

**An Examination of Athlete self-directed Film study Viewing times prior to a
Competitive Game.**

2.6.21

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Abstract

This study examined individual player video viewing times prior to a game over the course of a competitive season. Analysis of whether viewing times were directly influenced by the stage in the season, previous results, and recurrence of opponent were investigated (n= 7 games, 4 opponents, 19 participants, 125 viewing opportunities).

Participants were male student-athletes, playing competitive American Football and were members of the same team. Participants had their viewing time monitored over the course of each game week, utilising performance analysis software (Hudl, 2018).

There was no reported effect of viewing time on a result, ($p=.203$). or previous result influencing the next games viewing time ($p=.271$).

Where participants faced a repeat opponent, mean viewing time dropped for the second game by 10.32 (± 8.51) minutes but were individually not significant ($p=.054$; $p=.590$; $p=.448$).

Over the course of the season, all viewing time dropped significantly from a mean high of 42.56 minutes to a low of 16.54 minutes ($p=.014$).

There were 43 occasions of players who had accumulated no viewing time over the course of the season, (34% of all viewing opportunities) and the incidences of no viewing time increased when facing the opponent for the second time.

Key Words

Video Analysis, Preparation, Scouting

Word Count: 3262

1.0 Introduction

Video feedback on performance has been proven to be an effective method of coaching players both technically and tactically (Garcia-Gonzalez, Moreno, Moreno & del Villar, 2013). With advances in technology, video feedback is becoming more and more accessible to coaches and players in sport at amateur, collegiate and semi-professional levels (Truong & Venkatesh, 2007).

With the growth and development of video analysis, and applications available on mobile devices, many sports teams expect players to review previous game footage and opposition scout film out with, often limited, designated practice time (Groom & Cushion, 2004) .

Coaches can attach feedback to individual clips and share coaching feedback through video analysis platforms with many teams using video footage to prepare tactically for upcoming opponents (O'Donoghue, 2006). The ability for players to recognise opponent's formations and understand their patterns of play are key skills in order to have success (Belichick, 1962).

By reviewing video of opponent teams, players can improve these skills in the build-up to a game (Lee & Kitani, 2016).

Previously it has been difficult to assess the success of this form of film dissemination and whether players were actively accessing and watching the designated film footage and completing their coach led 'homework'. But with the further development of a number of the video analysis software packages it is now possible for coaches to monitor individual player usage (Hudl, 2018).

It has been found a performer reviewing their own successful performance via video feedback can improve their self-confidence (Achterkamp, Hermens & Vollenbroek-Hutten, 2015) as well as creating a 'no hiding' atmosphere which may improve work ethic (Baumeister 1984).

1.1 Aim:

This study investigated athlete video analysis viewing times in preparation before competitive games over the course of a season.

The study aimed to assess the amount of viewing time undertaken during a game week and if this had an influence on the outcome of the result. Similarly, it was investigated if the result of the previous fixture had an influence over the amount of footage watched in preparation for the next fixture, and the corresponding return match.

2.0 Methods

Initially the study used 25 male student-athlete subjects, American Football players competing in the British University and Colleges Sport (BUCS) Division 1. All participants were volunteers and were required to have at least one year of prior playing experience so they were familiar with the video analysis software. Additionally, all subjects were players in the starting line-up for the relevant games and no injured players were utilised. Participants were informed in advance of the purpose of the study and were provided with a pre-study information sheet. Written consent was received in advance from all participants and institutional ethical approval obtained prior to the commencement of the study.

The study took place over the course of a regular season containing seven games, between September and March. The team played three opponents twice and another team only once due to a cancellation for bad weather. All subjects had an expectation to attend two training sessions per week (a total of 5.5 hrs commitment) and an additional 1-hour pre-practice team video session during a game week.

All participants were given access to video of every training session and previous games as well as opponent scout footage through the online video sharing program, Hudl (Hudl, Agile

Sports Technologies, INC, 2006). The participants could access the software via different viewing platforms, either laptop or mobile.

There was no requirement for players to watch the shared video analysis, but they were tasked with homework of labelling three clips by the coaching staff so as to encourage viewing time. This was unmonitored and not all players completed this task.

