



Visual Aesthetics and Mathematics in Cinema: Comparative Content and Cultural Analysis of *Harry Potter and the Philosopher's Stone* and *The Conquest 1453*

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Received: 15 July 2023 | Revised: 8 October 2023 | Accepted: 20 October 2023

Abstract

Films are meticulously crafted using visual aesthetic elements, where mathematics and geometry play pivotal roles. Camera angles, timing in editing, staging sequences, lens specifications, and lighting ratios, demonstrate the intricate relationship between cinema and mathematics. Specifically, the virtual projection of isosceles and equilateral triangles is utilized in object positioning before the camera. Additionally, forms such as circles, squares, and rectangles are frequently employed in stage design. Number combinations, sequential numbers, and patterns are also common techniques used to enhance visual aesthetics in films. Fundamental components such as oblique, horizontal, vertical, and parallel lines are instrumental in achieving visual appeal.

In our research, we investigate the properties of these components as they are discussed in scientific publications and their relevance to aesthetics. In this context, a comparative and quantitative analysis is conducted on 2001's "Harry Potter and the Philosopher's Stone" and the Turkish film "The Conquest 1453" (known as Fetih 1453 in Turkey). It is observed that "The Conquest 1453" employs excessive mathematical and geometric data, which somewhat diminishes the thematic strength of the film. In contrast, "Harry Potter and the Philosopher's Stone" demonstrates a more balanced use of these elements.

Keywords

Turkish Cinema; Mathematics; Visual Aesthetics; Harry Potter; Fetih 1453; Cross-Cultural Cinema; Film Critic; Film Analyze; Cultural Studies



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Визуальная эстетика и математика в кино: сравнительный анализ содержания и культуры фильмов «Гарри Поттер и философский камень» и «Завоевание 1453»

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Рукопись получена: 15 июля 2023 | Пересмотрена: 8 октября 2023 | Принята: 20 октября 2023

Аннотация

Фильмы создаются с особым вниманием к элементам визуальной эстетики, где математика и геометрия играют ключевую роль. Углы съемки камеры, время монтажа, постановка сцен, характеристики объективов и соотношение освещения демонстрируют сложные взаимоотношения между кинематографом и математикой. В частности, виртуальное проецирование равнобедренных и равносторонних треугольников используется при позиционировании объектов перед камерой. Кроме того, такие формы, как круги, квадраты и прямоугольники, часто используются в дизайне сцены. Комбинации чисел, последовательные числа и узоры также являются распространенными техниками, используемыми для улучшения визуальной эстетики в фильмах. Такие элементы, как косые, горизонтальные, вертикальные и параллельные линии, играют важную роль в достижении визуальной привлекательности.

В нашем исследовании мы изучаем свойства этих компонентов в том виде, в каком они обсуждаются в научных публикациях, и их отношение к эстетике. В этом контексте проводится сравнительный и количественный анализ фильма 2001 года «Гарри Поттер и философский камень» и турецкого фильма «Завоевание 1453» (Фетих 1453). Наблюдается, что в «Завоевании 1453» используется избыточное количество математических и геометрических данных, что в некоторой степени уменьшает тематическую силу фильма. В отличие от этого, «Гарри Поттер и философский камень» демонстрирует более сбалансированное использование этих элементов.

Ключевые слова

турецкое кино; математика; визуальная эстетика; Гарри Поттер; Завоевание 1453; кросс-культурное кино; кинокритика; анализ фильмов; культурология



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Introduction

Cinema has been in close contact with many branches of art and science since the first period of its emergence. This relationship continues to increase in intensity today. Reinforcing many different fields of art such as painting, music, theatre and literature with its own forms of expression, cinema also closely followed technological and scientific developments and was positively affected by these developments. So much so that even the case of recording images with light, which is the existential technique of cinema, reveals the relationship that cinema establishes with science. The transformation of images into a bunch of numbers and becoming editable digital data is another strong example of the relationship between cinema and science. The question arises, at what level does cinema, which owes its existence to this unity, deals with this relationship in terms of narration?

It is a well-known fact that mathematics and geometry contents play a major role in construction of films providing visual aesthetics in many of the cult films such as *Dead Poets Society*, which has made a name for itself in the history of cinema. The film depicts the struggle of John Keating, who was appointed as a teacher of English at school managed by Welton Academy, which is dominated by strict rules and tradition. The overly prescriptive and conservative attitudes of the school administration have made the school a boring and suffocating place. Mr. Keating who uses extraordinary education methods in his classroom, gathers his students who are bored with the school's taboos, with the rhetoric of "Seize the day" in the face of the school administration which does not compromise on tradition and discipline. Keating, who aims to breathe new life into a stuck education model, asks his students to tear up their textbooks, move away from stereotypes and live their lives by thinking, but this situation does not please the school administration. In the image below, which reveals the *status quo* attitude of the school administration, the symmetrically designed visual elements centre the problematic of who has the power between the administration and the students.

The Conquest 1453 is a historical film. After the 2011 General Elections, the AK Party government has consolidated in Turkey. In this period, efforts to construct a national identity draw attention. As a result of these efforts, there is an increase in historical movies and TV series (Şahin & Uğurlu, 2022). The films *Çanakkale 1915* (Sezgin, 2012), *Taş Mektep* (Dönmez, 2013), *Çanakkale Yolun Sonu* (Uzun, Karaman, & Akar, 2013) have been shot during this period. The film "The Conquest 1453" was produced contemporaneously with, a work widely regarded as an epic film due to its scale and scope. "The Conquest 1453" was directed by Fatih Aksoy and filmed in 2012.



Figure 1. Symmetry in Visual Design (Dead Poets Association, 1989)

In the 18-year period between the years 1981-1999, 19 history series appeared on screens. In the 14 years between 2003 and 2017, 23 date series were shown. Another noteworthy point is that 16 different governments (and coalitions) were in power between 1981 and 1999. On the other hand, 9 governments between the years 2002-2017 were the AK Party governments (Okumuş, 2020, p. 48-49).

The Conquest 1453 reached approximately 6.5 million spectators with a budget of 18 million dollars. Despite the fact that the film differs from its foregoers with computer technologies and effects, it mediates the strengthening of the official ideology with its “glorious past” and “successful past” discourse. The movie displayed a widely accepted viewpoint and avoided negative connotations. It also contributed to the strengthening of the neo-Ottoman ideology, which can be perceived as presenting the image of the Ottoman Empire as a living and vibrant pride in daily life and cultural politics. (Orta, 2019, p. 1121-1122).

The symbols used in the construction of national identity in the movie “*The Conquest 1453*” are mostly based on religion and militarism. In this direction, “the flag with only the moon, the tugra, the janissary soldiers” were used. While the Janissary anthem was never used, the symbols on the sanjak were not used clearly. In the film, the duality of “us” and “others” is established with identity symbols. Those defined as “the Others” are Byzantium, Vatican City, and Western states. Symbols such as “Quran, call to prayer and tugra” are used for Turks. “Cross, church, priest costume” was used for Byzantium, Vatican, and Western



states. While places such as “mosque and tent” are used to indicate the Turkish identity in the film, the places used to highlight “them” are “church and hippodrome” (Şahin&Uğurlu, 2022, p. 88-89).

The Conquest of Istanbul (Aydın Arakon, 1951) and *The Conquest 1453* have also been analyzed comparatively in the article of Gülpınar (2023) who describes *The Conquest 1453* as a film that highlights Islamic and neoliberal values. However, the 1951 version puts an emphasis on Turkishness in accordance with the political climate of the period. This shows that art is directly influenced by politics.

Although they are popular, and fictional historical films shot in the same country elucidate the same historical topic, the 61 years of timelap between them is the main reason why the historical representations vary in the two films. “The Conquest of Istanbul” was made in 1951, the year after the conservative Democrat Party came to power. The party was influential in the revival of Islam, especially at the popular level, but it took time for this effect to cast over cultural life and cinema. For this reason, the film takes a closer stance to the nationalist Turkish History Thesis which shows Islam as a cause of backwardness. “The Conquest of Istanbul” was screened in the tenth year of The Justice and Development Party (JDP) ruling, a conservative party that synthesizes neo-liberalism and Islam. The understanding of the JDP government which emphasizes Islam rather than Turkishness and advocates Ottoman populism, has gained visibility in many historical productions in the cultural field, especially in “The Conquest 1453”, in the 2000s. In this film, the combat was not between Byzantium and Ottoman, but between Christians and Muslims. The Ottoman Empire is presented as an Islamic State (Gülpınar, 2023, p. 64).

“Harry Potter” series are closer to the fantasy movie genre. But both movies are epic movies. *The Harry Potter and the Philosopher’s Stone*, which inspired the movies, was first published in 1997. There are two worlds in the stories of Harry Potter: one is the world we live in and the other is the magic world full of extraordinary things. The wizards’ world can only be entered through evasion and cunning play. The magical world of sorcerers symbolizes the truth of children. Despite everything, this extraordinary world has human characteristics. In fact, sorcerers live like us and they do not always take advantage of magic in everyday life. There are schools, administration buildings, banks, boutiques, money and social classes in the world of wizards. In Rowling’s works, the use of magic enables her to address the concerns, anxieties, hopes, ambitions, and other pursuits of the younger generation (Aytekin, 2011, p. 171).

