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# Instant Replay in the National Basketball Association

Jacob Tingle

## Abstract

In this chapter the use of Instant Replay in the National Basketball Association (NBA) is described. After detailing the historical evolution of replay in the NBA, the chapter explores the impact of legal and illegal gambling on the expanded use of replay, followed by section on media perceptions, an explanation of real or perceived bias amongst NBA referees, and concludes with a description of the NBA Replay Center. Similar to the National Football League, the NBA has utilized some form of replay technology for multiple decades and how the league approaches the use of video technology to train and grade referees could serve as a roadmap for sports just beginning to utilize forms of replay.

## Keywords

NBA, instant replay, video technology, basketball, gambling

## Introduction

*“I think the mention of replay, none of us liked it when we first heard it. It’s a necessary evil. It’s necessary - you have to have it today.”*

*Joe Borgia, NBA Senior Vice President of Replay & Referee Operations (Lewis, 2019)*

At its heart basketball has always been an inclusive sport. A game popular among rural Midwesterners as an indoor refuge from the brutal winters, popular amongst inner city dwellers because of the relatively small space and limited equipment it requires, and a game popular among Twentieth Century American immigrants because unlike American football or baseball, it was never deeply ingrained into the cultural psyche of the political and economic elite (Mandelbaum, 2004). As such, it has been a sport quicker to innovate or change in order to fight for its place among American popular past times. Some of those rules changes included requiring the ball to be advanced past the mid-court line in under 10-seconds, restricting some defensive formations, and the introduction of the shot clock in 1954 (Rovell, 2016).

The free-flowing nature of the game, coupled with its popularity among such broad groups, and the wildly popular college game has led the National Basketball Association (NBA) to maintain its place as one of the most popular sports in United States (U.S.), with over 22 million fans attending games in person during the 2017-18 season (ESPN, n.d.).

The NBA (Koppett, 2007) began in 1946 and at present 30 teams play 82 games (for a total of 1,230 games) during a six-month regular season. The game is played between two teams of 5 players and squads have one head coach with an average of 5.5 assistant coaches. The game lasts four 12-minute quarters and each team is allowed to have 15 players on its active roster. Of these 15, at least 8 must suit up for each game.

The NBA’s 24-second shot clock, which requires teams to shoot the ball in less than 24-seconds, first appeared in the 1954-55 season. The NBA was not yet a popular televised sport, and the owners knew that to improve the game’s watchability - and thus improve its fan base, they

somehow had to prevent teams from consuming one or two minutes on every possession (Rovell, 2016; Turner, 2013).

### **Technological improvements and NBA officiating**

The process for becoming an NBA referee is detailed, demanding, and difficult. The NBA specifies a six step process on its web portal, which begins with potential candidates being reviewed from one of eight officiating systems; the top 100 candidates are then scouted and reviewed. A much smaller number move to the more formal training and evaluation phase (NBA Officials Instant, n.d.). A select group are hired to work in NBA developmental leagues and an even smaller number are added to the WNBA or NBA staff. Highlighting how difficult the pathway is, this year only 5 new officials were added to the NBA staff (Reynolds, 2018). The current 65 NBA referees on staff have an average of 14.1 years of experience in the league. Based upon a combination of tenure and number of playoff games worked, NBA referees earn between \$150,000 and \$550,000 a year (Interbasket, n.d.; Lewis, 2019).

Joe Borgia's comment about replay being a necessary evil is indeed how those officiating in the NBA in 2002 felt about replay's introduction. Referees are like officials in all sports in that they desire is to be right, to be accurate, but they also have a psychological bent towards certainty (Weinberg & Richardson, 1990). One must possess higher than average doses of self-belief and self-confidence to be comfortable knowing that 100% of your decisions will be despised by at least half those watching a game (MacMahon et al., 2105; Weinberg & Richardson, 1990). Even still, especially with the increased competition for top-level NBA jobs, more than anything - referees want to get the call right.

