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Significance and Impact of the Basketball Data Revolution
Japanese Basketball Enthusiasts as a Case Study

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Introduction

In recent years, the advent of big data has dramatically transformed various fields, including sports. This study delves into the intricate interplay between big data and basketball, underscoring how this synergy has revolutionized the sport. By examining the evolution of data analytics in basketball, the research highlights the profound impact of technological advancements on both the professional leagues and grassroots levels. The study also explores the nuanced perspectives of Japanese basketball enthusiasts, offering valuable insights into their interactions with and perceptions of the sport in the era of the data revolution.

At the heart of this transformation lies the integration of advanced data analytics into basketball. This shift has not only enhanced the strategic depth of the game but also reshaped the fan experience, allowing for a more interactive and engaging approach to spectatorship. The research analyzes the dual aspects of the data revolution in basketball - its role in elevating the game's strategic complexity and the way it has influenced fans' engagement and understanding of the sport.

Furthermore, the study investigates the evolving landscape of basketball from the perspective of Japanese enthusiasts. Through comprehensive questionnaires and interviews, the research captures the sentiments and viewpoints of this demographic, revealing their awareness and opinions on the

pervasive influence of data in basketball. This exploration provides a unique lens into how data analytics has permeated the sport, influencing everything from game strategies and player dynamics to fan interactions and media coverage.

In synthesizing these elements, the research offers a holistic view of the basketball data revolution. It not only underscores the symbiotic relationship between big data and modern sports but also provides a deep dive into the impact of data analysis on the sport's evolution. The findings from Japanese basketball enthusiasts add a valuable dimension to this discourse, highlighting the broader implications of the data revolution in basketball.

1. The Relationship Between Big Data and Sport

1.1. Definition of Big Data

Before delving into the intricate relationship between big data and basketball, it is important to provide a clear definition of the concept. However, because the emergence of big data coincided with the popularization of computers and the Internet, there is some ambiguity surrounding its precise contours. Broadly speaking, the term "Big Data" has been in circulation since the 1990s, with some attributing its popularity to John Massey. It refers to datasets of a scale or complexity beyond the reach of traditional data processing applications.

A more modern 2018 definition holds that "big data is where parallel computing tools are needed to process the data" (Fox, Charles. 2018).[1]

At the level of basketball, data similar to scoring, rebounding, and assists, which are obtained directly through the collection and indicate production, are commonly referred to as base data or base statistics; the operations performed on the base numbers in order to measure aspects such as a player's efficiency or overall ability are commonly referred to as data analytics; and data analytics are used to derive data that evaluates a player's efficiency or on-court impact, which we refer to as advanced data or advanced statistics.

1.2. Characteristics of Modern Sports and Big Data

There are seven characteristics in the modernization of sports, two of which are closely related to big data: "quantification" and "the quest for records". Allen Guttman aptly observes that "The accumulation of statistics on every conceivable aspect of the game is a hallmark of football, baseball, basketball, hockey, and of track and field sports too. " [2]

The strong connection between modern sports and data has also led to more people and money being invested in research in this area, facilitating the advancement of both together. This is not only reflected in the fact that in-game statistics have become more detailed and complex but also in the fact that different devices can be utilized to monitor an individual's athletic performance, allowing both athletes and enthusiasts alike to understand and record their reactions to their sport in a more objective manner.

The dissemination of in-game statistics in newspapers and other media platforms serves as a catalyst for viewers to gain a more in-depth understanding of athletes' performance, improving the entertainment aspect of the game and contributing to the rapid development of sports. In the digital age, real-time statistics are shared over the internet, building a more intimate bridge between fans and the game. At the same time, "statistics of the game are an integral part of the statistics of modern society. " [2] The development of the latter provided the underlying technology for sports statistics, which in turn provided a whole new field of experimentation for modern social statistics.

The synergy between the impulse to quantify and the pursuit of excellence culminated in the concept of the "record". Records transcended mere accolades to become the subject of fan discussion and the driver of league revenues. In contemporary basketball leagues, the traditional compilation of points or rebounds no longer satisfies viewers. Nowadays, whether it is the selection of MVP and other awards or the comparison and discussion between fans about different players, it is no longer simply about who scores more points, gets more rebounds, or assists. People pay more attention to the player's efficiency on the court, the contribution to the team's victory, and other aspects. This also encourages players to pay more attention to the right way to play the game, rather than just increase the number of shooting attempts to get more points, and indirectly improves the quality of the game as well as the spectacle.

On the other hand, new algorithms that generate advanced data become the basis for creating new records, and more different records can keep fans enthusiastic about the game and create more topics to keep fans fresh. For example, Nuggets player Jokic has led the NBA in advanced statistics since 2020 and has won two MVP trophies as a result. But he was also controversial because he had not won the most important award, the championship, at that time. For example, Kendrick Perkins once said in the ESPN program "Who should be the MVP of the 2022-23 season" that Jokic would like to get a triple-double by stats-padding to show that Jokic shouldn't be elected as the MVP of the 2022-23 season.[3]

But after the Denver Nuggets won the NBA championship in 2023 with Jokic at the helm, fans and media outlets used advanced statistics to compare Jokic to various superstars in history, praising Jokic without fear.

But regardless of how the data is used, or how it is viewed, the fact that the data itself adds to the conversation of the sport, while making the bond between the sport and the fans stronger, all contribute well to the co-evolution of sport and data.

1.3. The Interplay between Sport and Big Data

Despite the seemingly different nature of data science and sports, the combination of the two can yield extraordinary insights.

Baseball is known as the game with the largest amount of data and mathematician Cathy O'Neil, whose *Weapons of Math Destruction* (2016)[4] praises baseball as an "ideal" and "healthy" example of the use of mathematical models. And the fast-paced sport of basketball, which is full of physical confrontations and tactics, offers new directions for thinking about data development. In basketball's professional leagues, coaches use data analytics to inform decision-making and develop strategies with a higher winning percentage; managers use data analysis to select players better suited to their team's tactics; players use post-game data to modify their approach to the game and improve their training; and fans discuss the game in greater depth with more detailed data. Statisticians, on the other hand, are using the

professional sports arena as a laboratory. Some statisticians are analyzing player movements behind key goals, helping coaches and players combine their intuition with new data, and in doing so experimenting with data analysis to identify patterns of human movement in different areas. Big data and sports both interact and evolve together.[5]

2. The Evolution of Data Analysis in Basketball

The gradual maturation of data analytics technology and the development of basketball commercial leagues, combined with the inextricable link between modern sports and big data, have led more data analysts and basketball practitioners to look at the intersection of these two industries, prompting the beginning of the development of basketball data analytics. The trajectory of data analytics in basketball can be broadly categorized into hardware and software.

2.1. The Software: People from Various Industries Began to Study Basketball Data

With the development of basketball itself, whether it is a commercial league or a college league, the desire to win is getting stronger and stronger. To more accurately identify the factors that make a game win, people are no longer simply satisfied with trusting the intuition of people with professional basketball experience but go looking for ways to reflect the content of the game more objectively. Data fits this need perfectly. As the demand for data grows, more and more people are devoting their energies to the study of basketball data.

The origin of the progression of basketball data analysis can be traced back to 1959, when Frank McGuire and Dean Smith, the basketball coach and assistant coach of North Carolina University, introduced the concept of "per

possession" in their seminal work *Defensive Basketball*[6]. This pioneering notion segmented the continuous flow of basketball into discrete individual rounds, paving the way for qualitative investigations into basketball statistics. With "per possession" as the foundational unit, data analysts embarked on objective assessments and comparisons of player efficiency. This innovation catalyzed the creation of advanced metrics like BPM (Box Plus-Minus) and LEBRON, integral for evaluating player efficiency.

In 1980, economist Louis Guth astutely recognized the potential of data analysis within basketball. Leveraging economic principles of marginal benefit, Guth formulated the FAMS and FAME data models to quantify the impact a new player could wield within a team. In 1982, Guth's managerial involvement with the 76ers culminated in the utilization of these data models to analyze Moses Malone, the reigning season's MVP. This pivotal decision led to the acquisition of Malone through a trade, propelling the 76ers to secure the NBA Championship that very season. This marked the inception of data-informed decision-making in NBA history, a resounding triumph that laid the bedrock for subsequent managerial utilization of data analysis.[7]

In 1997, the establishment of APBRmetrics marked a critical juncture. APBRmetrics, synonymous with the objective scrutiny of basketball statistics, emerged as the birthplace of basketball analytics. While pivotal figures like David Berri and Dean Oliver also played significant roles, APBRmetrics provided a shared platform for data analysts to convene, propelling the

basketball data revolution forward.

The inception of the Sloan Basketball Conference in 2007 by Daryl Morey and Jessica Gelman, MIT students with a fervent passion for basketball analytics, marked a new era. This platform, birthed from the desire to facilitate discourse and idea exchange, evolved from a modest gathering of 175 attendees into a prolific congregation of over 3,000 participants. Renowned speakers from the realms of NBA, academia, media, and technology congregated to contribute to its growth. Notable outcomes of the conference include:

• Introduction of novel metrics and methodologies for gauging player performance, encompassing player tracking data, adjusted plus-minus, win shares, and real plus-minus.

• Unveiling of groundbreaking research encompassing optimal shot selection, defensive influence, lineup optimization, and injury prevention.

• Acknowledgment of exceptional contributions to basketball analytics through esteemed awards like the Alpha Award, Best Paper Award, and Research Paper Competition.

• Facilitation of collaboration and networking among basketball analysts, practitioners, and enthusiasts through dynamic panels, workshops, hackathons, and social gatherings.

The resonance of the Sloan Basketball Conference within the basketball data landscape is profound. It not only popularized and validated the application

of analytics in basketball decision-making but also fostered a culture of curiosity and innovation among aficionados and professionals. The conference's influence extended to the incubation of cutting-edge technologies and platforms for collecting, analyzing, and visualizing basketball data, exemplified by entities like Second Spectrum, SportVU, Synergy Sports, and NBA.com/stats.

2.2. Advancements in Hardware

The data revolution within the NBA has been accompanied by a series of pivotal hardware upgrades that have irrevocably transformed the landscape of the game. Noteworthy examples underscore the league's unwavering commitment to harnessing cutting-edge technology in the pursuit of enhanced insights and experiences.

