Drive & Determination in Becoming Cricketing All-rounder: Sporting Perspective

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Abstract

This paper attempts to study how **All Rounder** preceding a Specialist Batsman / Bowler is detrmined by his **Drive & Determination.** In cricket, all-rounders play an important role. A good all-rounder should be able to contribute to the team by both bat and ball as needed. However, these players still have their dominant role by which we categorize them as batting all-rounders or bowling all-rounders. Current practice is to do so by mostly subjective methods. In this study, the authors have explored different machine learning techniques to classify all-rounders into bowling all-rounders or batting all-rounders based on their observed performance statistics. Along with the typical performance-related psychological factors that are likely to be prevalent during the Ashes, more recently a series of high-profile individuals within cricket have reported mental health issues, including depression and burnout. Athletic burnout has been reported in the sport psychology literature to be related to athlete maladaptive perfectionistic beliefs and coach-created ego-orientated performance climates (e.g. Hill et al., 2008). Being an international cricketer may initially seem like a dream job for most – travelling the world and playing a sport one loves – but for some it can become the stuff of nightmares.

Given the rising popularity of cricket, and the increasing revenue generated by the sport, the use of such a prediction tool could be of tremendous benefit to decision-makers in cricket. what should matter to a sportsperson is the will to do well and back it with hardwork. The focus should not be on facilities per se that is grit and determination . Cricket is a sport that brings with it many psychological challenges and demands that players must deal with to be successful. As the 2015 Ashes series is almost with us, what are the main psychological factors that players are likely to encounter? And what psychological techniques are there available to sport and exercise psychologists to promote effective player thinking, behaviour, and performance?

Cricket is a unique sport on many levels. On the one hand it is a team game played by 11 individuals who combine to form an effective fielding unit, where thinking and acting as one is the ultimate aim (similar to sports such as football, rugby, and basketball). On the other hand cricket is an individual sport with the batter playing, in some senses, for themselves and their own individual performance. At the same time, though, cricket is also a contest between two individuals where the batter and bowler spar and joust to try and get the upper hand in an attempt to land the knockout blow.

Key words: Determination, talent requirement, Cricket, all-rounder, bowler, batsmen

Introduction

'I think ability is a 10 to 20 per cent requirement, you need 80 to 90 per cent mental strength.' Glenn McGrath, former Australian cricketer

'Cricket is a game that obviously requires talent, but when talent is equal, as it so often is, the formula for success comes from strength of mind.'
Steve Waugh, former Australian cricketer

An all-rounder is a cricketer who regularly performs well at both batting and bowling. Although all bowlers must bat and quite a handful of batsmen do bowl occasionally, most players are skilled in only one of the two disciplines and are considered specialists. Some wicket-keepers have the skills of a specialist batsman and have been referred to as all-rounders, but the term wicket-keeper-batsman is more commonly applied to them, even if they are substitute wicket keepers who also bowl.

There is no precise qualification for a player to be considered an all-rounder and use of the term tends to be subjective. The generally accepted criterion is that a "genuine all-rounder" is someone whose batting or bowling skills, considered alone, would be good enough to win him/her a place in the team. Another definition of a "genuine all-rounder" is a player who can through both batting and bowling (though not necessarily both in the same match), consistently "win matches for the team" (i.e., propel his/her team to victory by an outstanding individual performance). By either definition, a genuine all-rounder is quite rare and extremely valuable to a team, effectively operating as two players.

Confusion sometimes arises when a specialist bowler performs well with the bat. For example, West Indies pace bowler Malcolm Marshall achieved ten scores of 50 or above in 107 Test innings between 1978 and 1991, but had a batting average of less than 19. He would be termed a "useful lower-order batsman", or indeed "a bowler who bats a bit". Equally, a specialist batsman/woman may be termed a "useful change bowler" and a good example of this is Australian Allan Border, who in a Test match against the West Indies in Sydney in January 1989 took 11 wickets for 96 runs (7/46 in the first innings and 4/50 in the second) as the conditions suited his occasionally used left-arm spin.

One of the main constraints to becoming a recognised all-rounder is that batsmen/women and bowlers "peak" at different ages. Batsmen/women tend to reach their peak in their late twenties after their technique has matured through experience. Conversely, fast bowlers often peak in their early to mid twenties at the height of their physical prowess. Other bowlers, mostly spinners but also fast bowlers who can "swing" the ball, are most effective in their later careers.

In 2013, Ali Bacher used statistical analysis to argue that there had only been 42 genuine all-rounders in the history of Test cricket. He rated Garry Sobers as the best, followed by Jacques Kallis.