According to the psychoanalytic studies of Bruno Bettelheim, the presence of a child with supernatural features in the film is instrumentalized to save people. (Aytekin, 2011, p. 171). As a matter of fact, Yavaş’s (2022, p. 89:101) analysis on the “Harry Potter” film also shows that the Harry Potter character represents Jesus and the Christian faith through allusion.



Feldt (2016, p. 109-110) also states that the Harry Potter series has a strong relationship with religious references. But there are some consequences for presenting it in ways such as magic that today's audience would enjoy. It might appreciate the intrigue of religious depictions released from any dogmatic or institutional restrictions. According to thinkers such as Hjarvard, Lövheim, Ammerman, and Partridge, the transmission of religion through popular culture causes today's perception of religion turning into a multi-part structure.

The phenomenon of consumption was also criticized in *The Harry Potter and the Philosopher's Stone*. The scenes about little Dudley are important in this regard. The excessive consumption of toys and the commodification of the game can be given as an example from the movie (cited Aytekin 2011, p. 178 from Harou 2005).

Kara (2007, p. 63-65) who examines fantastic literature for children together with the phenomenon of violence, deals with Harry Potter and the Prophet Jesus. She draws this parallel and thinks that Harry Potter's powers are the irresistible power of the resurrected Lion, just like Jesus, and that they are his innate characteristics. The audience and the reader empathize with these heroes. According to Kara (2007), Rowling, the author of Harry Potter, presents violence by combining Celtic Culture with Ancient Roman/Greek mythology. The film deals with mystery and extraordinary games taken from the Old and New Testaments, and combines this accumulation with rich imagination to create a fantastic world.

When the stories belonging to the Harry Potter universe are examined, it is seen that they are in an intertextual relationship with the method of quoting from the stories, heroes, and mythological creatures from Ancient Greek Mythology. This situation is directly related to the post-modern narrative genre. The reason for this type of storytelling is to increase the reader's or the audience's pleasure in a familiar story (Arı and Köse 2021, p.20).

In Christianity, symbols date back to the age of torture, and the triangle and circle have an important place. Among the symbols of Christianity which formed its own practice and theory after those ages of torture, the following can be briefly mentioned: "Cross" symbolizing Jesus and Christianity. Circle set within an equilateral triangle (which symbolizes that all three persons of the Trinity are equal and eternal at the same time). A hand reaching out from the cloud (believed to symbolize the first person of the Three Uknuns [Father]). All of them are happy lambs, which are believed to symbolize Jesus Christ. A pelican opens its chest to feed fish and their babies. Dove, symbol of the Holy Spirit. Winged man, winged lion, winged ox and eagle, symbols of the four Gospels (Quoted from Pike, Royston, 1954, p. 297. Kılıç, 2013, p. 13).

According to Sharma (2023) who examines the historical and sociological characteristics of triangles, the latter symbolize the millennium, and the Three popular types of triangle (equilateral, isosceles and scalene), have commonly been used. Sharma (2023, p. 206) also evaluated the triangle in Christian theology as explaining what the triangle symbolizes:



“In Christianity, the triquetra symbol is sometimes used in a religious context to represent the trinity (See, Figures 5. a, and 5. b). The forms of a triquetra often include a circle to emphasize the unity of the three parts of the trinity. It is sometimes called the trinity knot or the trinity circle (when a circle is included) and is most often found in areas of Celtic influence. One of the most famous trinities, in Christian beliefs, is the Holy Trinity and represents the Holy Spirit as taking of the things of Christ and making them real and solid in our experience. As an aside, understanding of God as being three divine persons that exist at the same time, sharing the same essence and are all God – but are not the same being. The main feature that makes triangles so important and meaningful in Christianity is the fact that they have three points – three angles – and the number three is considered as the number of divine fullness. It is interesting to note that in the story of Jesus’ birth, the baby is visited by the Three Wise Men. Thus, we see the appearance of the number 3, which is surely no coincidence.”

“In Christianity, the Eye of Providence (See, Figure 16), is a symbol that is deeply associated with the faith. Triangle is depicted with an eye inside and represents the divine providence – or God keeping watch over humanity. Since the Renaissance times, it has been used in Christian art to depict the Holy Trinity that reminds the believers that God constantly maintains the natural order of the universe”.

Presenting the three values in Islam as a triangle, Sharma (2023, p. 208) says that Islam highlights values such as Allah, the Quran, and Ramadan. Therefore, in Islam, human or moral values have been developed consciously or unconsciously by a trio of forces:

“According to the Islamic beliefs, first, the God has sent the final revelation – the Quran – for the guidance of humankind. Hence, the Quran is the guidance (Huda) for humans. It is not merely for accumulating bits of rewards (thawab), but for using as comprehensive guidance for human life and for solving the problems in Akhirah – end bound life in this world. That is why the Quran is the guidance, but effectively only for those who are (Muttoqoon) (God-conscious). Second, God has not only revealed His expectation about us, but has also informed us about how to fulfil His expectations. It is for this reason that God has not only required a minimum level of Taqwa, but has also shown us the way to attain and improve our Taqwa. The third of the triangular link of ethical/moral system is the special month of Ramadan – the month of fasting. The significance of this link has been clearly identified in Quran”.

Methodology

This research approaches the use of geometric shapes in cinema from the perspective of aesthetic and ideological discourse and seeks answers to the following questions:

- Which geometric shapes and how often did the films examined within the scope of the research use?
- Which shapes were used most in the films examined within the scope of the research and what are their cultural, aesthetic, and ideological contexts?



- To what extent are two different cultures similar in their use of geometric shapes?

To answer these questions, we apply the thematic content analysis method to examine the frequency of mathematical, esp. geometric elements used in the films mentioned. These elements are as follows: Horizontal Parallel Lines, Vertical Parallel Lines, Odd Number Groups, Even Number Groups, Triangle Model, and Circle Model. In the research, the frequency of use of these in both films is analyzed comparatively.

According to the dictionary of the Turkish Language Association (TDK), the word *aesthetic* means “the theoretical science of beauty in art and life, with the general laws of artistic creation, related to the beautiful sense and suitable for the sense of beauty”. Since the Renaissance, there have been attempts to use mathematics to achieve aesthetics and perfection in painting. The main means here is the use of symmetry. Similar number groups were used to place objects on both sides of the symmetry line. The Enlightenment Philosophy follows the Renaissance and Reformation processes. Rationalism is dominant in this philosophical trend, and mathematics came to the fore in this mode of thinking. In the process, Newton’s expression of the colour spectrum with mathematical data constitutes a turning point. (Öztüfekçi & Dilmaç, 2021). According to the French painter Paul Cézanne, geometric shapes in the form of cones, cylinders, and cubes form the essence of objects, the basis of the world of feeling. (Yılmaz, 2014, p. 31). This leads to a trend towards Cubism in art. Regardless of the content of the painting, Cézanne is considered to be the leader of art based on geometric shapes and number groups (Lynton, 2009, p. 23). Similarly, artists like Wassily Kandinsky created paintings made of geometric shapes.

Lines parallel to a plane are called horizontal lines. Lines drawn perpendiculars to a plane are called vertical lines. Each line segment that descends obliquely to a plane is called oblique lines. If there is more than one horizontal line in a plane, they are called parallel lines. On the other hand, if there are more than one perpendicular lines in a plane, they form vertical parallel lines among themselves. If there are more than one oblique lines in a plane with the same angle with the plane, the line group they form is called oblique parallel lines. For example, when trees planted at the same distance from each other in a field change their gaze position at the same time, they form oblique, vertical and horizontal parallel lines. In films, impressive aesthetic images are obtained by placing the objects in front of the camera appropriately.