Through the video analysis software, each subjects viewing time for the week prior to a game was recorded and compared to previous results and opponents. Viewing time outliers were removed if by inspection of a boxplot, they had values greater than 1.5 box-lengths from the edge of the box. There were 6 outliers which were removed by this method in order to eliminate subjects who would play film footage but not necessarily engage with it in order to meet coaches' expectations, leaving 19 participants in the final data set.

3.0 Results

19 male student athlete American Football players were used in the final data for this study. The mean age of players was 20.9 (± 1.93) years old. The players had a mean playing experience of 3.55 (± 0.93) years. All of the players used were recruited from the same team that competed in BUCS Division 1.

Table 1- Means (SD), minimums and maximums for experience and viewing times.

	Experience (Years)	Viewing Time (Hours: Minutes)
Mean (SD)	3.55 (± 0.93)	0:28 ($\pm 0:27$)
Minimum	2	0:00
Maximum	5	1:49

Table 2- Details of all competitive games

Game	1	2	3	4	5	6	7	8
Score	15-0	6-9	0-32	6-9	20-2	6-14	0-17	N/A
Result	Win	Loss	Win	Loss	Win	Win	Loss	Cancelled
Location	Home	Home	Away	Away	Home	Away	Away	Home
Opponent No	1	2	1	2	3	3	4	4

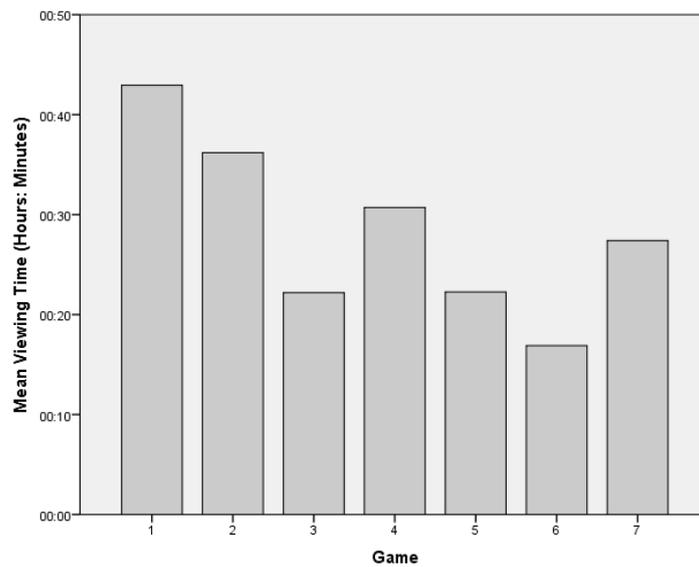


Figure 1- Mean viewing time for each game of the season

The mean viewing time over the season was 28 (± 27) minutes. Game 1 had the highest mean viewing time of 42 (± 36) minutes and game 6 had the lowest mean viewing time of 16 (± 21) minutes. As the data was not normally distributed as found by running a Shapiro-Wilk's test ($p < .05$) a Spearman's correlation was used on the data. There was found to be a statistically significant weak negative correlation between mean viewing time and games as the season progressed ($r_s(125) = -.219, p = .014$).