A watershed moment arrived in 2009 when the NBA introduced SportVU cameras across 10 arenas, signaling a groundbreaking shift. These cameras meticulously tracked player movements and ball trajectories at a staggering rate of 25 frames per second. This innovation laid the foundation for comprehensive data acquisition, affording unparalleled insights into aspects like speed, distance covered, player interactions, passes, rebounds, and much more. The efficacy of the system prompted its rapid expansion to encompass all 30 arenas by 2013, thus establishing an intricate web of real-time data acquisition.

The year 2017 witnessed a pivotal transition as the NBA embraced

Second Spectrum, an advanced player-tracking technology that propelled data analytics to new heights. Distinct from its predecessor, Second Spectrum leveraged the prowess of machine learning and computer vision to meticulously dissect gameplay dynamics. This transformative system unlocked a treasure trove of information, encompassing shot quality assessments, defensive impact evaluations, passing networks analysis, and intricate insights into spacing on the court. Second Spectrum heralded an era of granular understanding, enabling teams, players, and enthusiasts to perceive the game through an unprecedented lens.

In 2021, the NBA and Second Spectrum embarked on a monumental expansion of their partnership, marking yet another stride in their shared journey of innovation. The collaboration's scope extended beyond the confines of existing technologies, venturing into the realm of augmented reality, personalized highlights, and interactive gaming experiences. This multi-faceted endeavor promised to redefine fan engagement, media interaction, and team dynamics, setting the stage for a comprehensive transformation of the NBA experience.

These hardware upgrades, pivotal in their impact, stand as a testament to the NBA's unwavering pursuit of data-driven excellence. The SportVU cameras, Second Spectrum technology, and the expansive partnership with Second Spectrum all coalesce to engineer a revolution that redefines the NBA landscape through the prism of data. The relentless quest for innovation

continues to propel the league's evolution, beckoning forth a new era where data ceaselessly illuminates the court and resonates with fans around the globe.

2.3. Empowering Fans: The NBA's Data-Driven Evolution

A fundamental tenet of the NBA's data revolution lies in its unwavering commitment to enhancing the fan experience. The league's dynamic engagement with data has led to a series of transformative changes, forging an unprecedented synergy between basketball and its global audience.

In 2013, the NBA unveiled NBA.com/stats, a digital sanctuary that grants fans unparalleled access to a wealth of data and analytics encompassing every facet of the game. From comprehensive player tracking insights to intricate shot charts, advanced statistics, and captivating video highlights, this platform serves as a veritable treasure trove for enthusiasts seeking to immerse themselves in the intricacies of the sport. The launch of NBA.com/stats signaled the inception of an era where fans could actively engage with data, unfurling a new dimension of interaction.

An innovative partnership between the NBA and Twitter took flight in 2016, culminating in the creation of NBA Twitter Live. This live-streaming venture redefined the contours of fan engagement during games. It seamlessly merges real-time commentary and analysis by NBA personalities and influencers with data-driven insights, fusing statistical acumen with riveting game action. The immersive experience further integrates interactive elements, inviting fans to be

active participants in the dialogue surrounding the game.

The NBA's relentless pursuit of enhancing fan engagement soared to new heights with the introduction of NBA TV in 2019. This subscription-based streaming service introduces a panoply of choices and personalization options for game viewing. Empowering fans to curate their own experiences, NBA TV offers an array of camera angles, alternate audio streams, intricate statistics, and dynamic graphics. This democratization of viewing transforms the passive into the participatory, empowering fans to sculpt their narrative.

The disruptive impact of the COVID-19 pandemic elicited a swift response from the NBA. In 2020, the league joined forces with Microsoft to birth "NBA Together." This digital initiative illuminates the path forward, fostering unity and support for fans, players, and communities. It conjures virtual fan experiences replete with live games enriched by fan reactions, interactive polls, quizzes, and resonant social media campaigns. NBA Together served as a beacon, fostering connection and community amidst adversity.

The year 2021 heralded a watershed moment with the unveiling of the AI-powered NBA app, heralding an era where data and artificial intelligence coalesce to revolutionize fan engagement. Leveraging machine learning, this app offers a personalized, immersive journey for each fan. It delivers tailor-made content, suggestions, and notifications based on individual preferences and behaviors. Augmented reality, gamification, and seamless social media integration amplify the immersive experience, embodying the very essence of

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data-driven innovation.

Because of the NBA's strong support for open data, ordinary fans can also easily check and use a wide variety of game data. Whether it is the basic data of players published on the official NBA website, or the anecdotes about players' and teams' data summarized in basketball forum websites, or the various advanced data recorded in professional sports data websites, ordinary fans can have free access to them. By publicizing the data, the fans who can't watch the complete game understand more about the current situation of the team and the players, strengthen the connection between the fans and the league, and also provide a new viewing angle for the ordinary fans; at the same time, letting more people contact the data, understand the data, and learn the data also promotes the popularity degree of the data, and provides more talent reserves for the development of the data.

In summation, the NBA's synergy with data underscores a commitment to not just games, but to the global community that embraces them. These transformative changes coalesce to forge a dynamic bond between the league and its ardent fans, epitomizing a future where data fuels engagement and interaction.

3. Evaluating the Impact of the Data Revolution on Basketball

The data revolution has undeniably ushered in a new era of insight and innovation within the realm of basketball. However, its influence is complex, birthing both affirmative and concerning outcomes that ripple across the game, its participants, and its fervent community.

3.1. Positive Assessments

Central to the data revolution's positive impact is the profound illumination it brings to every facet of the game. Data analytics serves as an adept guide, unfurling a deeper understanding of game strategies, player dynamics, and the complex web of outcomes. It empowers teams to optimize performance, effectively identifying strengths and vulnerabilities that, when harnessed, confer a competitive advantage of paramount significance. This strategic acumen has undeniably elevated the standard of play, fostering an environment where innovation thrives.[8]

Additionally, the data revolution has heralded a paradigm shift in fan engagement. Fans, now armed with a wealth of insights, are empowered to dive into intricate details about their cherished teams and players. This surplus of information not only fuels the fan experience but also spawns a realm of increased interaction, engagement, and personalization across diverse platforms. Fans are not just spectators; they are co-conspirators, deeply

enmeshed in the unfolding narrative of the game.[7]

Furthermore, the data-driven resurgence has been a catalyst for innovation and creativity. Teams and players, emboldened by data-backed insights, explore novel tactics, skills, and styles of play, redefining the very contours of basketball's essence. Data has an uncanny ability to unveil concealed patterns, challenge age-old wisdom, and spark audacious new ideas. This ferment of innovation has breathed life into the game, ensuring its continual evolution.

3.2. Negative Assessment

However, the surge of the data revolution is not without its challenges, raising flags that warrant thoughtful consideration. The potential misuse, manipulation, or misinterpretation of data analytics looms as a prominent concern. Teams, players, and fans alike must tread with caution to ensure ethical application, preventing unintended consequences that could mar the integrity of the game.

Amidst the surging wave of data that permeates basketball, there lies a poignant concern – the erosion of the very essence that renders the sport a mosaic of intuition, passion, and artistry. While data analytics undeniably constitutes an essential facet, it also unfurls the potential of distilling the game into a clinical tableau of figures, statistics, and algorithmic scrutiny. This inherent dichotomy between the quantitative and the qualitative poses a

profound question: Can data coexist harmoniously with the emotional tapestry that forms the crux of basketball's allure?

The omnipresence of data, while catalyzing evolution and refinement, elicits a nuanced predicament. It stands as a double-edged sword, capable of chiseling away at the intangible facets that make basketball an embodiment of human expression. As data-analyzed insights amplify strategic decisions and transform training regimens, there exists the risk of relegating the sport to a mere accumulation of numbers, reducing the vibrant symphony of athleticism to a series of algorithmic notes. In this trajectory, the visceral connection that enthusiasts and professionals forge with basketball's emotional core could be eclipsed, leaving behind a hollow shell devoid of the raw beauty that once defined the game.

A pertinent parallel can be drawn from baseball, a sport that has traversed a similar path within the data revolution. Transformative changes in strategy, epitomized by the amplified use of home runs, strikeouts, and defensive shifts, have augmented the analytical underpinnings of the game. Yet, a poignant undercurrent underscores the evolving narrative – the game's dynamic diversity and excitement have subtly waned for myriad fans and experts. This rings as an eloquent reminder that the delicate interplay between data and the sport's soul must be vigilantly safeguarded.

In conclusion, as basketball navigates the data-infused terrain, an inherent tension emerges between the empirical and the experiential. A careful

equilibrium must be struck, one that acknowledges data's indispensable role while fervently preserving the human, emotional dimensions that define the sport's resonance. At the same time this is an important part of my interviews, asking my interviewees how they feel when they watch basketball games now allows us to get a handle on how the data revolution has affected basketball fans to some extent.

Furthermore, the data revolution has cast a spotlight on disparities in access. As data and technology become pivotal assets, inequities in their distribution emerge, deepening the chasm between the elite echelons and grassroots levels of the game. The advantages accrued by those with access to robust data analytics can inadvertently amplify the challenges faced by those without these resources, potentially hindering the balanced development and participation of young and amateur players.[9,10]

In the final analysis, the data revolution has woven a complex tapestry of progress and pitfalls. As basketball navigates this landscape, it is imperative to embrace the positives while proactively addressing the negatives, steering the course toward a future where data augments the essence of the game while upholding its cherished values.

4. Exploring the Perspectives of Japanese Basketball Enthusiasts

4.1. Preparation for the Conduct of Investigations

I have been playing basketball frequently since I was 13 years old. Whether it's as a spectator or a fan following the NBA, CBA, and other professional leagues, or supporting the national team in the FIBA, I have never stopped paying attention to the game of basketball; and as a player participating in the game I have enough time and experience to accumulate, I have been involved in basketball since my first year of junior high school, and started to develop my own training program when I graduated from my junior high school. I started playing basketball in my first year of junior high school, started my own program to train my basketball skills when I graduated from my third year of junior high school, joined my school's team to play in college, and now I've been playing on a social basketball team in Japan for 6 years. Therefore, I am very interested in the changes in basketball, and I am able to ask more in-depth and detailed questions about basketball in interviews, which is the basis of my ability to conduct this research.