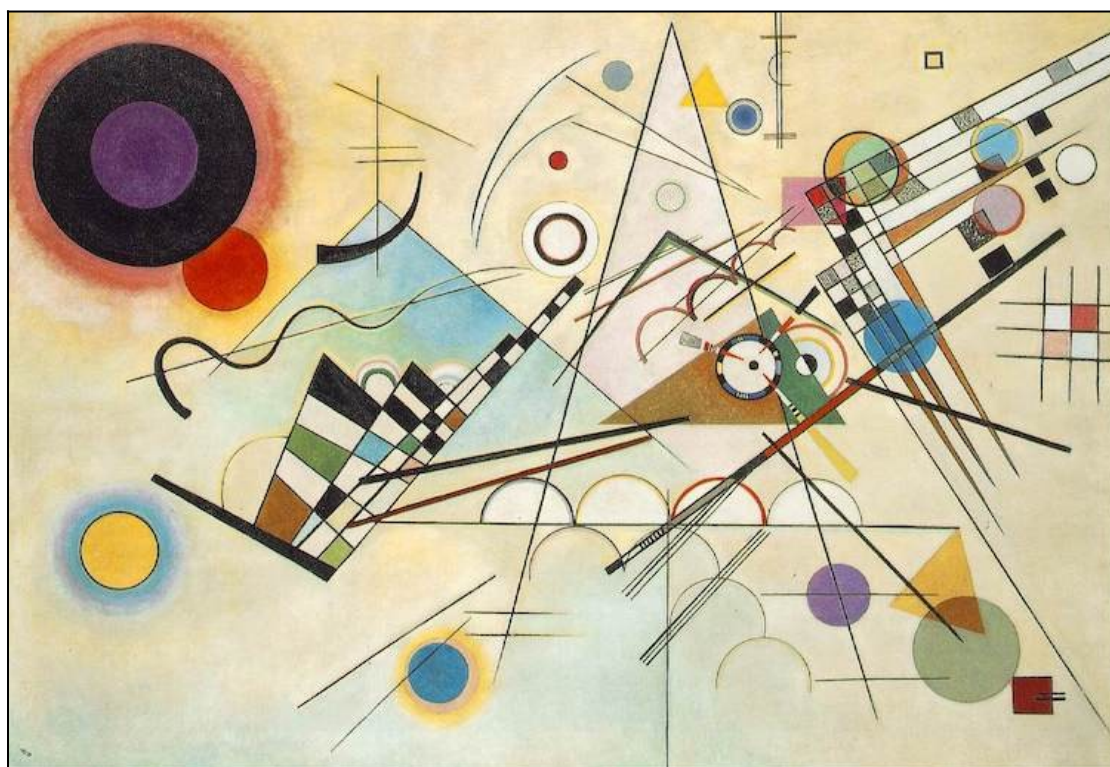


Figure 2. W. Kandinsky, 1923

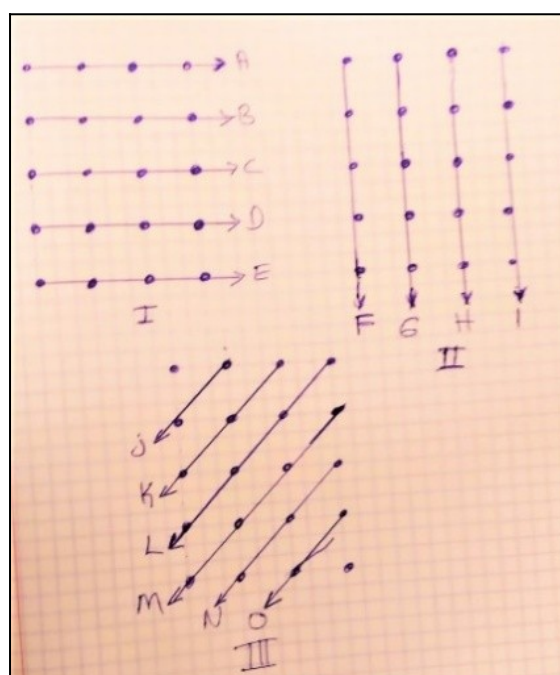


Figure 3. The parallel lines formed by 20 trees planted at the same distance from each other in all three cases are given above. The dots represent trees. In Figure 1, trees form horizontal parallel lines. In the 2nd figure, the same trees form vertical parallel lines, and in the 3rd figure, oblique parallel lines.



Figure 4. Curved parallel lines provided by trumpets (Zemeckis, 2004).

Symmetry is frequently used to provide visual aesthetics. Symmetry is the state of being the same on both sides of an axis passing through a plane in every respect such as shape, position, size. The axis is known as the line of symmetry. When folding from the symmetry line, all objects on both sides of this line overlap each other. Parallel lines are often used to achieve symmetry. However, it cannot be assumed that this is achieved with every parallel line. For this reason, the viewing directions of objects located on parallel lines must be opposite to each other, or the objects should be facing each other.



Figure 5. Symmetry created by the contrast of the children's gaze directions forming vertical parallel lines (Columbus, 2001).



Figure 6. The use of vertical and horizontal parallel lines in the movie *The Conquest 1453*. The mass burial of the Ottoman soldiers who were martyred during the siege of Istanbul in May 1453 was staged here. Due to the burial rules in Islam, the heads of the soldiers face the same direction. Therefore, although parallel lines are used here, there is no symmetry (Aksoy, 2012).

In order to ensure symmetry in horizontal lines some combinations of numbers are used in placing objects on the same lines. These are usually single number groups in the form of 1, 3, 5, 7, 9, because it is quite easy to find the number in the middle of odd numbers. The median of 3 objects placed on a line at equal distance from each other, whether these objects are initially counted from the right or left, the 2nd number remains in the middle. When the camera is placed vertically opposite this number, it remains equidistant from the 1st and 3rd numbers. In fact, there is an equilateral or isosceles triangle with no lines between the camera and the 1st and 3rd points or objects. In this case, the camera constitutes the apex angle of the triangle, and the 1st and 3rd numbers shape the base angles of the triangle. These are also the vertices of the triangle.

The perpendicular descended from the camera, in other words, from the angle of the vertex or the 2nd number, is the line that divides the base length into two equal parts and the triangle into two equal areas. This also applies to groups of numbers with 5, 7, and 9. The middle number of the group of 5 numbers is 3. The middle number of a group of 7 numbers is 4. In the group of 9 numbers, it is 5. The middle numbers are progressing as odd and even numbers, increasing by one. On the other hand, odd number groups larger than 9 are not used much in filming, because as the number of objects increases, their size must be reduced gradually to fit them into the frame. At the same time, it becomes difficult to understand whether the total number group used in crowded objects is an odd number group or an even number group. On the other hand, in the case of symmetry provided by 1 object, this object is usually placed in the middle of the frame. In other words, this object is thought to be positioned at the origin. It is seen that other materials placed to the right and left of this object are

at the same distance from this object. If the object is at the 0 point on the number line, the material A to its left is -1; B material to the right of the object is in the +1 position. We define this situation as the symmetry provided by the origin.



Figure 7. Symmetry with origin (Aksoy, 2012)



Figure 8. Triple linear combination (Aksoy, 2012)



Figure 9. Group of 5 numbers (Aksoy, 2012)



Figure 10. Group of 7 numbers (Wyler, Ben Hur, 1959)



Figure 11. Group of 9 numbers (Lang, 1954)

In order to provide film aesthetics and to create single number groups, it is not necessary for the objects to consist only of people. These can also be achieved with



lines, symbols, and items. An example of this is the seven-branched candlestick (Menorah), which has an important meaning in Judaism. There are three branches placed on the right and left of this origin; this is how the seven-branched candlestick is formed.



Figure 12. Menorah (Wyler, Ben Hur, 1959)



Figure 13. 5-digit group (Wyler, The Best Years of Our Life, 1946).

Since the number 0 expresses absence, it has no meaning in terms of providing visual aesthetics in movies. In addition to odd numbered groups, it is seen that groups of 2, 4, 6 and 8 numbers are used to provide film aesthetics and scene symmetry. The rule in odd number groups is applied here. For example, an imaginary point is situated in the middle of the objects placed by numbering 1 and 2 on a line. The camera is positioned in front of the objects in the direction of the vertical lowered to this point. Here, if the imaginary point in the middle is



accepted as a number, in fact, an odd number group is formed. The same is true for groups of 4, 6 and 8 numbers. Here, attention should be paid to the shape of the objects located on both sides of the symmetry line. For example, if the objects arranged on a line of 1, 2, 3, 4 are equidistant from each other, the symmetry line of this number object group passes through the middle of object 2 and object 3. In this case, object number 1 and object number 4 must be similar to each other. The same is true for objects 2 and 3. This similar placement of objects also suits the use of odd-numbered objects.



Figure 14. Ensuring symmetry in the use of even-numbered objects: Placement in such a way that short children are inside and tall children are outside (Columbus, 2001)



Figure 15. Symmetry provided by the 5 digit group. When the dancers (actors) are arranged as 1, 2, 3, 4, 5 from left to right or from right to left, person number 3 forms the origin (line of symmetry or zero point). Considering the origin, the persons 2 and 4 in the interior are female; it is seen that the remaining numbers 1 and 5 are male. For this reason, complete symmetry was achieved by placing similar objects on symmetrical points, not only in terms of number groups, but also in terms of the gender and clothes of the players (Lang, 1954).



One of the ways to provide visual aesthetics is to use some geometric shapes with symmetry in stage design. More precisely, it is to place the objects in front of the camera or on the scene in such a way that they overlap with the geometric shapes in question. It is certainly necessary to know the symmetry properties of some geometric forms in the form of a triangle, rectangle, square, trapezoid, regular pentagon, regular hexagon, and a circle. The median lines of width and height in a rectangle are also lines of symmetry. Therefore, the rectangle has two lines of symmetry. In a square, the medians and diagonals of all sides are also the symmetry line of this shape. Accordingly, there are four lines of symmetry in the square. In triangles, isosceles triangles and equilateral triangles can be evaluated in terms of symmetry. In an isosceles triangle, the perpendicular to the base from a vertex angle is both the median of the base and the line of symmetry of this triangle. In an equilateral triangle, median lines are both bisector and symmetry lines. There are three lines of symmetry in such triangles. In trapezoids, the sides connecting parallel lines are equal. These forms have only one line of symmetry. In a circle the diameter lines pass through the centre point. The diameter is also a line of symmetry of the circle. Theoretically, there is an infinite line of symmetry in the circle. Epic images are obtained in films by using the circular symmetry condition. The images taken by moving the camera around with the help of equipment such as a drone, without breaking the diameter line, as if the circle of a commander celebrating his victory on a hill is in the centre, exemplify this situation.