Former NFL official and current broadcaster Mike Pereira summed it up well.

“There is not a sports official around who wants to leave a field, court or rink thinking they didn't get it right. If you give them a tool that allows them to get it right, that's what they want. It's about getting it right, and the expectations are higher about getting it right than back in the old days before we had the technology” (Saunders, 2013, para. 39).

NBA referees, like officials from all sports, don't want to be wrong, but the reasons might not be clear to those who have never “worn the stripes.” As longtime NBA referee Courtney Kirkland said:

"I'm not trying to please this fan, I'm not trying to please this player – I'm trying to please the game itself. That's the way I look at it: What is best for the game? What does the game need? That's who my friend is: The game” (Forgrave, 2019, para. 14).

Given that mindset, despite initial misgivings, it's not surprising the NBA referees have come to appreciate the impact of technology on their ability to do what's right for the game. One such innovation significantly improved the timing errors in NBA arenas.

The introduction of the Precision Timing System (PTS) significantly improved how NBA games were officiated. Developed by former NBA referee Michael J. Costabile (Barkley, 1995), the system connects the ref's whistle to a transmitter worn in the waistband. As an official blows the whistle, the transmitter sends a signal stopping the clock instantly. Referees can then restart the clock using the same device. It is estimated PTS saves close to 3-minutes of game time.

Despite its impact even the PTS isn't perfect or fool proof: a) game and shot clocks at NBA arenas are still operated, mostly, by humans and b) there is a lag associated with the time it takes for an official to see a play, make a decision, and to actually put air in the whistle.

With its history of being an early adopter for technological innovations to improve training and development of players and make the game more enjoyable for fans, it's no surprise that the NBA adopted replay sooner than many other sport leagues. Even still, the decision for the NBA to begin its use of replay was reactive, rather than proactive. There are previous examples of plays in NBA games where replay could have been used (Abdul-Jabbar, 2011; Ryback, 2016), but finally after the 2002 NBA playoffs, a tipping point was reached and the league could no longer ignore that replay was essential to the future integrity of the game.

After three high profile missed clock-related calls in the 2002 playoffs (LeBron, 2014), one of which affected the outcome of a game, the league took swift and decisive action (Broussard, 2002). Highlighting the NBA's decision, Stu Jackson, then the senior vice president for basketball operations, said:

"I don't think there was any one event that drove this decision, but certainly during the past season and the playoffs, there were a number of instances where, quite frankly, for any human being it would've been nearly impossible to determine whether the shot got off in time" (Broussard, 2002, para. 6).

Furthermore, at each iteration of updating replay's use there was a catalyst that forced the league into action (Perrin, 2010). Below is a table that includes all 15 of the replay triggers used by NBA referees. The year the rules were updated to permit each trigger are also included.

Table 1: Replay Rules Updates (NBA Official Instant Replay Guidelines, n.d.).

2002-2003	<p>Referees will:</p> <ul style="list-style-type: none"> <li>Automatically review shots taken at the end of each quarter or overtime period. This review will not take place at any other time.</li> <li>Review whether a player's foot is on the 3-point line or out of bounds.</li> <li>Whether a 24-second shot-clock or 8-second backcourt violation has occurred before a shot is taken.</li> <li>Review foul calls, but only to determine whether a player was fouled before time expired.</li> <li>Have a maximum of two minutes to review plays on a courtside video monitor.</li> </ul>
2007-08 (Limited NBA replay, 2007)	<p><b>Player Altercations and Flagrant Fouls</b></p> <ul style="list-style-type: none"> <li>Referees will call either a Flagrant Foul 1 or 2 on the floor, but can only review Flagrant 2 calls.</li> </ul> <p>For replay purposes means any situation where:</p> <ul style="list-style-type: none"> <li>Two or more players are engaged in a fight or a hostile physical interaction that is not part of normal basketball play.</li> <li>A player is ejected from the game for committing a hostile act against another player, for example, when a player intentionally or recklessly harms or attempts to harm another player with a punch, elbow, kick or blow to the head.</li> </ul>

