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ORIGINAL RESEARCH

A comparative examination of World Cup Champions of European and American origin of national football players in terms of "relative age effect"

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Abstract

This study aimed to analysis the birth date distributions of the champion players between the years 1930-2022 to determine whether the FIFA World Cup champion national team football players between the years 1930-2022 were affected by the "Relative Age Effect" phenomenon. The universe of the research consisted of the national teams that were champions in the 1930-2022 FIFA World Cup Finals. The samples consisted of the football player group of the national teams that won the championship. The model of the research was determined as "Basic Qualitative Research". The data collection technique in the research was determined as "Document Analysis". The data analysis was made according to the Miles & Huberman model, which is a descriptive analysis form. In the study, the information of the athletes was detailed by looking at the squad structure for the FIFA World Cup champion national team football players between the years 1930-2022. In the highest level of professional football, it has been seen that the champion national team football players are numerically close to each other in terms of "relative age effect". As a result, it has been observed that the relative age effect in senior football decreases with increasing age. It was shown that the relative age effect in professional elite national teams changed negatively due to the high number of football players born in the second half of the year. In this case, it was not a negative situation for football players who transition to professionalism and reach the elite level, being born in the last months of the year. Looking at the intercontinental comparison, even considering the different football culture and structure, it has been revealed that late-born athletes have caught up with their peers at a professional level and even left them behind.

Keywords: FIFA, football, player, relative age effect, world cup.

Introduction

The “Relative Age Effect” refers to the asymmetry in the distribution of birth dates, which favors players born early in the election year and discriminates against participants born later in the year (Helsen et al., 2012). Grouping of athletes according to age is very common in sports. January is globally considered the start of the election year. In particular, categories in team sports correspond to annual or biannual competition cycles in which the athlete is included in competition groups according to his chronological age and a predetermined end date. The term “relative age effect” depends on the date of birth associated with the selection data used to place the child in a particular age group (Wattie et al., 2008). Parameters such as body size, strength, and strength in sports have a higher advantage over early-mature children of the age group than their late-

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maturing or adolescent peers (Malina, 1994; Malina, 1998). This situation is often reflected in youth sports contexts and is understood as over-representative for athletes born in the first months of the year due to greater maturation development (Barnsley et al., 1985). For this reason, it is seen that relatively older athletes have more opportunities than younger peers in terms of reaching a higher sport level in selection and competition performance (Till et al., 2010). Oldies are more likely to be described as talented and transferred to top teams. Thus, early maturing athletes benefit from higher quality coach training and experience at higher levels of competition (Helsen et al., 1998; Sherar et al., 2007). Most of the explanations on this subject focus on anthropometric, physical and physiological parameters and highlights biological factors as the source of imbalance among athletes (Baker et al., 2010). However, as athletes raise to higher performance levels, it is unclear whether relatively older athletes have certain sporting and competitive advantages over their younger peers (McCarthy & Collins, 2014). For this reason, as the transition to team sports such as football progresses, the "Relative Age Effect" tends to decrease but does not disappear (Brustio et al., 2018; Gil et al., 2020). In recent years, many studies have investigated the relative age effect in sports like football. The "Relative Age Effect" has been studied from various approaches and purposes which existence in collective and individual sports contexts has been investigated (Papadopoulou et al., 2019; Steidl-Müller et al., 2019; Mon-López et al., 2020). However, it is not yet to clear whether a relative age effect is noticed before players are transferred to professional teams. The "Relative Age Effect" has been studied in many sports branches. Due to the number and quality of studies, two sports stand out among others. These are football and ice hockey (Grondin et al., 1984). Indeed, this study is extremely important for world football. The aim of this study; on the history of the FIFA World Cup Finals, which is the biggest football tournament between countries, it provides the opportunity to both side the data of elite football players and compare the data of successful footballers from two different continents in terms of examining champion footballers in terms of "Relative Age Effect".