Figure 16. Circular symmetry situation (Aksoy, 2012)



Figure 17. Circular symmetry (Bergman, 1963).



**Figure 18. Circular Symmetry, Rotation of the diameter line (horses) around the Centre.
(Wyler, Ben Hur, 1959)**

More high-angle shots are wanted so that the circular symmetry can be perceived by the viewer. For this reason, aerial shots are often needed. In indoor environments, it cannot be used most of the time, depending on the ceiling height of the space. On the other hand, it is seen that triangle modelling is mostly used

in movies. This is due to the fact that such technique is quite simple. At the same time, this model works well in the establishment of dialogue scenes in movies.



Figure 19. Triangle model (Huston, 1941)



Figure 20. Triangle model (Aksoy, 2012)



Figure 21. Triangle model (Columbus, 2001)

Icons and symbols are produced from geometric shapes. It shows the film mathematics. For example, the symbol known as the Seal of Solomon consists of two identical equilateral triangles intertwined opposite each other. Thus 6 smaller equilateral triangles are formed. The total number of triangles is 8. There is also one hexagon in the centre. In fact, there is a visible centre (hexagonal shape) and 6 perimeter triangles. There are 7 items visible in total.



Figure 22. The Seal of Solomon (icon) on the Door (Wyler, Ben Hur, 1959).

Results

Mathematics-Based Visual Aesthetics Dynamics in the Conquest 1453



Figure 23. Triangle model (Aksoy, 2012).

According to Figure 24, vertical parallel lines are used more often in the movie *The Conquest 1453* than other parallel lines, since it is easier to detect vertical parallel lines with a camera positioned on the ground. Vertical parallel lines were used 24 times in this movie, while horizontal parallel lines were used only 5 times. The percentage of using horizontal parallel lines is 82.75. Inclined parallel lines are never used in the movie.

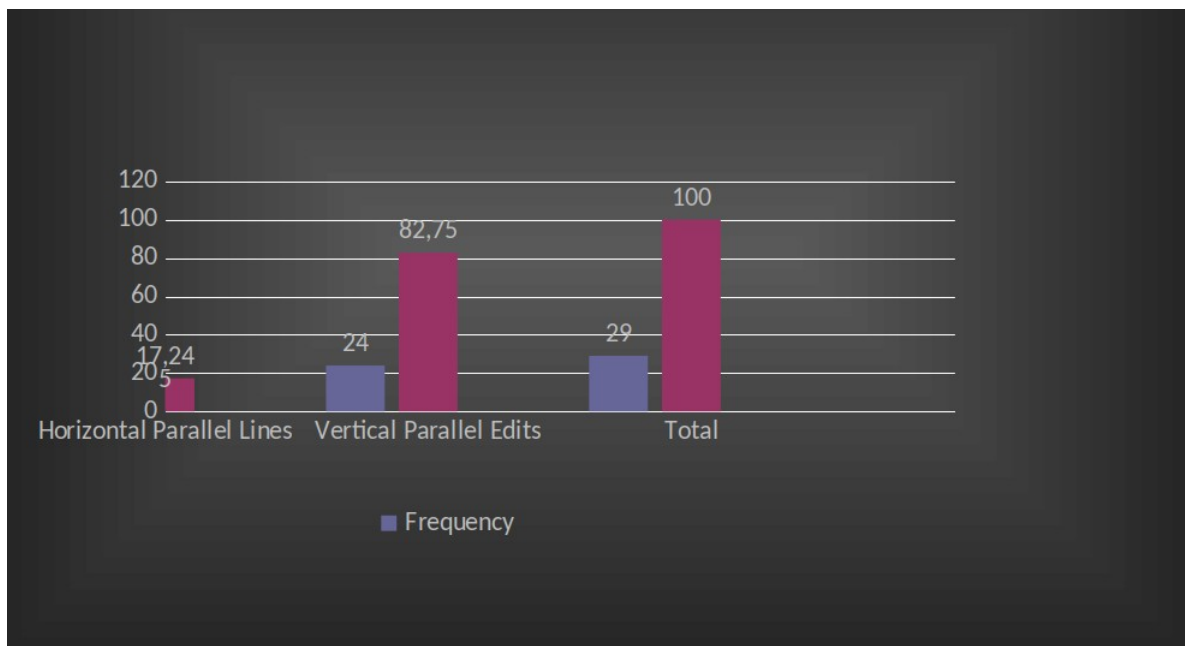


Figure 24. Parallel Lines Used in the Movie “The Conquest 1453”



The Conquest 1453 is the movie for the rulers. Since it is a war film, leadership is at the forefront. It is possible to see four leading characters in the movie. The first of these was Sultan Mehmet, the ruler of the Ottoman Empire. The other is the Eastern Roman Emperor Constantine. The Pope of the Catholic Church and the Pope of the Orthodox Church stand out as other leading figures. In the falsification of these leader types in the film, the figures in question are placed at the origin due to the throne and sovereignty situation. For this reason, in the case of symmetry provided by an odd number, the symmetry provided by the origin is mostly used.

Figure 25 shows that symmetry is provided by using triple number groups. It is striking that as the odd number values increase, the number of their use decreases.

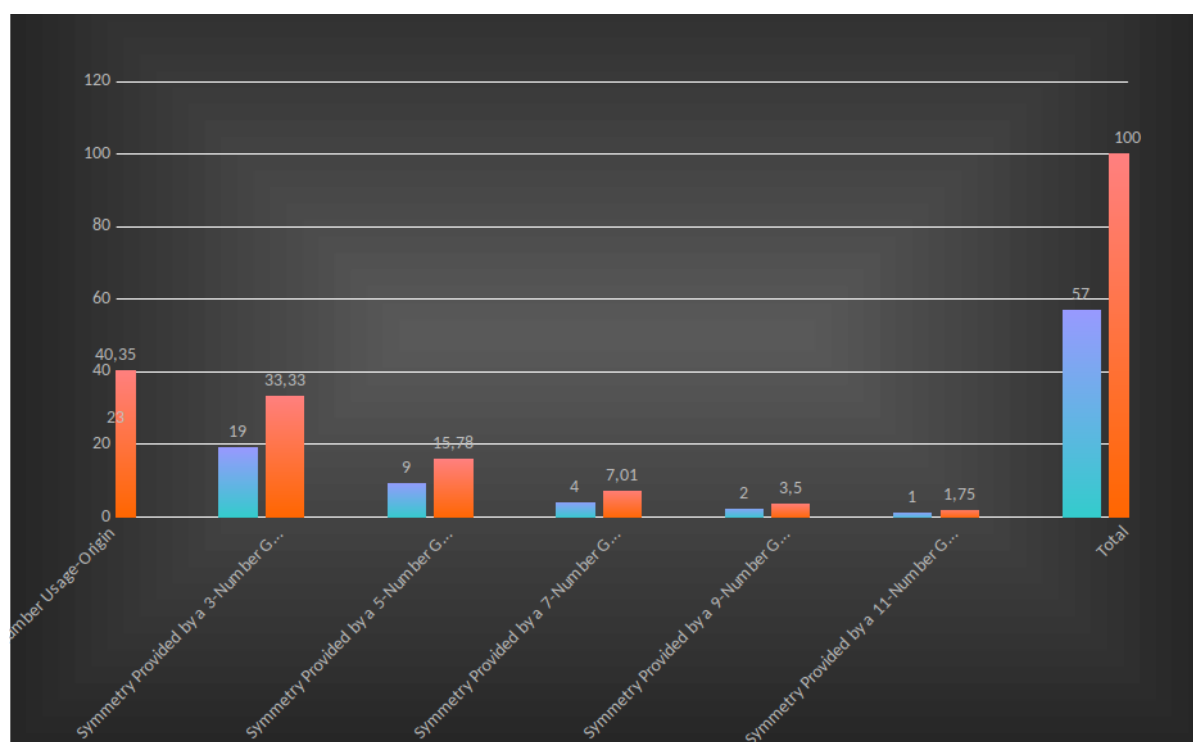


Figure 25. Groups of Odd Numbers Used in Objects Placed on a Line in the Movie “The Conquest 1453”

According to Figure 26 only the 2nd, 4th and 8th number groups of even numbers are used in the movie *The Conquest 1453*. Of these, the 2-digit number group was used 12 times, making it the most used number group.