	<ul style="list-style-type: none"> <li>This is an automatic trigger and referees are required to conduct the review regardless of score or time remaining.</li> </ul>
2008-09 (Description of the, 2008).	<p><b>A. 2-point/3-point shots</b></p> <p>Game officials will be permitted to use instant replay at any point during a game to determine:</p> <p>(i) whether a successful field goal was correctly scored as a 2-point or 3-point field goal</p> <p>(ii) whether, for purposes of awarding the correct number of free throws, an unsuccessful field goal attempt on which the shooter was fouled was a 2-point or 3-point attempt.</p> <p><b>B. Game Clock Situations</b></p> <p>Referees will consult instant replay if:</p> <ol style="list-style-type: none"> <li>1. A play concludes (i) with no time remaining on the clock (0:00) at the end of any quarter or overtime period or (ii) at a point when the game officials believe that actual time may have expired in any quarter or overtime period; and</li> <li>2. The game officials are reasonably certain that a game clock malfunction has occurred during the play.</li> </ol>
2009-10	<p><b>Out of Bounds</b></p> <p>Referees can review any out-of-bounds play that occurs in the last two minutes of the fourth quarter and during overtime when they are not reasonably certain as to which player caused the ball to go out-of-bounds.</p> <ul style="list-style-type: none"> <li>A review can only be initiated on a called out-of-bounds play and only those involving doubt as to which player caused the ball to go out</li> </ul> <p><b>Shot Clock Violations</b></p> <p>Referees can review plays in which they were not reasonably certain whether or not a 24-second violation occurred on a made basket or prior to a foul being called.</p>
2010-11	<p><b>Clear-Path-to-the-Basket Fouls</b></p> <p>Referees can use replay if they are not reasonably certain that a called clear-path-to-the-basket foul (clear-path foul) actually met all of the criteria of the rule.</p> <p><b>Review of Correct Free Throw Shooter</b></p> <p>Referees can use replay when they are not reasonably certain which player should attempt free throws on a called foul.</p> <ul style="list-style-type: none"> <li>Referees cannot review to determine which player committed the foul or whether a foul was warranted.</li> </ul> <p><b>Review of 24-Second Shot Clock Reset</b></p> <p>Referees can review situations where they were not reasonably certain whether the ball actually touched the rim and are therefore unsure if the shot clock was (or was not) reset properly.</p> <ul style="list-style-type: none"> <li>This type of replay is only conducted in the last two minutes of the 4th period and during all of overtime</li> </ul>

2012-13	<p><b>Flagrant Fouls</b></p> <p>Referees will review all Flagrant Foul calls any time a flagrant foul call is made.</p> <ul style="list-style-type: none"> <li>• This is an automatic trigger and referees are required to conduct the review regardless of score and time remaining.</li> <li>• The officials can also review whether any other players committed unsportsmanlike acts or unnecessary contact immediately prior to and/or immediately following the calling of the Flagrant Foul.</li> </ul> <p><b>Restricted Area Block/Charge</b></p> <p>Referees can review all block/charge calls when they are not reasonably certain as to whether the defender was inside or outside of the restricted area.</p> <p><b>Goaltending/Basket Interference</b></p> <p>Referees can review situations in which they are not reasonably certain whether a goaltending or basket interference violation was called correctly during the last two minutes of the fourth period and during all of overtime.</p> <ul style="list-style-type: none"> <li>• Possible goaltending violations that were not called are not reviewable.</li> </ul>
2013-14	<p><b>Off-ball Foul Timing</b></p> <p>Referees can use video to review situations in which they are not reasonably certain whether a player without the ball was fouled prior to</p> <p>(a) his teammate beginning his shooting motion on a successful basket or</p> <p>(b) his teammate releasing the ball on a throw-in.</p> <p><b>Delay of Game</b></p> <p>Referees can review to determine whether a delay-of-game penalty is called whenever a player or team commits an act that causes a postponement or interruption in play, whether or not the delay results in an unfair advantage.</p>

To be certain, since the NBA began using instant replay in 2002-2003, the game and its narrative arc have changed significantly (Allen, 2010; Ryback, 2016). Yet, despite the incredible accuracy of modern game replay systems, there is simply no way to remove human error from the equation.