As a Chinese national who has been involved in amateur basketball tournament activities in Japan for more than five years, it gives me a unique perspective to glean insights from Japanese enthusiasts who are passionate about the game. A substantial portion of my basketball comrades ardently engage in basketball activities on a weekly basis. The landscape reveals a

substantial number—approximately 620,000 individuals in Japan—whose ardor for the sport classifies them as seasoned basketball aficionados, who play basketball more than once a week.[11] To capture their sentiments and viewpoints, I embarked on a comprehensive endeavor employing questionnaires and semi-structured interviews. The aim was to unveil the awareness and opinions of Japanese basketball devotees pertaining to the pervasive data revolution in basketball.

4.2. Initial Foray: Questionnaire Exploration

My initial stride involved orchestrating a questionnaire survey that reached out to the orbit of basketball enthusiasts within my sphere. The purpose of this questionnaire was to collect a broader base of information about Japanese basketball enthusiasts so that I could further select more valuable interviewees; and collect their views on "changes in basketball" and "basketball data analysis", which would allow me to get to the point more quickly when I conducted the subsequent interview. This inquiry encapsulated foundational information: their basketball engagement initiation, the inception of participation in games, the impetus behind their game-watching and playing, their familiarity with basketball team data analysis, the depth of their comprehension, and their insights into the transformation of basketball since their introduction to the sport. This information not only laid the groundwork for subsequent interviews but also facilitated a targeted approach to probing a diverse array of interviewees.

4.3. Deeper Dive: Semi-Structured Interviews

The fulcrum of my exploration centered on engaging in semi-structured interviews with a cohort of pivotal subjects. Among these, a nucleus comprised the 14 members of the amateur basketball team I am an integral part of. These individuals, entrenched in regular gameplay and possessing a longstanding association with the sport, were deemed prime candidates for unraveling the nuances of basketball's metamorphosis. Moreover, my outreach extended to rival teams encountered during various matches, affording an opportunity to glean insights from diverse perspectives.

4.4. Structuring the Interviews

The semi-structured interviews were meticulously crafted to glean a panoramic view of the subjects' perceptions. Anchored in the following inquiries, the interviews probed the gamut of their perspectives:

1. Evolving Game Dynamics: Has your perception of the basketball games you presently watch undergone a transformation since you initially started engaging with the sport? If so, do you perceive this shift as positive or negative? What facets have experienced this change?

2. Personal Evolution in the Game: Has your approach to basketball evolved from the time you first embarked on your journey? Do you deem this

change as favorable or unfavorable? How has this transformation manifested?

3. Data Literacy in Basketball: Are you acquainted with the domain of data analysis in basketball?

4. Impact of Data Analytics: In your view, has the incorporation of data analysis reshaped the landscape of basketball? How has the sport's essence been impacted by this transformation?

5. Monetary Willingness for Data Analytics: Are you inclined to invest resources in basketball data analytics? If so, what specific services within this realm would interest you? If affirmative, what financial bracket would you consider for such services?

Adhering to the semi-structured format, the interviews were also tailored to respond dynamically to the subject's responses during the course of the conversation.

5. Findings from the Questionnaire and Interview

5.1. Questionnaire Results Briefly

Delving into the comprehensive analysis of the questionnaire survey, a vivid panorama emerges, illuminating the intricate contours of basketball enthusiasts' perspectives. The interviewees, encompassing an age bracket of 18 to 38 years (**Figure 1**), mirror the age distribution outlined in the "sports life data" disseminated by the Sasakawa Sports Foundation in 2018. The age concentration of the interviewees echoes that of the broader basketball populace, aligning primarily within the 20 to 40-year-old range.[11] This synchronization establishes a solid foundation, enabling us to confidently infer that the questionnaire interviewees aptly mirror the age composition of seasoned basketball enthusiasts in Japan.

Figure 1: Your Age
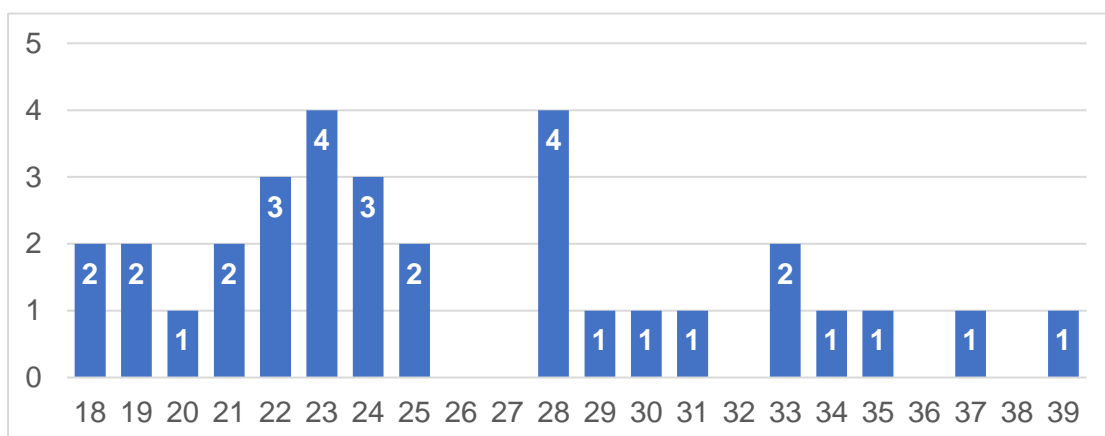
At the same time, the questionnaire, in which different generations of basketball enthusiasts participated together, provides an insight into whether there is any difference in the views of basketball among enthusiasts of different generations. The majority of the interviewees showed a high degree of similarity in their answers regarding the characteristics of basketball nowadays, mainly focusing on the fact that the number of three-point shots in the game has become more frequent, and the average score of the game has become higher. Through the interviews, it is possible to understand each person's impression of what basketball looked like when they first got involved in the sport.

5.2. Temporal Connection: Getting Started in Basketball

Considering the age at which the interviewees began their basketball journey was concentrated in elementary and middle school (**Figure 2, Figure 3**), an important revelation emerges. Interviewees generally had ten or more years of experience in basketball, a sufficient span of time for them to be able to more clearly determine whether basketball has changed, and for them to be able to keenly grasp the subtle changes in the game. Sufficient experience in basketball activities makes the part of the questionnaire about perceptions of changes in basketball more reliable.

Figure 2: When was the first time you saw a basketball game?

3.1%
18.8%
28.1%
43.8%

- Before elementary school
- At elementary school
- Junior High School
- In High School
- At University
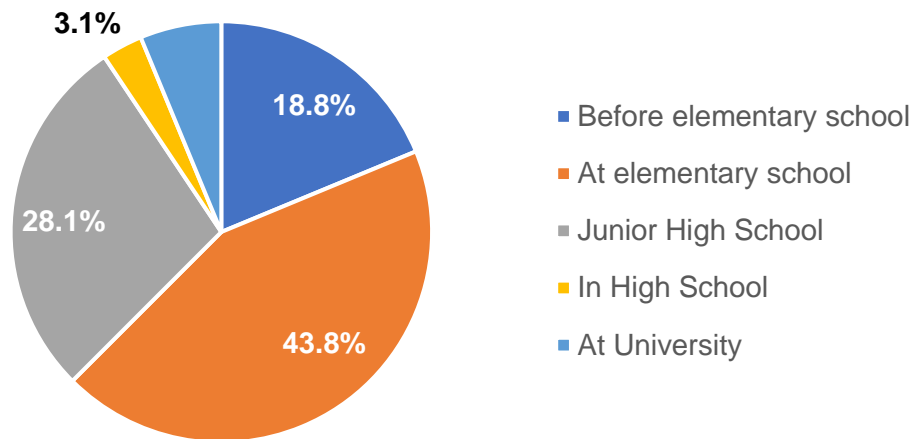
Figure 3: When was the first time you played basketball?

3.1% 3.1%
9.4%
28.1%
56.3%

- Before elementary school
- At elementary school
- Junior High School
- In High School
- At University
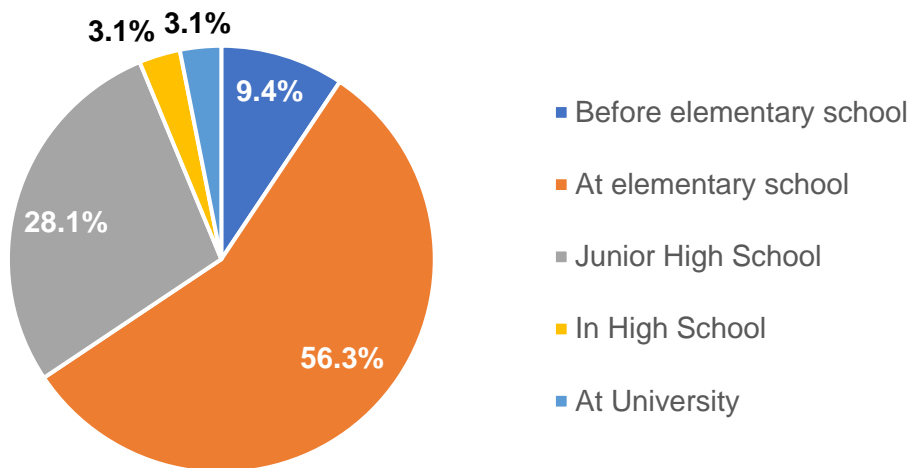
5.3. Perception of Evolution

Both in the section on "Watching" and in the section on "Playing" basketball, more than 80% of the interviewees explicitly acknowledged that they have perceived changes in both "Watching" and actively "Playing" basketball (**Figure 4, Figure 5**). This unequivocal affirmation emphasizes that the changes that have occurred in the game of basketball during this decade have been perceived by the majority of Japanese basketball enthusiasts. However, what factors have led to such a noticeable change in the sport of basketball, or how data analysis has played a role in this change, needs to be examined in depth through the ensuing surveys and interviews.

Figure 4: From the time you first saw the game to the present, have you noticed any changes in the content or coverage of the game as you watch basketball games?

