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INTRODUCTION

The first-place people use in social life is the home. The house is a place where many experiences, concepts and phenomena occur, rather than just an area surrounded by four walls. Home, which is the place where physical, spiritual and cognitive development takes place and is shaped, also gives people feelings such as trust and belonging. The narrative about the house first appears in children's drawings. Again, the house pictured here is not only an architectural element, but also contains many meanings and concepts about humanity. Many children describe houses with roofs and chimneys located in rural areas. In addition, there are those who draw tall buildings. Apart from children's paintings, some artists also use the image of the house in their works. In our study, first the house image was examined from different angles, and then the house image in children's drawings was discussed. In order to compare the house image in children's paintings with the house image in artists' works, artists such as Julian Opie, Katarzyna Jozefowicz and Callum Morton and their works were examined. The formal and intellectual structures in the works of these artists were investigated and compared with the semantic and formal structures created in children's drawings.

HOUSE IMAGE

Human beings have met their need for shelter with structures of different architecture made by human hands, which are called houses after naturally existing places such as caves and tree holes. Originally built for purposes such as shelter and protection, the house later turned into a meaning that encompasses many concepts about humans. Thus, the house has become a symbol of people and life, rather than just four walls. "Space gains value not because it is a geometric area, but because it can be defined as the representation of a whole connected to society. For this reason, space gains meaning with the existence of humans and the social relations they fit into their places" (Büyükağa and Tor, 2023: 614). Human life, which begins with birth, continues and takes shape in different places. Values regarding humanity and society were formed or maintained in these places. Houses were created as spaces for the family, the smallest unit of society.

A person sees as much as he can perceive or control, even in a very large area. This is also valid for creating space. "The concept of space does not refer to something that exists outside or despite humans, but on the contrary, it refers to the most important dimension of the social structure that gains meaning with humans. Therefore, space; It is nothing more than a plane that is perceived, evaluated and shaped by those living on it" (Yıldız and Alaeddinoğlu, 2011: 848). With the time spent in the place, it acquires a place in perception and then in memory. Its meaning and content

is formed through experiences. Space exists as places where individual, family and society share their common experiences. These places also signify privacy and boundary. In spaces that turn into a private area, an order and the rules that maintain this order come with it. “Social space includes social reproduction relations, that is, together with the specific organization of the family, biological-physiological relations between genders and ages, and production relations, that is, the division and organization of labour, and therefore hierarchical social functions - assigning (more or less) appropriate places to them.” (Lefebvre, 2020: 61).

Family is the smallest unit or unit that ensures the continuity of society. It consists of individuals living in the same house legally or by blood relatives. This community continues its life by meeting its social, cultural, psychological and sexual needs at home, which is a common space. Home is the place where harmony and participation in society is ensured and regulated. When we look at the opinions about the semantic structure of the house; Connerton (2012: 29) states that the house represents much more than a concrete order built from walls and boundaries, a shelter or spatially organized activities, and can be seen as a mnemonic system. According to Lefebvre (2020:71), the house is a living, speaking, representational space with a sensory centre. Many areas and places directly involve time, replacing actual actions and lived situations. Büyükağa and Tor (2023: 617) state that the house is a human shelter to protect from external dangers, a structure that allows separation from communities while remaining within the society, and a place that clearly reveals the boundaries of public and private space; In this respect, it states that the home provides the individual with the opportunity to both socialize and isolate himself from society. Based on these views, we can summarize the semantic content of the house as a mnemonic, sensory centre, representation of the actions and situations experienced, containing time, and a sign of presence in public and private life.

> The most important and popular place for people is “home”. According to Tuan (1991), home is the “place” where people hold on and feel rooted, the centre of meaning and care (Adıgüzel Özbek, 2016). It can be said that the perception of “place”, which Heidegger defines with the relationship between dasein (existence) and dwelling, corresponds with “home”, which is the source of taking root. Throughout the history of architecture, the house, or residence, has been the primary occupation for every society. The house is a type of structure that emerged to protect people from the negativities of the external environment, to meet their living needs and to create environments that will create a feeling of home. In fact, when examined etymologically, it is noteworthy that the concept of home, which has appeared in different forms and with different meanings in different cultures and geographies throughout hu-

> man history, carries much deeper historical and cultural meanings than other synonyms. When examined terminologically, it is revealed that the word "house" was used as "eb" in the Orkhon alphabet of the Gok Turk's, the first writing system used by the Turks, and over time, it began to be used as "house" with the "b" and "v" sounds changing places. In the Göktürk alphabet, which consists of 4 vowels and 34 consonants, the sound represented by the sign is read as "be" or "eb" and when used alone, it means 'house'. The sign is obtained by extending the two intersecting edges of a diagonally positioned square towards the ground. Thus, a defined and protected area is created on the ground, while the diagonal square on top looks like a human head (Usta 2020: 28-29).

A person must meet his psychological and physiological needs in the process of self-actualization. The hierarchy of needs theory, researched and presented by American psychologist Abraham Maslow, involves a pyramid. Accordingly, it is suggested that as the layers in the pyramid are met, one can move to the next step and complete the personality formation by realizing oneself. The steps of the pyramid are listed as physiological needs, the need for security, the need for love, belonging and socialization, the need for respect and esteem, and the last step, self-actualization. The house, as a space, stands at an important point in meeting these steps. Home is the place where the individual can easily meet his physiological needs, feel safe, belong, find love, and be respected and valued according to the home he lives in and his upbringing. All these situations we have listed cause the formation of many values such as a person's memories, memory, personality, character and perspective on the world. John Berger (2016: 72) states that in places where there is no civilization, the house is represented not only by a house but by an action or a set of actions, and this varies according to individuals or units. Thus, the house is more than just a place, it is an element that carries the unknown stories of a life lived. Gaston Bachelard (1996: 31-35) states that the house provides people with a set of images, and in this respect, it is an integrative power for people's thoughts, memories and feelings. He adds that the achievements of human life are protected, it gives the person the ability to cope with the negativities he encounters in the outside world, the value of existence and the beauty of life are realized through the nature of the house, which is the essence of the place. According to Madanipour (2003: 62), the house is a place of social life that includes many things related to the private sphere, where the continuation of the species is ensured and where the unity is protected by separating it from the public, and at the same time it cannot be considered independently of interpersonal relations. It contains many meanings in memory depending on time and place. The house, which contains many human experiences, interactions, semantics and concepts, finds a place in expression in different disciplines. Lefebvre (2020: 143) defines spaces of

representation as places where significant changes occur where stagnation and situations that can remain the same are hidden. In this respect, while the house bears the traces of modernity, it has taken its place as a historical-poetic reality in the urban texture, and the circulation of the house continues in art, poetry, philosophy and theatre, thus the house; It expresses that it gains meaning as a sacred, religious, cosmic, humane, rational and privileged place. One of the first expressions of the house in human life can be seen in children's drawings.

THE PLACE OF THE HOUSE IN CHILDREN'S DRAWINGS

The house has been the subject of many disciplines due to its historical process, the meaning it carries for the individual and society, and the concepts it has transformed. The expression of this structure in human life first appears in children's drawings. Although the house in the pictures is drawn with certain features, it does not consist of only four walls. The house appears as the most important point in the process of people's perception of nature and life. Oulmane-Bendani (2013: 163) defines the home for the child as the best place that helps him create his spatial signs and emotional references. It is also accepted that every child needs a place to establish his/her environment, where he/she can then start to learn, understand and embrace. This place helps him understand and begin to learn to take ownership of his environment, which will allow him to first develop his personal life, with all the consequences that may arise in material or emotional circumstances. Home is the place where he meets his physical and spiritual needs and feels safe and belonging. It is the source of the soul, which is shaped by the individuals that make up the family, such as mother, father, sibling, and the experiences that occur as a result of the relationships and interactions with these individuals. For these reasons, the house appears as the primary element in children's paintings. Di Leo (1983: 40) states that in order to please themselves, children draw themes such as people, houses, trees and sun, which can be found in the works of children from all countries and cultures, and that this confirms the basic universality of mind and emotions. Whether the child lives in the countryside or in the city, it is seen that he draws country-type houses in his paintings. This situation is explained by the fact that the child ignores the visible reality and transforms it into a subjective world with his imagination, that is, he draws the houses he desires.

Children's drawings are related to things that are intended to be expressed beyond what is visible. The themes used appear as metaphors for many things that exist in life. According to Di Leo (1983: 44), people, houses and trees are important factors in children's lives because they are located around them. While the child draws them, they tell more than what

they draw. For example, house; It represents the place where compassion and security are sought in family life. Animals are often added to the picture as part of the family. Trees, flowers and sun; It is an expression of the need for the world limited by light, nature and home. All elements in the pictures represent the family and the house they live in. In his book titled Children with Pictures (1995: 69), Haluk Yavuzer includes house drawings of children between the ages of 4 and 7 from the Kellogg Collection (Image 1). When these examples are examined, drawings similar to houses with single-storey roofs located in the countryside are seen. "Neighbourhood, house, school, etc. With images such as these, children describe themselves or their relationships with their environment, what they feel and what they experience. In addition, the child reflects his/her view of himself according to his relationships with others" (Malchiodi, 2005: 217).

Image 1. House Pictures Drawn by 4-7 Year Old Children (Kellogg's Collection).

Another interesting point in the drawing of these houses is that the elements drawn with the houses are not related in size (Image 2). Each element is drawn different from its actual size. Because here we encounter a conceptual structure rather than a house to enter. "To understand children's interpersonal relationships, we can examine pictures showing their families, home, environment, society and interpersonal relationships. In addition, gender is an important factor as it reflects how children see themselves compared to others" (Malchiodi, 2005: 128).

Image 2. Example of a House in Children's Drawings.

House is the place where emotional and physiological needs are met and satisfaction is achieved. In this place, places such as the kitchen, bedroom and living room are seen as new spaces, boundaries and sections created within the house. "Living rooms and kitchens are used most during the day, and bedrooms are used at night. The interactions that take place in these regions are limited by both temporal and spatial divisions" (Giddens, 2012: 186). The concept of home and its boundaries formed in consciousness, individual boundaries are related to the control of these boundaries, in other words, the desire of the human being to constantly control his environment. "The mortar that keeps the house standing is nothing but a memory, even for a child. Visible and tangible clues - photographs, gifts, trophies - are placed inside the house, but the walls and ceiling that protect its inhabitants are invisible, intangible, biographical (Berger, 2016: 72).

Even during periods when language or expression is not developed, painting has become an area where the child can express his feelings and thoughts. This process, which started with the doodling period (2-4 years old), differed in parallel with the development of visual perception. According to Farokhi and Haşimi (2011: 2220), children's drawings have a developmental sequence and this brings with it the development of motor skills, emotional, psychosocial and perception. Children draw what they "know" in their own unique style. In other words, perception functions, sensitivity/emotions and motor functions interact, the social experience factor is added and finds its way into the picture.

> In places without civilization, home is not represented by a house, but by an action or set of actions. Everyone's is unique. Actions chosen without a sense of necessity may be temporary in themselves, but they

> offer shelters more permanent and solid than any building. The house then ceases to be a place and becomes the untold story of a life lived. The most crucial point is that the house is actually nothing but a person's name, and according to many people, a person is nameless (Berger, 2016: 72).

ARTISTS WORKING ON HOUSE IMAGE

Julian Opie

Although the artist, who was born in England in 1958, made works related to the Pop art movement in his early years, he cannot be included in a specific group. Known for his figurative, especially portrait, works in the early years, Julian Opie produced works in different disciplines with materials other than classical materials. John Slyce (2014: 8-9) Julian Opie, who was initially closely associated with the New British Sculpture group, which included names such as Richard Deacon, Antony Gormley, Bill Woodrow, Anish Kapoor and Richard Wentworth, first appeared in the 1980s. He states that he is starting to come to the fore and that although the artists affiliated with his group do not produce works in a similar style, they continue to work with ordinary objects based on daily life. He adds that towards the end of the 1980s, Opie's works produced works that revealed the relationship between art and architecture and our experiences with the world order formed by industrial production forms, and that these works transformed from large-scale works to simple and minimal ones.

İmage 3. Julian Opie, Imagine That is Raining, 1992.

Among Julian Opie's architectural works, his works on houses will be examined in this section. His work, Imagine That is Raining (Image 3), which he first produced in 1992, includes houses consisting of three groups of different sizes, each with nine pieces. Houses made of plywood are painted in off-white and grey. Houses with sloping and gable roofs, which appear modern at first glance, represent examples of houses built in northern Europe in the past. In this work, essential parts of the house such as doors, windows and chimneys are not included. When we look at the work, we see the silhouettes of houses that were once lived in in northern Europe. Specifying the features of the building here also gives us the architectural, cultural and artistic structure of the geography covered. Richard Shone (2018: 4), Opie's houses appear modern at first glance, but it is clear that they are based on the triangular and sloping roof type of house architecture style, which was the basic structure of Northern European buildings in the past centuries. However, he argues that the Houses in Imagine emerge from a mixture of visual memories, rather than a specific house, and the general view of buildings that Opie saw in Cornish villages during his years in England, and later in the Netherlands, Switzerland and Germany. The past and memories gain formality with the image of home.

Image 4. Julian Opie, You Pass a House (2), 1996.

Another work by Julian Opie about the house is You Pass a House. The work is made of plywood, a durable and lightweight material, and is painted. The house offers us an example of houses located in the countryside in ancient times. The dimensions of the work are 192 x 142 x 180 cm. When the work is reconsidered with these dimensions, we see a home work that a normal person can enter and experience physically. The house, built with a pictorial effect, is located in a space that includes the viewer. Instead of looking at the painting from outside, the viewer and the artist are inside the painting as it gains dimension. Richard Shone (2018: 2) states that from the very beginning, Julian Opie has taken home-related formations as the subject of his works, because everyday objects present a common and general life and at the same time, due to the strong semantic structure of their unique features. Another work by Opie is called You want to move house but you are worried that nothing will change (Image 4), which he made in 1994. This work consists of a composition of houses made of plaster. The houses do not have a uniform architectural feature and the way they are laid out is also different. This work, with dimensions of 28x25x25 cm, gives the viewer the chance to see it from afar and with a general overview. The fact that the houses are in the form of silhouettes reminds us of the unclear images in the past that we try to remember.

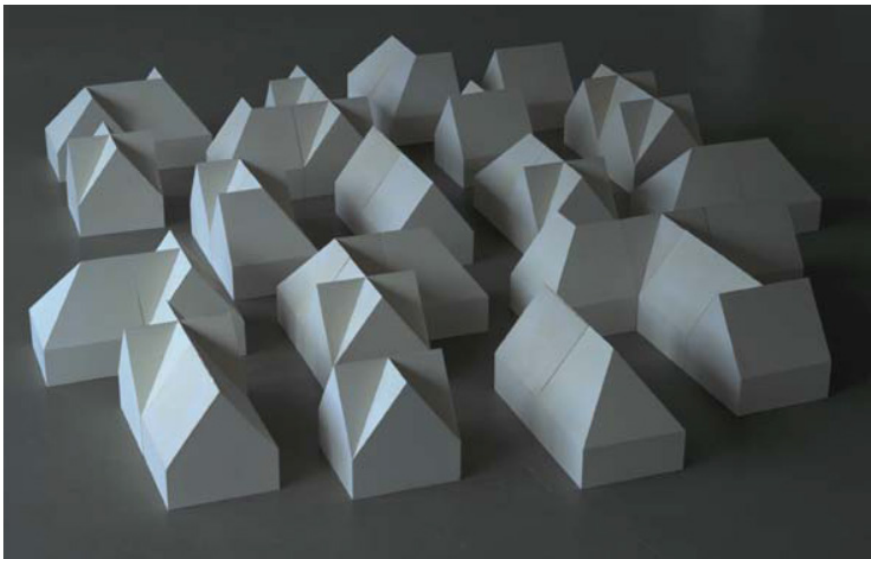

Image 5. Julian Opie, You Want to Move House but You are Worried That Nothing Will Change. 1994.

Katarzyna Jozefowicz

Born in Lublin, Poland, Katarzyna Jozefowicz studied sculpture and continues her studies in the same field and works as an instructor. She generally uses paper and cardboard as materials. In the 1990s, he carried out studies on City and Habitat using these materials. Goździewski explains that the exhibition opened in the brochure of Katarzyna Jozefowicz's Habitat Exhibition, which he curated in 2015, covers not only Józefowicz's achievements and artistic development, but also the post-socialist apartment blocks that are exceptional in Polish art, and her own home, from fear and escape from those blocks to living in her own house with her family. and expresses that he shows his thoughts about his desire to find his own place. Regardless of the fact that cities are sculptural landscapes of chaos, fear and confusion, they are produced, and this also shows us how Habitat is produced with a frame of shelves and wall units of a rented flat that neither belongs nor feels like it belongs, and that " He adds that it helps tame the "foreign" space and turn it into a place that feels a little more comfortable and a little more "one's own." (Reference: https://archiwum.u-jazdowski.pl/upload/file/201501_press_jozefowicz_leaflet_eng.pdf)

Katarzyna Jozefowicz's Habitat work, produced between 1992 and 1996, consists of houses stacked on top of each other in different sizes. When we examine the work, we see that the houses have no walls and the inside is visible. This situation is similar to the pictures in the child's pre-schema period (4-7 years old). There are no walls in the drawn house and the child shows the inside (Image 5). The situation seen here describes these pictures as transparent because the child draws as he thinks, not as he sees. Katarzyna Jozefowicz's works about home are also related to the life there. It is depicted both in blocks and with their insides visible (Image 3, Image 4).

Image 6. Katarzyna Jozefowicz, The Detail of Habitat, 1992-1996.

When viewed from a distance, although there is furniture inside the houses, there is no sign of life. An emptied and abandoned settlement stands out. We understand this from buildings without walls. At the same time, the transparency feature ensures that the emotion desired to be expressed is stronger.

Image 7. Katarzyna Jozefowicz, Habitat, 1992-1996.

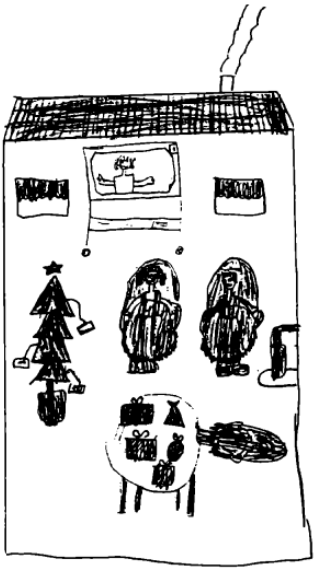

Image 8. Example of transparency feature in children's drawings.

Callum Morton

Born in Canada in 1965, Callum Morton is known for his installation and sculpture works. Morton, who studied sculpture and architecture, created most of his works by combining these two disciplines. His connection with architecture is also related to his childhood years and the fact that his father was an architect. Koop (2015:1) states that Morton deals with family life and the troublesome conflicts within it in his works. When we dig deeper, we find personal narratives, past times, transformation, community life and utopian topics in Callum Morton's works. Because buildings present us with the unknown passions and inevitable weaknesses of humanity.

Image 9. Callum Morton Habitat 2003.

The first work we will discuss by Morton is the Habitat work he made in 2003. This work shows a group of buildings treated with paint on wood. The artist also used light and sound elements in this work. Koop (2015:2) Morton's work titled Habitat 2003 is a 1:50 scale architectural model of the public housing project designed by architect Moshe Safdie in Montreal for Expo1967. It is also of particular importance that the project was worked on by Morton's father and was built at the time of his birth. In this work, Callum Morton recreates the living space of the modern age, reducing the speed and cyclical structure of life from 24 hours to 28 minutes by using light and sound together. Offering a critical look at the intersection of public and private life, Habitat is a day in the life representation. It presents us with both the ordinary and extraordinary aspects of constantly recurring experiences in life, allowing us to think about them. Another work by Callum Morton was produced by the artist for the 52nd Venice Biennale in 2007. This house, which is in ruins, refers to the house designed by the artist's father, where he lived during his childhood, and which was destroyed after the conflicts in Afghanistan. Viewers can enter this building, which is dilapidated from the outside, and experience the interior of this house. Hawker (2009: 161) states that this work resembles a bombed building that has been exposed to more deterioration than Morton's other works, and thus the title of the work emphasizes the terrible connotations. He adds that the inside and outside of the building are completely opposite to each other, inside there is a slippery, anonymous elevator foyer and a woman sitting silently with a mop and bucket in her hand, those who press the lift button hear a sound indicating that the machine has started to work, but the doors are closed. The work presents to the viewer both the space and memories that constitute childhood and the emotional devastation caused by the destruction of this space. The work has a narrative that includes many senses such as visual, auditory and physical.

Image 10. Callum Morton, Valhala, 2007.