## The Impact of Gambling on Professional Basketball

Gambling is nothing new to the world of basketball in the U.S. During the mid-1940s to early-1950s there was pervasive game fixing that led to over 30 college basketball players being charged with point shaving by the New York City district attorney. The scheme involved gamblers bribing college players to keep scores within an expected range. The scandal led to a yearlong suspension for then powerhouse University of Kentucky and other universities to cancel their basketball programs all together (Gems, Borish, & Pfister, 2008). So appalled was the NBA by the actions of those players that it banned them for life from the league. With one glaring exception, the NBA - and its referees - have managed to stay above the fray that has impacted college basketball and other professional sports.

**Enter 2007**

In 2007, the worst case scenario for the league hit the headlines of every major news outlet in the country. Tim Donaghy, a long serving veteran NBA referee, admitted to and was convicted of conspiracy to commit wire fraud and conspiracy to transmit wagering information over state lines (Beck & Schmidt, 2007).

During the previous two to four NBA seasons (depending on who is telling the story), Donaghy was paid between \$2,000 and \$5,000 to impact the point spread of games. He accomplished the illegal activity through a variety of techniques, such as calling more fouls to ensure a team would get to the free throw line more often. At the time, some reporters said the NBA's integrity took a major hit and the league would be deeply scarred by the news (Adande, 2007; Jones, 2008).

Then NBA commissioner David Stern said that in three decades working for the league it was, "the most serious situation and worst situation that I have ever experienced" (NBA Commissioner David, 2007). He also indicated that,

"No amount of effort, time or personnel is being spared to assist in this investigation, to bring to justice an individual who has betrayed the most sacred trust in professional sports, and to take the necessary steps to protect against this ever happening again" (Wojnarowski, 2007, para.4).

Given the swift and immediate response from the league, it's not surprising that for years the NBA took a position that legalized gambling in the U.S. was ultimately bad for business. What did, in some circles, come as a surprise was NBA Commissioner Adam Silver's response to the watershed U.S. Supreme Court case which ostensibly paved the way for more legalized gambling.

### **Embrace of Supreme Court Ruling**

In 2018 the U.S. Supreme Court issued an important ruling that seems to open the doors for more legal sports wagering. Some important background: The U.S. Congress passed the Professional and Amateur Sports Protection Act (PASPA) in 1992. PASPA prohibited state-sanctioned sports gambling with a few exceptions and also permits any sports entities whose games might be or become the subject of sports gambling to bring an action to enjoin the gambling.

The NBA joined other professional sports leagues and the National Collegiate Athletic Association (NCAA) to prevent the State of New Jersey from legalizing sports gambling schemes in the state. In *Murphy v. National Collegiate Athletic Association* (2018), the U.S. Supreme Court found that PASPA violated certain elements of the 10th Amendment to the U.S. Constitution; thus overturning the law. The ruling, then opened the door to legalizing sports betting in the U.S., which is illegal in all, but a very few areas.

The law was originally passed by Congress to ensure the integrity of sporting contests, and the Supreme Court ruling signals a sea-change in the moral relationship between spectators and sports leagues. According to Gabriel Feldman, the director of the sports law program at Tulane Law School:

"... It [Murphy v NCAA] will likely change how we have viewed sports for the past 100 years. It's called the gamblization of sports. Fans will become much more focused on gambling than following a team. It will make every second of every game of every week interesting to fans as it will give everyone something to root for" (Liptak & Draper, 2018, para.10).