Methods

The universe of the research was formed the national teams that were champions in the 1930-2022 FIFA World Cup Finals. The sample consisted of the players of the national teams that had won the championship. Density sampling was used in the sampling method of the study. Density sampling used in qualitative research includes the best or most informative examples of the investigated phenomenon rather than extreme or unusual situations (Morgan & Morgan, 2008). Among the qualitative research methods, heuristic-based research generally uses density sampling (Mays & Pope, 2000). The heuristic approach aims to discover and make sense of the nature of the studied event or phenomenon through self-experiences and the researcher's subjective explanations (Denzin & Lincoln, 2008). It enables the researcher to clearly express and make sense of the creative thought that exists within him. The heuristic approach is the only research approach that enables human experiences to establish subjective and creative connections between the researcher and the researched phenomenon (taking into account the researcher's tacit knowledge) (West, 2001). The method of the research was determined as "Basic Qualitative Research" and the data collection technique in the research was determined as "Document Analysis". In the analysis of the data, the Miles-Huberman model, which is a descriptive analysis form, was used.

Participants

Between 1930 and 2022, the national team football players who played a total of 22 FIFA World Cup finals and won the championship constituted the sample group. Working group; 490 football players who became FIFA World Cup champions at the national team level.

Data Collection Tools

The information of the football players is taken from the "transfermarkt.com" and "football.instatscout.com" web page. For the validity of the research, data triangulation was made and the data collected from 2 different sources were interpreted by making document analysis, thus increasing the internal validity of the study. In this study, document analysis technique was used as a data collection tool. The document review technique is based on interpretive philosophy. It is combined with rough technique (review, condensation, summarizing) with detailed analysis (category of refinement, hermeneutic interpretation, describing data). The aim is to produce common explanations by describing various data, explaining them in detail or comparing different data (Flick, 2013; Creswell & Creswell, 2017). It also includes understanding the essence of large amounts of data by reducing the volume of raw data, identifying important patterns and creating a logical chain of evidence for the researched

phenomenon by making sense of the data (Patton, 2014).

Data of Analyses

This research aimed to form a basis for data analysis with the theory known as 'Embedded Theory'. This type of analysis was developed by Glaser and Strauss (Walker & Myrick, 2006). The embedded theory was used both as a research strategy and as a data analysis method. Today, it is called the most impressive paradigm for qualitative research method (Ilgar & Ilgar, 2013). In embedded theory, data collection and data analysis are directly related to each other. Each collected data is directly compared with the next data, and in this way the comparison is continued until the most common data is reached. The embedded theory method consists of systematic but flexible guidelines developed for collecting and analyzing qualitative data to construct theories embedded in and sourced from data (Charmaz, 2006). Data analysis in embedded theory is a well-defined process that begins with basic descriptions, continues with conceptual arrangement, and leads to theorization (Patton, 2002). The embedded theory was turned into an excuse presented to the scientific world for the qualitative approach by ensuring that qualitative research was evaluated according to quantitative standards (Atkinson, 1997). Qualitative data analysis is a collection of activities in which the data that can be obtained by different data collection methods and techniques such as document review, observation and interview are organized, categorized, themes are discovered, and ultimately this whole process is transferred to the report. In this context, the Miles and Huberman model qualitative data analysis is essentially carried out in three steps: The first step is data reduction. Data reduction is the selection, examination, simplification, summary and transformation of the data obtained at the end of the research. In the second stage, data is displayed. Data representation is to create an organized version of the collected data to reveal the results. The third stage is inference/validation. Deduction/validation is to test the results in terms of validity, along with revealing causal relationships, patterns and possible structures between events and objects (Miles & Huberman, 2016). The reality, which is uncertain at the beginning of the research process and remains hidden in the data, is discovered and brought to light in the final stage.

Results

This study examined the "relative age effect" distributions of 490 national team football players who were FIFA World Cup champions at the national team level.

Table 1 shows the average age and date of birth of those born in the first and last six months of the year, according to the relative age effect in the squads that won the FIFA World Cup. The FIFA World Cup Champion was classified the number of national team players according to the relative age effect, and examined the documents regarding the team rosters in the relevant World Cup finals for a total of 490 football players. The data were processed and the players' birth dates were determined individually.

Table 1

Numerical status of team rosters by birthday distribution.

