chris White and Tony Spreadbury who frequently initiated the behaviours in random order.

DISCUSSION

Of interest was the number of tackle/ruck situations that were independent of the game or referee. It was assumed that a referee who erred on the side of continuity would have more tackles in a game than one that encouraged more contest for the ball. This result probably indicates all the referees used in this study achieved a similar balance of continuity versus contest at the tackle.

No account of the content of the message or how it was said or delivered was used when compiling the effect on talking. This was because there was a wide variation in what was said and how it was said. The message content often varied and was dependant on whether nonverbal cues were added. The tone of voice varied from clam, referee 1 to 4 to excited, referee 6. However in the main the instruction content had relevance to the action at hand. Compliance significantly rose when the ratio of no talk to talk increased. When listening to the tapes the instruction coming at measured intervals was easier to comprehend than the non-stop talk interspersed with instructions. Perhaps the players just hear the chatter, no matter how specific and accurate it is, as sound flak in the background and tune out. It often took 3 or 4 takes to get the entire voice details of referee 5 or 6 whereas referee 2 was much easier to listen to and comprehend on the first take. This hypothesis is furthered when compliance is plotted with the number of instructions per minute data. The current advice of talk only when necessary and keep the message short is supported by the data.

Adding gestural elements to verbal communication greatly enhanced the probability of compliance being achieved. At times when the referee said nothing, facial expressions (arched eyebrows, furrowed brow or a combination of both) were used instead, often combined with hand gestures. It is probable that when these nonverbal elements are used in conjunction with eye contact compliance increases and when these gestures are coupled with verbal instructions compliance is almost assured. Unfortunately eye contact and many facial expressions are not easy to judge from the standard television game tape but there is enough preliminary evidence to suggest it is an important element.

Although the data on positioning of the referee and compliance is a little imprecise due to having to guess arbitrary distances from a video there is a trend showing that close is better than far away from the action. There was an increase in compliance when the referee was close to the phase of play being managed. From this result the rugby league referee, being at least 10 metres from the play, should have scored poorly but did better than expected. This was thought to be a result of the way he spoke to the players, frequently calling them by their Christian names in a firm but calm voice. Non-compliance was generally a result of players out wide getting away too early but rugby league referees generally ignore these players unless they were perceived to have a material affect on play. There is little doubt that being close to the play results in greater compliance and it would be interesting to see if players respond better to their name rather than the current, impersonal approach of calling colour and number. This would be a fruitful area for ongoing research and trial.

The sequencing data provides some good insights into how one referee, number 2, may obtain a higher compliance when compared to some of his peers. Despite some shortcomings with the data (events not independent and stationarity) it does allow a good first approximation of data trends. Better compliance was achieved when a sequence of behaviours was initiated, and the data further implies, that the preceding behaviours must be completed before the next behaviour. When the referee arrived at the tackle, assessed the situation and then if necessary issued instructions, was a behavioural sequence that resulted in high compliance. Specificity of instruction appeared to be more important than directing a particular player and this factor increased with the speed of the action. This would also be a interesting area to investigate further. By way of contrast, frequently referee 5 and 6 would initiate behaviours in random order often issuing instructions before they had arrived at the tackle *i.e.* starting the last behaviour before the first had been completed. It is suggested that this may be the cause of them achieving poor compliance at this phase of play.

CONCLUSION

This current study generated some interesting data and confirmed some current coaching axioms. Certainly there is good evidence that being close to the action, talking only when necessary and using nonverbal gestures are essential prerequisites for good management. Of interest would be if these factors also play a part in other phases of the game, *e.g.* static phase such as line outs and scrums, or if they need modification to be effective. Further research is necessary to tease out the relationships inferred in the behavioural sequences data and how the makeup of the verbal content of the message when added to a nonverbal gesture affects compliance.

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