- Yes
- No
- Cannot say each way
- I do not know

3.1%
0.0%
15.6%
81.3%

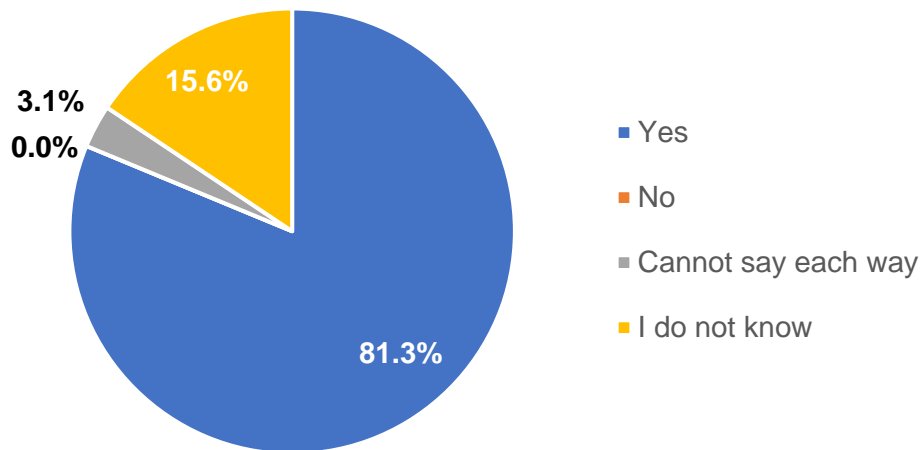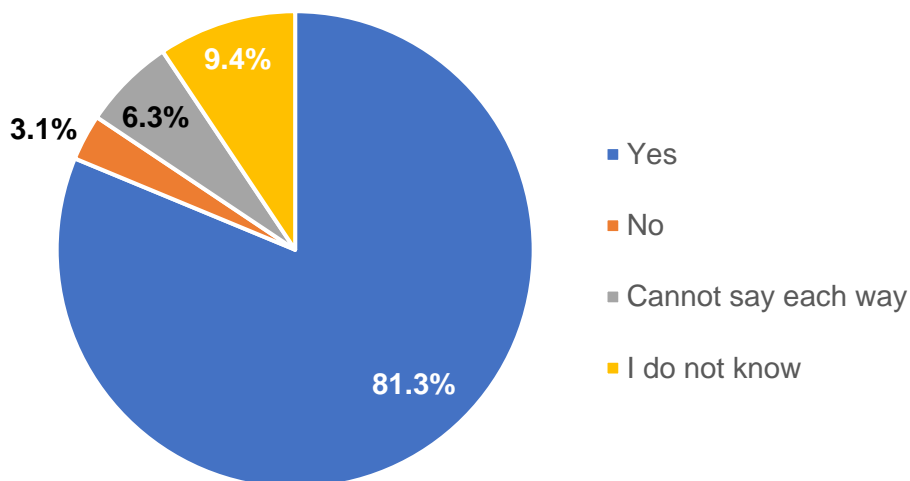**Figure 5: Have you noticed any changes in your game skills, tactics/strategy, content, etc. of playing basketball from the time you first played to the present?**

- Yes
- No
- Cannot say each way
- I do not know

3.1%
6.3%
9.4%
81.3%

5.4. Exploring Enthusiasts' Level of Understanding of Data Analytics

Additionally, we provided a perspective on interviewees' familiarity with and interest in basketball data analytics. A noteworthy revelation surfaced; 72% of the 32 interviewees in the questionnaire had some interest in the field. Seven of these individuals explicitly stated that they cared about data teams or players, and two stated that they cared a great deal about data in basketball (**Figure 6**).

As for the responses on how much they know about data and statistical analysis in basketball, more than half of the interviewees indicated that they have some knowledge about data and statistical analysis in basketball. There was also one person who explicitly stated that he understood basketball data, and two people stated that they had sufficient knowledge about data and statistical analysis in basketball (**Figure 7**).

This suggests that data in modern basketball has some influence on the average basketball enthusiast. The rich variety of data on basketball interests basketball enthusiasts to a greater or lesser extent. The relatively long duration of basketball games and the fact that professional leagues, such as the NBA, have a large number of teams and long seasons, do not allow most fans to have enough energy to watch a full game. However, the love of the game still makes enthusiasts have the need to understand the game, so enthusiasts are willing to understand the data, and then through the data to grasp and understand the content of the game, as well as the direction of the team and the state of the players.

The motivation for enthusiasts to pay attention to game statistics and how they view and use these specialized basketball statistics will be discussed in more depth in the following interviews.

Figure 6: Are you interested in data and statistical analysis regarding basketball games, players, and teams?
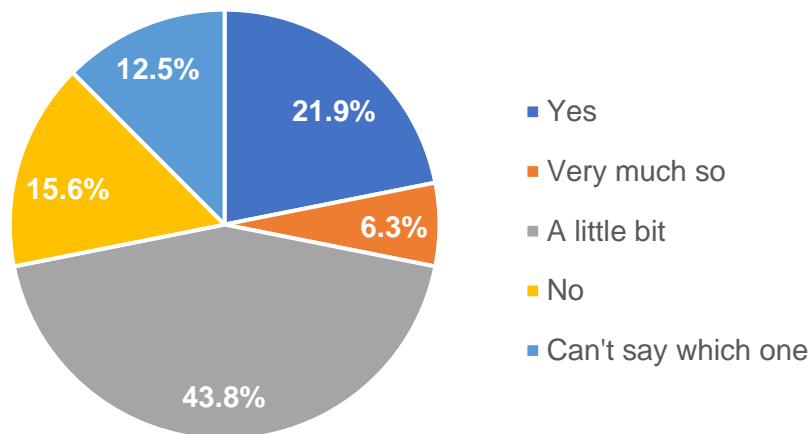
Figure 7: How much do you know about data and statistical analysis in basketball?
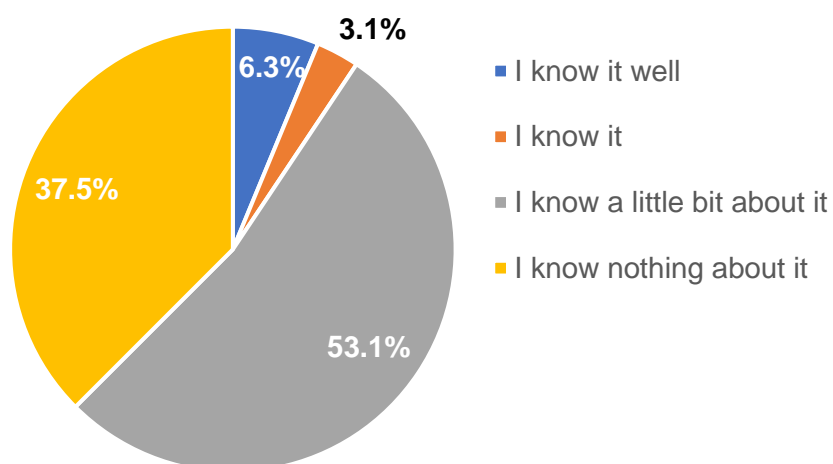
5.5. "Watching" and "Playing" Against Expectations

In the 32-person sample, roughly the same number of people thought that the data influenced their experience of watching the game as thought that the data influenced their participation in the basketball game. 12 people chose to feel the impact of the experience of watching the game and 6 people did not. 13 people in the experience of playing the game felt the impact of the data analysis and 5 people did not. The total number of people who responded that they couldn't say and didn't know was the same as 14 people (**Figure 8, Figure 9**).

Figure 8: From the time you first saw the game to the present, have you ever felt the impact of data/statistical analysis when watching basketball?

- Yes
- No
- Cannot say each way
- I do not know

Figure 9: From the time you first played until now, have you ever felt the impact of data/statistical analysis on your basketball playing experience?

- Yes
- No
- Cannot say each way
- I do not know

First, while most basketball enthusiasts have some interest in and understanding of data in basketball, they are ambivalent about whether the development of data affects the games they watch or the games they participate in. Many therefore chose to answer, "I don't know" or "I can't say either way".

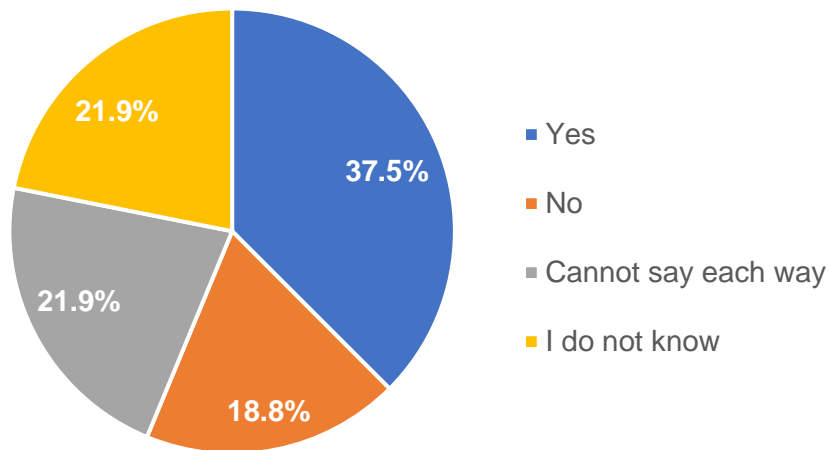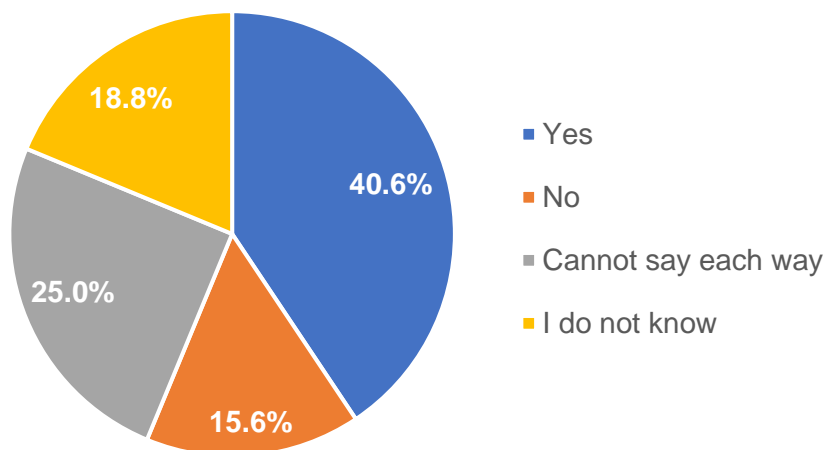Second, the results of the number of people who thought that the data influenced their experience of watching the game and the number of people who thought that the data influenced their participation in the basketball game were very different from my own experience and the guesses I had made before administering the questionnaire.