One commonly used statistical rule of thumb is that a player's batting average (the higher the better) should be greater than his/her bowling average (the lower the better). In Test cricket, only two players i.e., Garfield Sobers and Jacques Kallis, have batting averages that are 20 greater than their bowling averages over their entire careers. However, some other players have achieved such a differential over significant parts of their careers, such as Imran Khan. Wally Hammond and Doug Walters managed differences of 20.7 and 19.2, respectively, between their batting and bowling averages, however, they were generally regarded as occasional bowlers who could break partnerships rather than genuine all-rounders.

In overall first-class cricket, there are several players with significantly higher batting averages. Statistically, few can challenge Frank Woolley who had a batting average of 40.77 and a bowling average of 19.87. Woolley took over 2000 wickets in his career, scored more runs than anyone except Jack Hobbs and is the only non-wicketkeeper to have taken more than 1000 catches.

Many all-rounders are better at bowling than batting or vice versa. Very few are equally good at both and hardly any have been outstanding at both. Thus the terms "bowling all-rounder" and "batting all-rounder" have come into use. For example, Richard Hadlee had an excellent bowling average of 22.29 in Tests and a passable (yet unspectacular) batting average of 27.16, leading him to be termed a "bowling all-rounder". Meanwhile, a player like Jacques Kallis (batting average of 55.37 and bowling average of 32.65 in Tests) is known as a "batting all-rounder".

Also, batting all-rounders may not bowl much due to injury concerns (e.g. Corey Anderson, Angelo Mathews), or their batting skills are far better than their bowling to begin with (e.g. Kane Williamson, Steve Smith) to the point they revert to being known as a batsman.

Objective:

This paper intends to explore and analyze authors attempt to find a method to catalogue **all-rounders,** also primacy of passion **Drive & Determination for** excelling in cricket as all-rounder

What is Drive & Determination for an all-rounder

An all-rounder in cricket is a player who is capable of performing well at both batting and bowling. These all-rounders still have their dominant role by which one categorizes them as batting all-rounders or bowling all-rounders. To the knowledge of authors of this paper, currently, there is no precise method for a player to be categorized as a bowling all-rounder or a batting all-rounder. Therefore, the current practice of accomplishing this tends to be very much subjective. In this paper, authors attempt to find a precise method to categorize all-rounders using machine learning techniques. A review of the literature on the problem including a brief introduction to cricket is presented in the next section.

Cricket is a field game played between two teams. Each team consists of eleven players that include several batsmen, several bowlers, and a wicket keeper. Cricket matches are played on a grass field, in the center of which is a flat strip of ground 20 m long and 3 m wide called the pitch. At both ends of the pitch, 20 m apart, wickets are placed. A wicket, usually made of wood, is used as a target of the bowler. The bowler bowls the ball from one end of the pitch, and the batsman who is on the other end (striker) tries to hit the ball with the bat while protecting his wicket. Once a batsman hits the ball sufficiently far, he runs to the (non-striker) wicket while the other batsman at the non-striker wicket simultaneously runs to the striker wicket, accumulating a single run. Manage and Scariano (2013) provides more details about scoring and other aspects of cricket.

There are three main types of cricket games, namely test cricket, One Day International (ODI), and Twenty20, which is rapidly becoming popular among cricket fans. In a cricket game, before play commences, the two team captains toss a coin to decide which team shall bat or bowl first. The captain who wins the toss makes his decision on the basis of tactical considerations, based on ground conditions and the strengths and weaknesses of the two teams.

One day international (ODI) cricket

An ODI cricket match is played on a single day. Each team gets only one innings, and that innings is restricted to 50 overs (six deliveries per over). In an innings, each bowler is restricted to bowling a maximum number of overs equal to one fifth (10 overs in ODI) of the total number of overs in the innings. If ten batsmen are out before the end of the 50^{th} over, the innings is also over. Note that the batsmen play as pairs and as soon as the 10^{th} batsman is out, the last batsman does not have a partner to play. Even if the first team's innings ends in this manner, the second team still has all of its 50 overs to score the required runs. If the second team passes the

score before they run out of the resources (overs or wickets), then it wins the match. On the other hand, if the second team runs out of resources before it reaches the target, the first team wins the match.