Despite the fact that the NBA had joined the other leagues in bringing the suit, as early as 2014 Commissioner Adam Silver wrote: “I believe that sports betting should be brought out of the underground and into the sunlight where it can be appropriately monitored and regulated” (Purdham, 2016, para. 4). While the soil of U.S. professional sports has not yet been radically tilled looking at the models from across the globe, it does appear that Adam Silver could be on the right track. As for the referees; however, an important question remains.

How does the NBA’s embrace of legalized gambling impact the already great pressures league referees face to be *perfect*? Some contend that more money will lead to greater corruption (Eden, 2019). Which begs another important question yet to be answered: Will bringing gambling out of the shadows for U.S. sports lead to greater transparency and a reduced likelihood that a future Tim Donaghy will emerge or, will the legal status make NBA referees even more vulnerable to gambling outfits (Ziller, 2019)?

## What the Media Say

Nowhere is the debate about replay’s value more debated than amongst sport media. Some fall firmly in the *sport is beautiful because of the human element* camp (Cole, 2015; Ryback, 2016; Rymer, 2012), while others claim that *cameras don’t lie* (Abdul-Jabbar, 2011) and thus the use of replay is an essential element of the modern game (Clougherty, 2013; De Piccioto, 2017).

Firmly in the *replay is ruining sports* camp is Steve Politi (2018). After Game 1 of the 2018 NBA Finals he wrote: “For the most part, I want replay to go, because it hasn’t eliminated the ‘human element’ from sports at all. If anything, it has simply added another way in which us imperfect homo sapiens can get something else wrong” (para. 4).

Will Leitch (2018) also argues the replay is making sports less enjoyable. He contends that a big factor of sport fandom is arguing, both at the time and after the game, about a referee’s decision. Phil Barber from the Santa Rosa Press Democrat also calls for a complete elimination of replay. While he extols the notion that replay, in theory, can eliminate all mistakes by game officials, Barber wrote that, “human error has always been a part of officiating” (2017, para.13) and the imperfect attempt to remove error from one side of the game equation (i.e. the officiating and not the playing) has a negative effect on the reason sports have existed for centuries: the drama of the unknown storyline.

Alters (2016) wrote that the overuse of replay and the constant threat of a next day rebuke by the NBA offices has turned being a fan of basketball from joyous to laborious. She pled, “For the sake of the sport, let the officials be in charge of their own whistles, and let the players play” (para.11).

Leitch and Barber also argue that the time it takes to review a play, no matter how short, only exacerbates the pain (agony) for fans and as such, the use of replay is removing the drama and ruining the narrative arc of a basketball game. Instead of making the experience more enjoyable for sports fan, replay is having the counter effect.

Among his list of replay *cons*, Craig Berman includes the negative impact to the spectators watching the games live. Fans, “often have to wait for someone else to confirm what they just saw with their own eyes” (Berman, 2017, n.p.). Dubow (2018) also cited the controversial play from the 2018 NBA Finals, in which LeBron James was called for a blocking foul after the referees went to the monitor based on the Restricted Area Block/Charge trigger [see Table 1] as the perfect exemplar of Berman’s complaint.



Chief among the concerns voiced by the anti-replay media have is the nature of what is and isn't reviewable (Barber, 2017; Berman, 2017). According to Leitch (2018):

“One big problem is just how litigious the matter of whether or not to consult replay has become, with each sport having drawn mind-numbingly arcane, labyrinthine distinctions between those things (presumably cut-and-dried questions such as whether someone is out of bounds) that refs can review and those (presumably ‘judgment calls’) they cannot” (para.4).

Another important criticism comes from former NBA head coach and current ESPN analyst, Jeff Van Gundy. Coach Van Gundy expresses concern that the day-after review of calls, especially those that are contact/flagrant in nature might “undermine the credibility from the players’ standpoint that every player and every team gets the same and equal treatment under the rules” (Ryback, 2016, para. 19).