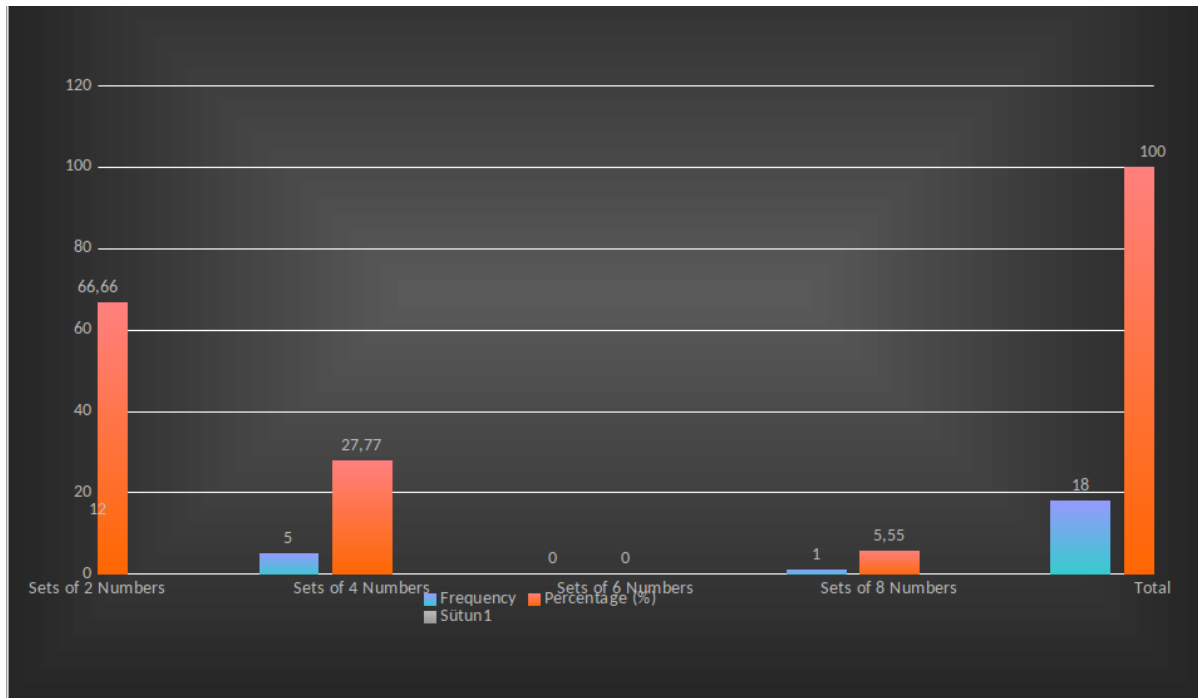


Figure 26. Even Number Groups Used in Objects Placed on a Line in the Movie “The Conquest 1453”

Figure 27 shows that odd-numbered groups are used more than 3 times of even-numbered groups in the movie *The Conquest 1453*. It is seen that odd numbered groups are used in approximately 75% of cases and even numbers in approximately 25%. This is entirely due to the nature of odd numbers. Finding the point where the line of symmetry passes is easier in odd-numbered groups.

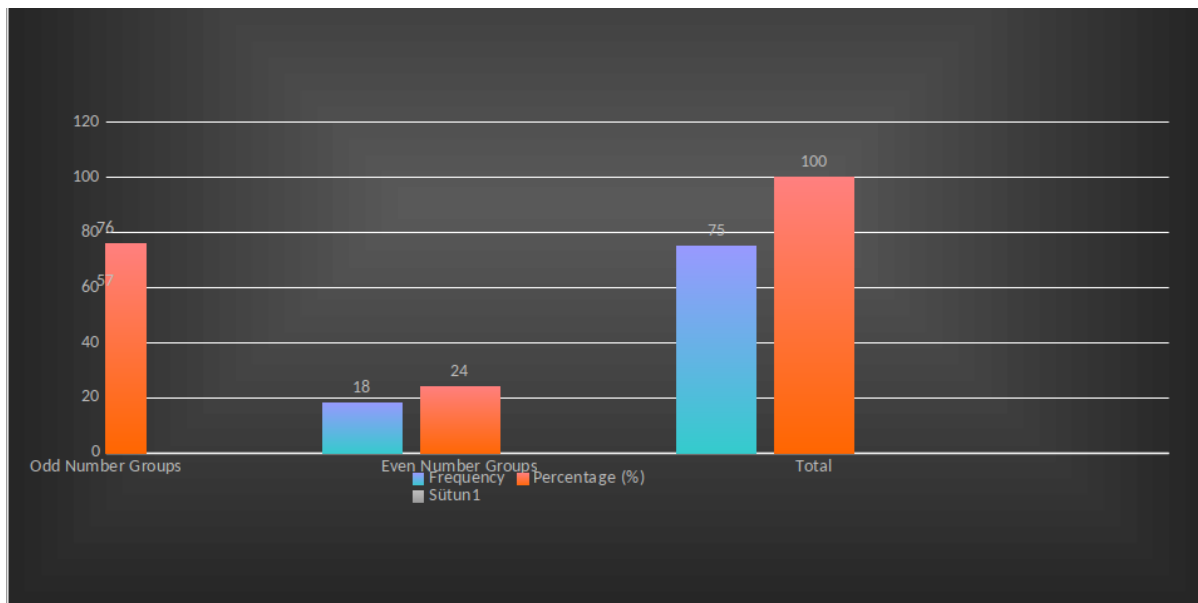


Figure 27. Comparison of the Frequency of Use of ODD Number Groups and Even Number Groups Used in the Movie “The Conquest 1453”



According to Figure 28, it is striking that the triangle model is used the most among the geometric forms in the movie called *The Conquest 1453*. While the circle model was used 3 times, the triangle model was used 16 times. The triangle model was used more than 5 times than the circle model. One of the reasons for this is that in order for the circle model to be perceived by the audience, it is necessary to shoot at high angles, right angles, or near vertical angles, so this model is not used very often. These types of models are used infrequently, generally to achieve epic looks.

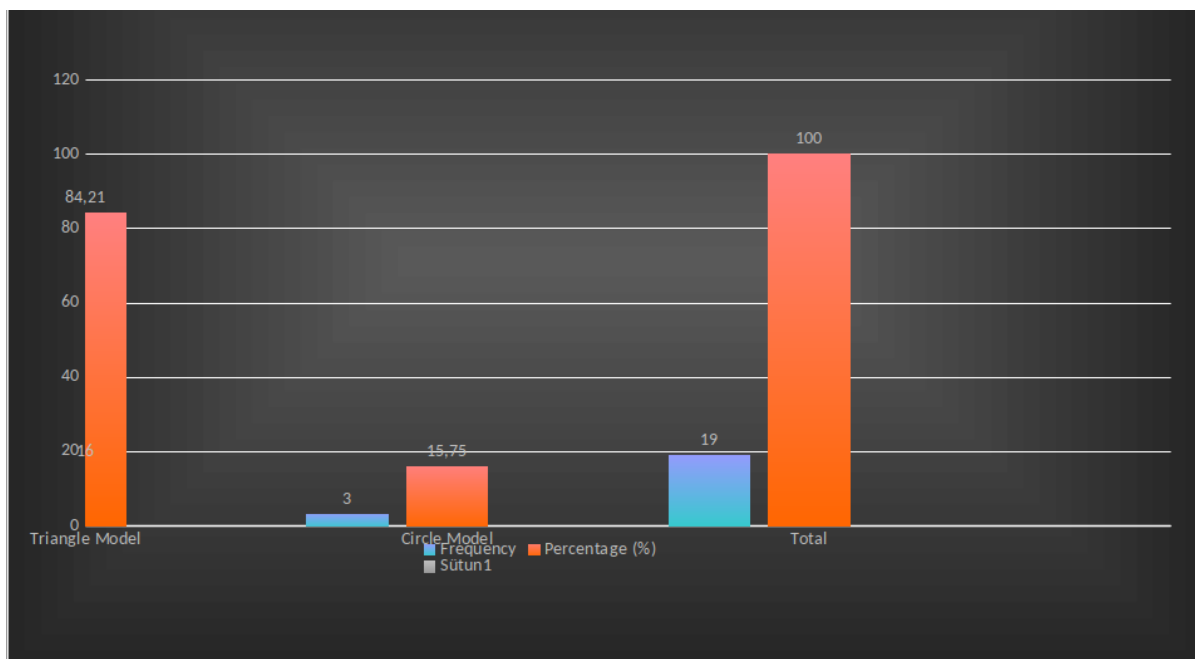


Figure 28. Geometric Shapes Used in the Placement of Objects in the Movie “The Conquest 1453”

Figure 29 shows that the symmetry provided by the origin (odd number -1) is used the most in the movie called *The Conquest 1453*. This situation is more than 2 times even the closest data. It is seen that vertical parallel lines are also used a lot in the movie. The circle model is the least used. In general, mathematical elements are used 123 times in the movie.