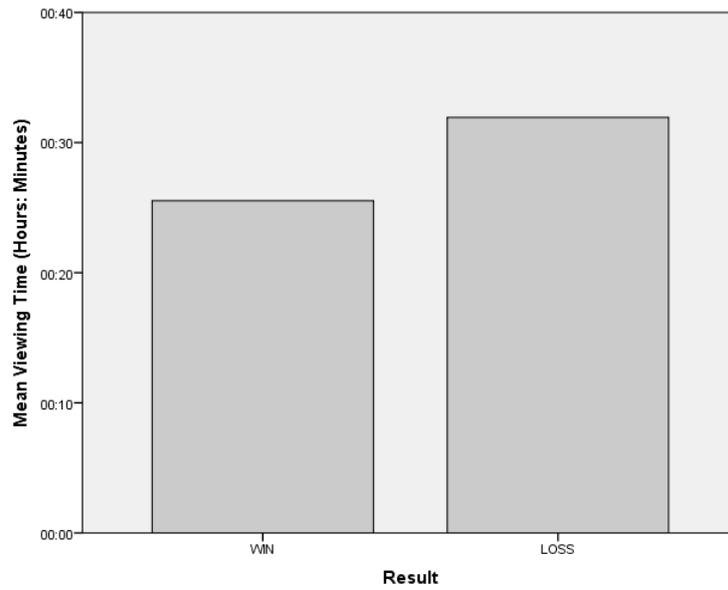


Figure 2 - Mean viewing time between games which were won and lost

The mean viewing times prior to games which were won was 25 (± 25) minutes and games that were lost had a mean viewing time of 31 (± 27) minutes. There was homogeneity of variances for viewing times for wins and losses, as found by Levene's test for equality of variances ($p = .762$). Using an independent samples t-test there was a mean difference of 6 (± 5) minutes of viewing time prior to losses than wins, however, this was not statistically significant ($t(125) = -1.281, p = .203$).

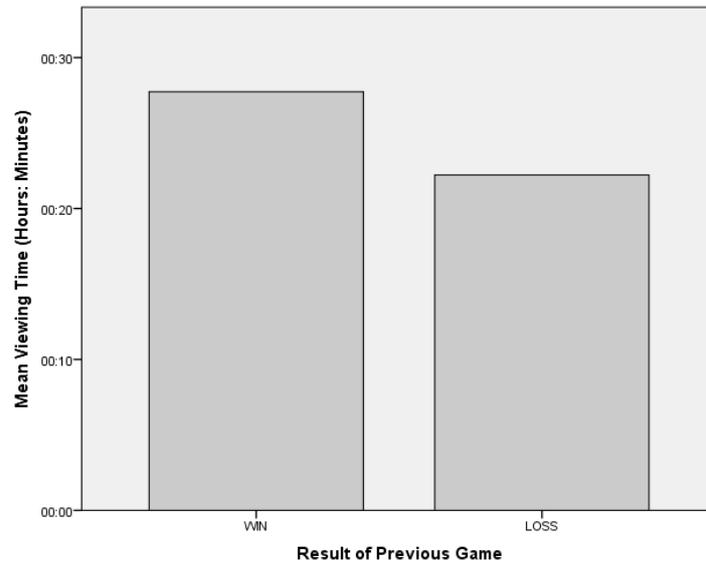


Figure 3 - Mean viewing time for games following a win or loss

The mean viewing time following a win was 27 (± 26) minutes and the mean viewing time following a loss was 22 (± 22). Homogeneity of variances was found using Levene's test for equality of variances for mean viewing times following wins and losses ($p = .155$). Using an independent samples t-test, the mean difference in viewing time was found to be 5 (± 4) minutes higher following a win than a loss, however, this finding was not statistically significant ($t(106) = 1.107, p = .271$).

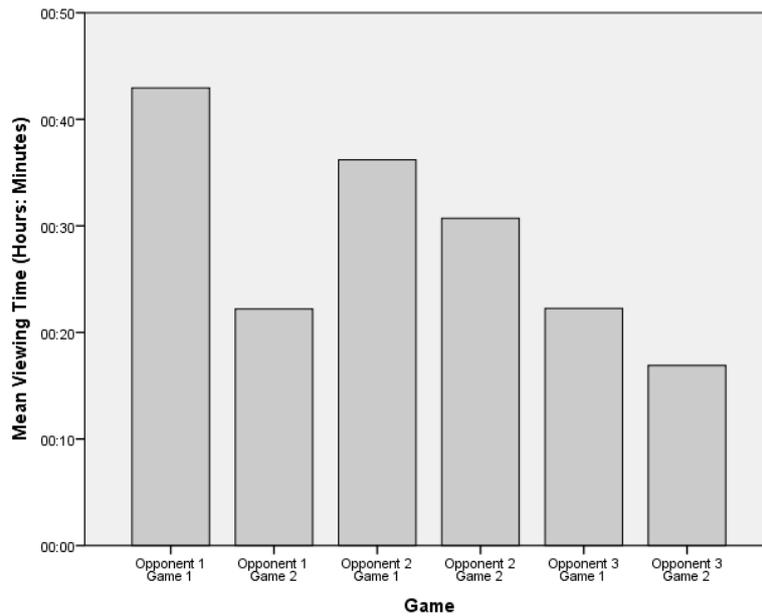


Figure 4 - Mean viewing time for opponents who were played more than once

Over the course of the season, the team played three opponents twice. In all games where the team faced the same opponent the mean viewing time was less for the second game. For games against opponent 1, the mean viewing time for game one was 42 (± 36) minutes compared to 22 (± 22) minutes in the second game.