FIFA	National Team	Number of Players Born in the First and Last 6 Months of the Year
2022	Argentina	18 – 8 (26 players)
2018	France	11 – 12 (23 players)
2014	Germany	12 – 11 (23 players)
2010	Spain	14 – 9 (23 players)
2006	Italy	11 – 12 (23 players)
2002	Brasil	14 – 9 (23 players)
1998	France	9 – 13 (22 players)
1994	Brasil	15 – 7 (22 players)
1990	Germany	10 – 12 (22 players)
1986	Argentina	8 – 14 (22 players)
1982	Italy	14 – 8 (22 players)
1978	Argentina	11 – 11 (22 players)
1974	Germany	9 – 13 (22 players)
1970	Brasil	9 – 13 (22 players)
1966	England	7 – 15 (22 players)
1962	Brasil	7 – 15 (22 players)
1958	Brasil	10 – 9 (19 players)
1954	Germany	10 – 12 (22 players)
1950	Uruguay	10 – 12 (22 players)
1938	Italy	11 – 11 (22 players)
1934	Italy	6 – 16 (22 players)
1930	Uruguay	12 – 10 (22 players)

Retrieved from httpps://www.transfermarkt.com/ and https://www.instatscout.com/, 23 January 2023

In Table 2, although it was shown that the athletes born in the first months of the year were mostly in the 8 champions national team, we saw a table dominated by the players born in the last months of the year in the 12 champion national teams. In 1938 and 1978, there was numerical equality among the champion national team football players.

For the FIFA World Cup, it was seen that there are 490 athletes managed to take part in the team squads in a total of 22 world cup finals. Among the 490 elite national athletes, the number of athletes born in the first months of the year was 238, while the number of athletes born in the last months of the year was 252. At this point, there was a positive trend in terms of the relative age effect. Already in Table 2, the superiority of the players born in the last half of the year as a team was in question. Between 1930 and 2022, a total of 22 FIFA World Cup finals were held and the Brazilian national team managed to become champions 5 times in these finals. The national teams of Germany and Italy became champions 4 times, Argentina 3 times, the national teams of France and Uruguay 2 times, and the national teams of England and Spain 1 time. When the intercontinental situation was evaluated, national teams became champions on only 2 continents, namely Europe and America (South) Continents.

As seen in the table 3, the numbers of champion athletes of the Brazilian, Argentina and Uruguay national teams from South America were 222, 114 of the athletes were born in the first months of the year and 108 athletes were born in the last months of the year. On the European continent, the numbers of champions from Germany, Italy, France, Spain and England national teams were 268, 124 athletes were born in the first months of the year and 144 athletes were born in the last months of the year. At this point, while the numbers of players born in the first half of the year were superior among South American football players, those born in the last months of the year were higher among European football players.

Table 2
Positive and negative situations of team cadres according to their birthday distribution.

FIFA	National Team	Born in First Half of the Year (Positive)	Born in Last Half of the Year (Negative)
2022	Argentina	✓	
2018	France		✓
2014	Germany	✓	
2010	Spain	✓	
2006	Italy		✓
2002	Brasil	✓	
1998	France		✓
1994	Brasil	✓	
1990	Germany		✓
1986	Argentina		✓
1982	Italy	✓	
1978	Argentina	=	=
1974	Germany		✓
1970	Brasil		✓
1966	England		✓
1962	Brasil		✓
1958	Brasil	✓	
1954	Germany		✓
1950	Uruguay		✓
1938	Italy	=	=
1934	Italy		✓
1930	Uruguay	✓	

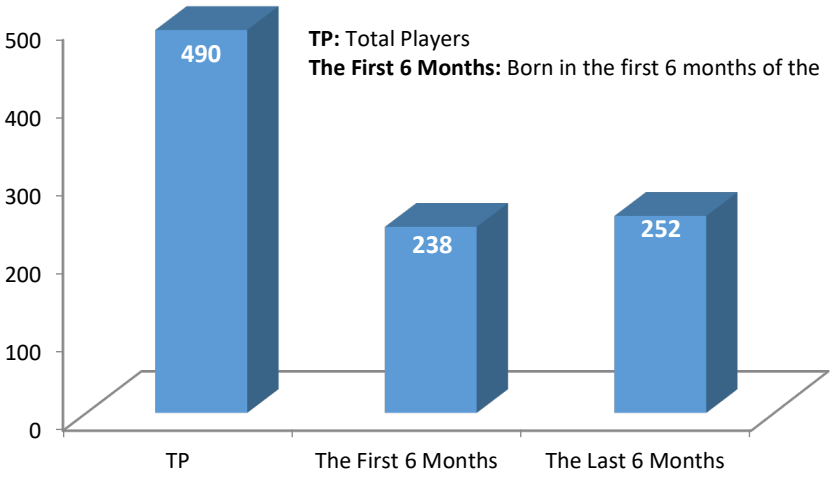

Figure 1. Disaggregation by relative age effect of players selected for FIFA World Cup Champion National Team Finals.