My own experience in watching basketball games, especially NBA games, is that data has a huge impact on the game. Whether it is the game screen will often insert a variety of traditional and advanced data, and commentators in the commentaries will also quote a large number of data to support their own views. In professional basketball forums, regarding team comparisons or player comparisons, both professional basketball practitioners and amateur basketball enthusiasts will use a lot of data, or even create their own tables as the basis for their own opinions. In the basketball games I have participated in, the use of data is not obvious. Although I can feel that people are imitating the more advanced and efficient methods of NBA players, it is a bit far-fetched to directly link these changes to the influence of data.

However, in the questionnaire survey of Japanese basketball enthusiasts,

even more people thought that data had influenced their participation in basketball than they thought that data had influenced their experience of watching the game. This figure is far from what I suspected before I started the questionnaire, and I think there are several main reasons for this gap:

1. of those who felt that data analysis did not affect the experience of watching the game, without exception, began their basketball training as Center or big-man players. As a result, their primary focus when watching games also tends to be on the game approach and performance of the Big Man players. In the NBA, changes in the way inside players play have been made to accommodate shifts in the NBA's overall style of play, and the main job of big-man players remains defense and grabbing rebounds, with the overall content of the game-changing insignificantly. This may be one of the reasons that the demographic that believes that the data has not had an impact on the experience of watching the game is predominantly big-man enthusiasts.

2. Differences in the rules commonly used in amateur basketball in China and Japan caused a deviation between my conjecture and the actual situation. Although there are a large number of outdoor basketball courts in China that are free to use, and the courts and props are FIBA-compliant, amateurs generally choose the half-court rule for basketball, and even the three-point line exists in many areas, but scoring a point is only counted as one point regardless of where it is scored anywhere on the court. As a result, although the experience of watching basketball games has led to the belief that players in the

professional leagues make more three-point shots, the use of the three-point shot is still not practiced in actual amateur basketball games in China.

In Japan, on the other hand, enthusiasts play more full-court games and have been trained more systematically in the Bukatsu since they were young, so they use the three-point shot more often and are not particularly sensitive to changes in the three-point shot in the games they watch, resulting in roughly the same number of people believing that the data has had an impact on their experience of watching the game as those believing that the data has had an impact on the games in which they have been involved.

Exploring these responses in a little more depth. Nine people felt that they had felt a change as a result of the data in both their experience of watching and participating in basketball games and two people explicitly stated that they had not felt a change as a result of the data in either their experience of watching or participating in basketball games. There were two individuals who felt that they felt the impact of the data in their experience of watching basketball games and at the same time did not feel the impact of the data in their experience of participating in basketball games, and the reverse was also true for two individuals.

Taken together, the fact that 17 of the 32 responses chose either "don't know" or " can't say either way" once again indicates that Japanese basketball enthusiasts have a vague attitude toward the role of data development in the development of the basketball game.

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5.6. Analysis of the Interview

Many of the questions in my interviews dealt with "watching" and "playing" separately, so I made a point of separating the experience of watching from the experience of playing in many of the questions.

5.7. A Widely Noted Change: The Importance of the Three-Point Shot

All interviewees, regardless of age or their own role in the game, talked about the increasing importance of the three-point shot in the game and the increasing frequency of three-point attempts.

The three-point shot, as a rule, added to basketball over time, has given the sport greater uncertainty, enriched the pace and tactics of the game, and enhanced the spectacle of basketball. However, whether it started with the NBA's introduction of the three-point line rule beginning in the 1979~1980 season or the shortening of the three-point line to a uniform 22 feet in the 1997~1999 season, the three-point shot has not attracted so much attention and emphasis as it has in the last decade. As the interviewee put it, "The emergence of a talented player like Stephen Curry has elevated the efficiency of the game to an unprecedented level through the three-point shot, causing people to rethink what is the right way to play the game of basketball." An interviewee who pays close attention to the junior high school league said, "When I was in middle school the coaches' tolerance for three-point shots was relatively low, and if you shot a three-pointer instead of choosing to make a

layup on a fast break, the coach would be mad at you; but nowadays it is common to see players making such attempts in the game, and the coaches allow it a lot of the time. " As you can see, the changes brought about by the three-point shot have spread to amateur and student leagues, and even when I attended the Shinjuku Kumin Competition, I saw a large number of three-point plays in the women's teams' games.

Among the 14 interviewees, there was a general agreement that "the emergence of talented players like Curry has led to more attention being paid to the three-point shot in the game," and some of the interviewees also talked about a combination of factors, such as changes in NBA rules, that have led to more attention being paid to the three-point shot in the game. The tactical value of the three-point shot in the professional game climbed at the same time, amateurs also quickly began to imitate the techniques and tactics for the three-point shot. There are different accounts as to why amateurs mimic this style of play from Curry. "People of short stature are the mainstay of basketball enthusiasts in Japan, so using more threes to score points away from the basket is the best way to make up for the size disadvantage." "Whether it's the national team or the B-league or basketball enthusiasts, everyone is trying to create space on the court for others by moving faster and taking longer shots." Five of them clearly stated that the method of play of players such as Curry is very suitable for the actual conditions of Japanese people at the same time, but also can help improve their basketball level, so they try to imitate it.

And of the five interviewees who believe that the impact of the data revolution is directly related to changes in the frequency of three-point shooting, efficiency, and hitting percentage are words they often bring up. They believe that the three-point shot has many advantages that other offenses don't have, provided they can maintain a certain percentage of shots. "If you can keep a three-point shot with a thirty-three percent rate, it's just as efficient as a two-point shot with a fifty percent hit rate." "Three-point shooting not only makes it easier for you to score, but it also helps your teammates get better space to attack and improves the efficiency of the entire team's offense." "While participating in the university's departmental activities, the coach would arrange for us to practice three-point shooting and encourage us to shoot more three-pointers at a reasonable time during the game. This is because it makes the team's field goal percentage and scoring efficiency better and helps the team win games."

There were also insights into the changes that the three-point shot brings to the experience while watching the game. A significant portion of interviewees believe that the change in the NBA's scoring average has a lot to do with the popularity of the three-point shot. "Once upon a time, most of the NBA's plays centered around big men who operated in the paint area, so the offense had to be initiated from an area close to the baseline on every single possession. And nowadays, NBA players are so good at the three-point game that many teams even start initiating plays just as the ball crosses half-court, and then shoot after

one or two more dribbles. So, the overall pace has gotten a lot faster and the opportunities to score have gotten a lot better." I couldn't agree more with this interviewee's opinion, because when I first started following the NBA, it was the period when Yao Ming had just entered the NBA. In those days, whether it was the Miami Heat with Shaquille O'Neal, the Huston Rockets with Yao, the San Antonio Spurs with Tim Duncan, or the Dallas Mavericks with Nowitzki, most competitive teams started many of their plays with big men getting the ball in the low post. It takes more than 10 seconds per possession just to design the play so that the big man can get the ball in a position where he feels comfortable, and more than 10 seconds can be enough time to complete a whole play in the NBA today. As a result, the massive increase in the number of rounds played gives both sides of the game more scoring opportunities, leading to an increase in scoring averages.

Also, the faster pace of play and more three-point attempts have made for a more exciting viewing experience. "There was a time when a 10-point lead in the last 2 minutes of a game would make everyone feel safe and think it was a winnable game. But that's not the case anymore, a 10-point lead can be caught up or even reversed in less than a minute, which will keep the game in doubt until the last second." The added uncertainty that comes with the three-point shot allows enthusiasts to enjoy the complete game more fully, while also making each turn full of unknowns and surprises that hold the enthusiasts' attention. "Nowadays, NBA games change rapidly, and the effective attack

range of star players extends even to near the center line. As soon as the ball crosses the half-court, players like Trae Young can make three-point shots, which forces defenders to start defending from near the center line. But this defensive strategy also allows offensive players to get easier breaks, and the various options happen in a split second, making it impossible to blink while watching the game for fear of missing a single moment."

In the interviews I conducted, there was a consensus that more three-pointers in the game were positive, and that praise for three-pointers doesn't just appear in the experience of being a spectator. In the experience of participating in games as a player, one interviewee said, "When I participated in section activities in high school, my coach assigned me the task of grabbing rebounds and only allowed me to score through layups. But now the game of basketball requires everyone to be able to shoot threes, so I also started practicing three-point shots and began to master more basketball skills." He said that being able to master more basketball skills makes him very happy and that the fact that he can use these different skills in the game makes him feel recognized and needed by the team.

Two interviewees who are managers on their teams also gave another perspective on what they see as the positive impact of the three-point shot. "Three-point shooting allows even beginners to contribute to the game faster." Once upon a time in basketball, a player had to master a more comprehensive skill set to contribute positively to the game, and thus it took a longer cycle to

get accomplished in the game. A person who is already in the workforce, because he is unable to get enough training time in his daily life, and if he did not participate in basketball when he was a student, it will be difficult for him to contribute while participating in the game, and therefore it will be difficult for him to get enough participation and fulfillment to give up the game of basketball. This is one of the factors that make it difficult for untrained socialites to sustain the game of basketball.

But now, if a beginner in basketball wants to contribute to the game, he only needs to master the three-point shot. "We've been playing with Mr. A for over two years and he doesn't get the beginner's treatment anymore. When he first started playing with us scoring a field goal counted for double points, and several times he scored a three-pointer to change the game." In the present day, beginners are motivated to stay involved in basketball by contributing to the game and gaining a sense of accomplishment once they have mastered the skill of the three-point shot. Therefore, the popularity of the three-point shot has somehow made it easier for more people to participate in the game of basketball, and the greater number of participants can help the overall level of basketball enthusiasts to go to the next level.

5.8. Insights from "Watching" and "Playing"

A very important part of the interviews was to ask the interviewees how they felt about the changes that have occurred in basketball in a detailed and

in-depth manner. I asked each interviewee the following four questions:

Please describe what basketball games looked like when you first started watching them.

Please describe the difference you felt when you watched basketball games then and when you watch basketball games now.

Please describe what basketball games looked like when you first started participating in basketball activities.