For the games against opponent 1, there was not homogeneity of variances as assessed by Leven's test for equality of variances ($p=.021$), therefore the Welch t-test was used. There was found to be a mean difference of 20 (± 10) minutes however this was not statistically significant although it is very close to the accepted .05 confidence interval ($t(25.5) = 2.121$, $p=.054$). For games against opponent 2, game one had a mean viewing time of 36 (± 27) minutes and game two had a mean viewing time of 30 (± 30) minutes.

The games against opponent 2 had homogeneity of variance using Leven's test for equality of variances ($p=.769$). The mean difference in viewing time was 5 (± 10) minutes however this also was not statistically significant ($t(32) = 0.544$, $p=.590$).

In games against opponent 3, game one had a mean viewing time of 22 (± 22) minutes and game two had a mean viewing time of 16 (± 21) minutes. Homogeneity of variance was found using Leven’s test for equality of variances ($p=.803$). The mean difference in viewing time was 5 (± 6) minutes however this also was not statistically significant ($t(36)= 0.768, p=.448$).

Opponent 4 had no corresponding return fixture as a scheduled game 8 was cancelled due to bad weather.

Over the course of the season, there were 43 incidences of players who had accumulated no viewing time over the course of the week. No viewing time was defined as true zeros, and incidences of less than 10 seconds. This was equivalent to 34% of all viewing opportunities.

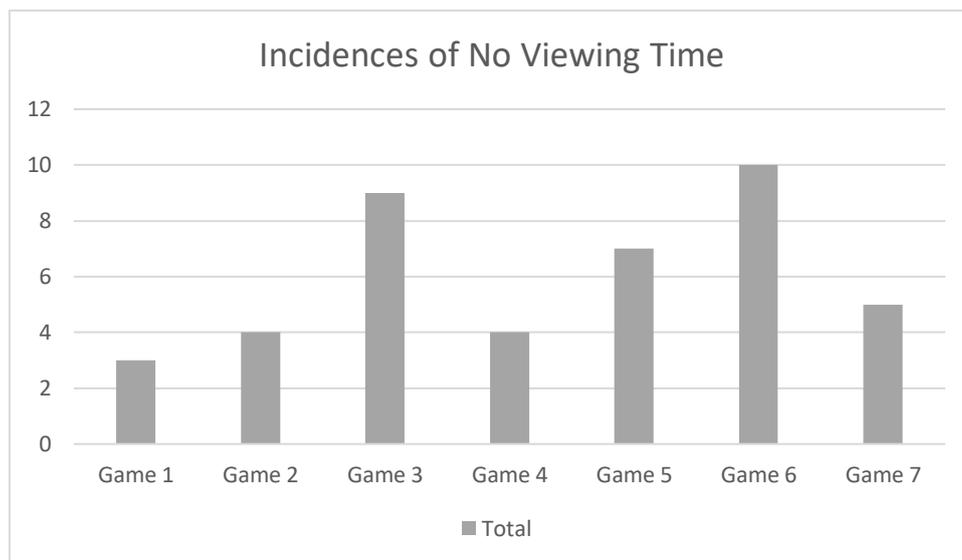


Figure 5 – Incidences of no viewing time self-directed film study among players

The incidences of no viewing time increased when facing a same opponent with the exception of opponent 2 which recorded the same number as the first game (but did have a lower mean viewing time). Opponent 1: 3 & 9 incidences; Opponent 2: 4 & 4 incidences; Opponent 3: 7 & 10 incidences; Opponent 4: 5 incidences but no corresponding fixture.

4.0 Discussion

The mean viewing time decreased over the course of the season for each game. This may be due to the players feeling less need to prepare as extensively for each progressive game. The first game of the season having the highest video viewing time could be a result of players feeling the need to do extra preparation, increased motivation for a season opening game, and the opposing team being a new opponent and an unknown quantity (Hardy, Jones, & Gould, 1996). One reason for a reduction in viewing time as the season progressed, in a collegiate participant group, may be due to an increase in other commitments such as university coursework and exams which may take priority and cause players to assign less time to leisure time activities (Buckworth and Nigg, 2004).