It is the responsibility of the selectors to strategically choose batsmen, bowlers, and a wicket keeper based on both teams– strengths and weaknesses. Furthermore, as we mentioned, each team must have at least five players who are capable of bowling. Cricket captains usually change the bowlers around to introduce variation and to prevent the batsmen building longer innings and partnerships. For this, even though a team must consist of a minimum of five bowlers, team captains usually take advantage of having more than five players to bowl during an innings. Consequently, team selectors place particular emphasis on having several players who can excel in both batting and bowling.

All-rounders contributing to the team success

An all-rounder is a player who is capable of contributing to the team by both bat and ball as needed. Having several capable all-rounders in a team is a great asset to the captain. While it is not uncommon to have all-rounders as top-order batsmen, they usually play in the middle order. Their task is to carry on the momentum built by the top-order batsmen or to take control of building the innings if the top-order batsmen collapse early. Even though all-rounders are good at both batting and bowling, they still have their dominant role by which we categorize them as batting all-rounders or bowling all-rounders. In some situations, this classification can be a challenging task. To best of our knowledge, there is no standard method to do this classification. The goal of this paper is to determine an appropriate method for classifying all-rounders into bowling all-rounders or batting all-rounders, based on their performance parameters.

Applications of machine learning in cricket

Machine learning is becoming popular in statistical data analysis, especially as a classification technique. It has the potential to predict both game outcomes and player performance in cricket. Given the rising popularity of cricket, and the increasing revenue generated by the sport, the use of machine learning as a prediction tool could be of tremendous benefit to decision-makers in cricket.

Several studies have used machine learning techniques and other related statistical procedures for prediction and classification in sports. Saikia and Bhattacharjee (2011) used stepwise multinomial regression and naïve Bayes classification models to classify all-rounders in the Indian Premier League (IPL) tournament. In that article, the authors suggested four different classifications of cricket players as performer, underperformer, batting all-rounder, and bowling all-rounder. Akhtar and Scarf (2012) suggested a method to forecast the outcome probabilities of test matches using a sequence of multinomial logistic regression models. Davis et al. (2015) provided a methodology to investigate both career performances and current form of the players in Twenty20 cricket. Asif and McHale (2015) developed a dynamic logistic regression (DLR) model for forecasting the winner of ODI cricket matches at any point of the game. Pathak and Wadhwa (2015) used

modern classification techniques such as naïve Bayes, support vector machines, and random forest to conduct a comparative study to predict the outcome of ODI cricket. Agarwal et al. (2015) have considered factors for the selection of 11 players from a pool of 16 players, based on relative team strengths between the competing teams. Jayalath (2015) discussed a machine learning approach to analyze ODI cricket games. Jayanth et al. (2015) proposed a supervised learning method using the SVM model with linear, polynomial, and RBF kernels to predict the outcome of cricket matches. They also introduced a player ranking system using the performance statistics. Khan et al. (2015) used logistic and log-linear regression models to explore the association of influential factors with match results of ODI cricket games. Wickramasinghe (2015) discussed a naïve Bayes approach to predict the winner of an ODI cricket game.

There have been numerous studies that apply machine learning techniques and other related methods in other sports data as well. Ofoghi et al. (2013) discussed the utilization of an unsupervised machine learning that assist cycling experts in the crucial decision-making processes for athlete selection, training, and strategic planning in the track cycling. Leung and Joseph (2014) presented a sports data mining approach to predict outcomes in sports such as college football. Rein and Memmert (2015) discussed how big data and modern machine learning technologies aid in developing a theoretical model for tactical decision making in team sports. Baboota and Kaur (2015) created a feature set for determining the most important factors for predicting the results of a football match using feature engineering and exploratory data analysis. They also created a highly accurate predictive system using machine learning. Thabtah et al. (2015) proposed a new intelligent machine learning framework for predicting game results in the National Basketball Association (NBA) by aiming to discover the influential features that affect the outcomes of NBA games. Yi and Wang (2015) used the advantages of machine learning techniques in data analysis and feature mining in the training of dragon boat sports. They proposed a machine learning-based safety mode control model for dragon boat sports physical fitness training. Cust et al. (2015) reviewed the literature on machine and deep learning for sport-specific movement recognition using inertial measurement units and computer vision data inputs. By analyzing some recent research on sports prediction, Bunker and Thabtah (2015) have also shown that machine learning techniques such as artificial neural network can be used as a prediction and classification technique in sports data.

Notable all-round feats

V. E. Walker of Middlesex, playing for All-England versus Surrey at The Oval on 21, 22 & 23 July 1859, took all ten wickets in the Surrey first innings and followed this by scoring 108 in the England second innings, having been the not out batsman in the first (20*). He took a further four wickets in Surrey's second innings. All-England won by 392 runs.