CONCLUSION

The place that people use in social life after the womb is the home. Rather than just being an area surrounded by four walls, the house is a place where many lives, concepts and phenomena are formed and experienced. Home, which is the place where physical, spiritual and cognitive development takes place and is shaped, also gives people feelings such as trust and belonging. The narrative about the house first appears in children's drawings. Again, the house pictured here is not only an architectural element, but also contains many meanings and concepts about humanity. Many children describe houses with roofs and chimneys located in rural areas. In addition, there are those who draw tall buildings. There is a relationship between the semantic layers present in children's drawings and the houses created in the artwork. When the artists we discussed in our study, such as Julian Opie, Katarzyna Jozefowicz and Callum Morton, who make houses and related works are examined, it is seen that they are produced based on family and related concepts, rather than just an architectural element. In these works, we come across traces of childhood and the family and experiences that make up it. The viewer is expected to get the feeling and thought given by experiencing the work in a space. Elements such as size differences seen in children's paintings, drawing walls as if they were not there to strengthen the expression, and colour are also observed in the artist's works. Family, life, memory, unity and different emotions are also

processed in these works.

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Image 1: Yavuzer, H. (1995). Resimleriyle çocuk. İstanbul: Remzi kitabevi.

Image 2: Yavuzer, H. (1995). Resimleriyle çocuk. İstanbul: Remzi kitabevi.

Image 3: https://forart.no/wp-content/uploads/sites/2/2018/01/Richard-Shone.pdf

Image 4: https://www.julianopie.com/sculpture/1996/you-pass-house-2

Image 5: https://www.julianopie.com/sculpture/1994/you-want-move-house-you-are-worried-nothing-will-change

Image 6: https://u-jazdowski.pl/program/wystawy/katarzyna-jozefowicz

Image 7: https://u-jazdowski.pl/program/wystawy/katarzyna-jozefowicz

Image 8: Yavuzer, H. (1995). Resimleriyle çocuk. İstanbul: Remzi kitabevi.

Image 9: https://www.mca.com.au/exhibitions/callum-morton/

Image 10: https://www.flickr.com/photos/monashada/7627095620

THE EFFECTS OF TURKISH TAX PROCEDURAL CODE (TPC) DRAFT'S PROPOSAL THAT INFLATION ADJUSTMENTS WILL BE DONE ONLY ON THE BALANCE SHEET, ON EVALUATION OF FINANCIAL POSITION OF COMPANIES

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1. Introduction

According to economics and business principles, the main objective of any business organization is to maximize their profit. Maintaining the subsistence of the business organization and maximizing the wealth of the investors are the complimentary objectives. In order to reach these objectives, it is crucial to make the right decisions in every area of the business organization. There is a direct relationship between the right decisions and the information that those decisions rely on. The important part of information, which is necessary to make right decisions, is produced by accounting system.

Accounting, as an information system, prepares the financial statements as the base for decision making. As any information, financial statements must have some qualities that make them "information", such as; accuracy, completeness, reliability, relevance, comparability, consistency, timeliness, etc. In the case of an inflationary environment, where the general price level increases, the traditional accounting practice is not able to provide good quality information necessary for right decision making. Increase in the general price level will cause purchasing power of money to decrease, and will cause understatements and overstatements of figures in financial statements. The decisions that will be given, by taking those figures into consideration, will mislead the companies' operations and cause to fail to fulfill the objectives of business organizations.

2. The Effects of Inflation on Financial Statements

Financial statements present the asset and capital structures of a business organization and the profit or loss, which is the difference between the revenues generated and the expenses incurred by a business organization as a result of its operations. It's known that financial statements may not present the final or the objective or the real results. This may arise partially from the accounting principles and partially from the accounting methods chosen. Determining the deficiencies and limitations of the financial statements is very important for quality of financial statements and reliability of the analyses on these statements (Durmuş, 1991). In his book, Durmuş summarized some deficiencies of financial statements. Some examples are; figures in financial statements are not final figures and they may not be realistic, statements may be subjective, statements present the past information, and they provide summarized information. In addition to these deficiencies that cause inaccuracies in financial statements, the effects of inflation on figures may be the most important of them.

2.1. The Effects of Inflation on Balance Sheet

In inflationary environments, a balance sheet, that is prepared taking traditional accounting principles into consideration, will lose its ability to show the reality and consequently will lose its ability to contribute to company's stakeholders (Gökçen, 2023). A typical balance sheet is prepared taking historical cost principle into consideration which means that most of the company's assets must be recorded at their cost value at the date of acquisition while financial instruments might be recorded at their fair market value. Once an asset is recorded in the books, the value of that asset must remain at its historical cost, even if its value in the market changes. In order to record a transaction, there is an important system which is monetary measurement**,** to value the transaction. This concept ignores any change in the purchasing power of money due to inflation. (Books: Openstax, n.d.).

2.2. The Effects of Inflation on Income Statement

An income statement presents the revenues, expenses and resulting net income or loss for a period of time. In an environment where prices are increasing, in other words, where the purchasing power of money decreases, an operating result calculated from the figures having different purchasing powers of money will be meaningless. In such an environment, expenses and revenues will be misstated. Due to increases in prices, the sales revenues will be overstated and due to the historical costs taken into consideration in calculation of the cost of those sales, the expenses may be understated.

2.3. The Effects of Inflation on Financial Statement Analysis

Financial statements help investors and creditors make better economic decisions. The financial reporting system is not perfect. Economic events and accounting entries do not correspond precisely; they diverge across the dimensions of timing, recognition, and measurement (White, Sondhi, & Fried, 2003)

Inflation may be the worst factor that makes financial statements not reflect the correct financial position of a business organization. Decision makers are trying to give the best decisions by using the financial statements that are generated by the accounting system which is already not perfect. The biggest negative impact of increase in general price level on accounting information is misunderstanding of profit and profitability ratios (Durmuş, 1991). In addition, assets and capital structures are misstated; comparison of financial analysis results will be meaningless.

There are some tools, such as inflation accounting, that try to make financial statements available for analyses so that the results of an analysis will provide a better base for better business decisions.

3. Inflation Accounting

In literature, there are basically three methods of inflation accounting;

1. Current Purchasing Power Method or General Price-Level Accounting (CPP Method or GPLA)
2. Current Cost Accounting Method (CCA Method)
3. Hybrid Method (a combination of CPP and CCA methods)

3.4. Current Purchasing Power Method (CPP)

This method assumes that the values of a currency at different times must be comparable. In case of inflation, the values of the same currency at different times cannot be compared. CPP adjusts historical cost figures based on changes in the general level of prices, as measured by the general price level index. In other words, the basic idea of the CPP method is to apply changes in the value of money in response to changes in general price index (Tamplin, 2023). CPP method classifies the balance sheet items into two: Monetary Items and Nonmonetary Items. Monetary items keep their nominal values in inflationary environment but they lose their purchasing power. On the contrary, nonmonetary items maintain their purchasing power but they lose their nominal values. Most of the income statement items are monetary.

3.5. Current Cost Accounting Method (CCA)

The main core of this method is to present the financial statement items at their current values rather than their historical cost values. There are several suggestions about the current value; such as fair market value, net present value, net realizable value or replacement value. In CCA, fixed assets and inventories are shown at their replacement value. Depreciation is calculated at the current value of the fixed asset where cost of goods sold is calculated with the price at the date of sale.

3.6. Hybrid Method

This method aims to combine the advantages of the other two methods. The CPP method determines the purchasing power gains and losses created by inflation on monetary items and includes them in the income statement. Nonmonetary items are also adjusted according to general price indices and shown with their adjusted values in the balance sheet. However, holding gains of real items are not taken into account. On the other hand, in the CCA method, specific changes in prices are taken into account, and as a result of these changes, the gains and losses of holding assets are calculated, but the purchasing power gains and losses arising from monetary items are not taken

into account. The hybrid accounting method takes into account both specific and general price changes. Thus, the net income is more accurately divided into real and fictitious parts. (Kishalı, Yılmazcan, & Işıklılar, 2002)

3.7. Inflation Accounting in Türkiye

These are the national and international regulations about inflation adjustment of financial statement in an inflationary environment:

a) International Accounting Standard 29 (IAS 29) – Financial Reporting in Hyperinflationary Economies

b) Türkiye Accounting Standard 29 (TMS 29) – Financial Reporting in Hyperinflationary Economies

c) Accounting Standard for Big and Medium Size Enterprises 25 (BOBI-FRS 25) – Financial Reporting in Hyperinflationary Economies

d) Code No. 5024 about amendments to the Tax Procedural Code, Income Tax Code and Corporate Tax Code (Gökçen, 2023).

When the inflation accounting methods used by above regulations are examined, even not clearly mentioned, it can be derived that they adopted the Current Purchasing Power Method.

Recently, Revenue Administration published a draft of Tax Procedural Code General Communiqué (from now on will be referred as **Draft**) regarding the determination of the procedures and principles about inflation adjustments on financial statements which are subject to inflation adjustment for the year ending 2023 and the following periods. In this Draft, mostly CPP method is used but there are some modifications.

In this article, the differences between the CPP method and Draft's approach on financial statement adjustments and effects on basic financial statement analysis results will be examined.

4. Comparison of Financial Statements of a Hypothetical Company which Statements are Adjusted under CPP Method and Draft's Approach

As mentioned above, the Draft adopted the CPP method but with some differences.

In preparing CPP statements, it's essential to distinguish between monetary and nonmonetary items. Monetary items are contractual claims to receive or pay a fixed amount of cash. All assets and liabilities not classified as monetary items are classified as nonmonetary for CPP purposes. Nonmonetary items whose prices in terms of the monetary unit change in proportion to

changes in the general price level. The following chart indicates some major monetary and nonmonetary items (Kieso & Weygandt, 1998).

Monetary Balance Sheet Items	**Nonmonetary Balance Sheet Items**
Cash and Banks	Investment in Shares
Investment in Bonds	Inventory
Receivables	Prepayments
Accrued Receivables	Tangible Fixed Assets
Payables	Intangible Fixed Assets
Accrued Payables	Accumulated Depreciation
	Unearned Revenues

Table 1: *Chart of Monetary and Nonmonetary Balance Sheet Items*

In his book Uman (Uman, 2002) summarized the CPP method in nine phases;

1) Determining the financial statements (Balance Sheet, Income Statement) prepared by traditional accounting principles for at least past two years, determining the price index and restatement factors
2) Classifying the monetary and nonmonetary balance sheet items
3) Analyzing the nonmonetary assets to determine their capitalization dates
4) Analyzing all revenues, expenses, gains, losses, dividends distributed and retained earnings to determine when they arose and booked
5) Restating the nonmonetary items at current values
6) Restating the monetary items in the beginning balance sheet at current values
7) Determining the "lower of current or restated values" of adjusted nonmonetary items to be presented in balance sheet
8) Calculating the net monetary position gain or loss
9) Restating the past period's financial statement with current period's purchasing power.

4.1. Adjusting Balance Sheet

In this application, a hypothetical company -XYZ CO.- and its financial statements are used. In the following table, the 31 Dec. 2023 Balance Sheet is presented:

Table 2: *Balance Sheet of XYZ Co. as of 31 Dec. 2023*

Assets		**Liabilities and Shareholders' Equity**	
Current Assets		Current Liabilities	
Cash	200,000	Accounts Payables	220,000
Accounts Receivables	550,000	Other Current Liabilities	60,000
Inventory	700,000	Total Current Liabilities	280,000
Prepaid Expenses	50,000		
Total Current Assets	1,500,000	Long Term Liabilities	
		Bonds Payables	700,000
Fixed Assets		Unearned Revenues	50,000
Investment in Shares	220,000	Total L/T Liabilities	750,000
Land	110,000		
Buildings	300,000	Shareholders' Equity	
Equipments	700,000	Capital	1,000,000
Total Fixed Assets	1,330,000	Retained Earnings	800,000
		Total Shareholders' Equity	1,800,000
Total Assets	2,830,000	Total Liab. and Shareholders' Equity	2,830,000

According to Uman's summary steps for CPP Method, to apply the CPP method, end-of-period traditional financial statements must be available; which is presented above. In order to adjust the traditional accounting figures, price index and restatement factors must also be available. Below table presents the domestic producer price index which the base year is 2003. While this paper is written the price index for November and December 2023 were not determined. By using time series analysis, price index for November and December 2023 were estimated.

Table 3: *Domestic Producer Price Index (source TUİK)*

2003=100

Domestic Producer Price Index			
Year 2006	135.16	Year 2015	249.31
Year 2007	143.19	Year 2016	274.09
Year 2008	154.80	Year 2017	316.48
Year 2009	163.98	Year 2018	422.94
Year 2010	178.54	Year 2019	454.08
Year 2011	202.33	Year 2020	568.27
Year 2012	207.29	Year 2021	1022.25
Year 2013	221.74	Year 2022	2021.19
Year 2014	235.84	Year 2023	2949.10

	Year 2021	Year 2022	Year 2023
1. quarter	614.93	1321.90	2147.44
2. quarter	693.54	1652.75	2320.72
3. quarter	741.58	1865.09	2749.98
4. quarter	1022.25	2021.19	2949.10
Average	719.53	1643.94	2467.17

Company's monetary and nonmonetary items are determined; the monetary items are not adjusted. The nonmonetary items are adjusted according to following calculations:

Inventory: In this hypothetical example, the inventory control method used by the company is not known. By looking at the inventory turnover ratio it's found out that the company holds inventory approximately for 90 days. Assuming as if the company's last inventory purchase made 90 days ago, the restatement factor is calculated as below:

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 30 Sept., 2023}}$$

$$= \frac{2949.10}{2749.98} = 1.0724$$

$$\text{Adjusted Value} = \text{TRY } 700{,}000 \times 1.0724 = \boxed{\text{TRY } 750{,}684} \quad (1)$$

Prepaid Expenses: Of TRY 50,000 prepayments; TRY 35,000 was made for the purchases of supplies and TRY 15,000 was made for insurance premiums. It's assumed that the purchases of supplies distributed evenly throughout the year, that's why average price index is used in calculation. The payment for insurance premiums made on 30 June, 2023.

$$\text{Restatement Factor (supplies)} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index of 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Restatement Factor (insurance)} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 30 June, 2023}}$$

$$= \frac{2949.10}{2320.72} = 1.2708$$

$$\text{Adjusted Value} = (\text{TRY } 35{,}000 \times 1.1953) + (\text{TRY } 15{,}000 \times 1.2708) = \boxed{\text{TRY } 60{,}898} \quad (2)$$

Investment in Shares: Investment in shares were purchased on 31 Dec., 2021.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2021}}$$

$$= \frac{2949.10}{1022.25} = 2.8849$$

$$\text{Adjusted Value} = \text{TRY } 220{,}000 \times 2.8849 = \boxed{\text{TRY } 634{,}679} \quad (3)$$

Land: Land was purchased on 31 Dec., 2010.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2010}}$$

$$= \frac{2949.10}{178.54} = 16.5178$$

$$\text{Adjusted Value} = \text{TRY } 110{,}000 \times 16.5178 = \boxed{\text{TRY } 1{,}816{,}963} \quad (4)$$

Building: Building was purchased on 31 Dec., 2003.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2003}}$$

$$= \frac{2949.10}{100} = 29.4910$$

$$\text{Adjusted Value} = \text{TRY } 300{,}000 \times 29.4910 = \boxed{\text{TRY } 8{,}847{,}287} \quad (5)$$

Equipment: Company is holding three equipment; the one with TRY 300,000 net book value purchased on 31 Dec., 2017, the other one with TRY 300,000 net book value purchased on 31 Dec., 2020, and the last one with TRY 100,000 net book value purchased on 31 Dec., 2022.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2017}}$$

$$= \frac{2949.10}{316.48} = 9.3184$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2020}}$$

$$= \frac{2949.10}{568.27} = 5.1896$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2022}}$$

$$= \frac{2949.10}{2021.19} = 1.4591$$

$$\text{Adjusted Value} = (\text{TRY } 300{,}000 \times 9.3184) + (\text{TRY } 300{,}000 \times 5.1896) + (\text{TRY } 100{,}000 \times 1.4591) = \boxed{\text{TRY } 4{,}498{,}318} \quad (6)$$

Unearned Revenues: The advance collections made by the company belongs to the services to be delivered in future. Of TRY 50,000 amount on the balance sheet; TRY 10,000 collected in 2022 and TRY 40,000 collected in 2023. It's assumed that the collections distributed evenly throughout the year, that's why average price index is used in calculation.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2022}}$$

$$= \frac{2949.10}{1643.94} = 1.7939$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Adjusted Value} = (\text{TRY } 10{,}000 \times 1.7939) + (\text{TRY } 400{,}000 \times 1.1953) = \boxed{\text{TRY } 65{,}753} \quad (7)$$

Capital: It's assumed that the total amount of capital is invested at the establishment date; 31 Dec., 2003.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 Dec., 2003}}$$

$$= \frac{2949.10}{100} = 29.4910$$

$$\text{Adjusted Value} = \text{TRY } 1{,}000{,}000 \times 29.4910 = \boxed{\text{TRY } 29{,}490{,}957} \quad (8)$$

Retained Earnings: In 31 Dec. 2023 Balance Sheet, the retained earnings figure is TRY 800,000. Of the amount; TRY 200,000 is the net income of year 2023 (which will be excluded in calculation) TRY 300,000 is the net income of year 2022, TRY 200,000 is the net income of year 2021 and TRY 100,000 is the net income of year of 2020.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 March 2021}}$$

$$= \frac{2949.10}{614.93} = 4.7958$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 March 2022}}$$

$$= \frac{2949.10}{1321.90} = 2.2310$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 31 March 2023}}$$

$$= \frac{2949.10}{2147.44} = 1.3733$$

$$\text{Adjusted Value} = (\text{TRY } 100{,}000 \times 4.7958) + (\text{TRY } 200{,}000 \times 2.2310) + (\text{TRY } 300{,}000 \times 1.3733) = \boxed{\text{TRY } 1{,}337{,}765} \quad (9)$$

Net Income: 2023-year Net Income figure will be found out by taking the balance of assets and liabilities after adjustments.

Adjusted Value = Total Assets-Total Curr. Liab. -Total L/T Liab.-Capital-Ret. Earnings

Adjusted Value = TRY 17,358,830-TRY 280,000-TRY 765,753-TRY 29,490,957- TRY1,337,765 = TRY (14,515,645) (10)

XYZ CO.'s before adjustment Balance Sheet items and after adjustments Balance Sheet items applying both CPP and Draft's approach are presented in below table. As it can be seen the balance sheet figures are the same in both approaches.

Table 4: *Comparative Figures of Balance Sheet of XYZ Co. as of 31 Dec. 2023*

		Adjusted Figures	
	Book V. Year 2023	CPP Year 2023	TPC Draft Year 2023
Assets			
Current Assets			
Cash	200,000	200,000	200,000
Accounts Receivables	550,000	550,000	550,000
Inventory	700,000	750,684 (1)	750,684 (1)
Prepaid Expenses	50,000	60,898 (2)	60,898 (2)
Total Current Assets	1,500,000	1,561,583	1,561,583
Fixed Assets			
Investment in Shares	220,000	634,679 (3)	634,679 (3)
Land	110,000	1,816,963 (4)	1,816,963 (4)
Buildings	300,000	8,847,287 (5)	8,847,287 (5)
Equipments	700,000	4,498,318 (6)	4,498,318 (6)
Total Fixed Assets	1,330,000	15,797,247	15,797,247
Total Assets	2,830,000	17,358,830	17,358,830
Liabities and Shareholders' Equity			
Current Liabilities			
Accounts Payables	220,000	220,000	220,000
Other Current Liabilities	60,000	60,000	60,000
Total Current Liabilities	280,000	280,000	280,000
Long Term Liabilities			
Bonds Payables	700,000	700,000	700,000
Unearned Revenues	50,000	65,753 (7)	65,753 (7)
Total L/T Liabilities	750,000	765,753	765,753
Shareholders' Equity			
Capital	1,000,000	29,490,957 (8)	29,490,957 (8)
Retained Earnings	600,000	1,337,765 (9)	1,337,765 (9)
Net Income	200,000	(14,515,645) (10)	(14,515,645) (10)
Total Shareholders' Equity	1,800,000	16,313,077	16,313,077
Total Liab. and Shareholders' Equity	2,830,000	17,358,830	17,358,830

4.2. Adjusting Income Statement

According to CPP Method, not only the Balance Sheet but Income Statement must be adjusted too. 01 Jan. 2023-31 Dec. 2023 Income Statement of XYZ Co. is presented below:

Table 5: *Income Statement of XYZ Co. for the period of 01 Jan. 2023 - 31 Dec. 2023*

Net Sales		3,700,000
Cost of Goods Sold		(2,750,000)
Gross Profit		950,000
Operating Expenses		(710,000)
Selling and General Adm. Exp.	535,000	
Depreciation	175,000	
Operating Income		240,000
Financial Expenes		(40,000)
Net Income		200,000

The items of an income statement are nonmonetary items and the expenses and the revenues must be adjusted. For the first time adjustment, in order to choose the correct price index, the expense and revenue items must be examined carefully, and must be separated into two groups.