With games which were won and lost having no statistically significant difference in viewing time between them it indicates that video viewing times are not the deciding factors in the outcome of the game. It is also likely that during team training sessions the players were informed by coaches what their upcoming opponents were likely to do. The coaches themselves receive this information through film study, therefore further study into the relationship between coaches' video viewing times and team success is recommended.

Although not statistically significantly, there was a higher mean video viewing time for the team following games that they had won. This is possibly due to players creating highlight reels of their best clips from each game, popular amongst athletes looking to create highlights for recruiting and posting on social media (Stringfield, 2015). It is plausible that following games that were won players had more individual events that were successful during the games and therefore spent more time viewing these games than games where they had lost and possibly had less successful individual events.

Some of the games were not played on consecutive weekends so this also may have affected the results. The team also never lost consecutive games so it may be of value to investigate whether a team who have had consecutive losses have an influence on the players' viewing times.

For games where the team played the same team a second time, the video viewing times decreased on all occasions. Although this was not statistically significant there may be the possibility that, without reminders and encouragement from coaches which occurred during the study, that the players' level of video viewing times may decrease to a greater level.

Over the course of the season, there were 43 incidences of players who had accumulated no viewing time over the course of the week. The reason for this may be due to the player feeling adequately prepared for the upcoming opponent without watching any video footage after attending the team training sessions. Throughout the season, during a game week, there were 1-hour pre-practice team video sessions run by coaches. These comprised of watching game film of the forthcoming opponent. Whilst not mandatory it is likely these were attended by players who had no individual self-directed viewing time that week, and who used these sessions as their only film study.

The amount of video viewing time and feelings of preparedness is considered an essential part of preparation in American Football (Belichick, 1962). But there will be individual differences expected due to each player having a different perception of how much video viewing time is required to be fully prepared. For example, one player may feel that 15 minutes has them feeling very prepared whereas another may only feel the same level of preparation after 45 minutes of video viewing. This could also in turn be related directly to player experience (more experienced players perceiving they need less viewing time *or* more experienced players realising they need more viewing time to effectively prepare).

4.1 Limitations

One of the main limitations of the study was there was no way to monitor each player to ensure that while the video footage was playing, they were actually watching the footage. The construction of the study allowed for outliers to be removed but there was still the possibility that players turned the video on and left it running for a reasonable time.

The nature of the team and sport assessed meant, with injuries and players leaving and joining the team, over the course of a season there was a fluctuation of team membership with differing study habits. To remove this variation in future studies it is advised only a core group of subjects who returned feedback on their own plays should be used, so as to confirm that they have watched the video. Additional teams could also be analysed to assess the impact of different opponents and results which may have had an influence on the results.

4.2 Future Implications

It is recommended that further research be conducted into the influence of perceived opponent level and its effect on player viewing times. This could lead to coaches reducing, or increasing, the amount of video viewing time their players are undertaking prior to playing against opponents and utilising their preparation time more efficiently.

Player experience comparisons are also recommended using a subject group with a wider experience span than available in the current study (mean of 3.55 years). This will allow coaches to determine if they need to set levels of recommended viewing time for different experience levels of players.

Coaching influence around encouragement and incentives to watch film (including different methodologies) should also be assessed to ascertain if this significantly affects players' levels

of video viewing times. This would allow coaches to identify effective methods to encourage their players preparation. The longitudinal issue of video viewing times decreasing over the season, as identified in the current study, could be monitored through methods such as ‘homework’ tasks issued by coaches in order to measure how it affected viewing time.

Analysis could also be conducted into the relationship between coaches’ video viewing times and team success. As most of the information that players receive comes from their coaches, the amount of information the coaches receive from video study could be very influential on team success. Coach viewing time therefore can be recorded by the video analysis software and a comparative study undertaken.

4.3 Conclusion

In this study self-directed video viewing time decreased over the course of the season and in all games where participants faced the same opponent a second time.

Incidences of players who had accumulated no viewing time over the course of the week also increased when facing the same opponent for a second time.

The results of this study are important for coaches and performance analysts, as it flags a propensity for athletes to ‘tail off’ in their self-directed film study. An awareness of this situation should allow coaches and analysts to be more prescriptive in their viewing tasks, more closely monitor viewing times, and to guard against potential complacency when facing the same opponent.

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