On the other side of the replay discussion, Hughes (2013) pulls no punches. “Those espousing the value of the ‘human element’ . . . in officiating are just clinging to the sorts of necessary evils—relics, really - of yesteryear” (para.40). Others go so far as to argue that replay use by NBA referees should be expanded. In other words, if the NBA is going to allow referees to use replay, the focus should be helping them get calls right; especially during times in the game when calls are most important. Jim Cavan (2014) summed up this argument:

“If video technology is going to be used at all, it might as well be used toward the best possible outcome . . . a fair ruling that strikes a balance between accuracy on the one hand, and a timely conclusion on the other” (para. 20).

Other arguments are used to support use of replay by NBA referees. Among those are increased accountability, quieting the conspiracy theorists (Instant Replay & Sports, 2015), more game stoppages mean more commercial revenue for the league and its broadcasting partners, and a greater likelihood that referees will get calls correct (Hughes, 2013; Instant Replay & Sports, 2015).

Still others take a more nuanced approach (De Piccioto, 2017); attempting to weigh the pros - in essence the technology is there and it should be used - with the cons, that NBA referees are hamstrung by what plays the rules permit and don't permit them to review. As Dan Levy wrote: “Replay can be great, but not when the rules surrounding the process seem to be trumping common sense” (2014, para. 8). Those making this argument contend that the league should allow officials to review MORE plays, if they're going to be allowed to use replay at all.

The media debate about replay's pros and cons often echo that of the fan, but arguments about NBA officials go far beyond how *good* they are and extend to whether that are scofflaws and cheats.

## **The Game is Rigged? Bias and Referees**

Even outside of the officiating community, there is acknowledgement that that NBA referees are great at their jobs.

“So I think I should put in a few words for the guys in the striped shirts. They have an incredibly difficult job; and for the most part, they do their thing very competently. They could succumb to being corrupt; but to the best of my knowledge, there has only been one major league official (Tim Donaghy of the NBA) who has ever been found to have tried to

dishonestly affect the outcome of a game. The officials of the various pro sports are overwhelmingly honest, dedicated, knowledgeable and in shape. Their love of the games they officiate is obvious. No one in his right mind would go through all the trouble it takes to qualify for those jobs if they didn't love what they do" (Abdul-Jabbar, 2011, para. 5).

Even with accolades from an NBA legend, the need for replay is real. A big reason replay exists is that the timing (and other) errors, no matter when they occur, can influence a game's outcome (MacMahon et al., 2015). In addition to the real or perceived threat of future Tim Donaghy situations, there are; however, other reasons for expanded use of replay in NBA games.

A study in The Quarterly Journal of Economics (Price & Wolfers, 2010) found that NBA referees called more personal fouls against players when the game officials were primarily opposite-race than when they the referee crew and players were primarily the same race. They further indicated that the biases were so significant as to impact the outcome of games. While the results didn't distinguish whether the bias stemmed from the actions of white or black referees, it nonetheless caused a massive public relations problem for the league.

The NBA responded with its own analysis, but independent experts reviewing both studies thought Price and Wolfers research to be more credible. Yale University law professor, Ian Ayers, told the New York Times:

"I would be more surprised if it [implicit association bias] didn't exist. There's a growing consensus that a large proportion of racialized decisions is not driven by any conscious race discrimination, but that it is often just driven by unconscious, or subconscious, attitudes. When you force people to make snap decisions, they often can't keep themselves from subconsciously treating blacks different than whites, men different from women" (Schwarz, 2007, para.9).

NBA referees' decisions are accurately described as "snap," but interestingly enough in a follow-up study years later, Price and Wolfers found the bias had disappeared. It's not as if the decision making process, or time to make them, improved. When asked then for an explanation about why the bias seemed to disappear, Price said: "Racial bias is a malleable trait. Large-scale public focus on a specific type of racial bias in a specific group can make it go away" (Ingraham, 2014, para. 8). One wonders, has the expanded use of replay, coupled to an increased awareness of their own bias, had an impact on current referee decisions?