In the first group, there will be expenses and revenues which are generated by the exchange of monetary assets and monetary liabilities. Most of the expenses and revenues are in this group, and they are reported in income statement with a value at the reporting period.

In the second group, there will be expenses and revenues generated by the exchange of nonmonetary assets and nonmonetary liabilities. The most common examples are the depreciation, prepaid expenses and unearned revenues. These items are adjusted with a restatement factor at the point when the nonmonetary item was recorded, not the point when expenses incurred or revenues earned.

The Income Statement of XYZ CO. is adjusted according to following calculations:

Sales Revenues: All sales are assumed to be earned evenly throughout the year.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Adjusted Value} = \text{TRY } 3{,}670{,}000 \times 1.1953 = \boxed{\text{TRY } 4{,}386{,}881} \quad (1)$$

Service Revenues: The collection related with this revenue is made in advance. Of TRY 30,000 service revenue, TRY 20,000 accrued in 2022 and TRY 10,000 accrued in 2023. It's assumed that collections of these revenues are distributed evenly throughout the year, that's why average price indices are used.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2022}}$$

$$= \frac{2949.10}{1643.94} = 1.7939$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Adjusted Value} = (\text{TRY } 20{,}000 \times 1.7939) + (\text{TRY } 10{,}000 \times 1.1953) = \text{TRY } 47{,}832 \quad (2)$$

Cost of Goods Sold: It's assumed that the purchases of goods distributed evenly throughout the year. The inventory holding period was calculated as 90 days above, the beginning and ending inventories are adjusted by taking the third-quarter-end price indices into consideration.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 30 Sept., 2022}}$$

$$= \frac{2949.10}{1865.09} = 1.5812$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Price Index at 30 Sept., 2023}}$$

$$= \frac{2949.10}{2749.98} = 1.0724$$

	Book Values			Adjusted Values
Beginning Inventory	680,000	x	1.5812 =	TRY 1,075,222
Curr. Period Purchases	2,770,000	x	1.1953 =	TRY 3,311,079
Cost of Goods Available for Sale	3,450,000			TRY 4,386,300
Ending Inventory	(700,000)	x	1.0724 =	TRY (750,684)
Cost of Goods Sold	2,750,000			TRY 3,635,616 (3)

Selling and General Administrative Expenses: It's assumed that the expenses are distributed evenly throughout the year, that's why average rate is used.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Adjusted Value} = \text{TRY } 535{,}000 \times 1.1953 = \boxed{\text{TRY } 639{,}504} \quad (4)$$

Depreciation: Depreciation expense can be found by applying depreciation rate to the adjusted values of fixed assets.

	Acquisition Year	Net Book Value	Remaining Economic Useful Life	Year-2023 Depreciation	Restatement Factor	Adjusted Net Book Value	Adjusted Year-2023 Depreciation
Building	Year 2003	300,000	20 years	15,000	2949.10/100.00	8,847,287	442,364
Equipment	Year 2017	300,000	4 years	75,000	2949.10/316.48	2,795,528	698,882
Equipment	Year 2020	300,000	5 years	60,000	2949.10/568.27	1,556,881	311,376
Equipment	Year 2022	100,000	4 years	25,000	2949.10/2021.19	145,909	36,477
				175,000		13,345,605	1,489,100 (5)

Financial Expenses: It's assumed that interest expenses accrued evenly throughout the year.

$$\text{Restatement Factor} = \frac{\text{Price Index at 31 Dec., 2023}}{\text{Average Price Index at 31 Dec., 2023}}$$

$$= \frac{2949.10}{2467.17} = 1.1953$$

$$\text{Adjusted Value} = \text{TRY } 40{,}000 \times 1.1953 = \boxed{\text{TRY } 47{,}813} \quad (6)$$

Net Monetary Position Gain (or Loss): The gain from holding monetary items refers to the purchasing power gain obtained from monetary liabilities as a result of the decrease in the purchasing power of money. The loss of holding monetary items indicates the purchasing power loss over monetary items such as cash, bank and receivables in the assets of the business, due to the decrease in the purchasing power of money. By offsetting these gains and losses from each other, the net monetary position gain or loss is obtained.

This figure can be calculated as the difference between the adjusted period net income on the Balance Sheet and the adjusted net income calculated in the Income Statement. In order to prepare statement of Net Monetary Position Gain or Loss, at least two years detailed statements must be available.

In this hypothetical example, since only the current year's details are available, the statement of Monetary Position Gain or Loss is not prepared.

Adjusted Value = Adjusted Net Income in B/S - Adjusted Net Income in I/S

Adjusted Value = TRY (14,515,645) - TRY (1,377,321) = **TRY (13,138,324)** (7)

According to Draft article no.7, the inflation adjustments will be done only on the Balance Sheet, in other words Income Statement will not be adjusted, as of the end of 2023 (Gelir İdaresi Başkanlığı, 2023). So, for this hypothetical example, Income Statement of 2023 is not adjusted, as the Draft says.

In the below table the adjusted and unadjusted Income Statements can be seen.

Table 5: *Comparative Income Statements of XYZ Co.*

			01.01.Year 2023 - 31.12. Year 2023		
			CPP Appr. Adjusted		Draft's Appr. Book Values
Net Sales			4,434,712		3,700,000
Cost of Goods Sold			(3,635,616) (1) (2)		(2,750,000)
Gross Profit			799,096 (3)		950,000
Operating Expenses			(2,128,604)		(710,000)
Selling and General Adm. Exp.	639,504 (4)			535,000	
Depreciation	1,489,100 (5)			175,000	
Operating Income			(1,329,508)		240,000
Financial Expenes			(47,813) (6)		(40,000)
Net Income			(1,377,321)		200,000
Net Monetary Position Gain (or Loss)			(13,138,324) (7)		
Adjusted Net Income			(14,515,645)		

4.3. Analysis of Financial Statements

Financial statement can be analyzed using several approaches; vertical analysis, trend analysis and ratio analysis. In this study ratio analysis will be done in order to compare the financial position indicators of the company after inflation adjustment -using both CPP and Draft's approach. Selected ratios will be calculated from the unadjusted and adjusted figures of the hypothetical company's financial statements and then ratios will be compared.

In a typical ratio analysis, financial ratios can be examined under four groups; liquidity ratios, activity ratios, solvency and leverage ratios and profitability ratios.

Except the liquidity ratios, for almost all other ratios, income statement items and/or past year's figures must be available and will be used.

According to the Draft's approach, the past year's balance sheet and the current year's income statement will not be adjusted. The necessary figures for the calculation of ratios are taken from the book value balance sheet of 2022 and the book value income statement of 2023.

Below table shows the selected ratios and the results calculated CPP adjusted financial statements and Draft's Approach adjusted financial statements:

Table 6: *Comparative Financial Ratios – Liquidity, Activity*

			Adjusted	
			CPP	Draft's Appr.
Liquidity Ratios	Current Ratio	$= \frac{\text{Current Assets}}{\text{Current Labilities}}$	5.58	5.58
	Quick Ratio	$= \frac{\text{Cash + Marketable Securities + Accounts Receivable}}{\text{Current Liabilities}}$	2.68	2.68
Activity Ratios	Receivables Turnover	$= \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivables}}$	8.29	6.92
	Inventory Turnover	$= \frac{\text{Cost of Goods Sold}}{\text{Average Inventories}}$	3.98	3.84
	Total Asset Turnover	$= \frac{\text{Net Sales}}{\text{Average Total Assets}}$	0.25	0.37

Table 7: *Comparative Financial Ratios – Solvency and Leverage, Profitability*

			Adjusted	
			CPP	Draft's Appr.
Solvency and Leverage Ratios	Debt-to-Equity	$= \frac{\text{Total Debt}}{\text{Total Shareholders' Equity}}$	0.06	0.06
	Times Interest Earned	$= \frac{\text{Earnings before Interest and Tax (EBIT)}}{\text{Interest Expense}}$	-302.59	6.00
	Financial Leverage Effect	$= \frac{\text{Earnings before Interest and Tax (EBIT)}}{\text{Net Income}}$	-1.00	-0.02
Profitability Ratios	Profit Margin	$= \frac{\text{Net Income}}{\text{Net Sales}}$	-327%	-392%
	Return on Assets (ROA)	$= \frac{\text{Net Income}}{\text{Average Total Assets}}$	-82%	-144%
	Return on Equity (ROE)	$= \frac{\text{Net Income}}{\text{Average Shareholders' Equity}}$	-90%	-162%

As can be seen from Table 6, liquidity and activity ratios are very close to each other. But some of the solvency, leverage and the profitability ratios are dramatically different from each other.

Since the Income Statement is not adjusted in Draft's approach, some ratios are compulsorily calculated by the book values of income statement items; such as Sales, EBIT, Interest Expense. For the ratios in which the net income figure is used, it is taken from the adjusted balance sheet. For the averages of some balance sheet items like Average Total Assets, Average Accounts Receivables, Average Inventories and Average Shareholders' Equity, book values of past year's balance sheet items are taken into calculation.

Because of these inconsistencies, some ratios, especially Times Interest Earned ratios are dramatically different than CPP statement ratios. Profit Margin, ROA and ROE ratios are slightly different than CPP statement ratios.

In evaluating the financial position of a company which is operating in an inflationary environment, the above ratios are very important. For example; the Times Interest Earned ratio is a measure of a company's ability to meet its debt obligations based on its current income. According to Draft's approach adjusted statement ratio, it seems that the company is able to earn six times of its interest liability while CPP adjusted statement ratio shows the opposite with a huge difference.

For profitability ratios, the denominators and numerators of are again inconsistent. The numerator -Net Income- is an adjusted figure but the denominator -Net Sales- figure is not. Average Total Assets and Average Shareholders' Equity figures are calculated by the average of adjusted current period figure and unadjusted figure of past period. Because of the book values used in average calculations, denominators are understated, this caused ratios to be overstated.

In the above ratios, the Net Income figure used is the Adjusted Net Income -in this case Net Loss- figure. Adjusted Net Income (Loss) includes the Net Monetary Position Gain or Loss figure. This is the amount that expresses how much purchasing power the company lost to inflation during the period on company's monetary assets (if they are greater than non-monetary assets) or how much the company gained if the situation is the opposite (Silvia, n.d.).

One of the important outcomes of inflation accounting, maybe the most important one, is the presentation of the "net monetary position gain or loss" as a separate item in the income statement (Uman, 2002).

In this example net monetary loss is almost 10 times of the adjusted net income itself. It means that the company generated a monetary loss 10 times bigger than the loss generated by activities. In other words, holding monetary assets more than monetary liabilities caused company to generate that much of loss.

Conclusion

Inflation Accounting aims to adjust financial statements to current purchasing power of money in order to present the realistic financial position of the companies. The basic set of financial statements include at least Balance Sheet and Income Statement in order to present the financial position of any company. For inflation accounting to be served its aim, both financial statements must be adjusted. Adjusted Balance Sheet will present a realistic asset and liability structures of the company and adjusted Income Statement will present the realistic performance of the company.

Adjusting only the Balance Sheet as of the end of 2023, ignoring the adjustment of Income Statement according to TPC Draft, will cause some inconsistencies in evaluating the realistic financial position of the companies.

Net Income (or Loss) figure is not the only information provided by the Income Statement but the adjusted items in the statement must be provided and will be used in evaluating the performance of the company. In addition, the Net Monetary Position Gain or Loss must be sorted from Net Income (or Loss) and separately presented in Income Statement. The Net Monetary Position Gain or Loss is not presented in an unadjusted Income Statement. Consequently, the net income amount will be reported more than it should be, or the loss will be reported less than it should be in the Income Statement. Even the adjusted Balance Sheet reports the adjusted Net Income which includes the net monetary position gain or loss, how much of the loss or gain is coming from net monetary position is not available. This information is available only in an inflation adjusted Income Statement.

In order to make right decisions, the decision maker must have the realistic and reliable financial information. In inflationary environment, adjusting both Balance Sheet and Income Statement, instead of adjusting only the Balance Sheet, will provide a better base for better decisions.

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A STUDY ON THE EXAMINATION OF THE TECHNICAL SPECIFICATIONS OF INSURANCE COMPANIES MARKETING AUTOMOBILE INSURANCE POLICIES WITH QUALITY FUNCTION DEPLOYMENT[1]

Mert ERSEN[2]

1 Bu çalışma "Kalite fonksiyon göçerimi ile kasko poliçesi pazarlayan sigorta şirketlerinin teknik özelliklerinin incelenmesi üzerine bir çalışma" adlı yüksek lisans tez çalışmasının geliştirilmesiyle üretilmiştir. İlgili tez "Mert Ersen" tarafından Dr.Öğretim Üyesi Banu Özgürel'in danışmanlığında yapılmıştır.

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1. INTRODUCTION

Quality is a word that means the same everywhere in the world. It is the most basic definition of success. Every company aims to produce this success. To customers, quality means features and broad functionality. It is the successful fulfillment of the product's own characteristics, apart from their own wishes for a feature that customers want in the product. Quality improvement methods, which aim to extend the quality function, ensure that this desire is realized (Şahin, 2007).

The quality function deployment method was first introduced in Japan in 1966 by Yoji Akao. This method was first applied in Mitsubishi's Kobe shipyard. In Turkey, Arçelik was the first company to use this method (Mizuno and Akao, 1994; Akao, 1990). Among the main users of the quality function deployment method are companies such as 3M, IBM, General Motors, Ford, NASA, NATO, etc. Quality function deployment is a method used to create a quality product in line with the wants and needs of our customers, to create new ideas and thus to provide more customer satisfaction. QFD aims to provide our customers with a quality product that the customer wants to buy during the planning, design and production stages (Ersen, 2015). Companies can successfully apply this method, reducing costs, design time and processing time while increasing know-how, productivity and quality (Akbaba, 2005). The quality function deployment method establishes a good means of communication between customers and companies. Companies that succeed in the competitive environment care about their customers and offer them the best products.

In quality function deployment it is necessary to collect information about demand creation and customers' expectations about the product. This information can be collected through surveys or focus groups (Ardıç et al., 2008). In order to meet customer requirements, it is necessary to define technical specifications (Meriç, 2003). The specification will be used for the correlation matrix, providing both positive and negative improvements. Customer requirements and technical characteristics are correlated with each other to see how well they score (Yenginol, 2008). According to the scoring, those whose technical characteristics have the highest score are committed to improvement. The subject of this study is to identify the characteristics that insurance companies selling motor insurance should improve in order to maximize customer expectations and thus help increase sales rates.

After all the quality, customer requirements and customer needs that emerge at the end of this stage are determined as the basic input, multi-criteria decision-making methods are used to weight customer needs. These methods include: simple sum weighting model, revised analytical hierar-

chy process, weighted product model, TOPSIS method, ELECTRE method, analytical hierarchy process (AHP) methods. We used the analytical hierarchy process (AHP) method as a multi-criteria decision method.

AHP finds answers to the questions of choosing the best alternative, "Which one will you choose?" Or "Which one is the best?" . Alternatives are ranked according to an evaluation. AHP is used in decision making problems. A decision on a hierarchy uses a predefined comparison scale. The factors influencing the decision and their importance values at the decision point are compared one-to-one. As a result, the importance values at the decision point are converted into a percentage distribution (Ersen, 2015).

In the second part of the study; QFD characteristics literature study was conducted. In the third part, the focus is on investigating how effective the QFD application is in the selection of this product.

The main objectives of the study were to collect the voice of the customer, to determine the technical characteristics of the insurance companies, to determine the relationship between the technical characteristics and customer expectations, and to prioritize the technical characteristics. In addition, competitive benchmarking, examining the relationship between technical characteristics, and the contribution of characteristics to sales at the point of sale are also included. In the fourth chapter, the QFD for motor insurance is applied step by step. In the fifth and final section, the quality house is analyzed in detail and comments and suggestions are presented.

2. REWIEW OF THE LITERATURE

Quality Function Deployment is a management method first introduced by Yoji Akao in Japan in 1966. It was first applied at Mitsubishi's Kobe shipyard in 1972. In 1972, the concept of QFD was introduced by Akao in the journal "Standardization and Quality Control" in the article Archive System, "New Product Development and Quality Assurance-Quality Diffusion System" and compiled from previous publications (Abasov, 2002). Toyota Auto Body used the framework matrix for the first time in quality charts. In 1979, Tsuneo Sawada used the concept of House of Quality for quality in the conference program of JSQC. After that, Fukuhara introduced quality charts under this name in America (Akao, 1997).The first application of QFD in service organizations was realized in 1981 by Ohfuji, Noda and Ogino companies (Abasov, 2002:25). QFD attracted the attention of the western world when Toyota achieved success with its QFD practices between 1977 and 1984 (Akbaba, 2000). With QFD, Toyota reduced product development costs by 61%, shortened product development time by 33% and eliminated corrosion warranty problems (Akbaba, 2000).

The first book on QFD was published in Japan in 1978. Another first in the Japanese relationship with QFD was the introduction of the technique to the service business process in 1981. This method has been successfully applied in Japan in manufacturing sectors such as electronics, household goods, clothing, textiles, construction machinery, agricultural machinery. In the USA, the development started in 1983 with an article by Akao and Kogure published in the journal Quality Progress. QFD was first implemented in America in 1984 by Dr. Clausing at Xerox (Akbaba, 2000). After Xerox, many companies such as Digital Equipment, Hewlett Packard, AT&T and ITT started this application, and Ford and General Motors made more than 50 successful applications (Akbaba, 2000). Again in Japan, the first "Deming Quality Award" was given in 1987 and the first symposium on QFD was organized in 1991 (Öter & Tütüncü, 2001). Between 1984 and 1988, the first book on QFD was published in the USA and the method was adapted to service companies.

Today, the use of QFD continues to arouse curiosity, creating applications and research around the world every year. Today, national and international QFD symposiums are organized in countries such as Japan, Germany, Australia and Turkey. In Turkey, the National Quality Function Deployment Symposium has been organized every year, the first one in 2002 in Izmir. With this practice, the promotion and practice of QFD has become widespread in Turkey.

3. QUALİTY FUNCTİON DEPLOYMENT

The most fundamental meaning of QFD is a method used to create a quality product in line with the customer's wishes and needs, to create new ideas, and thus to achieve greater customer satisfaction. Quality Function Deployment has been defined in different ways by different authors and scholars. Mizuno states that "QFD is a quality system that helps to ensure customer satisfaction in total quality management" (Yenginol, 2002). According to Day, QFD is not just a tool, but a planning process that helps a business to actively use other technical tools to support and complement each other and to identify priority issues. According to Akao, QFD is a method that aims to convert the main quality assurance points into design quality, which will be used to transform customer satisfaction and customer demands into target steps during design and production (Yenginol, 2000).

In the view of Guinta and Praizler, QFD is a way of listening to customers and finding out exactly what they want, and then how these needs can be met (Abasov, 2002). For Cohen, "QFD is a structured method of product planning and development in which a development team clearly defines customer wants and needs and systematically evaluates proposed

product and service capabilities to meet those wants and needs" (Abasov, 2002).

As Yenginol explains, "QFD is a detailed and structured, yet flexible and simple development method in which customer wants and needs are fulfilled by transforming all functional components in the organization into product or service features and carried out by a cross-functional team" (Yenginol, 2000). In the view of Acar, QFD is a systematic of basic coordination, planning and communication processes that focus on the skills of the organization within the design, production and marketing objectives of the products/services that consumers want to buy. In a sense, the approach can be defined as enabling the creation of a conceptual diagram between design, production, marketing, planning and communication functions (Savaş, 2002). As Griffin and Hauser explain, QFD is a function performed by a team in the product/service development process in which customer inputs are communicated to the home using a similar matrix sequence in design, production and service forms (Akbaba, 2000).

For Akbaba, "QFD is a detailed and structured, yet flexible and easy method of product and service development that does not require the determination of customer expectations, wants and perceptions, where the expectations, wants and needs of the organization are determined, where all functional components are fulfilled by transforming them into product or service features, and which is carried out by a team across functions" (Akbaba, 2000).

QFD is aimed at ensuring the quality demanded by the customer during the design and marketing stages of the product marketed by the company. QFD improves a company's quality and efficiency, while at the same time reducing product cost and product development time. In QFD, the most accurate information for the customer and the company can be requested and evaluated before the production of the product. The time losses that will occur after the products are put back into production will not only cause financial losses for the customers, but also the products that are closest to the desired results will be produced by collecting and considering the information previously requested by the customers.

Companies collect information about their customers' learning desires in various ways. It is not possible to satisfy all customers at the same time with the products produced. Therefore, it is necessary to understand the collected data correctly and determine precisely what customers need about the products.

3.1 Quality Function Deployment Process

The QFD process comprises four stages. The first stage is represented by 0. At this stage, preliminary preparations are required for the implementation of QFD (Dinçer, 2017).

The Quality Function Deployment system is generally established in 4 stages (Delice & Güngör, 2008).