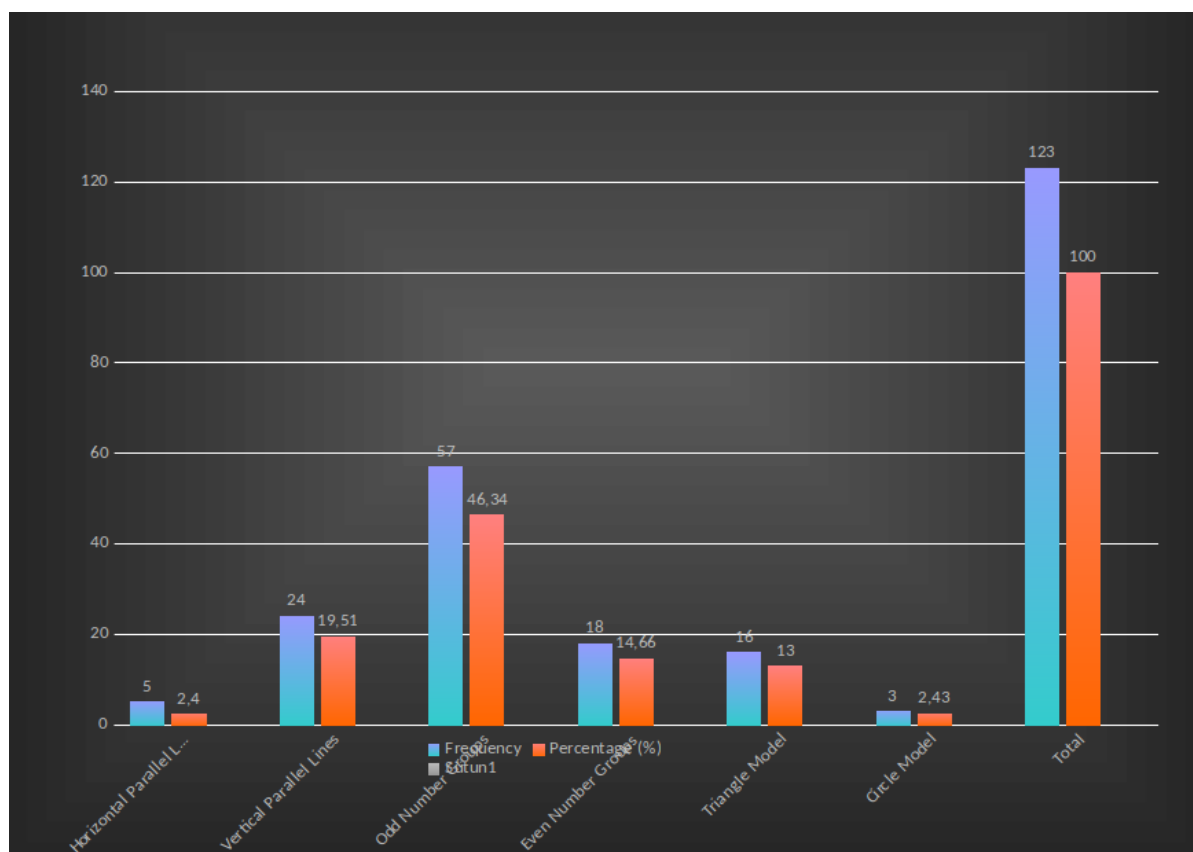


Figure 29. Comparison of All Mathematical Elements Used in the Movie “The Conquest 1453”

Mathematics-Based Visual Aesthetics Dynamics in *Harry Potter and the Philosopher's Stone*

The Conquest 1453 is a historical movie. *Harry Potter and the Philosopher's Stone*, on the other hand, can be considered a fantastic movie. However, since this film contains too many mythological elements, the film has something to do with history, especially Ancient History in this respect. On the other hand, looking at the spatial setup of this movie, it is seen that huge castles are created in the middle of the lake. This situation mostly points to the Gothic understanding that prevailed during the Middle Ages. At the same time, elements such as steam trains and banks in the movie show the times when the mercantilist effect turned into capitalism with the Industrial Revolution throughout the 1800s. Therefore, although this production is a fantastic genre, it exhibits strong hybrid features based on historical information.



Figure 30. Triangle model (Columbus, 2001)

According to Figure 31, horizontal parallel line elements are mostly used in *Harry Potter and the Philosopher's Stone*. It is possible to say that oblique parallel line elements are used the least. While the rate of using oblique parallel lines is 15.38%, the rate of using vertical parallel lines is 69.23%. Thus, horizontal parallel lines are used at the same rate as vertical parallel lines.

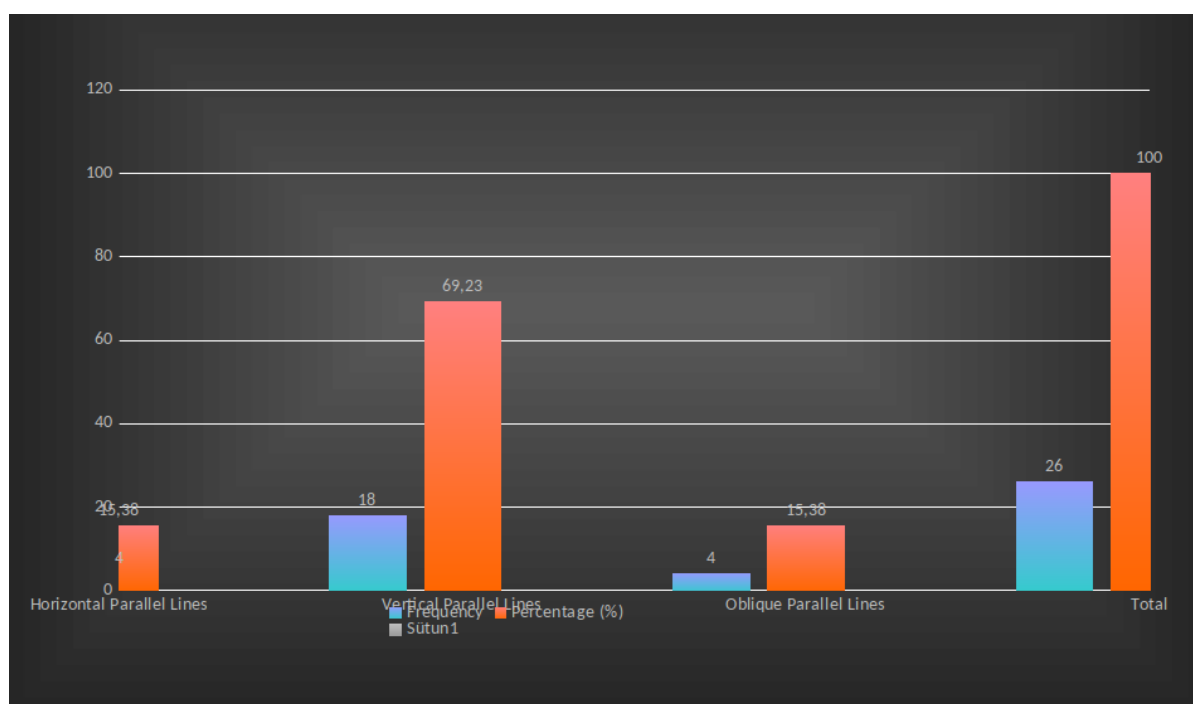
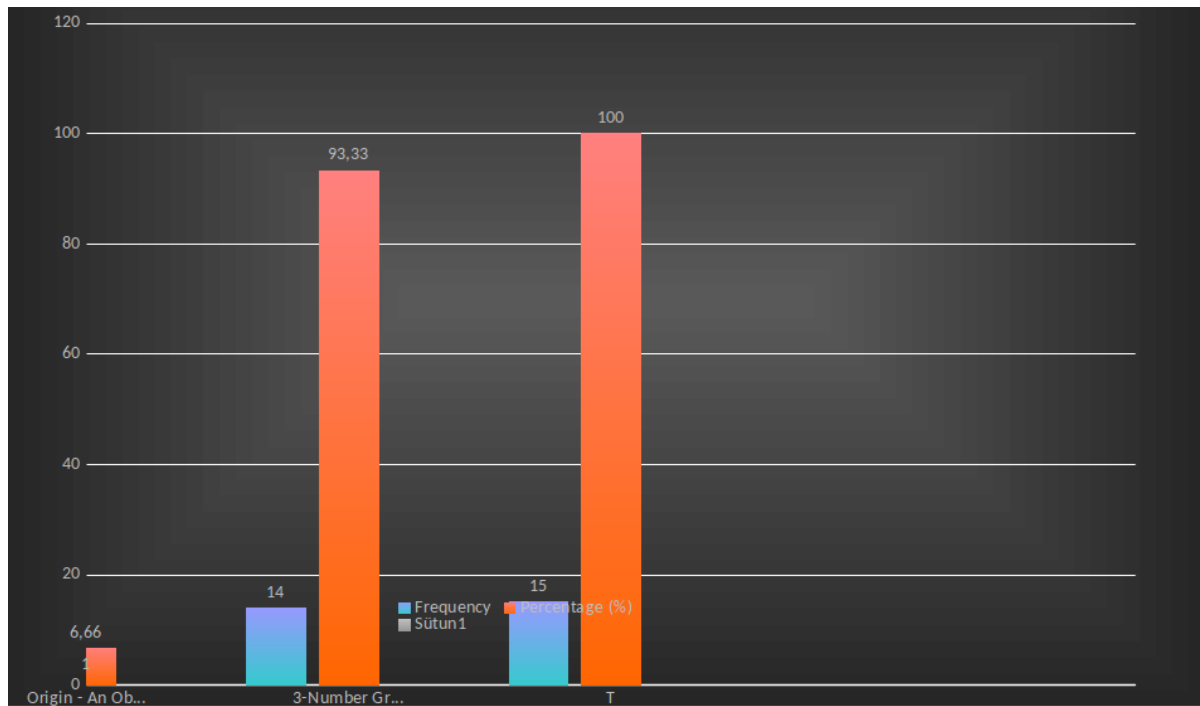