Either way, despite the reports of potential in-group racial bias and the continued fall out from the Donaghy scandal, fans aren't staying away. More than 22 million fans attended games in person (ESPN, n.d.) and viewership is up or constant across the four major NBA television partners after the 2107-18 season. So, what has been the long-term impact of the scandal? Broadly speaking, the so called Donaghy-effect hasn't gone away and won't soon dissipate.

Is the Donaghy scandal indeed a permanent stain (Ziller, 2019), a Scarlet G (gambler) or Scarlet F (fixed) on the NBA? The fact that 12 years later the league and its prominent media partners, e.g. ESPN, are still writing in detail (Eden, 2019) about the situation leans towards that answer being a hard yes. As Ziller (2019, para. 7) concluded, "Regardless, it's clear that the unprovable nature of the allegations will keep the Donaghy scandal alive for years and years."

The broad use of replay and perhaps the push towards embracing legalized gambling, it could be argued, are the NBA's battle armor against a future Tim Donaghy. By providing fans more access to how replay decisions are made [more on the NBA Replay Center to come], the thought is that

the massive number of eye-balls on each decision won't permit Donaghy-level corruption from a future game official. In fact; however, one might argue that even with the greater push for transparency, evidenced by the 2014 creation of the NBA Replay Center, there is an ever more strained relationship between NBA referees and fans. With greater access to information comes greater perceptions that the fans know how to do the job of an NBA referee.

## **A Brave New World: Big Brother and How Technology has changed it all**

In his 2015 study, Deutscher found no evidence to support biased decision-making amongst NBA referees, including no home court bias, star bias, or U.S. versus non-U.S. player bias. He further asserted that referees have a built-in financial incentive to avoid bias (i.e. future employment), and contended that the constant monitoring of officials could be an explanation.

Furthermore, as reported in the Boston Globe, according to the National Basketball Referees Association, NBA referees get 97% of their calls correct. In that same article, the NBA Replay Center indicated that in the last two-minutes of games, arguably the most intense and most difficult, league officials get more than 86% of their calls right (Goldenberg & Bowers, 2015). Bottom line: NBA refs are really good at their jobs. Which then begs the question, where does the animus come from?

What is happening in the relationship between NBA referees and fans can be considered part of a larger societal trend to distrust those in authority. Scandals in the automotive industry (e.g. Volkswagen), major college sports in the United States (e.g., Penn State University), international sports (e.g., United States Gymnastics), and match-fixing in German football, have led many to assert there is a growing movement to distrust those in authority (Tingle, 2016). While some of that distrust has been earned (Kihl & Richardson, 2009), others contend this lack of trust might be related to other broad societal factors such as the income inequality gap and the growing tribalism we see in global politics (Lewis, 2019).

All this scrutiny and the greater movement to review, seemingly, every decision coupled with increased levels of abuse from player, coaches, and spectators - resulting from those high expectations and distrust of authority - has contributed to a global shortage of sports officials. From basketball officials in lower division American leagues (Warner, Tingle, & Kellett, 2013) to football referees in the U.K. (Cleland, O'Gorman, Webb, 2018). Enter big brother.

“If technology offered the promise of perfect monitoring of movement, a sort of closed-circuit surveillance state in which every play was registered and adjudicated exactly as it happened, with no potential for misuse or arbitrary judgment or inequitable application, would we embrace it? Or would we just want to clobber it with a bat” (Leitch, 2018, para. 6)?

The NBA is betting that the increased scrutiny, i.e. transparency, will actually improve the experience for its officials. Indeed, its response to critics of NBA referees was to create the NBA Replay Center in 2014 (Amick, 2014).