Phase 0: Planning

Phase 1: Collecting Customer Voice (Identifying Customer Needs)

Phase 2: Creating the Quality House

Phase 3: Analysis and Interpretation of Results

3.1.1. Planning Phase (Phase 0)

The planning phase includes organizational support, ensuring objective identification of the customer group, decision making, time horizons, estimation of product/service concept decision, team building, QFD process design and provision of necessary materials and facilities (Çinpolat, 2007; Akbaba, 2000).

3.1.2. Identifying Customer Needs (Phase 1)

Before starting to develop a new product, design or customer-focused organizations need to learn. For some time after the target market has been identified, the company or organization must continue its activities to identify and meet customer needs and demands (Eymen, 2006).

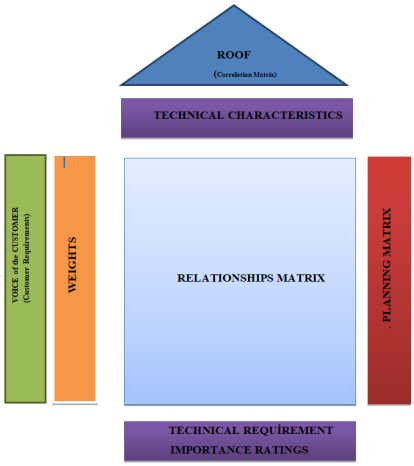
3.1.3. Creation and Analysis of the Quality House (Stages 2 and 3)

"Quality house", which is the basic tool of KFG, is a tool to identify customer needs and wants is a visual tool where technical features can be seen together (Ersen, 2015).

The quality house is a visual tool where many chambers can be brought together for different purposes and where customer wants, needs and expectations form the basis of the house tool. The product and specifications are associated with the help of this matrix (Delice & Güngör, 2008).

Figure 1 shows a classic quality house.

Figure 1. *Sample Quality House*



The main elements of the House of Quality shown in Figure 1 are explained below in the form of sub-items.

- **Voice of the Customer**

The House of Quality starts with customer needs. Customer requests are determined in the first stage through methods such as focus groups, face-to-face interviews, customer visits and surveys (Ersen, 2015)

- **Weights**

Analytic Hierarchy Process (AHP) method can also be utilized in addition to interval scales when establishing the importance levels of customer requests. AHP values are found in the column containing the importance levels. In this study, weights will be obtained by AHP method.

- **Technical Characteristics**

According to the information obtained from the customers, this section contains the technical specifications that show how the customer requests determined by the KFG team will be met. In order to fulfill each request made by customers, at least one quality characteristic must be determined. Quality characteristics form the upper part of the quality house.

- **Relationship Matrix**

After the determination of the technical characteristics, it is necessary to establish a relationship between each technical characteristic (the how's) and the customer requirements (the what's). While creating this relationship matrix, the extent to which each characteristic meets the customer request is tried to be explained with the help of symbols and points (Ersen, 2015).

Table 1 shows the meanings of the relationship matrix according to its values.

Table 1: *Relationship Matrix*

Degree of Relationship	Symbol	American System Score	Japanese System Score
Strong Relationship	◘	9	5
Medium Relationship	○	3	3
Weak Relationshio	Δ	1	1

Technical importance is used to see the extent to which each of the characteristics can meet the customer's requirements. Those with a higher technical importance than others receive priority.

- **Planning Matrix**

The comparison of the analyzed product with the opinions of customers and competitors is made in the planning matrix. Thus, it is ensured that the enterprises learn the place of their own product in the market in a better way. In this matrix, the values in the columns of the company conducting the research and the competitor company are filled in according to the information provided by the customers. The values in other columns such as target, sales point and improvement rate are filled in by the KFG team.

- **Targets**

Comparisons are made with the characteristic measurement values of competitor products and objectives are set for improvements in areas deemed necessary.

- **Roof**

The relationship between the identified technical characteristics may be strong or weak. The correlation (roof) matrix is used to decide whether this relationship is strong or weak.

Table 2 shows the symbols according to whether the degree of correlation is positive or negative and Table 3 shows the symbols according to whether the degree of correlation is strong or weak.

Table 2: *Degree of correlation (positive-negative)*

Relationship	**Symbol**
Positive	√
Negative	X

Table 3: *Degree of correlation (strong-weak)*

Correlation	**Symbol**
Strong	+
Weak	-

3.2 Quality Function Deployment Process

The Analytic Hierarchy Process (AHP) was first used by two scientists, Myers and Alpert, in 1968, and then by Saaty in 1977 on a model to make it useful in decision making problems. The use of AHP is necessary to define the decision hierarchy (Saaty, 1980; Yaralıoğlu, 2001). We can briefly define AHP as a decision-making and estimation method that allows us to find the percentage distributions of decision points. AHP uses a predetermined comparison matrix on the identified decision hierarchy and is based on pairwise comparisons in terms of factors affecting the decision. The differences in importance on the decision points are converted into percentage distributions. The steps required for a decision-making problem that can be solved by AHP are given below (Vaidya & Kumar, 2006).

Step 1: Define the decision making problem

The decision-making problem is defined in two steps. In the first step, decision points are determined. In other words, the answer to the question of how many outcomes the decision will be evaluated is sought. In the other step, the factors that are effective in determining the decision points are found. We can express the number of decision points as m and the number of factors affecting the decision points as n. It is important to know the exact number of factors that may have an impact on the outcome and to define each of the factors in detail so that the pairwise comparisons are logical and consistent.

Step 2: A comparison matrix between factors is created

We can define the inter-factor comparison matrix as a square matrix in its dimensions. The matrix components on the diagonals of the matrix are assigned a value of 1. The comparison matrix is shown in Equation 1.

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix} \quad (1)$$

Points on the diagonal of this matrix are given a value of 1. The reason for this is that the factors that are compared with themselves take the value 1. Factors are compared with each other one-to-one and mutually according to their importance levels. The importance scale in Table 4 is used to compare the factors with each other.

For example, if the second factor is considered to be superior to the fourth factor when the second factor is compared to the fourth factor by the comparator, the second row fourth column value of the matrix (i=2, j=4) takes the value 3. If it is decided that the fourth factor is more important than the second factor when comparing the second factor with the fourth factor, then the second row fourth column value takes the value 1/3. If the second factor and the fourth factor component are considered to be equally important in this comparison, then the matrix component value is 1.

Since the values on the diagonals of the matrix already take the value 1, comparisons are made for the remaining values. The values of the remaining components on the diagonal are calculated using the formula in Equation 2 below.

$$a_{ji} = \frac{1}{a_j} \quad (2)$$

Considering the example given above, if the second row fourth column value of the comparison matrix (i=2,j=4) takes the value 3, the fourth row second column value of the comparison matrix (i=4,j=2) will take the value 1/3 from Equation 2. Table 4 shows the importance scale of the values.

Table 4: *Importance Scale*

Importance Values	**Value Definitions**
1	Both factors are of equal importance
3	Factor 1 is more important than factor 2
5	Factor 1 is much more important than factor 2
7	Factor 1 has a very strong importance compared to factor 2
9	Factor 1 has an absolute superior importance compared to factor 2
2,4,6,8	Intermediate values

Step 3: Determine the percentage importance distributions of factors

The degree of importance of the factors relative to each other is shown in the comparison matrix within a logical framework. In order to determine the distribution of the obtained factors in the whole matrix, in other words, the percentage importance distribution of each of them, the column vectors in the comparison matrix are utilized and a column vector B with n and n components is obtained.

This vector is shown in Equation 3.

$$B_i = \begin{bmatrix} b_1 \\ b_2 \\ . \\ . \\ . \\ b_{n1} \end{bmatrix} \tag{3}$$

The formula in Equation 4 is used to calculate the B column vectors.

$$b_{ij} = \frac{a_j}{\sum_{i=1}^{n} a_j} \tag{4}$$

If we need to calculate the B vector by defining the comparison matrix A (See Equation 5), which expresses the comparisons of the evaluation factors with each other, as follows,

$$A = \begin{bmatrix} 1 & 1/2 & 4 \\ 2 & 1 & 3 \\ 1/4 & 1/3 & 1 \end{bmatrix} \tag{5}$$

Here the value of the element of the vector B is calculated by substituting the data in the formula of Equation 4.

In the same way, the other elements of vector B are calculated and vector B is formed as follows. The sum of the column vectors has a value of 1 (See Equation 6).

$$\mathbf{B} = \begin{bmatrix} 0{,}308 \\ 0{,}615 \\ 0{,}077 \end{bmatrix} \tag{6}$$

When the same process is repeated for the other comparison factors, the B column vector is calculated. When N column vectors B are combined and arranged in matrix format, matrix C is obtained (See Equation 7).

$$\mathbf{C} = \begin{bmatrix} c_1 & c_1 & \dots & c_{1n} \\ c_1 & c_2 & \dots & c_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ c_{n1} & c_{n2} & \dots & c_n \end{bmatrix} \tag{7}$$

According to the example given above, matrix C is formed as follows (See Equation 8).

$$\mathbf{C} = \begin{bmatrix} 0{,}308 & 0{,}273 & 0{,}500 \\ 0{,}615 & 0{,}545 & 0{,}375 \\ 0{,}077 & 0{,}182 & 0{,}125 \end{bmatrix} \tag{8}$$

Percentage importance degrees, which show the importance degrees of the factors relative to each other, can be found by utilizing the C matrix. For this process, the column vector W, which is called the priority vector, is calculated by taking the arithmetic mean of the row components that make up the C matrix as expressed in Equation 9 below.

$$w_i = \frac{\sum_{j=1}^{n} c_j}{n} \tag{9}$$

The vector W is shown in Equation 10.

$$W = \begin{bmatrix} w_1 \\ w_2 \\ . \\ . \\ . \\ w_n \end{bmatrix} \tag{10}$$

The priority vector for the example given above can be calculated as in Equation 11. When we calculate all three factors in this example, we see that the first factor has 36% importance, the second factor has 51% importance and the third factor has 13% importance.

$$\mathbf{W} = \begin{bmatrix} \dfrac{0{,}308 + 0{,}273 + 0{,}500}{3} \\ \dfrac{0{,}615 + 0{,}545 + 0{,}375}{3} \\ \dfrac{0{,}077 + 0{,}182 + 0{,}125}{3} \end{bmatrix} \cong \begin{bmatrix} 0{,}360 \\ 0{,}512 \\ 0{,}128 \end{bmatrix} \tag{11}$$

Step 4: Measure the consistency of factor comparisons

Although the realism of the results is a consistent systematic of the AHP, what is really important is the consistency in the one-to-one comparison made by the decision maker between the factors. In order to measure the consistency of these comparisons, AHP proposes to calculate the so-called Consistency Ratio. The resulting Consistency Ratio (CR) allows to check the consistency of the calculated priority vector and also the consistency of the pairwise comparisons between the factors. AHP bases the CR calculation on a comparison of the number of factors with a coefficient called the Baseline Value (**λ**). In order to find λ, it is first necessary to obtain the column vector D from the matrix product of the comparison matrix A and the priority vector W (See Equation 12).

$$\mathbf{D} = \begin{bmatrix} a_1 & a_1 & \dots & a_{1n} \\ a_1 & a_2 & \dots & a_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ a_{n1} & a_{n2} & \dots & a_n \end{bmatrix} x \begin{bmatrix} w_1 \\ w_2 \\ . \\ . \\ . \\ w_n \end{bmatrix} \tag{12}$$

The base value (E) for each evaluation factor is calculated by dividing the reciprocal elements of the W column vectors by the calculated D column vector as specified in Equation 13 below. In Equation 14 below, the arithmetic average of these values is taken to calculate the λ (base value).

$$E_i = \frac{d_i}{w_i} \quad (i = 1,2,...,n) \tag{13}$$

$$\lambda = \frac{\sum_{i=1}^{n} E_i}{n} \tag{14}$$

After the calculation of λ, the Consistency Indicator (CI) value can be found using the formula in Equation 15.

$$CI = \frac{\lambda - n}{n-1} \tag{15}$$

In the last step, CR values are calculated by dividing the CI values by the standard correction values given in Table 5 below, expressed as Random Indicator (RI) (See Equation 16 formula). Then the value corresponding to the number of factors is found from Table 5. For example; when a comparison with 4 factors is made, we find that the RI value to be selected should be 0.90 when we look at Table 5.

Table 5: *RI Values*

N	**RI**	**N**	**RI**
1	0	8	1,41
2	0	9	1,45
3	0,58	10	1,49
4	0,90	11	1,51
5	1,12	12	1,48
6	1,24	13	1,56

$$CR = \frac{CI}{RI} \tag{16}$$

A CR value less than 0.10 allows us to conclude that the comparisons made are consistent. A CR value higher than 0.1 indicates an error in the calculation in AHP or an inconsistency in the comparison made by the decision maker (Saaty, 1980).

Step 5: For each factor, percentage importance distributions at m decision points

This step is done in the same way as above, but this time the percentage importance values of the decision points of each of the factors are calculated. In other words, pairwise comparisons and matrix operations are repeated n times, which is the number of factors. But this time, the size of the comparison matrix G that we will use in the decision points for each of the factors will be mxm in size. After each of the comparison operations, column vectors S, which are dimensional and express the percentage distributions of the evaluated factor by looking at the decision points, are calculated. This column vector is expressed below (See Equation 17).

$$\mathbf{S}=\begin{bmatrix} s_{11} \\ s_{21} \\ . \\ . \\ . \\ s_{m1} \end{bmatrix} \tag{17}$$

Step 6: Finding the distribution of results at decision points

In this step, first of all, the decision matrix K of size mxn, consisting of S column vectors of the above-mentioned dimension, needs to be obtained. This decision matrix is expressed below (See Equation 18).

$$K=\begin{bmatrix} s_{11} & s_{12} & \dots & s_{1n} \\ s_{21} & s_{2} & \dots & s_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ s_{m1} & s_{m2} & \dots & s_{m} \end{bmatrix} \tag{18}$$

As a result, if the decision matrix and the column vector W (priority vector) are multiplied as shown below, a column vector L with m elements is calculated. The percentage distribution of decision points is expressed by the column vector L. In other words, the sum of the elements of the vector takes the value 1. The order of importance of the decision points is also shown with the help of this distribution (See Equation 19).

$$L = \begin{bmatrix} s_{11} & s_{12} & \cdots & s_{1n} \\ s_{21} & s_{22} & \cdots & s_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ s_{m1} & s_{m2} & \cdots & s_{mn} \end{bmatrix} x \begin{bmatrix} w_1 \\ w_2 \\ . \\ . \\ . \\ w_n \end{bmatrix} = \begin{bmatrix} l_1 \\ l_2 \\ . \\ . \\ . \\ l_{m1} \end{bmatrix} \quad (19)$$

4. METHOD

Motor insurance is the most widely sold product in the sector, but it is also a product that is cited as a source of loss by insurance companies every year. For this reason, it is necessary to conduct a study to find out why the problem arises. In this study, the motor insurance offered by the sector as a product was compared with the expectations of the customers. In this study, which is carried out with Quality Function Deployment, it is aimed to offer solutions to the problems of the sector on this damaged product.

The aim of the QFG was to compare the technical features of insurance companies marketing motor insurance with the voice of the customers. The quality house created for this purpose was obtained step by step. These steps are analyzed one by one below.

4.1. Voice of the Customer

In order to create the voice of the customer part of the quality house, interviews were first conducted with marketing experts from insurance companies offering motor insurance services. Customer expectations were learned through focus group and mutual interviews. The customer expectations obtained are listed below;

a. Vehicle Insurance Cost (Customer Requirement 1=CR1)
b. Policy Price (Customer Requirement 2=CR2)
c. Brand Awareness (Customer Requirement 3=CR3)
d. Reliability of the Company (Customer Requirement 4=CR4)
e. Damage Payment Speed (Customer Requirement 5=CR5)
f. Whether Indexed to Inflation (Customer Requirement 6=CR6)
g. Service Agreements (Customer Requirement 7=CR7)
h. Additional Guarantees (Customer Requirement 8=CR8)
i. After Sales Service Quality (Customer Requirement 9=CR9)

j. After Damage Service Quality (Customer Requirement 10=CR10)

k. Special Conditions (Customer Requirement 11=CR11)

l. General Conditions (Customer Requirement 12=CR12)

4.2. Weights

In order to create the weights column of the quality house, the customer expectations obtained in this study were compared with the Analytic Hierarchy Process. In order to be able to use the AHP method, these pairwise comparisons had to be made by motor insurance users. For this purpose, the formula in Equation 20 was used to determine the sample to participate in the study.

$$n_0 = \frac{t^2 pq}{d^2} \tag{20}$$

The above formula is used when n_0 / N < 0.07. This tells us that 'is a satisfactory approximation for the required sample size, otherwise n is calculated using the formula (See Equation 21) below (Cochran, 1977).

$$n = \frac{n_0}{1 + (n_0 / N)} \tag{21}$$

In the formula in Equation 20, the p-value, which is required to find the data that can be used instead of the main mass, is expressed as the rate of answering a certain option by the customers participating in the survey. Since this rate is not known until all the questions are answered, the p value is replaced by the worst possible value of 0.5. The "t" value is defined as the table value corresponding to the desired confidence level, and d^2 is defined as the margin of error. N is the population size.

In this study, since the margin of error d is 0.07, p value is 0.5 and confidence level is 0.05, t value is accepted as 1.96. Thus (sample size) is calculated with the help of the formula in Equation 20 as shown in Equation 22.

$$n_0 = \frac{t^2 pq}{d^2} = \frac{(1.96)^2 (0.5)(1-0.5)}{(0.07)^2} = 196 \tag{22}$$

Since the total number of policies in the year of the study was 6,600,000, the population volume was taken as 6,600,000 in this study.

$$\frac{196}{6.600.000} = 0.00002969696 \quad (23)$$

Since the value calculated in Equation 23 is 0.00002969696<0.07, the sample size is accepted as 196.

Thus, it was decided to apply this questionnaire to 196 customers receiving insurance services. The questionnaires were administered to 196 randomly selected customers receiving motor insurance services via face-to-face and e-mail.

Survey results were analyzed according to the AHP method. "Expert Choice 11.00" program was used to apply the AHP method. With the help of this program, the importance levels corresponding to the voice of the customer were obtained as shown in Table 6.

According to Expert Choice 11.00 outputs, the internal consistency (inconsistency) ratio should be less than 0.10. (Saaty, 1980)

Table 6. *Importance Levels of Customer Requests*

Priorities with respect to	**Inconsistency : 0,09**
	Importance Levels of Customer Requests
CR1	0.148
CR2	0.083
CR3	0.053
CR4	0.03
CR5	0.066
CR6	0.052
CR7	0.145
CR8	0.069
CR9	0.079
CR10	0.072
CR11	0.071
CR12	0.131

As a result of the AHP, it was observed that the top three features that customers attach the most importance to are "Car Insurance Price", "Service Agreements" and "General Terms and Conditions". These are

followed by "Policy Price" and "After Sales Service Quality". The results obtained are presented in the weights column of the quality house (See Figure 2 - Quality House).

4.3. Creation of Technical Characteristics

In the technical characteristics section at the top of the quality house, at least one technical characteristic was identified for each customer request. The technical characteristics were created as a result of interviews with marketing experts of insurance companies operating in the sector. The identified technical characteristics are listed as follows;

a) Education Level of Employees in the Company (Technical Requirement 1=TR1)

b) Portfolio Volume (Technical Requirement 2=TR2)

c) Number of Employees (Technical Requirement 3=TR3)

d) Number of Branches (Technical Requirement 4=TR4)

e) Experience in Insurance (Technical Requirement 5=TR5)

f) Fund Performance (Technical Requirement 6=TR6)

g) Number of Customers (Technical Requirement 7=TR7)

h) Foreign Capital Assets (Technical Requirement 8=TR8)

i) Information Technologies (Technical Requirement 9=TR9)

j) Price (Technical Requirement 10=TR10)

k) Reliability (Technical Requirement 11=TR11)

l) Customer Relations (Technical Requirement 12=TR12)

m) Brand Image (Technical Requirement 13=TR13)

n) Payment (Technical Requirement 14=TR14)

4.3. Relationship Matrix

In the relationship section of the quality house, the marketing experts of the insurance companies were asked to evaluate which customer demand would be maximized by which technical characteristic and the level of relationship between them. The relationship section of the quality home was created by determining the relationship levels that marketing experts preferred the most in each relationship. For example, the relationship between "Reliability of the Company" in the voice of the customer section of the quality house and the technical characteristic "Education Level of the Employees in the Company" was determined as 5 by the experts. This

shows us that there is a high level of relationship between "Reliability of the Company" and "Education Level of the Employees". Another relationship between the technical characteristic "Policy Price" and "Number of Employees" is shown with the symbol "0". Thus, it is seen that there is no relationship between policy price and number of employees. All of the identified relationships are shown in the quality house (See Figure 2 - Quality House).