Table 3
The differences of Intercontinental national team players relative age distribution.

Intercontinental National Teams	Number of Players Born in the First Half of the Year	Number of Players Born in the Last Half of the Year	Total
America (South)	✓ 114	108	222
Europe	124	✓ 144	268
Total	238	✓ 252	490

Discussion

In the study, players of the same level but different chronological ages as professional football players were analyzed and the result was tried to be reached. It has been assumed that the relative age effect would decrease in higher-level leagues and teams, since maturity was argued to be the underlying reason for the existence of the relative age effect, since the relationship between physical superiority and performance is high at early ages. Similarly, it has been predicted that the relative age effect would become less pronounced in senior professional football than in junior football, as maturity differences disappear once adulthood was reached. Many studies have investigated the relative age effect in the sports setting. Comparing birth dates between junior and senior athletes in sports such as baseball, ice hockey, netball, rugby, soccer, and tennis revealed skewed birthdate distributions that favour individuals born prematurely in the election year (Musch & Grondin, 2001). Like other sports, football is characterized by a significant overrepresentation of players born early in the election year among youth (Baxter-Jones, 1995; Brewer et al., 1995; Musch & Hay, 1999; Vaeyens et al., 2005; Verhulst, 1992). In sports where body size, and strength are advantageous, early maturing children in one age group are therefore late maturing and puberty probably have an advantage over their peers, who are more frequently represented among athletes (Malina, 1994; Malina, 1998). Thus, veterans are more likely to be identified as talented and transferred to top teams, thus benefiting from higher quality coaching and experience at more advanced levels of competition (Sherar et al., 2007). However, with this study, it has been understood that the relative age effect disappeared in professional football at the elite level. In professional football at the elite level, the "relative age effect" was evenly distributed. In the

champion national team squads, the athletes born in the first half of the year and the athletes born in the second half of the year produced results that were close to each other in percentage. Baumler (1996), based on a study of German professional adult football players, declared that the relative age effect in senior football decreases with increasing age. Similarly, recent findings suggest players born late in an election year are catching up with their adult peers. According to the findings of this study, it has been seen that the athletes born late in the election year caught up with their peers at the professional level and even surpass them. As a result, it has been observed that the relative age effect in senior football decreases with increasing age. The first study evaluating RAE in national teams was written by Barnsley et al. (1992), who found in the 1990 World Cup that 55% of players were born in the first half of the year. In the U-17 and U-20 World Cup, a greater bias was shown, as in the average of both, 79% of players were found to have been born in the first half of the year. Helsen et al. (2005) also analyzed the ranks of the national teams (U-21, U-18, U-17, U-16 and U-15) in the 1999-2000 season. The national teams of Germany (50.49% in the first quarter, 3.89% in the fourth quarter) and England (50% and 17%, respectively) were the ones with the greatest impact of RAE. RAE was not observed in Portugal in the U-21 male category. If these data are compared to those presented in the results section of the present study, it could be noted that RAE has been reduced over the years. Helsen et al. (2012) compared the RAE of professional soccer players in 10 European countries over a 10-year period (2000-2001 and 2010-2011 competitive seasons). Generally, results indicated no change in the RAE over the past 10 years in professional soccer. In this study, it has been observed that the relative age effect in professional elite national teams increased through last half of the year due to the high number of football players born in the second half of the year. In this case, it was not a negative situation for football players who transition to professionalism and reach the elite level, being born in the last months of the year. Looking at the intercontinental comparison, even considering the different football culture and structure, it has been revealed that late-born athletes have caught up with their peers at a professional level and even left them behind.

Authors' Contribution

Study Design: AÇ; Data Collection: AÇ; Statistical Analysis: AÇ; Manuscript Preparation: AÇ; Funds Collection: AÇ.

Ethical Approval

The study was approved by Kilis 7 Aralık University Ethics committee with the decision of 2023/02 E.17559/15. The study was carried out in accordance with the Declaration of Helsinki.

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Conflict of interest

The author hereby declares that there was no conflict of interest in conducting this study.

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