Please describe the difference between the basketball activities you participated in then and the basketball activities you are participating in now.

Interviewees were not asked how they feel about watching and playing basketball now because, after the initial interviews, it was realized that the above elements were already included in the exploration of the changes that have occurred in basketball over time, so the feelings about watching and playing basketball now were omitted from subsequent interviews.

Almost all the interviewees follow the NBA and started following basketball when they first started following the NBA (**Figure 10**), so the following feelings, if not specifically mentioned, are the feelings that arise when watching NBA games.

Figure 10: Have you ever watched any of the following basketball games or leagues?
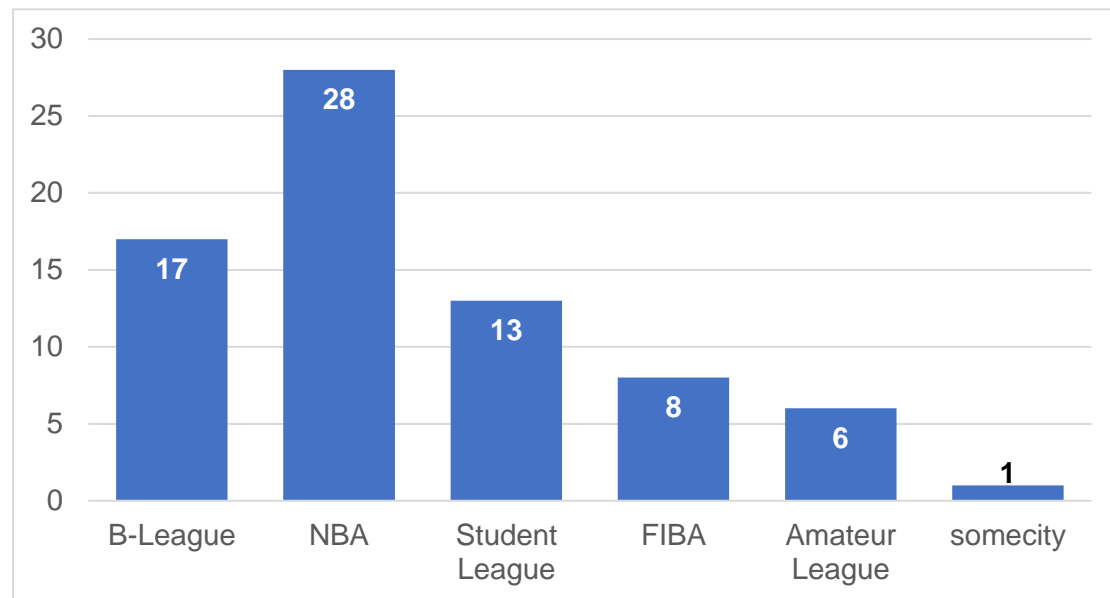
Interviewees of different ages gave different answers about how they felt when they first started watching NBA games.

Interviewees over 25 years old generally said that the NBA at that time mainly had the following characteristics: big men as the center of tactics; emphasis on defense; intense physical confrontation; more lenient refereeing and not interrupting the game so easily; and a strong sense of competition among players, etc. Some interviewees explicitly said that they did not want to watch NBA games at that time.

Some interviewees explicitly stated that they did not like the style of play at that time: "Fighting skills, totally fighting skills." "Rough fouls, fouls that were not part of the basketball action, made the game tactless." "It was a slow-paced game with very little scoring, and it was boring." But with the same content of the game, there were also interviewees who expressed their nostalgia for the game at that time. This began with comments about the stars of the time: "The

stars of that time gave a strong sense of oppression, whether it was Kobe

Bryant or Dwyane Wade, they came on the court to crush the opponent and

then win" There were many comments like this one, with the difference being

that the stars were replaced with Allen Iverson, O'Neal, or Paul Gasol, etc.

These interviewees said that the NBA stars of the time were more competitive,

and served as an incentive for their younger selves to participate in basketball.

Most of the interviewees disliked the slow pace of the game, saying that

the slow pace and excessive physical confrontation were important reasons for

the reduced entertainment of NBA games. However, one interviewee, who was

influenced by his father as a child, expressed a strong preference for physically

intense games. "My father is a basketball enthusiast who loves physical

confrontation and is always aggressive on the court, so I also pay special

attention to how players use their bodies to gain an advantage when I watch

the NBA and try to mimic their moves in my own games. That also allowed me

to get an advantage in the game from a young age."

The interviewees were generally more accepting of the aspect that

referees are more lenient in their calling scale. But this was mainly because the

interviewees were addressing the fact that current NBA referees are blowing

calls too liberally, limiting players' emotions and lengthening the overall length

of the game. "Originally a game didn't take two hours even in overtime, now

games often go over three hours. I'm usually so busy that it's hard to watch a

game for a whole morning. So now I do not like watching the game live, it's nice

to watch the highlights." In addition to their dissatisfaction with the increase in the length of games, interviewees showed even more emotion when it came to changes in the power of referees during games.

The NBA enacted what is commonly known as the zero-tolerance policy to further improve the quality and fairness of the game after the vicious brawl at the Palace of Auburn Hills in 2004. With the help of this rule, referees have gradually been given more power on the court, including the power to give technical fouls for players' complaints. That's why one interviewee, who is a certified basketball referee in Japan, said, "There are often referees who want to be the center of attention in games nowadays, and they take it as their achievement to send players out of the game, which is not the referee's job, and this practice makes the game unfair." Other interviewees have also expressed their disgust at the fact that the game nowadays is not flowing because of too many foul-calls and the game is becoming too long. This was also recognized among interviewees under the age of 25.

Interviewees under the age of 25, who have been watching NBA games roughly since around 2010, were not impressed with the big men in the game. The main reason for this, I believe, is that the dominance of big men was diminishing at the time due to changes in the league's rules and the emergence of talented players like Kobe Bryant who were proficient in both forward and guard skills. These interviewees, while agreeing that at one time the game was more defensive, more difficult to score on, and more physically intense, did not

appear to have views similar to those that considered the game at the time to be a fighting game.

Since their idols were more often guard players, whose size and technical characteristics were closer to the reality of Japanese basketball enthusiasts, they also imitated the skill characteristics of their idols more frequently than interviewees over the age of 25. Many of these interviewees talked about how they used to imitate Kobe as students, waking up very early in the morning for shooting drills and even training to score 1,000 shots a day.

When discussing how the data revolution has impacted the viewing experience, many interviewees first expressed their recognition of the advances in broadcasting technology. Whether it's the picture quality of game broadcasts, in-game replays, or even some of the 360° analog footage, all bear the hallmarks of technological advancement.

Data is being presented more and more to the viewers on the TV or internet broadcast screen. "Players' data are put up in real-time on the broadcast screen, sometimes it's the comparison data of the best performers of the two teams, sometimes it's the milestone records reached by the players, and sometimes it's the advancement data of certain players who have been performing hot in recent times." One interviewee who watches live NBA games every week said this. Another interviewee who has experience watching live games said, "There are big screens in arenas where players' stats are rolled out, and there are also stats that are aired that are not understood to have a

clear meaning." She also said that although she didn't understand the exact meaning of those advanced stats, he could still get a rough sense of how they were used to measure the role of certain specific abilities of players.

The impact of the data revolution on the game itself, with some interviewees expressing a clear interest in more tactical setups in the game. They felt that data analysis has clarified the strengths and weaknesses of each player, allowing coaches to be more targeted in selecting players with different skill sets to play with each other, and as a result, the game is now more skillful in teamwork. "Once the game was full of individual heroism performances, nowadays the coach will set up more tactics to improve the team's scoring efficiency, so that each player will play his role, and the team's teamwork becomes more skillful." A larger number of interviewees believe that the impact of data on the game is more focused on the defensive side of the game, and they believe that data is a more comprehensive analysis of the offense in basketball, so it will allow coaches to set up more targeted defensive plays. But overall, it was difficult for my interviewees to give a definitive answer as to how data analytics affects the game itself.

Data analysis presents a stronger impact after the game is over. "Regardless of whether one has time to watch the game or not, one will pay attention to the stats of the team one supports when their game is over." "Nowadays, the statistics can give a more comprehensive picture of the progress of the game and the status of the players." Almost all the interviewees

said that they would be checking the post-game stats, and more than half of them said that the wide variety of advanced stats now helps viewers get a quicker picture of the dynamics of the game and the performance of the players. Detailed post-game stats effectively strengthen the connection between the game and the enthusiasts, allowing enthusiasts to get the quickest information about the game.

In the section on their own experiences with the basketball activities they were involved in, each interviewee shared with me their experiences with the game they had played. Since most of the interviewees had the experience of participating in the school's basketball department activities, the answers given were relatively similar. The main characteristics were that the games at that time were dominated by individual offense on the offensive side and Zone Defense on the defensive side. Regarding individual performance, most of the interviewees said that they were not the most talented players, and showed aspirations and longings for the best players, as well as reluctance for their lack of ability, but all of these ultimately served as the motivation for them to keep up with their training and continue their basketball activities.

When talking about what kind of basketball activities they are currently involved in, probably because my interviewees and I often play basketball together, we are currently in a basketball environment that is relatively close to each other, so the answers given are relatively similar. The main points were as follows: increase in average scoring; more people making more frequent

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three-point shots; better tactical awareness of every player; more tactical designs in the game, both offensively and defensively; better at playing with thinking; and so on.

But even so, each interviewee's perception of the impact of data analytics on their experience of playing basketball varied widely. five interviewees who were deeply involved in the basketball department said that scouts in the college basketball department would obtain opposing teams' scoresheets and give them to the coaches, who would then combine the opposing team's data with the video of the game to analyze key points of the next game to improve their winning percentage. "We will watch the video together one or two practices before the game, and the coach will combine the scoresheet to tell us the skill characteristics of each opponent's player and the area where they specialize in shooting. I will also always remind myself on the court of what my coach has deployed before the game." "This pre-game analysis of the opposing team is very important and every team at every school prepares for this." **Figure 11**, **Figure 12**, and **Figure 13** are what one of my interviewees showed me about their team's summary of the characteristics of opposing players, as well as a datasheet of the opposing team obtained by scouts. In it, the characteristics of each player and what to look for when playing defense are succinctly and documented, as well as the tactics that the opposing team specializes in, and the characteristics of the players are recorded. Combined with the video analysis, it can be seen that there is a relatively high level of professionalism in

the activities of the university basketball department in Japan. Therefore, these five interviewees have a strong sense of agreement about the impact of data analysis on their own game.