4.4. Planning Matrix

In order to compare domestic and foreign insurance companies offering motor insurance services, customers were informed about the structure of these two types of insurance companies and were asked to make comparisons with the help of a scale. In the planning matrix of the quality house, these two insurance companies were evaluated in terms of customer demands and technical characteristics. While the customers trust the local companies more, they consider the foreign company superior to the local company in terms of "Damage Payment Speed". Although foreign companies are 1 unit ahead in terms of "After Sales Service Quality", it is seen that both companies are evaluated by customers at the same level in "After Damage Service Quality".

In addition, each of the customers' expectations was evaluated by the customers in terms of its impact on the "Point of Sale". The evaluations are shown in the "Point of Sale" section of the quality house. For this, a scale of "strong impact: 1.5, moderate impact: 1.2, weak impact: 1.0" was used. In the sales section, "Whether it is indexed to inflation or not", "Service Agreements", "Additional Coverages", "After Sales Service Quality", "Special Terms" and "General Terms" have a moderate level of influence in the eyes of the customers, while "Car Insurance Price", "Policy Price", "Brand Recognition", "Reliability of the Company", "Speed of Claim Payment" and "After Claim Service Quality" are more important technical characteristics. Thus, it has been determined which technical characteristics insurance companies should pay attention to and improve the most in order to retain their existing customers and gain new customers.

In addition, each of the customers' expectations was evaluated by the customers in terms of its impact on the "Point of Sale". The evaluations are shown in the "Point of Sale" section of the quality house. For this, a scale of "strong impact: 1.5, moderate impact: 1.2, weak impact: 1.0" was used. In the sales section, "Whether Indexed to Inflation", "Service Agreements", "Additional Guarantees", "After Sales Service Quality", "Special Conditions" and "lGeneral Conditions" have a moderate level of influence in the eyes of the customers, while "Vehicle Insurance Cost", "Policy Price", "Brand Awareness", "Reliability of the Company", "Damage Payment

Speed" and "After Damage Service Quality" are more important technical characteristics. Thus, it has been determined which technical characteristics insurance companies should pay attention to and improve the most in order to retain their existing customers and gain new customers.

4.5. Identification of Targets

In the objectives section of the quality house, the ranking scores and normalized ranking scores of the technical characteristics were obtained. The objectives column was located at the bottom of the quality house. The following steps were followed to calculate the ranking scores and normalized ranking values for each technical characteristic.

Step 1: First, the decision matrix was created for ranking. All (x_{ij}) values in the decision matrix were used for correct ranking (See Equation 24).

$$X = \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ . & & & . \\ . & & & . \\ . & & & . \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \tag{24}$$

x_{ij} : The value of alternative i according to criterion j.

$W = (w_1, w_2 \dots\dots, w_j, \dots\dots, w_m)$

W: Vector of the relative weight values of the criteria.

Step 2: The ranking score of each technical characteristic was obtained from the weighted normalized decision matrix formed by multiplying the weight values with the weighted normalized decision matrix (See Equation 25).

$$v_{ij} = w_j r_j \text{ , } i = 1,2,3,\dots n \text{ , } \quad j = 1,2,3,\dots m \tag{25}$$

Step 3: The normalized ranking score is obtained by dividing the ranking score of each technical characteristic by the total ranking score (See Equation 26).

$$\text{Normalized ranking score} = \frac{v_{ij}}{\sum v_j} \tag{26}$$

For example, the ranking score and normalized ranking score of the education level of the employees in the company are calculated as follows based on the values in the quality house (See Equation 27, Equation 28 and Equation 29).

$$v_{ij} = 0(0.148) + 0(0.083) + 5(0.053) + 5(0.030) + 5(0.066) + 0(0.052) + 0(0.145) + 5(0.069) + 5(0.079) + 5(0.072) + 3(0.071) + 5(0.131)$$

(27)

$v_{ij} = 2.713$ = (Ranking score of the education level of employees in the company)

The normalized ranking score of the education level of the employees in the company is

$$= \frac{2.713}{2.713 + 2.319 + 0.845 + 0.249 + 3.259 + 0.507 + 1.895 + 1.485 + 3.647 + 2.845 + 3.007 + 1.045 + 2.251}$$

(28)

$= \frac{2.713}{\text{Ø}\ .067} = 0.104$ was found.

It has been seen that the most important technical characteristic open to development is “Price” with 14%. This situation is about attracting the customer to their side by creating a quality service at an affordable price.

The second important technical characteristic was found to be “Experience in Insurance” with a 12% share. This situation is closely related to the reliability and professionalism of the customers to the company to which they hand over the fund management as the experience increases.

It has been seen that the technical characteristic that takes the third place is “Customer Relations”. “Reliability” is the fourth important technical characteristic.

As a result of the research conducted on annual reports and the internet, although the “Portfolio Volume” and “Number of Employees” information of foreign firms were found, this information was not available for domestic firms. Although the domestic company is superior to the foreign company in the number of branches, it has been observed that the foreign-partnered company has more customers than the domestic company in the number of customers. From this, we can conclude that customers trust the foreign partner company more in the insurance service.

4.7. Creating the Roof

The relationships between the technical characteristics are analyzed in the roof section of the quality house. As a result of the evaluations made, those with a strong relationship between them are shown with the symbol "+" and those with a weak relationship are shown with the symbol "-" on the roof of the quality house (See Figure 2).

Those with a strong relationship are the technical characteristics;

- Education Level of Employees in the Company and Portfolio Volume
- Education Level of Employees in the Company and Number of Customers
- Education Level of Employees in the Company and Foreign Capital Assets
- Education Level of Employees in the Company and Reliability
- Education Level of Employees in the Company and Customer Relations
- Education Level of Employees in the Company and Brand Image
- Portfolio Volume and Number of Employees
- Portfolio Volume and Number of Branches
- Portfolio Volume and Experience in Insurance
- Portfolio Volume and Number of Customers
- Portfolio Volume and Information Technologies
- Number of Employees and Number of Branches
- Number of Employees and Number of Customers
- Number of Branches and Fund Performance
- Number of Branches and Number of Customers
- Number of Branches and Price
- Number of Branches and Reliability
- Number of Branches and Brand Image
- Experience in Insurance and Fund Performance
- Experience in Insurance and Number of Customers
- Experience in Insurance and Price
- Experience in Insurance and Reliability

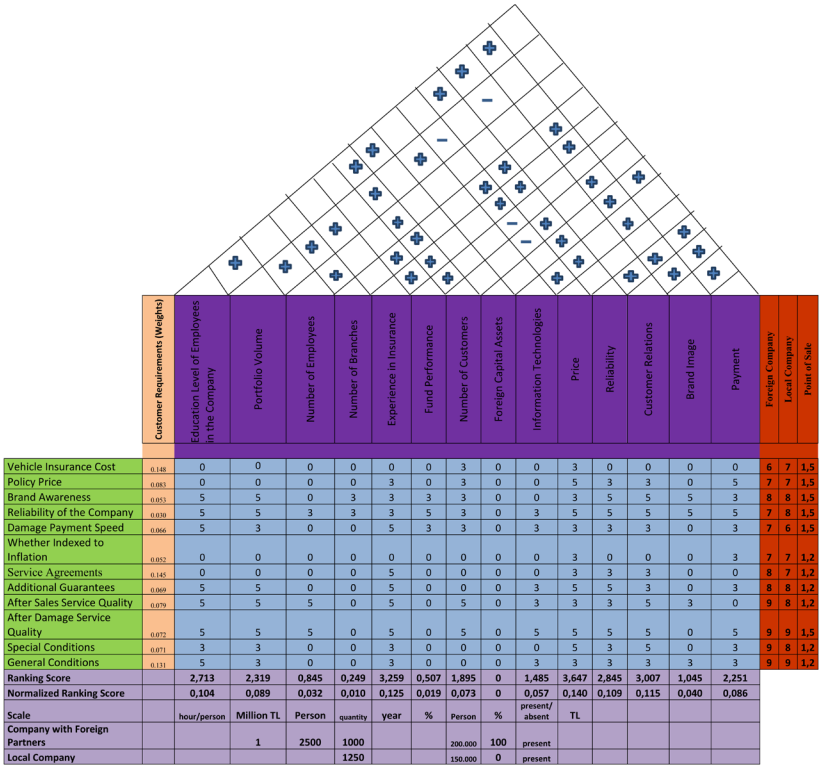
- Experience in Insurance and Brand Image
- Fund Performance and Number of Customers
- Number of Customers and Reliability
- Number of Customers and Brand Image
- Foreign Capital Assets and Reliability
- Foreign Capital Assets and Brand Image
- Foreign Capital Assets and Payment
- Information Technologies and Price
- Information Technologies and Reliability
- Information Technologies and Brand Image
- Reliability and Customer Relations
- Reliability and Brand Image
- Reliability and Payment
- Customer Relations and Brand Image
- Customer Relations and Payment
- Brand Image and Payment

Technical characteristics with a weak relationship between them;

- Portfolio Volume and Price
- Portfolio Volume and Customer Relations
- Fund Performance and Price
- Number of Customers and Price

was found as.

Figure 2. *Quality House*



Customer Requirements (Weights)		Education Level of Employees in the Company	Portfolio Volume	Number of Employees	Number of Branches	Experience in Insurance	Fund Performance	Number of Customers	Foreign Capital Assets	Information Technologies	Price	Reliability	Customer Relations	Brand Image	Payment	Foreign Company	Local Company	Point of Sale
Vehicle Insurance Cost	0.148	0	0	0	0	0	0	3	0	0	3	0	0	0	0	6	7	1,5
Policy Price	0.083	0	0	0	0	3	0	3	0	0	5	3	3	0	5	7	7	1,5
Brand Awareness	0.053	5	5	0	3	3	3	3	0	0	3	5	5	5	3	8	8	1,5
Reliability of the Company	0.030	5	5	3	3	3	5	3	0	3	5	5	5	5	5	7	8	1,5
Damage Payment Speed	0.066	5	3	0	0	5	3	3	0	3	3	3	3	0	3	7	6	1,5
Whether Indexed to Inflation	0.052	0	0	0	0	0	0	0	0	0	3	0	0	0	3	7	7	1,2
Service Agreements	0.145	0	0	0	0	5	0	0	0	0	3	3	3	0	0	8	7	1,2
Additional Guarantees	0.069	5	5	0	0	5	0	0	0	3	5	5	3	0	3	8	8	1,2
After Sales Service Quality	0.079	5	5	5	0	5	0	5	0	3	3	3	5	3	0	9	8	1,2
After Damage Service Quality	0.072	5	5	5	0	5	0	5	0	5	5	5	5	0	5	9	9	1,5
Special Conditions	0.071	3	3	0	0	3	0	0	0	0	5	3	5	0	3	9	8	1,2
General Conditions	0.131	5	3	0	0	3	0	0	0	3	3	3	3	3	3	9	9	1,2
Ranking Score		2,713	2,319	0,845	0,249	3,259	0,507	1,895	0	1,485	3,647	2,845	3,007	1,045	2,251			
Normalized Ranking Score		0,104	0,089	0,032	0,010	0,125	0,019	0,073	0	0,057	0,140	0,109	0,115	0,040	0,086			
Scale		hour/person	Million TL	Person	quantity	year	%	Person	%	present/ absent	TL							
Company with Foreign Partners			1	2500	1000			200.000	100	present								
Local Company					1250			150.000	0	present								

The parts of the quality house shown in Figure 2 are analyzed separately and interpreted in the method section.

5. CONCLUSİON

With the technology developing today, it is now seen as a need for people to have a car. Especially due to the increase in the number of people who own a car, the need for automobile insurance is gradually increasing, and therefore the competitive environment in car insurance is constantly heating up.

The most used area of insurance in our country is automobile insurance. When we talk about automobile insurance, we think of the damage caused as a result of accidents caused by vehicles to be covered by securing.

The insurance sector in our country has entered into a rapid growth recently. For this reason, many new insurance companies have started operating and have entered into a fierce competition with each other. Insurance companies that provide automobile insurance for motor vehicles try to provide different services to their customers in order to get a higher share of the market, and to ensure that customers use their preferences in favor of themselves when making decisions.

In the study, the technical characteristics that any insurance company should focus on in order to ensure that the expectations of a customer group that is likely to have a automobile insurance policy and who has already taken out a automobile insurance policy are at the maximum level. On the one hand, while investigating the expectations of the customer group from the system, at the same time, thanks to the information received from the expert personnel in insurance companies, the relationship of customer expectations related to the technical characteristics of the companies was focused on.

In the second part of the study; a literature study on QFD was conducted. In the third part; it is focused on investigating how effective the QFD application is in the selection of this product. Here, collecting the customer's voice, determining the technical characteristics of insurance companies, determining the relationship Decoupling between the specified technical characteristics and customer expectations and prioritizing technical characteristics are identified as the main goals. In addition, comparisons based on records, the study of the relationships of technical characteristics with each other and the contribution of characteristics to sales at the point of sale have also been included. In the fourth section; QFD has been applied step by step for car insurance. In the fifth and last section, a detailed analysis of the quality house was made, comments and suggestions were presented.

As a result of AHP, it has been seen that the first three features that customers attach the most importance to are "Vehicle Insurance Cost", "Service Agreements" and "General Conditions". These are followed by "Policy Price"and "After Sales Service Quality". The results obtained have been included in the weights column of the quality house.

It has been seen that the most important technical characteristic open to development is "Price" with 14%. This situation is about attracting the customer to their side by creating a quality service at an affordable price.

The second important technical characteristic was found to be "Experience in Insurance" with a 12% share. This situation is closely related to the reliability and professionalism of the customers to the company to which they hand over the fund management as the experience increases.

It has been seen that the technical characteristic that takes the third place is "Customer Relations". Reliability is the fourth important technical characteristic.

While customers trust domestic companies more, they consider the foreign company superior to the domestic company in terms of "Damage Payment Speed". Although foreign companies are 1 unit ahead in terms of "After Sales Service Quality", it has been seen that both companies are evaluated equally by customers in the "After Damage Service Quality".

In the point-of-sale section, "Whether Indexed to Inflation", "Service Agreements", "Additional Guarantees", "After Sales Service Quality", "Special Conditions" and "General Conditions" have a medium level of influence in the eyes of customers, while "Vehicle Insurance Cost", "Policy Price", Brand Awareness", "Reliability of the Company", "Damage Payment Speed" and "After Damage Service Quality" are more important technical characteristics. Thus, it has been determined which technical characteristics insurance companies should pay attention to and improve the most in order to retain their existing customers and gain new customers.

As a result of the research conducted on annual reports and the internet, although the "Portfolio Volume" and "Number of Employees" information of foreign firms were found, this information was not available for domestic firms. Although the domestic company is superior to the foreign company in the number of branches, it has been observed that the foreign-partnered company has more customers than the domestic company in the number of customers. From this, we can conclude that customers trust the foreign partner company more in the insurance service.

In this study, the technical characteristics of insurance companies that market insurance policies were examined by taking into account the voice of customers. As insurance companies, when they want to sell automo-

bile insurance correctly, they should pay attention to the points “Vehicle Insurance Cost”, “Policy Price”, “Brand Awareness”, “Reliability of the Company”, “Damage Payment Speed” and “After Damage Service Quality” that the customer chooses as criteria. By looking at the quality house, domestic and foreign partner companies have the opportunity to see their shortcomings or the complete and correct work they have done. This work can also be done for other products of insurance companies. It is seen that important results can be obtained by conducting the study on the basis of companies as well. In addition, it may be recommended to apply such studies to Food, Health and Life Insurance.

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TRANSFORMATION OF INDIVIDUAL MEMORY INTO ART: WON JU LIM'S WORKS

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INTRODUCTION

Experiences take their place in memory by turning into knowledge through the relationships established by the human mind. Time and space play an important role in this association process. Although their definition and content may differ depending on the individual or society, these concepts are of great importance for human life. The time in which experiences occur and the area in which they occur shape us, and therefore our feelings and thoughts. The main place where this shaping takes place is memory. Memory is divided into four: social, cultural, political and individual. Although memory types differ from each other in terms of content, they are connected and related to each other when necessary. The individual memory that is the subject of our study is specific to the person. Because the spiritual, intellectual and physical characteristics of individuals are not the same. That's why there are differences in experiences and experiences, and personality structure and individual memory are formed accordingly. Hence the diversity of ways of seeing that occur in any discipline that involves expression.

Individual memory has taken its place among the topics emphasized and studied in the field of art, as in many other fields. An example of this is Won Ju Lim, an artist of Korean origin who lives and works in America. The artist deals with individual memory as a subject in his works in the context of time and space. Real and fictional spaces are reconstructed in the artist's works. The longing for the past and its place in the mind are concretized and shared with the audience through Lim's installations. In our study, first of all, individual memory will be discussed, and the transformation of this concept into formalism in the field of art will be examined through the works of the artist named Won Ju Lim.

INDIVIDUAL MEMORY

Memory consists of information experienced and learned through experiences and stored in a certain part of the mind. This information is included in a systematic that can be remembered and recalled, as well as being stored, no matter when it is acquired. In his book Philosophy Dictionary (2005: 224), Cevizci defines the concept of memory in 4 different ways: Past experience, experience and the ability to remember what happened. The power to remember and visualize experiences or experiences and preserve the past in the present. The remembering subject's non-inferential knowledge about his past experiences, states of consciousness, or objects he has previously perceived. The function of preserving the cognition or knowledge about the concepts in question when images and ideas, facts and objects, and original events are not present. The system or place where such information is supposedly stored and accumulated. Informa-

tion learned and stored in memory comes from the past, whether it was ten years ago or ten minutes ago. Memory is all the experiences that occur as a result of experiences. Experiences that occur at a certain time and affect us in different ways are processed in the mind and stored for use. The memory formed in the past is effective in our living and understanding of the present and in our expressions and behavior in situations we will encounter in the future.

Memory has an important place in the continuity of life. A person's life cycle combines with the society and geography to shape memory. As a result, the individual adapts to the environment in which he lives, along with the behaviors that occur in the individual. Özteke (2022: 12-13) states that although remembering is an event that occurs individually, it cannot be attributed only to the individual and cannot be used on an individual level, but is also used by associating it with the communities to which it belongs. He adds that in addition to the individual's own experience and subjective knowledge, a memory shaped by society is formed in coordination. Experiences and the memories formed as a result shape a person's character, psychological state, and perspective on life. A person does not try to relearn what he has learned thanks to memory. He collects them and uses them. Because there is a place and community he belongs to and a time he spends. Knowing us and everything outside us ensures the continuity of this cycle.

Data obtained from encountered and experienced situations turn into images in memory. These images are equipped with codes as a result of being obtained through the senses and processed in the individual's emotional and intellectual world. The separation of information in memory occurs in this way. The codes in memory are full of personal and social data that occur over time and space. Aleida Assmann (2006: 211) states that memory is generally divided into two categories: individual and collective, but this is not a sufficient definition. For this reason, he attempts to divide memory into four forms: individual memory, social memory, political memory and cultural memory. Other types of memory and individual memory differ from each other in some issues. Social memory, cultural memory and political memory are more related to social life and have a general structure. Individual memory, on the other hand, is specific to the person and the existing information is more of a subjective nature. Therefore, when individual memory is evaluated in itself, it includes memories that are numerically different from each other on a person-by-person basis. We can give as many examples of this as there are people living in the world.

Personal memory is a type of memory that exists throughout an individual's life and disappears when his life ends. It is specific to the indi-

vidual and varies. The subject's personality structure, psychological characteristics, physiological characteristics, experiences and sociocultural characteristics are factors in shaping the subject's memory. This variability also varies in the individual's perception and storage of space. Personal memory, which can change over time, has a structure that interacts with space, can be affected by the social environment and can undergo change (Çolpan, 2017: 16).

Every moment that is included in the time and place a person is in, like every situation that a person experiences and encounters knowingly and assimilated, takes place in memory. According to Orhan Hançerlioğlu (1978: 68), remembering in psychology is the spontaneous repetition in consciousness of events that are not known to have occurred or are known to be very weak and blurry. Unlike memory, it is not evoked, produced, explained, or detected. Because these transactions are only possible for certain events that have occurred in the past. Since birth, humans perceive and make sense of their environment through their own body, sensations, emotions and thoughts. Because every person is different from each other physically, spiritually and cognitively. These differences create the diversity in individual memory. Mücük (2021:105) states that individual memory, formed through experiences, experiences and rituals, emerges together with social and cultural memory, and is remembered in memory as a result of common sharing. He adds that social and cultural memory awakens similar thoughts in individual memory and enables people to agree on an object, being, place, and time. Although individual memory is formed together with social and cultural memory, the traces left on the person differ here. This difference can be defined as the effect and reaction of the individual in every experience. "Individual memory creates perceptions; the body is in a relationship with perceptions. In individual memory, memories are created by various groups and remain in memory (Assmann, 2001: 31-44). The relationship between individual memory and social and cultural memory only shows pluralism in that culture and society. When he enters a different society, the memory he has formed with his own society and culture returns to an individual structure. According to Halbwachs (2018: 22), individual memory is the social conditions that form the source of our personal feelings and thoughts. The ideas that a person puts forward about any object he sees are realized thanks to the people who accompany those ideas. Accompanying people may agree or disagree on the learning and teaching side. The fact that a person cannot survive both physically and spiritually on his own is related to the sense of trust. The time spent by a person who wants to feel a sense of security with the community he belongs to turns into common experiences and memories and is reflected in his behavior. Çelepi (2020: 33) states that the area where the individual

stores his past is called individual memory and that it is revitalized through the act of remembering, shaping the moment/present and making it meaningful. He adds that in this effort to make sense, the individual internalizes only what is important, and by remembering, he gives those internalized a chance to live. All information included in memory is stored. Information that is not remembered or remembered as a faint memory can be associated with the person's psychological state at that moment. In other words, these can be defined as unimportant situations that are desired to be forgotten. In the event of an encounter, it is inevitable for this information or memories to emerge and be remembered.