Figure 31. Parallel Lines Used in "Harry Potter and the Philosopher's Stone"



While looking at the data in Figure 32, the fact that three children shape the main character of the movie *Harry Potter and the Philosopher's Stone* should also be kept in mind. Therefore, it is seen that the number 1 or the symmetry condition provided by the origin is used once in the movie. The 3-number group was used 14 times in total. The percentage of using it was 93.33%. Except for 1 and 3, no odd number groups were used in the movie.



**Figure 32. Odd Numbered Groups Used
in the Movie “Harry Potter and the Philosopher's Stone”**

Figure 33 shows that the double numbered groups are used the most compared to the other number groups. Apart from this, it is striking that the groups of 4 and 6 numbers are used at a very low level. Other even-numbered groups were never used in the film.

According to Figure 34, odd-numbered groups are used three times more than even-numbered groups in the movie *Harry Potter and the Philosopher's Stone*. This is due to the nature of odd-numbered groups and the fact that three children shape the main character of the movie.

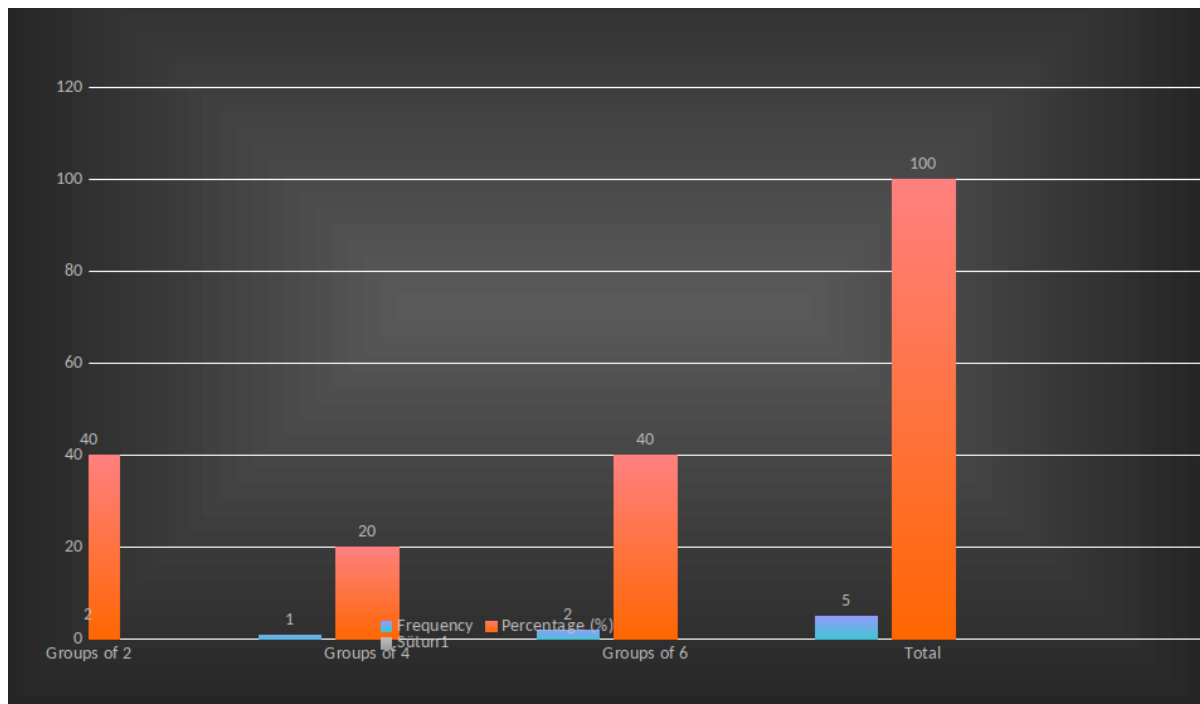


Figure 33. Even Number Groups Used in the Movie “Harry Potter and the Philosopher's Stone”

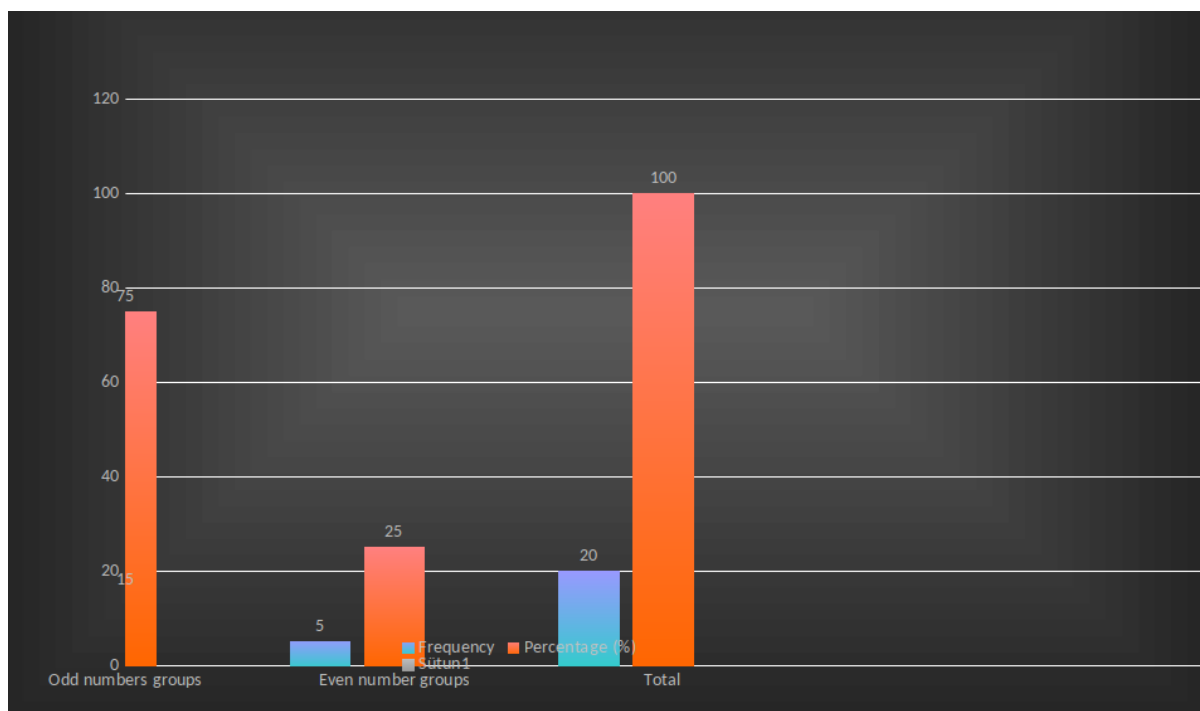


Figure 34. Comparison of Odd and Even Number Groups Used in “Harry Potter and the Philosopher's Stone”

In Figure 35, it is noteworthy that the triangle model is used more than three times than the circle model. The fact that three children shape the main character



of the movie in *Harry Potter and the Philosopher's Stone* is one of the reasons for the high ratio of the triangle model. It is seen that other objects are also used to place them in front of the camera to fit the triangle model in the movie. The triangle model is also useful for aesthetically shooting three-way dialogue scenes. The circle model was used 5 times and the triangle model was used 20 times in the movie. The percentage of using the triangular model in the film is 80%, while the percentage of using the circular model is 20%.