One of the key features of the NBA Replay Center is the “Last Two Minute (L2M) Reports.” Introduced in March 2015, the league hopes to provide a more detailed and transparent picture of decisions made by NBA referees. From the league web-page, the L2M reports were created, “recognizing that NBA officials are correct roughly 90 percent of the time, we felt it important and fair to list all the correctly officiated plays as well” (NBA Officials, n.d.). The league also reports that L2M's help with the effort to “build a greater awareness and understanding of the rules and

processes that govern our game . . . and serves as a mechanism of accountability to our fans and the media who fairly seek clarifications after our games.” Reports are issued on all calls and “material non-calls” during last two minutes of the fourth quarter or overtime for all games during which the point differential is three points or less at any point during those time intervals (NBA Officials, n.d.).

According to Joe Borgia, the “main goal of the NBA Replay Center is to get the officials the exact angle they need when they come to replay” (NBA Replay Center, n.d.). The Center is equipped with a 10 gigabit network and more than 90 screens, which allows referees in every arena to view video at 60 frames per second (Lewis, 2019). Replay officials use a touch screen automated program which allows them to zoom and select multiple angles for referees in the arena, all with the simple “tap of a button” (McCue, 2014, n.p.). The network allows referees, at one time, to see split screens with multiple angle views of a play. These multiple angles provide referees with more comprehensive looks, and more “clear and comprehensive evidence” that allows decisions to be more accurate and more timely.

Another important outcome of the NBA Replay Center is the enhanced fan experience for those watching games on TV (Golden, 2014). The Center has established direct feeds and lines of communication with broadcast partners. The improved and more direct communication with the TV networks, allows the NBA to better frame the narrative about a) what decisions are made, b) how they are made, and c) perhaps most importantly, why they are made. According to Frank DiGraci, YES Network game producer:

“This is going to help our storytelling in a number of ways. One, we’re going to actually see the angle used for the review. Two, we’re going to see the process. Our fans and our viewers are going to get a live shot into the replay center. And third, we can parlay that now to our audience by speaking directly to the NBA Replay Center” (NBA Replay Center, n.d.).

The statistics from its first year suggest the replay center has achieved both aims: to improve accuracy and speed with which replay decisions are made. During the 2014-15 season the NBA Replay Center conducted 2,162 reviews with an average decision time 42.1 seconds. Stated another way, in about half the time teams are allotted for one of its timeouts, referees can review one of the 15 “triggers” detailed in Table 1. The average game had 1.76 reviews and nearly 81% of those confirmed the officials real time decision and while just over 19% of the initial referee decisions were overturned (NBA Official, 2015). As good as those numbers were from its initial season, at the midpoint of the 2018-19 season, the average time for reviews was down to 29 seconds. As of January 2019, over a third of the official reviews were to determine whether a shot was a two-pointer or a three-pointer, while with the buzzer beater accounted for 20% of replay requests (Forgrave, 2019).

While still far from removing controversy and making the officiating perfect, the NBA Replay Center has made great strides in improving the level of officiating.

## Conclusions

Regardless of whether one is pro or con the use of instant replay in the NBA one thing's for certain, it is here to stay. It has become too deeply ingrained in how fans experience the game, players play, and coaches coach. In short, instant replay is now part of the narrative arc of the NBA. As Patrick Saunders, a reporter from the Denver Post wrote: “Indeed, instant replay itself has become

theater as fans — whether at home on their couch, or in the stadium, or in a sports bar — wait on the edge of their seats until the replay call is announced” (2013, para.12).

The controversy and debate about when and how much replay should be allowed will not go away, because no matter how much technology advances, no matter how much it seeps into the game, it will never be 100% accurate (MacMahon et al., 2015). Referees, like the players and coaches, are humans and the concept of human frailty and imperfection has and will continue to be an important feature of the sports narrative. For all the cries for perfection, unbiased decision-making, and accuracy, players will miss shots, coaches will make bad choices, and referees will blow calls. But, what the use of replay technology in the NBA has taught us is that, though it might fall short, the moon shot of 100% accuracy and full transparency from the league office is, in Joe Borgia’s words, “a necessary evil” (Lewis, 2019).

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