When the information contained in the individual memory is recalled, it communicates with other memories in a relevant situation and when necessary. This situation is related to associating existing or upcoming information with other situations and making the information more meaningful. Arslan (2017: 9) explains the reason for establishing a relationship with the past by making the current moment meaningful. The connection with the past is established, on the one hand, with historical documents and information, and on the other hand, with the mental coding created in flow, and this setup allows people to position and make sense of the universe and themselves; Then it indicates that it allows saving to memory. He adds that the codes related to collective memory, which become evident with this setup, emerge through various recollections. Newly acquired information becomes meaningful when it is compared with past information. The information in the memory and coming from the past emerges as a result of being needed in the present or as a result of encountering a similar or related situation, event, person or object. "Remembering is too complex a phenomenon to be seen as just a function of the human brain. "It both makes existence meaningful and ensures that this existence becomes a tradition by being passed on to future generations" (İlhan 2018: 24). Experiences are formed within the individual's own process in particular, and with society in general. Belonging to a time, place and community brings with it feeling safe. Starting from here, memory creates and nourishes many emotions and thoughts about humans. "Freud claimed that memory does not lose any memory, and that every moment/memory can be remembered again and come to the surface under appropriate conditions. He says that the memories we cannot remember are actually just fragments of experience that we prefer to hide and suppress" (Hasgül and Turgut, 2018: 2).

Positive, negative, important or unimportant experiences that occur spontaneously or as a result of a certain situation throughout our lives remain in our memory, whether we remember them or not. These form the person's character and voluntary or involuntary behaviors. According to Assmann (2001: 46), memory records all kinds of information (data) that

have entered our lives, reveals the data it recorded in the past in the present when it needs it and carries it to the future. Memory not only constructs the past, but also organizes the experiences of the present and the future. İlhan (2018: 28-29) basically states that human cultural existence is a combination of two modes of existence: existential and historical, which include the present and past; In this case, he states that the link between the existentiality and historicity of culture is the human act of remembering. He adds that humans carry the past of their cultural existence to the present by remembering it, and reinterpret the present with the content of remembering. He continues with the following words: In individual memory, the memories formed by the experiences of members of a group together determine the idea of the past. While the past lived by an individual creates the idea of individual memory, the past lived together creates collective memory. Although these memory types are separated by name and content, they work in an organized manner when needed. All information that constitutes an individual's memory occurs within a certain place. Every place has its own identity, and the experiences that occur within the framework of this identity differ from each other. The timing of experiences is also important. The effects of something when we experience it for the first time are different from when we experience it the next time. Process teaches us to process, use and organize information. We can look at the emerging self and external conditions more consciously from the outside. Assmann (2001: 42) states that since the figures of remembrance are based on an abstract time and place, they must be embodied in a certain place and updated at a certain time. According to him, memories are based on place; It means the house for the family, the village for those living in rural areas, the city for the urbanites, and the geographical region in that geography for those living in a geography, forming the environment of spatial remembrance. "The past is over and done with. What is called "past" is an accumulation created by images or memories that are the result of the impressions obtained from them. The image accompanies itself to a moment in time in the past. By remembering the past in the present, a picture about the past comes to life in the mind" (İlhan 2018: 47). The images in memory are subjective visuals of the moment experienced, created within the framework of time and space. For example, when people want to draw a tree, the tree images that come to life and are depicted in different people differ. Because the temporal and spatial representation of the trees he encountered throughout his life is embodied in this image. This is more than just a tree; it is also a representation of concepts that have meaning in a person's inner life. Ricoeur (2011: 115) mentions three features of memory that emphasize its completely personal nature. The first of these is that memory seems to be a completely individual thing, one's memories are not the same as others and they cannot be transferred to someone else's memory. Secondly,

the place where the original connection of consciousness with the past is found is memory, as Aristotle and then more strongly by Augustine said, memory belongs to the past and this past is the past of impressions. In this sense, memory ensures the temporal continuity of the person, thanks to the fact that the past is specific to the person. This continuity allows an uninterrupted journey back from the present to the most distant events of my childhood. On the other hand, memory remains the ability to traverse time, to go back in time. Thirdly, the sense of direction during the passage of time is also linked to memory in two directions: According to the direction of the arrow showing the change of time, moving forward by being pushed from behind, that is, turning from the past to the future; The second is to turn from the future to the past while hoping to capture the memory in the opposite direction in the present. The tradition of introspection is built on the features gathered through this common experience and everyday language.

WON JU LIM'S WORKS IN THE CONTEXT OF INDIVIDUAL MEMORY

From past to present, types of memory about society are transferred from generation to generation through verbal, written or formal languages. In this way, the continuity of common values that hold society together is prevented and the continuity of these values is ensured. One of the tools used to transfer memory is art. A lot of information about the past is obtained through works of art. In addition, we see studies on direct memory towards the end of the 20th century. The existence of world wars, the deaths of many people and genocides have been recorded by artists through studies on memory. In other words, the memory of memory is created. In addition to the artists working on social, cultural and political memory, there are also artists working on individual memory. One of these artists is Won Ju Lim.

Won Ju Lim, who was born in Korea in 1968, continues his studies in America. Working in different disciplines, the artist is generally known for his installation works that combine sculpture and architecture. Art works generally consist of a combination of real and imaginary spaces. The places here are representations of the images in Lim's memories. Lim's works are works in which memory is experienced within the concepts of time and space, including the viewer. Won Ju Lim spent the first years of his life in Korea, and then settled in America with his family. The artist carries the memory of two cultures that are different from each other in terms of social and collective memory. One is the place where it has its origins, and the other is where it later gained ground and tried to put down its roots. At the same time, we see double-sided emotional and intellectual states in his

life and art as individual memory. In his works, he deals with memories that describe his longing for the past or the moments he has experienced, and the codes that create these memories and appeal to different senses. These codes are sometimes embodied in his works with elements such as three-dimensional elements, sometimes moving images and sometimes sound. The situations in Won Ju Lim's past are explained through the places she experienced. Here, rather than an exact copy of the space, the re-created formality of the artist's impressions specific to that moment is seen. There is an element of movement in Lim's works, with images projected and changing on the space, that is, the ground-shape relationship. Movement comes into play when the ground changes constantly.

The first work of Won Ju Lim that we will examine is 24 Seconds of Silence (Image 1), which he made in 2008. This work consists of images reflected from 5 projections, as well as 14 sculptures spread throughout the space, made using mixed media. As a result of reflections, the shape turns into the ground and the ground turns into the shape. Memories of a certain time are presented to the viewer through both three-dimensional architectural forms and projected images. Some of the projections are placed on a rotating stand, allowing the image to flow in a circular manner in the space. While some projected images resemble a fast-flowing film strip, others turn into visuals or shadows created by colored lights circulating in the space or reflected on the sculptures.

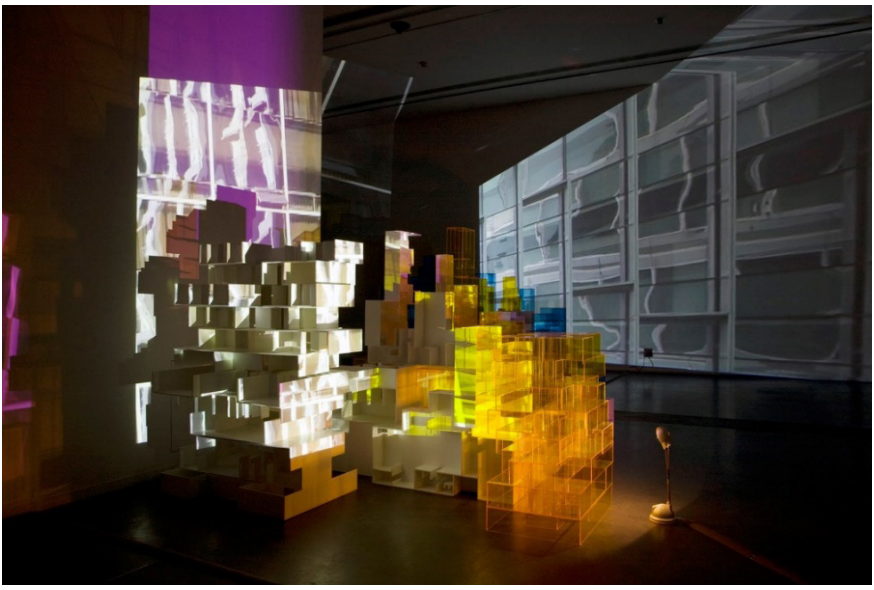

Image 1. Won Ju Lim, 24 Seconds of Silence, 2008.

The formal aspect of the work titled 24 Seconds of Silence consists of the photographs and impressions taken by Won Ju Lim during her visit to Beijing, the capital of China (Image 2). Lee Ambrozy (2009: 212-213) states that the architectural images reflected in the work titled 24 Seconds of Silence mix with the sculptures and create ghost shadows, and that the sculptures reflect four types of architectural motifs. The first of these is wooden columns covered with vertical strips of industrial tape; other works, the second modeled from thin strips of colored Plexiglas and glued together to form tall, elegant towers; third, models of floor plans with plexiglass and foam core clustered in an organic spread on the floor, based on plans in the Case Study House Program; Finally, referring to a theatrical understanding of how a city can curate its public image, a craft perfected in Beijing, Metropolis lists detailed models encased in plexiglass display cases of the cityscapes seen in visionary films such as Things to Come, The Wizard of Oz, Logan's Run, and Dark City. The installation work presents us with a mixture of the artist's experiences regarding real and fictional places in his life and memories. Space-related elements such as light, form, emptiness, and occupancy are included in this study, increasing the semantic level of the spaces to be described.

Image 2. Won Ju Lim, 24 Seconds of Silence, 2008.

Lee Ambrozy (2009: 212-213) states that the 24 Seconds of Silence installation is a complex pastiche of changing elements such as form, light, perception, and that it shows a city in itself, as can be clearly understood from the complementary forms, but it has no distinguishing features, no narrative, no intellectual center. expresses. Through Lim's experience as a newcomer to Beijing in 24 seconds, the viewer is left in an ever-changing environment and space that creates a fascination with the new and the unknown. There is no sound element accompanying the work, but the content of the entire installation is visually recorded every thirty-eight and a half minutes. He describes it as turning into a "silent" twenty-four seconds. Changes in the light used provide us with data about the space we want to describe. Especially for the viewer, these sensory data are important in assimilating the memories in the artist's memory. The light transitions used in the work (Image 3) take us on a journey between reality and imagination. With this work, which embodies the artist's individual memory, new elements are created in the viewer's memory. Traces of the artist now appear in the audience. There is a time presented to the viewer and codes related to the place at that time. That moment is presented to the viewer visibly in the gallery. Won Ju Lim explains the relationship between the viewer and his work as follows:

The mobile subject is fragmented, multiple, and almost a channel through which the active conditions of Baroque architecture resonate (scale change, multiple perspectivism, interiors within interiors, optical illusion spaces, continuity through discontinuous materials, to list a few). There is a constant negotiation, exchange or reciprocity between the wandering subject and the Baroque interior. Yes, they are stylistically opposite, and these moments in western history are reflections of different ideologies. However, both allow for similar experiences vis-à-vis the agency of the guiding subject. Both expand the frame, that is, the frame that includes the body and mind of the viewer/viewer. In doing this, a dialogue and exchange opens between the viewing subject and the art object; My practice is most geared towards creating interesting subject-object relationships. (Linder, 2023)

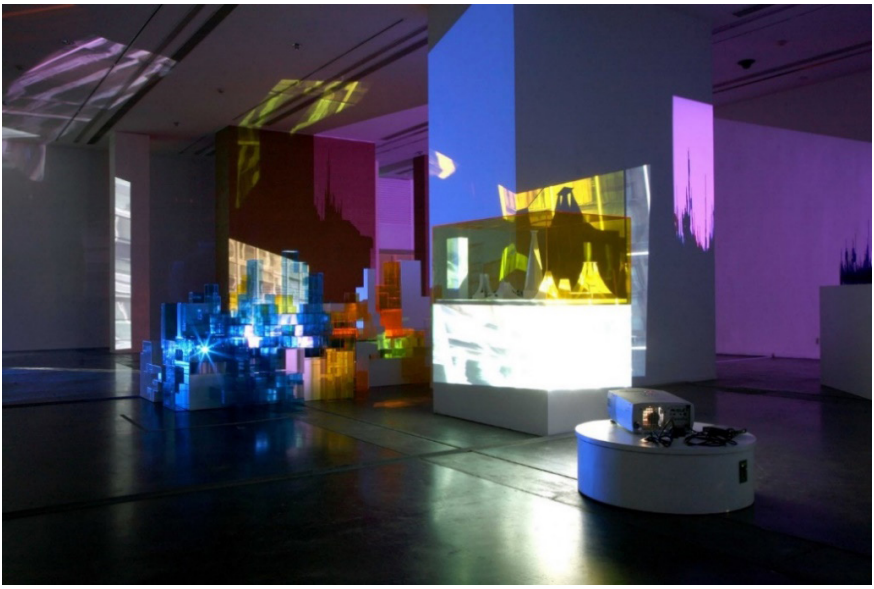

Image 3. Won Ju Lim, 24 Seconds of Silence, 2002.

Another work by Won Ju Lim regarding individual memory is the installation titled California Dreamin', 2002 (Image 4). This installation work was created from materials such as foam board, plexiglass, lamp and digital projection. As in his other works, the artist chose easy-to-find, everyday materials that he usually uses for this work. It has been transformed into an interactive work by projecting images onto architecturally specific forms made of foam board and plexiglass placed in the venue where it is exhibited. California Dreamin' consists of five pieces: a large installation, 3 light boxes on which images are projected, and a sculpture depicting a place in nature with houses placed in a plexiglass box.

Image 4. Won Ju Lim, California Dreamin', 2002

Lim's work California Dreamin' presents us with the landscapes symbolizing the state of California in America. These landscapes also contain an abstracted and poetic expression of the city. The viewer takes a short tour in those landscapes with California Dream's work. There are around 150 architectural models in the large installation in the work. These models are created from foam plates and colored plexiglass. Silhouettes, shadows and reflections were created with the lights and visuals projected onto the plexiglass works and the space through projections. Due to the reflected lights coming to the viewer, its shadow (Image 5) is added to the reflections in the exhibition. The viewer is involved in the work with both his physical experience and his shadow. The artist's choice of these materials is to better explain the relationship and interaction between light and space. This is another aspect addressed in the study. When we look at the dimensions of the work, we see that it is such that the viewer can view the general image from all sides. Tall buildings are clustered in a way that the viewer can look at from above. In Kelly Linder's interview with Won Ju Lim (2023), the artist explains that the background of his work consists of his childhood memories. The artist, who is part of an immigrant community, describes being stuck between two cultures, Korea and America, and not being able to belong to either of them. In the continuation of the interview, Lim reflects on his memories of the seemingly magical city full of flickering amber and green lights during his rides in the burgundy Chevrolet Malibu that his father bought from his aunt, and also the artist's dream of one day living in the futuristic city of lights, his unfulfilled desires for a place

where he cannot feel like he belongs completely. We see that he reflects his longing for a place in his works.

Image 5. Won Ju Lim, California Dreamin', 2002

The influence of French writer Marcel Proust can be seen in Won Ju Lim's works. The subject of Proust's book, In Search of Lost Times, consists of a detailed treatment of the times of a certain moment. We can consider Lim's detailed visualization of past memories in his works as the influence of Proust. In an interview with Kelly Linder, Lim relates the importance of memory in his work to the impact of Marcel Proust's writings on him. Won Ju Lim continues:

Samuel Beckett said that Proust had a short memory, and I agree. Forgetting and remembering are not opposites; One does not erase or replace the other, but exists within each other; They relate to each other dialectically. Remembering is never about having a correct explanation. Memory is a product of confusions, confusions and dreams. For example, the memory of my first home is the memory of a memory... The narrator in Proust's story talks about an involuntary memory, spontaneous explosions of events that occurred in the past, initiated by a certain sensation (Linder, 2023).

Lim's transformation of his memories of the past into a visual language in his own style can be explained as the influence of Proust. Another part of California Dream's work is the Memory Palace Terrace, which hangs on the wall of a room-shaped gallery space. This work consists of boxes made of anodized aluminum in different sizes. Sculptures representing different urban images inside the boxes are illuminated with LED lights. In this part, light and space were used together, creating silhouettes,

shadows and reflections.

Image 6. California Dreamin,Memory Palace Terrace

Image 7. California Dreamin', Memory Palace Terrace

A Piece of Echo Park, the last part of the California Dream installation, is a three-dimensional sculpture of a landscape from nature placed inside a yellow plexiglass box. When we look at this work, we see trees and houses located in a hilly area. A Piece of Echo Park presents us with the representation of residential areas on rugged terrain that can be seen in the city of Los Angeles, California. This area is limited by fitting inside a plexiglass box. The moment and time of a particular image are fixed with this study.

Image 8. California Dreamin', A Piece of Echo Park,

CONCLUSION

Memory, which is a requirement of being human, stands at a very important point in life. If we did not have memory, we would try to relearn everything we have learned and we would not be able to demonstrate behaviors that require continuity in life. Since memory is also a place where everything about the past is stored, it fosters emotions such as belonging and trust that ensure the health of human psychology. Memory is divided into four: social, cultural, political and individual. Types of memory include information and values about both the individual and the society to which he belongs. The lived time is coded, stored and recalled here. Individual memory is a type of memory in which personal data is stored compared to other memories and disappears with the individual when he or she dies. From past to present, types of memory about society are transferred from generation to generation through verbal, written or formal languages. In this way, the continuity of common values that hold society together is prevented and the continuity of these values is ensured. One of the tools used to transfer memory is art.

A lot of information about the past is acquired through works of art. In addition, we see studies on direct memory towards the end of the 20th century. World wars, many deaths and genocides lead to studies on memory. Generally, these studies are about social and cultural memory. Studies on individual memory find a place in today's art. In these works, the memories experienced by the artists and in their individual memories are transformed into concrete forms in different disciplines. One of the artists who works on individual memory is Won Ju Lim. Lim is known for his works that combine architecture and art. These are installations created with everyday objects and spread across space. The artist uses his individual memory as a subject, bringing together imaginary and real places that show longing for the past. In these works, shadows and silhouettes are created by reflecting light and images through projection. It automatically joins these shadows. Memories and experiences related to a specific moment meet with the audience in the gallery environment. Won Ju Lim transforms the memories that only she knows, in her memory, into something that everyone can see and experience by concretizing them with the forms she creates. Visuals that only individuals can see in the mind turn into concrete forms that everyone can experience with their senses through art. In this way, individual memory, which has a unique and subjective structure, is saved from extinction by being included in other memories.

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THE INNOCENT NEUROMARKETING DELUSION: MANIPULATION OF CONSUMER BEHAVIOR

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INTRODUCTION

The relationship between neuroscience, the collection of data from the human body, and the ethical concerns surrounding these practices is a complex and controversial topic to discuss. Even though science often seems harmless and has good intentions, there are concerns about how the data gathered could be misused or have unexpected effects. Upon initial examination, collecting scientific data measuring human brain reactions may appear benign, motivated by a pursuit of comprehending human intellect and behavior. However, this pursuit, which seems harmless at first glance, creates critical ethical problems. Does collecting this much data turn people into nothing more than plug-and-play gadgets that can be manipulated? Do we intentionally or negligently create opportunities for potentially malicious entities to exploit our vulnerability? The central issue pertains to the potential utilization of data collecting to manipulate human behaviors and choices without voluntary agency.

The fundamental essence of the issue resides in the purpose driving the utilization of neuroscience data. Does it genuinely intend to comprehend and advance humanity, or does it have the capacity to violate personal freedom and influence behavior? Despite its considerable potential for understanding human cognition and behavior, the topic is characterized by a need for more thorough study. Because there are so few studies that cover the issue in its entirety and because of ethical concerns, there must be a vigorous conversation between researchers and academics. The differentiation between humans and animals within the field of neuroscience lies in the complex structure of our cognitive processes and our capacity for self-awareness. The human species exhibits an elevated degree of consciousness and introspection, hence offering prospects and issues of ethics in the realm of neuroscience research and its practical implications.