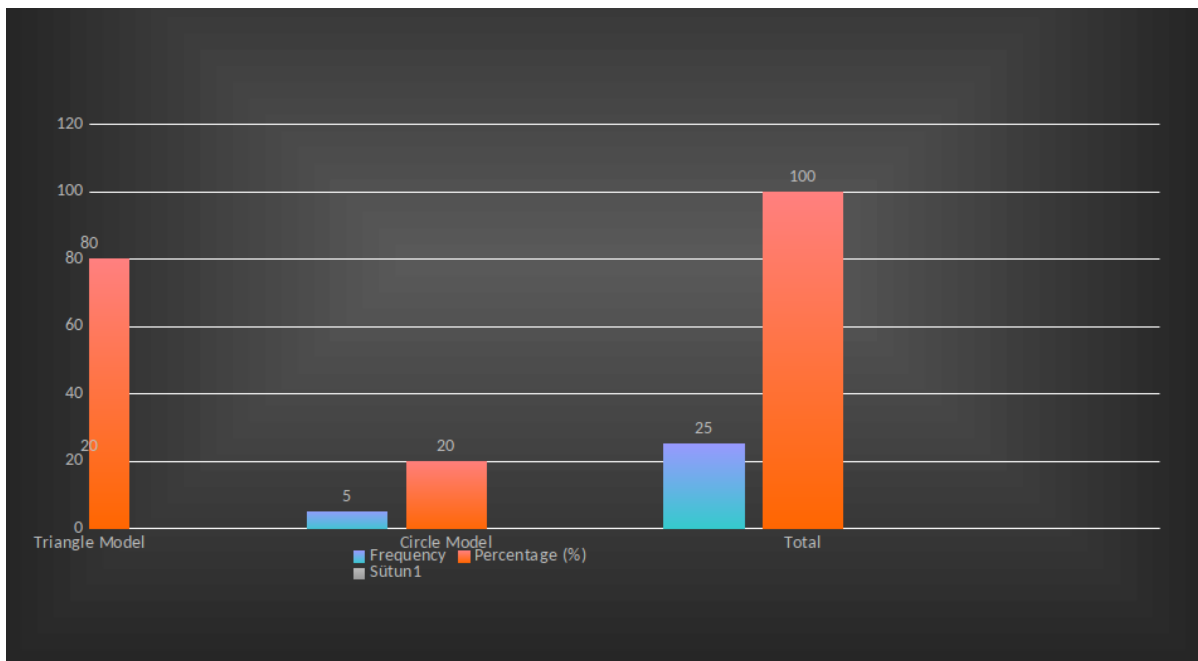


Figure 35. Geometric Shapes Used in the Movie "Harry Potter and the Philosopher's Stone"

According to Figure 36, it can be stated that much more mathematical elements were used to provide visual aesthetics in *The Conquest 1453* than in the *Harry Potter* movie. It is noteworthy that the movie *Harry Potter and Philosopher's Stone* is ahead in using a single triangle model. Again, oblique parallel lines were not used in the movie *The Conquest 1453*, but they were used a little in the movie *Harry Potter and Philosopher's Stone*.

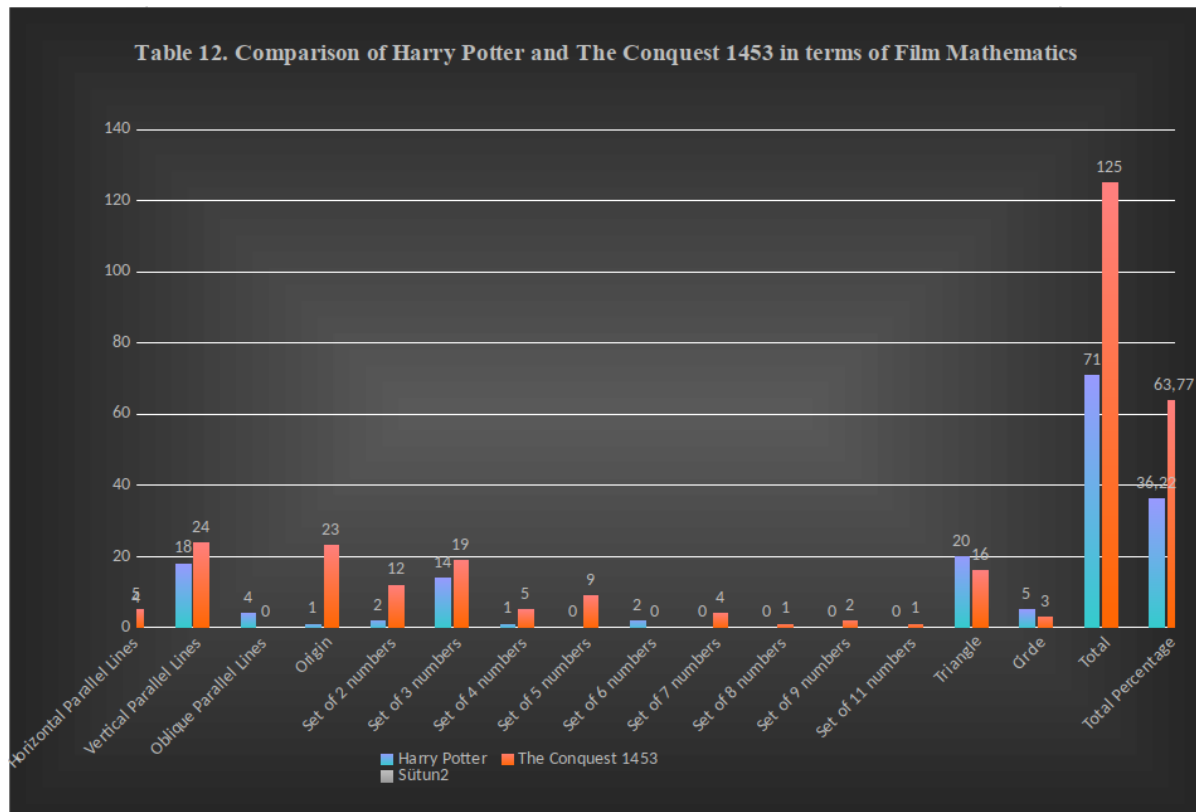


Figure 36. Comparison of “Harry Potter” and “The Conquest 1453” in terms of Film Mathematics

Conclusion

In *The Conquest 1453*, visual aesthetic concerns came to the fore, which has weakened the film thematically. In the *The Conquest 1453*, the story about the Ottoman Empire’s conquest of Istanbul is told. Most people are familiar with the basic myths used in this movie. The result of the movie is also clear before watching the movie. In this case, it is understood why visual aesthetic concern dominates. However, paradoxically, too much use of aesthetic elements based on mathematics and geometry in the film is likely to have reduced the literary influence of the film on the audience.

Harry Potter and the Philosopher’s Stone is a fantastic movie. In this film, visual aesthetic elements based on mathematics and geometric knowledge are used sufficiently.

Even though the genres of *Harry Potter and the Philosopher’s Stone* and *The Conquest 1453* are different, these films are both epic films. For this reason, in these two films, information based on mathematics and geometry was used to provide visual aesthetics. These elements are realized by using horizontal-vertical-oblique parallel lines, and different number groups of objects placed on a line. On the other hand, geometric forms such as triangles and circles were



also used to provide visual aesthetics in films. The excessive use of mathematical and geometric data in *The Conquest 1453* reduced the thematic power of the film. In the *Harry Potter* movie, these are used in a balanced way.

As the name suggests, “the *Harry Potter*” movie metaphorically includes the struggle between good (Potter) and bad (Harry) or God (Potter) and Evil (Harry). Harry explains in the Cambridge Dictionary as “in to repeatedly demand something from someone, often causing them to feel worried or angry.” The frequent use of the triangle symbol in the film helps to better understand the cultural characteristics of the film by referring to the trinity belief of Christianity. From this point of view, the figural, literary, or visual symbols implemented in the film cannot be considered separately from cultural and historical narratives.

In the movie called *The Conquest 1453*, very intense technology, effects, and symmetrical shapes are used. While this feature shows an approach that refers to the concept of authority, political order and system, it also makes a reference to the technology and consumption-centred nature of the neo-liberal economic order.

Vertical lines are frequently used in both films. Gothic architecture in Christianity and minarets in Islam are vehicles or symbols of reaching God, which is assumed to be in the sky. This indicates that religious themes and elements are frequently employed in both films. This situation can be interpreted as a reflection of the religious characteristics of the millennial age in cinema, as emphasized in Samuel Huntington’s thesis called *Clash of Civilizations*.

According to Huntington’s thesis, unlike the Cold War period, an identity and civilization-oriented perspective dominated the world that was reshaped after the collapse of the Soviet Union, and this point constituted the determining factor in new conflicts or alliances. In this new era, the relationship of each country with the civilization to which it belongs and its representative role within this civilization is also a point that should be taken into consideration. According to Huntington, civilization identity will become increasingly important in the future and that the world will be largely shaped by the interaction between seven or eight major civilizations that are Western, Confucian, Japanese, Islamic, Indian, Slavic-Orthodox, Latin American, and possibly African. Huntington’s thesis reveals that the contemporary world will be part of the war of civilizations and within that, religion and identity will be in the centre. Religious-nationalist discourse has recently increased in leading EU countries such as Germany and France. Trump phenomenon in America and Brexit in England showed that the Western bloc has a conservative, republican, and nationalist discourse. It is possible to discuss a multicultural nationalist wave in the Middle East beginning with the Arab Spring. The Syrian civil war is also a part of this process. Movies such as *Harry Potter* series and *Conquest 1453* reproduce this religious-nationalist discourse on mythological characters today, but in aestheticized forms.



America demonstrates the political balance in the world by supporting the distinctions of civilization and religion at certain times and to certain extents.

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