On 15 August 1862, E. M. Grace carried his bat through the entire MCC innings, scoring 192 not out of a total of 344. Then, bowling underarm, he took all 10 wickets in the Kent first innings for 69 runs. However, this is not an official record as it was a 12-a-side game (though one of the Kent batsmen was injured).

The first player to perform the double of 1000 runs and 100 wickets in an English season was W. G. Grace in 1873. He scored 2139 runs at 71.30 and took 106 wickets at 12.94. Grace completed eight doubles to 1886 and it was not until 1882 that another player (C. T. Studd) accomplished the feat.

In the 1906 English cricket season, George Herbert Hirst achieved the unique feat of scoring over 2000 runs and taking over 200 wickets. He scored 2385 runs including six centuries at 45.86 with a highest score of 169. He took 208 wickets at 16.50 with a best analysis of 7/18. In the same season, Hirst achieved another unique feat when he scored a century in both innings and took five wickets in both innings of the same match. Playing for Yorkshire versus Somerset at Bath, Hirst scored 111 and 117 not out, and took 6/70 and 5/45.

George Giffen (1886, 1893 and 1896) and Warwick Armstrong (1905, 1909 and 1921) achieved the double in an English season three times, the most by members of touring teams.

Betty Wilson was the first player, male or female, to score a century and take ten wickets in a Test match. She scored 12 and 100 and took 7/7 and 4/9 against England at the Junction Oval in Melbourne in 1958.

Alan Davidson was the first male to take ten wickets and score one hundred runs in a Test match, though without scoring a century. Playing for Australia against West Indies at Brisbane in 1960–61, he took 5/135 and 6/87, and scored 44 and 80 in what became the first Tied Test. He was playing throughout with a broken finger.

Twenty-seven players, on a total of 40 occasions, have taken five wickets in an innings and scored a century in the same Test match. Ian Botham achieved this feat five times, Ravichandran Ashwin, Enid Bakewell and Betty Wilson three times, while Jacques Kallis, Garfield Sobers, Mushtaq Mohammed, and Shakib Al Hasan have all done so twice.

Betty Wilson (see above), Enid Bakewell, Ian Botham, Imran Khan and Shakib Al Hasan are only three players who have achieved the feat of scoring a century and taking 10 wickets in a Test match.

In 2013, Bangladesh's Sohag Gazi became the first, and so far only, player to score a century and take hat-trick in same Test match against New Zealand.

Kapil Dev is the only player to score 5000 runs and take 400 wickets in Test cricket. He is also the youngest player to score 1000 runs and reach the 100, 200 and 300 wicket mark in Test cricket.

Viv Richards, Paul Collingwood and Rohan Mustafa are the only players to have taken a 5-wicket haul and scored a hundred in the same One-Day International. Fourteen more players have taken a 5-wicket haul and scored a half century in the same game. Shahid Afridi is the only player to achieve this feat thrice in his career and Yuvraj Singh & Shakib Al Hasan (Against Afghanistan) the only cricketers to do so in a World Cup match.

Amelia Kerr, for New Zealand against Ireland in Dublin in 2015, scored 232* (the highest score in Women's ODI history), sharing a second-wicket stand of 295 (the second highest in Women's ODI history) with Leigh Kasperek, and took 5/17 in the second innings.

Jacques Kallis, Shahid Afridi and Shakib Al Hasan are only three all-rounders in the history of international cricket to reach 10,000 runs and take 500 wickets across all three formats.

In 2015, Shakib Al Hasan of Bangladesh became the first, and so far only, cricketer in history to be ranked the No.1 all-rounder by ICC in its Player Rankings in all three formats of the game (Test, ODI and Twenty20)

Conclusion

The game of cricket– offers many mental challenges for players. Sport psychology is therefore recognised as an integral part of a players' development to optimise performance along with establishing positive mental health. Cricket also has many different formats and can be played over many days, over one day (40 or 50 overs), or over just a few hours (in the case of T20 cricket). The constraints of the game, including the long duration, breaks in play for drinks, lunch, tea, and of course weather, all create a series of obstacles that successful players need to respond effectively to.

In sum, arguably the biggest challenge to a cricketer is not the learning of the skills – most players have reasonable techniques. Instead, the biggest challenge is being able to deal with the many psychological factors that can affect thinking and, ultimately, performance during a game. So let's explore what performance-related psychological factors will be at play for England and Australian players during the 2015 Ashes series.

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