The act of exerting control over individuals and manipulating their behavior as if they lack the capacity for free will and autonomy gives rise to profound ethical concerns. This statement encourages contemplation over the appropriate extent of scientific investigation into human behavior and cognition while emphasizing the importance of safeguarding individual autonomy and dignity. The problematic nature of the role of neuroscience in the well-being of humanity is a subject of ongoing debate. A comprehensive approach is necessary, considering ethical limitations, preserving individual autonomy, and the conscientious application of scientific progress to benefit humanity rather than exert undue influence or control over individuals. In contrast to this perspective, Gazzaniga (2011) argues that the issue is not whether we are "free" but whether we should hold people accountable and responsible. Mental states arise from neuronal interactions and cannot be defined or understood by only cellular interactions.

Understanding this nexus is the most complex and unique problem in science. Personal responsibility, a concept in human societies, depends on social interactions and rules of engagement. It is not something to be found in the brain but relies on a social group's presence (Gazzaniga, 2011).

Smartphones and tablets, while not inherently designed to gather neural data, can be transformed into data collection platforms for primary brainwave data through software and accessories, such as EEG headsets. Smartwatches and fitness trackers are technologically advanced devices that may have sensors capable of detecting heart rate variability (HRV) or stress levels. These features offer indirect insights into the activities of the autonomic nervous system. Wearable electroencephalogram (EEG) devices have been specifically engineered to capture brainwave activity by collecting EEG data from the scalp. The concepts of Augmented Reality (AR) and Virtual Reality (VR) Headsets employed for immersive experiences, specifically virtual reality (VR) headsets, may integrate sensors capable of collecting restricted brain data, particularly of head movements and eye tracking. The subject of discourse concerns wireless earbuds and headphones. Specialized headphones or earbuds may include sensors to track brain activity or levels of attention, although these features are not commonly found in regular consumer devices and smart home devices. While smart home devices are not designed to collect neurological data, they can indirectly provide information about an individual's routines or habits, which could be analyzed for neural activity or patterns.

Based on Gazzaniga (2011), relying solely on neuroscientific information may not be sufficient for shaping one's behavior. However, it is essential to note that these technologies can gather neuroscientific data, as previously indicated, and acquire private information about consumers. Smart devices capture data on social interactions through diverse methods, including monitoring user movements, collecting daily activity data, and deducing user preferences from incomplete information (Arshad, ur Rehman, Niazi, Kalra, & Mansoor, 2022; L. N. Dery & A. Jelnov, 2021; F. Şahin & Söylemez, 2021). The data is commonly maintained on servers owned by suppliers and can be retrieved by third parties, raising privacy issues (Mojibur & Shamim, 2021). The perpetual advancement and investigation in communication networking have facilitated the interconnectedness of smart devices, leading to data transmission across applications and devices (F Şahin & Söylemez, 2022; Yang, Fu, Liu, & Walid, 2022). Nevertheless, the heightened interconnectivity also introduces concerns regarding security and privacy since consumers may lack awareness regarding the vulnerabilities and risks associated with sophisticated technologies (Duan, Zhang, Cheng, & Ren, 2021). The balance between privacy and accuracy is an essential factor to consider. While collecting and utilizing private user

data can improve the accuracy of personalized help, it also puts confidential user information at risk.

For instance, Apple Vision, one of the technologies that has received the most attention, can include all the components, enabling it to make a relationship between the social interaction of customers and neural data. Apple incorporated deep learning for face detection in their Apple Vision framework. Crispin (2023) was employed at Apple as a neurotechnology prototyping researcher within the technology development group. Crispin explains the ultimate product, Apple Vision. The Vision Pro headset by Apple utilizes neuroscience to anticipate user behavior. The primary interface employs eye tracking and gestures for navigation, ensuring prompt detection of the user's attention. Crispin's research on the headset, which he compares to "mind reading," focused on identifying users' cognitive states by analyzing data gathered from their bodies and brain during immersive experiences. AI models employ metrics such as eye tracking, electrical brain activity, heartbeats, muscle activity, blood pressure, skin conductance, and other measurements to anticipate users' thoughts. An outstanding outcome was expecting a user's click before it occurred, thereby establishing biofeedback through the user's brain. Another method entailed employing subliminal visuals or auditory stimuli while leveraging machine learning and physiological signals to anticipate a user's level of attention, relaxation, or cognitive engagement. Although the headset has had a beneficial influence, Crispin cautions that it is still ahead of the curve in virtual reality (VR) and may take the industry a decade to catch up fully. Several researchers maintain the prevailing notion that human behavior is highly complex, and as a result, we have yet to establish a definitive link between specific brain regions and corresponding behaviors. Nevertheless, what if we can open Pandora's box? The objective would be to either emancipate individuals, enabling them to live unrestricted lives or to confine ourselves within a perpetual prison and relinquish control to the hyper-intelligent machine. This section conducts a detailed examination of the literature about the subject matter discussed in this section.

WHAT IS NEUROSCIENCE?

Neuroscience is a scientific discipline that examines the nervous system, encompassing the brain, spinal cord, and peripheral nervous system, as well as their respective functions (Ertek, Tokdil, & Günaydın, 2018). Neuroscience examines the functioning of the brain and its connection to human behavior and cognition (Chudler & Bergsman, 2014). Recent decades have witnessed substantial progress in neuroscience, primarily due to advancements in related disciplines such as molecular biology, electrophysiology, and computational neuroscience (Gage, 2015). It is a multidis-

ciplinary field with several other sciences, such as chemistry, engineering, psychology, and medicine (McFarland, 2017). Neuroscience can be traced back to ancient civilizations that acknowledged the brain as the organ responsible for regulating behavior (Gross, 1999). The advent of advanced tools and techniques paved the way for the inception of modern neuroscience, enabling the meticulous study of the intricate structure and intricate functions of the nervous system. It has facilitated an enhanced comprehension of brain anatomy, growth, operation, neurological ailments, and potential therapies. Neuroscience investigates a wide range of subjects, including sensation, vision, hearing, movement, learning, memory, language, neurological conditions, personality, emotion, mental illness, and consciousness.

Neuroscience can be employed to investigate human behavior through many methodologies. One way is to use machine learning, where cutting-edge models like as TRACE can extract meaningful brain representations based on human behavior from neuroimaging data (Orouji et al., 2022). Another method is to investigate the biological and genetic elements contributing to deviant and criminal behavior. This process can assist in identifying potential factors that influence the will and consciousness of an individual (Serban, 2023). Research in cultural neuroscience has demonstrated the existence of culturally distinctive patterns of brain activity, which can account for variations in behavior across various cultures (Han, 2015). Neuroscience may assist the criminal justice system by giving judges more information about how to punish people, reducing bias, and making recovery better (Denno, 2016). Neuroscience provides insights into the neurological systems that underlie human behavior and can change various domains, including medicine, biotechnology, biochemistry, psychology, psychiatry, pharmacology, computer science, linguistics, education, and marketing.

NEUROMARKETING TECHNIQUES

Neuroscientific methods utilize a range of tools and techniques to measure, map, and record brain and neural activity during an individual's engagement in behavior. These methods generate neurological representations of actions, enabling the understanding of precise brain and nervous system reactions that occur due to exposure to a stimulus. Neuroscientists employ three primary categories of techniques to observe the neural processes in real-time during behavior: instruments and approaches that record neural activity within (electromagnetic and metabolic) and external to the brain, as well as methods for manipulating neural activity (Lim, 2018). Lim (2018) categorized the most used neuroscientific approaches for neuromarketing practices. The classification is illustrated in Table 1.

Table 1. *Neuroscientific Neuromarketing Techniques*

				Outside Brain Neural Activity Recording		Neural Activity Manipulation	
	Electromagnetic (Electrochemical)		**Metabolic (Energy Consuming)**	**ECG**	Electrocardiography	**TMS**	Transcranial magnetic stimulation
EGG	Electroencephalography	**fMRI**	Functional Magnetic Resonance Imaging	**ET**	Eye Tracking	**NT**	Neurotransmitter
MEG	Magnetoencephalography	**PET**	Positron emission tomography	**fEMG**	Facial Electromyography		
SST	Steady-state topography			**SC**	Skin Conductance		

Source: (Lim, 2018)

Lim (2018) explained the objectives and methodology utilized in neuromarketing. Electroencephalography (EEG) is a technique that captures the brain's electrical activity by placing electrodes on the scalp of the individual being tested. It is a non-invasive method. This device detects alterations in cerebral electrical activity that occur when an individual is subjected to marketing stimulation. EEG provides precise measurements of brain activity with a high level of accuracy in terms of time and has a compact and easily transportable structure. However, the limited spatial resolution hinders its capacity to capture brain activity in small subcortical regions and comprehend the cognitive processes that initiate action throughout the entire brain. Magnetoencephalography (MEG) is a non-invasive method that uses a helmet with over 100 and 300 superconducting quantum interference detectors to detect changes in magnetic fields induced by electrical brain activity when exposed to a marketing stimulus. The method provides exceptional temporal resolution for detecting rapid fluctuations in brain activity, although it entails higher initial expenses and lacks portability. MEG has a higher spatial resolution compared to EEG, allowing for the visualization of deeper brain structures. However, its spatial resolution is still constrained. Steady-state topography (SST) is a non-invasive technique that measures and records brain electrical activity using a headband or helmet equipped with 64 electrodes. The measurement quantifies the changes in the phase difference between the visually evoked potential that remains constant and the marketing stimulus. This provides valuable information about the speed at which neural processing occurs. SST provides a precise and uninterrupted monitoring of quick alterations in brain activity, yet it is constrained by its restricted ability to accurately locate these changes in space.

Functional magnetic resonance imaging (fMRI) is a non-invasive technique that quantifies and charts brain activity by detecting abnormal-

ities linked to blood circulation. The method utilizes an MRI scanner to monitor the level of oxygenation in the brain by taking advantage of the magnetic characteristics of blood that is both oxygenated and deoxygenated. This offers a tridimensional perspective of the brain, indicating specific locations within the brain. When subjected to a marketing stimulus, certain regions of the brain experience increased blood flow with higher oxygen levels. This causes a disruption in the magnetic field emitted by hydrogen protons that are found in blood water molecules. Although fMRI offers a high level of spatial resolution, it is both costly and limited in its usage. Positron emission tomography (PET) is a technique used to measure and record the emission of two high-energy gamma rays resulting from the radioactive decay of a radionuclide that emits positrons. This method is invasive and involves placing detectors on the heads of test subjects to track radiation pulses and visualize glucose metabolism in the brain. PET provides exceptional spatial resolution, allowing for the identification of alterations in chemical composition or fluid movement within the inner regions of the brain. Nevertheless, there are drawbacks associated with it, including reduced temporal resolution, limited applicability, and increased financial expenses. Its utilization is limited to individuals in good health and nonclinical research.

Electrocardiography (ECG) is a method used to measure and record the heart's electrical activity over time using external skin electrodes. Cardiac and extracardiac factors influence it and are crucial for neuroscientists to accurately determine the heart's state. Although physiological responses in ECG lag behind brain activity, they provide real-time information about emotional state about exposure to a marketing stimulus. ECG offers physiological responses that are less affected by social desirability biases and at a low cost. Eye tracking (ET) is a method used by neuro marketers to measure eye positions and movements using eye trackers. It uses infrared light to identify cornea and pupil positions, allowing neuromarketers to understand human behavior in response to marketing stimuli. ET offers high temporal resolution, low cost, and is accessible, making it a powerful tool for evaluating marketing effectiveness. Facial electromyography (fEMG) is a technique that captures and amplifies electrical signals to measure and record the physiological properties of facial muscles. It is a non-invasive method. This technology can assess both voluntary and involuntary movements of facial muscles in order to comprehend emotional expressions within marketing contexts. fEMG provides neuro marketers with the capability to identify and record alterations in facial expressions at a relatively inexpensive price, even when individuals are directed to suppress emotional expression. Skin conductance (SC) is a non-invasive technique that measures minute variations in skin reactions when the autonomic nervous

system is stimulated. Neuromarketers may find it beneficial to assess tonic activity, although it does not provide definitive proof of the emotional response's direction or valence. Both enjoyable and unpleasant marketing stimuli can elicit significant sympathetic nervous system responses.

Transcranial magnetic stimulation (TMS) is a technique that uses magnetic fields to activate nerve cells in targeted areas of the brain, enabling the direct investigation of brain function. It induces a temporary disturbance in brain function, resulting in a transient virtual impairment. When combined with various other neuroscientific techniques, Transcranial Magnetic Stimulation (TMS) offers a significant degree of external validity for studying causality and making causal inferences. This device is easily transportable and can be utilized in various marketing environments. Nevertheless, there are certain constraints associated with it, including restricted spatial resolution, challenges in establishing precise causal interpretations due to the interconnectedness of the brain, and the possibility of unforeseen prolonged side effects. Neurotransmitters, also known as NTs, are chemical compounds that facilitate the transmission of neurological signals from one neuron to another. These substances are derived from shared precursors and necessitate only a small number of biosynthetic steps. Neuromarketing studies may incorporate pharmacological substances, but alternative approaches such as inducing excessive or insufficient levels of specific neurotransmitters through dietary manipulation can activate neural systems. Neuromarketing, when used in conjunction with other neuroscientific methods, can evaluate the necessity, sufficiency, and correlation between neuropsychological processes and consumer behavior in response to marketing stimuli.

Neuromarketing employs diverse techniques to examine the neurological reactions of the human brain to marketing stimuli. Methods such as EEG and MEG provide excellent temporal resolution but lack accurate spatial resolution, posing challenges in identifying specific brain areas. fMRI and PET scanning provide exceptional spatial resolution; however, they are costly, less readily available, and less suitable for real-time investigations. Physiological measures such as electrocardiography (ECG), eye tracking, facial electromyography, and skin conductance can capture different facets of human response, thereby offering valuable insights into immediate reactions. Transcranial magnetic stimulation (TMS) examines the hypothesis that a single occurrence can induce alterations in other regions of the brain by temporarily interrupting specific areas. Nevertheless, the restricted spatial resolution and potential adverse effects pose challenges in reaching precise conclusions. Studying neurotransmitters (NTs) in conjunction with other neuroscientific methods provides a biochemical viewpoint on consumer behavior.

NEUROSCIENTIFIC APPLICATIONS IN MARKETING

By utilizing techniques from the field of neuroscience to gain an understanding of the factors that influence consumer decisions, neuromarketing improves the accuracy of predictions regarding consumer behavior. It presents novel viewpoints and powerful approaches to the process of conducting marketing research, particularly regarding the behavior of customers (Mashrur et al., 2023). When measuring customer engagement, traditional marketing strategies, such as surveys and interviews, can be expensive and unreliable on numerous occasions. Neuromarketing can circumvent these limitations by measuring the brain's electrical activity in response to marketing stimuli (Bansal, Pruthi, Bansal, & Chaudhary, 2023). By analyzing EEG signals, neuromarketing can accurately predict consumers' affective attitudes and purchase intentions (Shah et al., 2022). As the research demonstrates, it is feasible to achieve 97% accuracy in forecasting consumer behavior by combining various methodologies. Removing noise and applying machine learning and deep learning classifiers are methods utilized in the preprocessing and classification of EEG signals. This is accomplished through the utilization of these techniques. A more in-depth analysis of consumer behavior is made possible through the utilization of EEG signals, which includes the examination of the influence that stimuli like logo colors have on consumer memory (Rahmadani, Fauzi, Lubis, & Ariyanti, 2022). Today's advanced technology enables the accurate prediction of consumer behavior using low-cost sensors (Phutela, Abhilash, Sreevathsan, & Krupa, 2022). Neuromarketing offers a more comprehensive and precise understanding of consumer behavior, ultimately improving marketing predictions and decision-making.

Harrell (2019) delineates the prospective advantages and ethical quandaries of neuromarketing. One potential approach is better segmentation, which could be more effective than traditional demographic or psychographic segmentation. Brain differences may also be a factor in this, as studies have shown that people are more susceptible to influence during sleep. Sleep nudging, where exposure to certain smells during sleep can lead to reduced smoking, has also been shown to increase preferences for specific products or behaviors. Hormone manipulation is another study area where hormones and neurotransmitters influence brain activity. For example, dosing consumers with testosterone increased their preference for luxury brands, suggesting that luxury goods represent social markers and that people are more sensitive to status. Temporary neural inhibition, where TMS machines temporarily stimulate or depress nerve cells in the brain, could also be used to influence consumer behavior. In 2011, researchers used TMS to repress activity in the posterior medial prefrontal cortex, reducing the degree to which people exhibited socially conforming

behavior. This could help marketers target individuals with suppressed or amplified fear and disgust, enabling them to engage with messages encouraging them to engage with potentially frightening things (Harrell, 2019).

Mileti, Guido, and Prete (2016) assess that the progress in neuromarketing and nanotechnology are interrelated phenomena that have the potential to enhance our comprehension of consumer behavior and marketing principles. Nano-marketing studies can corroborate consumer decision-making processes and validate marketing principles. Miniaturization and nanotechnology can improve predictive ability and enable researchers to focus on the actual consumption experience. Nano-marketing devices can analyze physiological and brain indicators, allowing for continuous monitoring of consumer behavior. Mileti et al. (2016) claim that this can revolutionize marketing strategies, allowing firms to test advertising effectiveness and make necessary adjustments. According to del Mar Lozano Cortés and García García (2017), it is essential to analyze sellers' viewpoints and focus on understanding the causes of new product failures and the impact of neuromarketing in achieving success. Additionally, neurologists are forming additional collaborations with consumer neuroscience, as indicated by (Javor, Koller, Lee, Chamberlain, & Ransmayr, 2013). Neurologists can enhance their understanding of compulsive buying by employing consumer neuroscience paradigms in patients with these conditions. Research on trust in the medical field lacks empirical evidence from behavioral and neuroscientific studies. However, neurologists can still benefit from the extensive knowledge gained in economically oriented neurosciences.

The ethical considerations include whether neuromarketing methods should be used solely for profit maximization or if the findings can violate individual consumer rights (Madan, 2010). Neuromarketing should be evaluated based on potential added value for product improvement, such as better understanding consumer preferences rather than solely maximizing profit (Ariely & Berns, 2010). In contrast to the ongoing debate surrounding neuroethical practices, Stanton, Sinnott-Armstrong, and Huettel (2017) support neuroscience by incorporating marketing applications into the discourse. Neuromarketing and traditional marketing share similar ethical considerations (Stanton et al., 2017). Among these worries are the potential for an increase in prices, the encouragement of consumerism, and the lack of adequate supervision. Stanton et al. (2017) suggest that neuromarketing can create new desires for subpar products, increasing costs and consumer harm. Furthermore, marketing strategies have the potential to further amplify flawed decision-making or to increase the likelihood of acquiring products that do not provide any advantages to the consumer. Concerns about the ethical implications of behavioral research and its

effects on consumers have been a topic of heated debate in recent years, with implications for traditional and neuromarketing approaches. Both approaches could possibly end up being detrimental for customers in the long run (Stanton et al., 2017). Ethical issues in marketing and neuromarketing remain a topic of debate. The extent to which consumers must be influenced or predictable before an ethical violation occurs and the best recourse for regulation and consumer education are still open questions. Stanton et al. (2017) state that these ethical issues should not be quickly addressed by future research. However, understanding consumers' perceptions of neuromarketing practices can offer valuable insights for consumer education and regulation in academia and industry.

FREE WILL AND NEUROETHICS IN MARKETING

Free will is a concept that requires three conditions (Walter, 2009): the ability to do otherwise, control over one's choices, and responsiveness to reasons. To be free, one must choose from at least two alternatives or courses of action. This is known as agency, where one feels like the owner of their decisions and actions. Second, control over one's choices is essential, as the person who acts must be the same who decides what to do. This is known as an agency; it is the same person who determines what to do without interference from people or mechanisms outside one's reach. And last, response to reasons is crucial, as a decision cannot be accessible if it is random but rationally motivated. Although it is theoretically feasible to impact human conduct through external elements such as conditioning, persuasion, or environmental manipulation, regarding humans solely as deterministic machines devoid of free will or agency gives rise to substantial ethical and moral dilemmas. Humans exhibit autonomy, consciousness, and intricate decision-making capabilities that cannot be fully anticipated or programmed. Attempts to regulate humans in a manner resembling robots or automatons erode their dignity, rights, and individuality. From an ethical and moral standpoint, it is crucial to acknowledge and honor human autonomy, free will, and the entitlement to exercise personal choices. Mileti et al. (2016) propose that engaging in public discussion regarding the intrusive uses and ethical implications of neuromarketing and nanotechnologies in the lives of consumers and citizens is necessary.