Figure 11

No.	選手名	GS	PTS	3P M-A	%	2P M-A	%	DK	FT M-A	%	OR	DR	TOT	AST	STL	BLK	TO	PF	TF	OF	FO	DQ	MIN
73	結城 天翔		18	0-2	0	8-10	80	0	2-2	100	2	1	3	1	1	0	0	2	0	0	0	0	13:55
91	関根 悠人		4	0-1	0	1-4	25	0	2-2	100	1	3	4	4	1	0	1	1	0	0	0	0	14:52
	Team/Coaches		0	0-0	0	0-0	0	0	0-0	0	3	2	5	0	0	0	0	0	0	0	0	0	
	TOTALS		140	13-39	33	44-70	62	0	13-14	92	20	31	51	18	25	4	13	26	0	0	0	0	0

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No.	選手名	GS	PTS	3P M-A	%	2P M-A	%	DK	FT M-A	%	RBD OR	DR	TOT	AST	STL	BLK	TO	PF	TF	OF	FO	DQ	MIN
0	関 涼太郎		0	0-1	0	0-0	0	0	0-0	0	1	1	2	4	1	0	0	0	0	0	0	0	31:52
5	原田 大輝		3	1-2	50	0-0	0	0	0-0	0	0	1	1	0	1	0	1	0	0	0	0	0	3:50
7	永井 空		2	0-0	0	0-1	0	0	2-2	100	1	0	1	0	0	0	1	1	0	0	0	0	3:50
11	小松 達也	●	3	1-3	33	0-0	0	0	0-2	0	1	1	2	0	1	0	2	1	0	0	0	0	13:34
13	髙橋 陽己	●	21	1-2	50	9-13	69	0	0-6	0	4	6	10	1	2	0	2	3	0	0	0	0	36:09
15	藤原 郁弥		3	0-0	0	1-2	50	0	1-2	50	2	1	3	1	0	0	2	3	0	0	0	0	7:03
22	髙橋 謙心		1	0-0	0	0-1	0	0	1-2	50	0	0	0	0	0	0	3	0	0	0	0	0	3:50
30	大武 悠真	●	48	8-20	40	8-12	66	0	8-10	80	1	1	2	3	1	0	13	4	0	0	0	0	36:09
41	駒場 晨吾	●	2	0-3	0	1-4	25	0	0-0	0	1	0	1	0	0	0	2	1	0	0	0	0	27:30
46	柏倉 絢仁		1	0-0	0	0-0	0	0	1-2	50	0	2	2	0	0	0	2	0	0	0	0	0	3:50
47	熊田 尚輝	●	20	0-0	0	8-21	38	0	4-11	36	11	12	23	3	1	0	2	0	0	0	0	0	32:15
	Team/Coaches		0	0-0	0	0-0	0	0	0-0	0	3	8	11	0	0	0	0	0	0	0	0		
	TOTALS		104	11-31	35	27-54	50	0	17-37	45	25	33	58	12	8	0	30	13	0	0	0	0	0

No：背番号　PTS：得点　AVG：1試合平均得点　M：成功数　A：試投数　：成功率　2P：2ポイントシュート　3P：3ポイントシュート　DK：ダンク　FT：フリースロー　RBD：リバウンド　OR：オフェンスリバウンド　DR：ディフェンスリバウンド　TOT:合計　AST：アシスト　STL：スティール　BLK：ブロックショット　TO：ターンオーバー　PF：パーソナルファウル、クリア・パス・ファウル、アウェイ・フロム・ザ・プレイ・ファウル、フレグラントファウル、パンチングファウルの合計　TF：テクニカル・ファウル　FO：ファールオン　DQ：退場回数　MIN：試合出場時間

Figure 12 and its translation

朝鮮

DFはオールマンツー、ハーフマンツー、ハーフ1-3-1ゾーン、ハーフ2-3ゾーン、前から2-2-1プレスがあるが、基本マンツー。

全体的に身長が高いチームであるため、リバウンド注意

上の選手は全員ドライブ、3ポイント打ってくる

速攻やアーリーが多いため、キャッチアップ早く

エース2番
3ポイント、ドライブ、パワープレー全てやってくる身長も高く、スピードもある

4番
高身長ガードで、ドライブは鋭いが、ボール運びでドリブルスキルがあまり高くないため、プレッシャーかければ取れるかも？

1番
スリーのアテンド多い

0番
ドライブ、スリーが中心

TEAM A

DF is all court man-to-man, half-court man-to-man, 1-3-1 zone, 2-3 zone, starting from 2-2-1 full but basically man-to-man.

As the team is generally tall, they are strong in rebounds. All the upper players can drive and shoot 3-pointers.
Fast breaks are often quick, so catch up quickly.
Ace No. 2
3-pointers, drives, power-play, can do everything. Tall and fast
No. 4
Defend high and be ready for drives, not many dribbling mistakes when carrying the ball, pressure might cause turnovers?
No. 1
Shot a lot 3-pointers
 No. 0
Focus on drives and three

Figure 13 and its translation

桐蔭

基本マンツー
上のポジションの選手は全員ドライブしてくる
→3ポイントも打ってくる

速攻、アーリー以外はゆっくり組み立てて攻める

ドライブするときはスクリーンプレーが多い

7番
基本インサイドのパワープレーだが、ドライブもある
ため、3線意識。スリーは基本打たない。

23番
ボールを持ったら八割強スリーを打ってくる。
流れに乗ったら止まらないシューターであるため、チ
ェックしっかり。

36番
オールラウンダーな高身長フォワード。
本数こそ少ないが、スリーもあるため注意。

8番
出場は少ない。それかいない可能性が高い。
出たらしっかり仕事をするガード。
スリーの成功率が高いため、ノースリー。

TEAM B

Basic man-to-man
All players in upper positions will drive →
They will also shoot 3-pointers
Engage slowly unless it's fast-break, stand
ready Drives are often part of screen plays
No. 7
Basically a power play in paint area, but
also do dribbling and 3-way fast break.
Doesn't usually shoot threes.
No. 23
When holding the ball, 80% will shoot 3-
pointers. As a quick player who can't be
stopped once dispatched, check him.
No. 36
An all-rounder fast-type forward. Although
not frequent, be aware of the threes.
No. 8
A guard who plays less, but is focused
whenever he's on the court.
High success rate in threes, so no threes
allowed.

The remaining interviewees' most intuitive feelings about data analysis currently are also on the defensive side of the game. Currently, the use of data in Japanese amateur basketball is more of a personal analysis, and none of the interviewees mentioned analyzing the opponent's tactics in my interview. It's more about analyzing the opponent's individual player's ability and skill, such as the opponent's top three-point shooter prefers to shoot from specific positions, and the opponent's breakout player likes to shoot in certain ways, and so on.

Some interviewees also attributed the ability to use more different plays in actual games to the influence of data analysis. "Tactics that are often used in NBA games with a high success rate, I wondered if I could use the same tactics

when playing, so I trained with everyone on the team. Slowly the tactics the team could use became more and more abundant." He also said that he was able to learn a variety of tactics because of the amount of quality basketball instruction available for free on video sites like YouTube these days. This was also mentioned in conversations with other interviewees.

Most of the interviewees had two sources of knowledge about data analysis in basketball:

1. basketball videos on video sites like YouTube. Nowadays, there are a lot of basketball videos created by high-quality YouTubers on both the Japanese channel and the English channels, which contain introductions of advanced basketball stats, analysis of basketball tactics, explanations of basketball skills, and so on. There are many videos created by professional basketball players, so there are more ways to get professional basketball information now.

2. Introductions by commentators in-game broadcasts. "I forget when it was, there was a time when I was watching a Warriors game, and during a timeout, the screen gave a few advanced statistics about Curry. At that time, the commentator introduced several data respectively representing Curry's contribution to the victory of the game, the efficiency of the offense on the court, the average number of points that can be scored per shot, and so on. I found it very interesting, so I will also pay attention to these data of the players in the game afterward."

From these interviews, it is clear that the interviewees are cognizant of data analytics to a certain degree, and that many are interested in delving further into what these statistics imply. However, it can also be seen that most basketball enthusiasts' understanding of data stays at the level of player evaluation, and there is no concept of how data analysis plays a role in the professional game, so it is difficult to better utilize the energy of data in the amateur game.

While the use of data in professional basketball is widespread and data analytics affects a wide range of areas, what enthusiasts can learn through broadcasts is very limited. Most of the interviewees were able to sense that basketball was changing in the professional game through the broadcasts but were ambivalent about the impact of data analytics on these changes.

In the interviewees' own experiences with playing basketball, it is very different. Although their exposure to data analytics was not very advanced, data analytics for the most part helped them only in more limited ways, such as more targeted defensive strategies. But because in their experience of the game data analysis did help them, let them feel the difference, so for data analysis of "playing" the impact of a clearer attitude of affirmation. This is also similar to the results of the questionnaire: the two are very close, but the number of people who think that data analysis has an impact on "playing" is slightly higher than the number of people who think that data analysis has an impact on "watching".

5.9. Evaluation of the Data Revolution in Basketball

More similar to the findings in the previous section, the interviewees had benefited from data analysis in their own experience of playing basketball, and therefore generally had a clear positive attitude towards the impact of the data revolution, whereas a certain ambivalence was shown in their attitudes towards the experience of watching the game.

The ambivalence of game-watching is mainly reflected in:

1. the discussion in response to the convergence of games:

There is a general agreement that data analysis has helped teams to be able to filter out more efficient players and tactics, make the overall pace of the game faster and higher scoring, allow professional leagues to set more records, and so on, and that these are all very effective changes that have helped professional leagues to attract the attention of spectators and fans.

However, it is also argued that each team adopts roughly the same tactics to win more; while the roles of players are more clearly defined, most players adopt the same training methods and train their technical characteristics in roughly the same way to be able to adapt to the same style of the game. These have led to the style of basketball games becoming more consistent, making it easier for people to become fatigued while watching the games.

In response to this view, one interviewee said, "Although the functions of the average player on each team are becoming more and more similar, the star players are becoming more and more versatile. For example, like the current

Nikola Jokic and Luka Doncic, I've never seen basketball players as tall and skillfully well-rounded as them....... Everyone watching the game mainly appreciates the performance of the stars, so the different experience these technically well-rounded players bring to the table makes me feel that basketball is moving in a more interesting direction again. "

Another interviewee has a different view on basketball games where the tactics become fixed: "Although the games become closer and even a team will often use repeated tactics, it is also fun for an experienced basketball fan to discover the details of the players' different handling of the same tactics each time." He also stated that this different approach to the details and the gameplay on both sides of the ball allows him to generate the most insightful parts of the game that he can use to guide his own basketball game.

Overall, because my interviewees were people with more basketball experience, they did not have much of a problem with the homogenization of the game but instead could find different details in similar rounds of the game. This, on the contrary, became one of the joys of watching the game for them.

2. Conflict between professional players' sense of competition and professional ethics

The development of data analysis and medical technology allows teams to better protect their players from injuries. Nowadays, teams often take to rest their players in certain matches when they are not injured, to better rest their players' bodies. However, this is irresponsible for fans who cannot see their

favorite players in the game and is also seen as a lack of competitiveness, so there is no end to the discussion about this behavior.

My interviewees had their thoughts on this, "Sometimes it's hard to find the time to watch a live game, but I feel a little sad when the game is lost because my favorite player or the opposite team's starter is resting. But when you think that this can keep the players as far away from injuries as possible, you feel unqualified to criticize this practice."

Some interviewees also said that current ballplayers have a better work ethic. While stars in the past had a greater sense of competitiveness and played even with injuries in certain important games, stars nowadays obviously love their bodies more and teams don't allow them to play with injury concerns, which definitely extends their careers and allows them to create more records and legends. Combine this with the fact that LeBron James became the NBA's all-time scoring leader in the 2023 season and Curry became the NBA's all-time leader in making the most three-pointers, and it's hard to disagree with this.

Overall, the use of advanced medical technology and data analytics to guide player training and play is a double-edged sword from a fan's perspective.

5.10. Willingness to Pay for Basketball Data Analysis Services

As teams in professional leagues are already using data analysis to help them make decisions, and Japanese basketball enthusiasts are generally positive about data analytics, it is worthwhile to study whether amateur players

require data analysis services, what kind of need they have, and how much they are willing to pay for data analysis services.

First, only one of my interviewees said that he did not need any data analysis services, while the rest of the interviewees expressed interest in data analysis services. Moreover, the interviewees would be more willing to purchase services if the data services were available on their cell phones.

Currently, there are two types of data analysis services that interviewees need, the first one is the service that can automatically collect the data of each player through the video of the game, and this kind of demand mainly comes from the players who care about their own game data and those who are in charge of coaching position in the team. The second is editing software that can automatically edit goal-making videos or highlight videos, and people use this service mainly to monitor their training and to upload their highlights from matches more easily.

In the willingness to pay section, all interviewees expressed a preference for a one-time payment settlement method over a monthly rental payment method. Team managers and coaches had the strongest willingness to pay. Both interviewees in this position indicated a willingness to pay between 30,000 and 50,000 yen for both services. The rest of the interviewees, whether they were college students, regular salary men, or businessmen with successful careers, were willing to accept a price point of 5,000 yen or less.

Discussion

This study reveals the multifaceted relationship between data analysis and Japanese basketball enthusiasts, highlighting the nuances and complexities of their evolving perceptions and interactions with the game.

Japanese basketball enthusiasts hold considerable interest and passion for in-game data as well as records in different leagues, and as Guttman suggests, quantification and the quest for records are two very important characteristics of modern sports. The post-game stat sheet was a key part of my interviewees' focus, whether they had time to watch a full basketball game or not; most of them also showed full attention when we discussed the various new records that are now popping up in the NBA. With the popularity of data analysis software, my interviewees also have access to their post-game stats, which are an important topic of bragging and discussion among themselves. All of this certainly fits Guttman's definition of modern sports with precision.

Japanese basketball enthusiasts are already aware of data analysis in basketball to a degree that I think goes beyond the concept of "per possession". Most of my interviewees can clearly distinguish between the concepts of "points per game" and "points per possession," and can use some advanced data to determine a player's efficiency. However, my interviewees cannot yet use the data to select the right players or to make game plans. Therefore, I believe that Japanese basketball enthusiasts are now at a stage where they understand the

energy of data analysis but are unable to use it to its fullest extent, which is closer to the state of the NBA around the year 2000. As data analysis techniques are further refined and popularized, I think that more widespread use of data among Japanese basketball enthusiasts is just around the corner.

The positive attitude of academia and the basketball professional field toward the impact of data analysis was also generally supported by my interviewees. However, the current portion of the negative impact of data analysis in basketball was shown by my interviewees to be different. Of these negative comments, the belief that data analysis has exacerbated inequality in basketball received the most opposition from my interviewees. From their perspective, amateur basketball is inherently unfair and fraught with inequality from the age at which everyone participates in basketball; factors such as the inherent lack of a rational grading system in amateur basketball make the impact of data analytics even more insignificant. Most amateurs participate in basketball for the pure love of the sport, so it's not like anyone is going to do anything to hurt their team in order to embellish their stats.[10] As for the misuse of data analytics, this was so far beyond my interviewees' use of data analysis that they had no discernible feelings about it.

Conclusion

The changes in the game of basketball, especially the evolution of the three-point shot, are of great significance to Japanese basketball enthusiasts. From the perspective of Japanese basketball enthusiasts, the three-point shot is both the most visible change and the part of the game that has been most affected by the data revolution, both in their "watching" and "playing" experiences.

The increase in the number of three-pointers in the game and the change in each team's emphasis on the three-point shot were the first things enthusiasts noticed in their "watching" experience. In addition to the emergence of talented players, which was widely cited as a major factor in this change, this change as a notable skill in basketball was widely seen as reflecting the impact of data analysis on the trajectory of the game.

In terms of the 'playing' experience, each interviewee was now allowed and encouraged to attempt the three-point shot. As a result, interviewees generally reported that they had become more versatile in the game of basketball and that the game had become more unknown and challenging as a result. The feeling of being more accepted and needed by the team was highly valued in this change.

From the interviews and questionnaires, it can be seen that Japanese basketball enthusiasts generally have a certain understanding of data analysis

in basketball, and in particular, have a deeper understanding of the quantitative effects of data analysis on individual players' performance. They have a deeper understanding of the quantitative role of data analysis on individual player's play. The role of data analysis that radiates from data analysis such as setting up defense according to the opponent's individual characteristics is also well understood by the Japanese basketball enthusiasts.

However, it must be recognized that there are still significant limitations in their understanding of data analysis. For example, in professional leagues, interviewees generally expressed a lack of understanding of how data analysis is involved in team decision-making, or how data analysis is used to set up a team's offensive play. The reasons for this result, surmised from my interviews and other sources, I believe, are two. Firstly, Japanese enthusiasts have a single source of knowledge about data analysis, only YouTube videos and commentators' explanations during game broadcasts, both of which are difficult to relate to a more specialized level of knowledge; secondly, there is a clear division between professionals and amateurs, and it is difficult for ordinary enthusiasts to come into contact with people who have professional experience, which leads to a lack of understanding of more advanced concepts.

One of the most interesting aspects of the interviews was that the impact of data analysis has left an indelible mark on the experience of Japanese basketball enthusiasts, with positive repercussions in the field of in-person involvement in the game. In particular, interviewees who were deeply involved

in the basketball department during their college years rated data analysis very highly and had a deeper understanding of data analysis than the rest of the interviewees. The rest of the interviewees also felt the impact of data analysis in the games they participated in, especially in the areas of "using tactics more often in games" and "thinking more about the game to guide actions". In the process of trying to use data analysis, Japanese basketball players have more or less felt the positive change of data on their game.

Conversely, when it comes to the changes that have occurred in the spectacle of basketball, Japanese enthusiasts show a more ambivalent stance, characterized by wavering attitudes towards the impact of data analysis. The conflict between "increasing the power of the referees and the use of replay technology to determine the correctness of calls to achieve greater fairness" and "maintaining the flow of the game", the conflict between "Players try their best to participate in the game by bearing the risk of injury" and "Players avoid the risk by taking appropriate time off", and in the conflict between "higher scoring and more intense matches" and "more similar style of play becomes more boring", Japanese enthusiasts showed a certain degree of antagonism. The opinions of the interviewees were the most polarized in this section. However, since my interviewees are basketball enthusiasts who have had a lot of experience in the game, they can enjoy watching the game in various ways and get nourishment from it to improve their basketball skills, so most of them have a positive view of the changes in the spectacle of the game, especially the

changes resulting from the analysis of the data.

Currently, there are almost no data analysis services in Japanese amateur basketball, but there is a large demand for data analysis services among Japanese basketball enthusiasts. The types of services they need focus on two main types, a service that automatically collects and organizes each player's data based on video footage, and editing software that can automatically edit goal scenes and highlights. The price they are willing to pay for data analysis services does not depend on individual income, as long as it is determined by the individual's position in the team. For example, those who are managers and coaches in the team are willing to invest more money, with ¥30,000 to ¥50,000 being an acceptable price for them, while most of the ordinary participants in the team can accept a maximum price of ¥5,000.

Japan's sports training system has the principle of consistency, and the participants of basketball also have the characteristics of early exposure and generally have the opportunity to have more systematic training, combined with the current Japanese basketball enthusiasts' interest in data analysis and cognitive level, as well as the use of data analysis technology and mastery of the gradual maturity of the phenomenon, I think that the phenomenon of Japan's current endless number of talented basketball players is not a coincidence. Japanese basketball has a chance to create new glory in both professional league and international performance, and to become the representative of Asian basketball in the near future. At the same time, the

acceptance of new technologies and the high level of support for data analytics have allowed Japan to make faster progress in broadcasting, team promotion, as well as the advertising and lottery industry. While taking reference from the NBA, Japan's national conditions have allowed the commercialization of Japanese basketball to go even further.

With the strong interest of Japanese basketball enthusiasts in data analysis, and the widespread use of video platforms such as YouTube that provides a good foundation for the private exchange of data analysis technology, basketball analysis technology is likely to create its glory in Japan's sporting world.

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