People have long sought to understand the concept of free will, which is crucial for individual and social life. Lavazza (2016) explains that neuroscience has explored the brain correlates of free will, with recent studies suggesting that the build-up of brain activity before spontaneous voluntary movements may reflect background neuronal noise. This new understanding of free will is linked to capacity, which includes general skills without conscious control (Lavazza, 2016). Stanton et al. (2017) imply

that consumers face ethical marketing and neuromarketing research issues. Neuromarketing may increase prices due to increased expenses or neuroscience research giving companies greater pricing power. Additionally, neuromarketing may fuel consumerism, creating new desires for inferior products. Stanton et al. (2017) also state that traditional marketing research techniques may contribute to these issues. It is crucial to address these ethical issues in both fields. Consumer ethical issues arise from the potential of marketing and neuromarketing to exacerbate poor decision making and increase the likelihood of purchasing goods that do not benefit the consumer. Neuromarketing research can help address these issues by examining consumer perceptions and understanding how neuroscience can influence these practices (Stanton et al., 2017). For example, fMRI could be used to test new varieties of cigarettes or advertising materials that could engage brain systems associated with reward and reinforcement, potentially leading to higher addiction profiles (Stanton et al., 2017). Additionally, the ethical implications of predicting and influencing consumer choice remain debated. Solutions to these ethical issues will likely remain a topic of discussion for decades.

Madan (2010) supports the idea that neuromarketing research raises ethical issues because it has the potential to create marketing campaigns that are addictive and can manipulate an individual's free will. Consumer protection groups also are claiming it will bring an end to free will. Neuroscience academics focus on medically relevant questions, potentially infringing personal privacy. However, neuromarketing research may help reduce problems raised by Commercial Alert by examining brain activity differences between compulsive over purchasers and those with appropriate spending levels. Correlations between buying behavior and clinical disorders can provide helpful information for clinicians. Two major ethical issues in neuromarketing research are protecting vulnerable parties from harm and consumer autonomy (Madan, 2010). Recommendations for a 'code of ethics' include protecting research subjects from coercion, fully disclosing ethical principles, and accurately representing scientific methods to businesses and the media. Madan (2010) discusses the potential impact of neuromarketing on an individual's free will. It suggests that if neuromarketing becomes highly effective, it may infringe on an individual's ability to make choices freely. Madan (2010) also mentions the significance of neuromarketing, which includes neuroimaging techniques and computational neuroscience. It explains how value-based decision-making can be broken down into steps and how free choice may not accurately capture how humans make decisions. Madan (2010) also mentions studies that suggest neural activity precedes conscious intention, raising questions about free will. It discusses how neuromarketing can influence consumer

decisions by balancing the gain of obtaining a product with the downside of paying for it. Madan (2010) further connects neuroscience with marketing principles, proposing three branding laws based on the relevance of a brand's marketing strategy, the repetition and targeting of branding efforts, and the engagement of the branding environment. It suggests that these laws can be quantified using artificial neural networks. Overall, the potential of neuromarketing to improve marketing techniques by leveraging neuroscience Madan (2010).

Wilson, Gaines, and Hill (2008) argue that neuroscience significantly impacts decision-making and action, raising questions about the responsibilities between consumers and those influencing their beliefs, feelings, and behaviors. Since the Age of Enlightenment, scholars have debated free will, enabling individuals to make conscious choices and act voluntarily. Applied ethics scholars have used theories like contractualism to provide normative structures for actions and outcomes in business and marketing contexts. However, neuroscience findings and methods may threaten consumers' ability to follow preferences and dictates according to free will, contradicting justice (Wilson et al., 2008). Transgressions are particularly problematic when manipulation occurs without explicit awareness, consent, and understanding (Wilson et al., 2008).

ETHICS, PRIVACY, AND TECHNOLOGY

The human brain has evolved intricate neural structures that enable us to engage in sophisticated cognitive processes such as language, abstract reasoning, strategic planning, and self-awareness. Humans and other animals exhibit notable disparities in complexity and ability for higher-level cognition. Pang, Rilling, Roberts, van den Heuvel, and Cocchi (2022) examine the distinctive attributes of the human brain about its dimensions, structure, and interconnections. Additionally, they emphasize the impact of the anatomical connectivity of the human brain on neural activity, resulting in a more limited range of dynamics across various brain regions compared to chimpanzees. The results of this study suggest that the human brain's dynamics have evolved to enhance efficient associative processes that enable complex cognitive functions and behavior. The human brain's anatomical connectivity substantially impacts its neuronal dynamics, enabling rapid integration between different brain regions, particularly in transmodal systems (Pang et al., 2022).

Is it possible to decipher, replicate, and employ the human brain without detecting it? Wiring diverse colored cables to the human body and gathering extensive scientific data may appear harmless initially; however, these investigations appear to fulfill a significant and indispensable objective. Do humans function as quickly programmable tools that we use reg-

ularly, or do we inadvertently or deliberately empower malevolent forces through our actions? Disseminating data that can impact humans, whether or not they have consented, is considered harmless. The definitive answer to the question about the influence of neuroscience on humans can be found in the harsh reality. There is a limited and contentious movement among scholars due to the insufficient research conducted in this field. What distinguishes humans from animals in the realm of neuroscience? Exerting control over individuals as if they were machines, disregarding their ability to make independent decisions. Practically speaking, there are instances where individuals or groups try to exert excessive influence or control over others, resulting in ethical dilemmas, manipulation, or coercion. Nevertheless, widely recognized societal and ethical standards typically prioritize the preservation of human autonomy and individual agency, while recognizing the moral duty to treat others with consideration.

The response to the inquiry posed in the preceding paragraph is affirmative. Today, we are observing the convergence of two invaluable resources: the cognitive abilities of the human brain and advanced technology. These phenomena appear in our lives as artificial intelligence, robotics, and diverse other forms. Neurorobotics is a rising scientific discipline. For example, in neurorobotics, scientists are developing robots with artificial neural networks modeled after the human brain. These robots can learn and adapt to their environment, allowing them to perform complex tasks such as object recognition or navigating through unpredictable terrain. Neurorobotics is an interdisciplinary field combining neuroscience and robotics to improve robotic technology by integrating neural models with physical or virtual structures. Robotic technology, reliant on sensors and actuators, faces limitations in comprehending and interacting with its environment. Neurorobotics aims to imitate natural processes by employing neural systems to develop algorithmic solutions for robotic applications. The Human Brain Project allows neuroscientists to study the functional properties of brain models in a tangible setting, either by using simulated agents in numerical environments or by directly employing physical robots. The physical environment facilitates studying and understanding neuronal activities, leading to behavioral responses when exposed to real stimuli (Aicardi et al., 2020).

In addition, advanced technology allows for replicating human behavior, thus reducing the gap between the sender and the receiver of a message. The technology that facilitates customized manufacturing for consumers within mass production is crucial in this regard. Currently, brands equipped with technological prowess already provide these services to their customers. Preserving consumer autonomy is essential for upholding dignity, freedom of choice, independence, autonomy, privacy, and confiden-

tiality in the context of technological advancements. Artificial intelligence and smart technologies are progressing rapidly, including data processing and the acquisition of neuroscientific data through intelligent devices. However, these technological advancements also require increasing data with each iteration. Users' satisfaction with smart devices can be enhanced through tailored support, but this often comes with a risk of privacy (L. Dery & A. Jelnov, 2021). The device must obtain and exploit private user data, potentially jeopardizing confidential information. The utility of a device is positively correlated with the user's privacy risk and the quality of advice or assistance offered. Privacy-conscious users may choose not to interact with devices they perceive as unsafe (L. Dery & A. Jelnov, 2021). Smart devices have demonstrated their use and are expanding their reach to attract customers. The user-friendly interface ensures that individuals of all age groups, even those with limited knowledge of data protection, may comfortably navigate the system. Human behavior modification is facilitated through the collection of data from smart gadgets. In contemporary times, individuals' personal information is increasingly being made accessible to the public, resulting in the erosion of personal privacy. Users are now required to peruse the terms and conditions before availing of any services, while vendors must cease surveilling users. Smart devices have become indispensable to human existence, offering many contemporary features and amenities. For ease, intelligent devices are utilized in several sectors, such as health care, health management, education, and the science industry. Despite affirming its well-being, individuals overlook its drawbacks and regard smart devices as essential. Smart devices are actively monitoring and gathering data on users' every movement, including their interests, level of engagement, and daily routines. Due to the storage of data on vendors' servers and the lack of strong security measures on lightweight smart devices, data leakage might occur, resulting in unauthorized access to the data. Vendors and third-party organizations use this sensitive data for commercial and other purposes to influence and manipulate human behavior by presenting information consistent with the gathered data. Due to the significant user engagement with smart devices, marketing strategies have undergone substantial changes. The introduction of digital marketing has proven to be crucial for the success of numerous firms, as it allows for the precise targeting of certain leads with tailored content and advertisements. The subsequent action of an internet user is determined by implementing multiple techniques derived from previously gathered data. In the age of intelligent technologies, our private lives and personal data no longer remain confidential.

Neuromarketing and neuroscience-based lie detection raise concerns about privacy and the potential misuse of brain-reading technology (Mess-

er, 2021). Concerns include overconfidence in the technology's capabilities, premature use, and potential privacy threats. Messer (2021) also emphasizes that privacy is a moral right based on individuals' interests in autonomy and dignity. Neuromarketing could compromise individuals' autonomy and threaten both autonomy and dignity. Consent-based objections may mitigate privacy concerns but consent alone is not a panacea. Messer (2021) argues that concerns about mental privacy are overstated, as humans have evolved a natural ability to "read" one another's minds. Due to its potential to provide better and more dependable data, consumer neurotechnology—a technology that monitors and analyzes users using brain data—has been gaining attention (Midha, Wilson, & Sharples, 2022). However, neither supranational nor international law establishes a mandatory governance framework for brain data. The General Data Protection Regulation of the European Union is a legally enforceable framework that governs the handling of personal data, encompassing all stages from collection to processing.

However, the current state of the GDPR leaves gaps for brain data, making it vulnerable to privacy breaches. Regulations around privacy for brain data are severe, with no safeguards in place to protect it from data mining and privacy-intruding measures. Safety-critical workers may have fewer rights to brain privacy compared to other jobs and individuals, sparking discussions about different regulatory requirements for different consumers. Conventional methods of obtaining informed consent may not be appropriate for the utilization of brain data in situations that involve high levels of risk to safety. The issue of data validity is intricate since many consumer neurotechnology companies refrain from categorizing their devices as medical devices. Instead, they promote them for purposes such as wellness, relaxation, and other non-medical uses. Consequently, users cannot be assured that the data is accurate and reflects genuine cognitive ability. Regulation of personal identity is a complex matter, as it primarily pertains to the unique attributes of individuals rather than the rights they should possess. Understanding these negative effects is especially important for technology that is advertised as helping mental health and wellbeing (Midha et al., 2022).

Cognitive and mental profiling in neurotechnology is a complex field that faces numerous challenges, including security vulnerabilities, bias in AI algorithms, unrealistic marketing claims, and potential collateral effects (Valeriani, Santoro, & Ienca, 2022). The increasing prevalence of consumer neurotechnology devices and the availability of brain-related datasets further exacerbate these issues. Concerns about fairness and equality are also raised by the problems with concluding brain data that are sensitive to privacy, the chance of discrimination based on neuroanatomical or neu-

rofunctional traits, and the use of neurotechnology as a weapon in offensive warfare. Furthermore, the unveiling of semantic or visual content of mental states via neurotechnology and brain-data analytics raises further concerns (Valeriani et al., 2022). Neuroethical studies primarily address the ethical implications of neuroscientific techniques, particularly in relation to consumer privacy and autonomy. Studies suggest that it is necessary for researchers to evaluate the capabilities of these tools, considering the autonomy of consumers and their privacy rights. Marketers can utilize the gathered data for deceptive or incomplete advertising, potentially infringing upon consumer autonomy. Advancements in technology have led to a future possibility where decision-makers may no longer be human. It is well known that AI-based decision-making techniques are used in a variety of industries, particularly in the context of Industry 4.0 and Society 5.0. In the unlikely scenario where neuroethics are universally applied to every aspect of our lives, how can we ascertain whether artificial intelligence utilizes neuroscientific findings to manipulate us? The ethical analysis of artificial intelligence (AI) is rapidly growing, with ethics guidelines being published to guide policy and address issues raised by AI design, development, and implementation (Farisco, Evers, & Salles, 2022). Interfacing with neuroethics, which has been addressing these issues in brain research, could help address the content of AI-related questions. Additionally, using neuroethics methodological resources, especially conceptual and action-oriented approaches, could improve how practical ethical problems are found and dealt with. Farisco et al. (2022) state that integrating conceptual analysis, analyzing assumptions, meanings, and mutual relevance, can help avoid misplaced concerns and achieve a more realistic approach to identifying and managing emerging ethical issues.

Artificial intelligence (AI) systems are increasingly impacting diverse social domains, encompassing entertainment, employment, healthcare, and education. According to Farisco et al. (2022), it is essential to carefully examine concepts such as intelligence, action, interest, goal, consciousness, and autonomy to prevent extreme attitudes. Farisco et al. (2022) argue that a more intimate partnership between neuroethics and AI ethics is crucial for two reasons. Neuroethics and AI ethics can mutually strengthen one another, resulting in more robust regulation grounded in well-defined concepts. Furthermore, interdisciplinary conceptual analysis grounded in fundamental neuroethics can be a methodological framework for addressing AI ethics and regulation. This approach should encompass conceptual introspection that surpasses mere definition clarification and centers on conceptual development and interpretation in diverse contexts. AI ethics can enhance the development of AI by providing guidance on its ethical implications, supplementing the practical examination of its outcomes,

and improving the effectiveness, proactivity, and motivational impact of AI guidelines (Farisco et al., 2022).

ETHICAL PERSPECTIVES IN NEUROMARKETING, PRACTICES, AND CODES

Advancements in technology have expanded the scope of data collection from consumer brains beyond the confines of specialized laboratories. The extensive adoption of artificial intelligence and advanced technologies, including data processing and the collection of neuroscientific data using smart and nanodevices Researchers in the fields of marketing and neuroscience have primarily concentrated on addressing ethical concerns associated with experimental neuroscientific studies when analyzing the ethical implications of neuromarketing practices. Nevertheless, they might be disregarding the ethical implications linked to present methodologies employing intelligent and nanoscale devices. Extensive data accumulation is taking place because of the swift and unparalleled adoption of technologies such as wearables, smart devices, and connections to the Internet of Things (IoT). The accumulation of large amounts of data could achieve a level of generalizability. In this context, the data is not limited to a particular group participating in the experiment, but instead, it pertains to the entire human population. Frequently, this point is disregarded.

The ethical implications of neuromarketing encompass a wide range of concerns, including consumer autonomy, privacy, the responsibilities of neurologists, and the establishment of ethical standards. The field requires robust ethical frameworks to guarantee the well-being of consumers and maintain fundamental ethical principles. A meta-analysis (Shahriari, Feiz, Zarei, & Kashi, 2020) sheds light on one of the research inquiries in neuromarketing. Neuromarketing and advertising are heavily influenced by ethical concerns and issues, as evidenced by 9% of research papers specifically addressing these matters. These concerns encompass market dynamics, consumer behavior, advertising strategies, and the potential influence of neuroscience on the interplay between mental processes and brain functions, measurements of awareness, personal accountability, and individual freedom. The utilization of technology that analyzes the human brain presents notable ethical concerns, encompassing safeguarding vulnerable populations and preserving consumer autonomy. The ethical principles of independence, autonomy, privacy, confidentiality, and honesty in research findings should be guided by the concept of human dignity (Shahriari et al., 2020).

Neuroethics is an interdisciplinary domain that examines the ethical consequences of neuroscience and neuroscientific methodologies, specifically concerning matters of privacy, autonomy, and human rights. It delves

into the moral dilemmas caused by new developments in neuroscience and related fields, including neurotechnology for the public and analytics based on brain data. Integrating neuroethics into the discourse makes it feasible to scrutinize the ethical ramifications of utilizing neuroscientific discoveries to manipulate individuals and recognize and handle emerging ethical concerns about artificial intelligence and smart technologies. Neuroethics is a discipline that examines the concepts of consumer free will and privacy, with a particular emphasis on the moral responsibility involved in decision-making (Bercea Olteanu, 2015). Neuromarketing is a method employed in advertising, product development, and packaging with the objective of creating products that consumers can connect with, enabling them to make well-informed decisions. Although ethical concerns may impede the advancement of neuromarketing, they also function as regulatory mechanisms to ensure its development. Comprehending human emotions, self-awareness, logical thinking, and autonomy is essential for the progress of neuromarketing (Bercea Olteanu, 2015). Colors can elicit feelings of urgency and excitement, prompting consumers to engage in impulsive buying behavior. Moreover, comprehending the impact of self-consciousness on consumer decision-making can assist marketers in creating campaigns that correspond to consumers' yearning for social validation or individuality. Neuromarketers can employ neuroscientific discoveries about reasoning and decision-making to create tactics that exploit consumers' cognitive biases, thus enhancing the probability of achieving desired results. The success and effectiveness of neuromarketing rely on incorporating various facets of human psychology and behavior.

Levy (2008) and Roskies (2002) highlight the dual emphasis of neuroethics, which centers on both the characteristics of the tools employed and the ethical dilemmas they tackle. The distinction is made between the ethical concerns arising from new forms of intervention in neuroscience and the study of ethical aspects related to free will, self-control, personal identity, intention, and moral judgment in neuroscience. Northoff (2009) and Macdonald (2011) distinguish between ethical concerns arising from human capabilities and those arising from human knowledge, such as the ethical implications of brain scanning. The ethical dilemmas stemming from human capabilities pertain to the advancement and application of technologies that enable direct manipulation of the brain, such as deep brain stimulation or neuroenhancement. Conversely, the ethical dilemmas arising from human knowledge are related to the possible misapplication of neuroscience research findings. This includes privacy concerns when it comes to brain scanning and the potential for discriminatory use of neuroscientific discoveries.

Neuromarketing, a developing field in marketing, has the potential to transform traditional research by utilizing neuroimaging tools (Ulman, Cakar, & Yildiz, 2015). The ethical concerns about brain scanning and interpretation, as emphasized by Ruanguttamanun (2014), suggest that marketers have the potential to exploit individuals' autonomy and essence. Nevertheless, consent forms are consistently signed to mitigate privacy concerns. With the increasing sophistication of brain scanning and interpretation, privacy concerns may escalate, thereby requiring the implementation of new legislation and regulations. Consumers may experience excessive consumption as marketers exploit their purchasing triggers by identifying potent stimuli and introducing irresistible products and services (Ruanguttamanun, 2014). Ulman et al. (2015) argue that ethical concerns persist due to the lack of a clear definition of neuroimaging technologies. Research in this emerging field should incorporate public policies grounded in human rights laws and bioethical principles. Bioethics committees and review boards are recommended to conduct ethical evaluations and make decisions. An intricate and diverse conversation can foster logical and significant discussions to develop effective policies on neuromarketing. The primary objective of scientific research is to promote the well-being and physical condition of all organisms, and experts have a moral obligation to disseminate information and enlighten the general population (Ulman et al., 2015).

Neuroscientists are studying how the brain can influence consumer behavior, which has generated excitement and ethical concerns (Javor et al., 2013). Neurological patients can contribute valuable insights to the ethical discussion surrounding invasive techniques in neuromarketing and consumer neuroscience. These patients may exhibit unique susceptibility as consumers and become the target of specific marketing tactics (Javor et al., 2013). Consumer neuroscience, a subset of neuroscience, is experiencing rapid growth and encountering ethical quandaries in marketing research. Moral consideration is of utmost importance as it can result in conflicts of interest and publication bias in research sponsored by the industry. To guarantee ethical behavior, initiating a comprehensive moral discourse on marketing research and practice , which should involve marketing scientists, practitioners, ethicists, and potentially neurologists, is necessary (Brinkmann, 2002; Murphy, 1998). These standards should be relevant to marketing research, applied neuromarketing, and scientific research in consumer neuroscience. Although most methodologies used in neuromarketing do not involve physical invasion, Javor et al. (2013) suggest that it is mandatory to provide participants with detailed information before their involvement and obtain their written consent for the use of the results.

Neuromarketing, an academic field that utilizes brain imaging to understand consumer behavior, has gained significant attention in recent years. However, the ethical implications of neuromarketing and consumer neuroscience are complex and require the expertise of neurologists. Neurologists play a crucial role in understanding the potential impact of neuromarketing on consumers, particularly children, minorities, and individuals with disabilities or disadvantaged backgrounds (Javor et al., 2013). Critical ethical considerations in consumer neuroscience brain imaging revolve around effectively addressing unexpected pathological findings and accurately communicating the results to the public. The ethical implications of neuromarketing and consumer neuroscience are significant, as neurologists must have a solid understanding of this field due to its widespread media coverage and the potential for public scrutiny (Javor et al., 2013). Moreover, there has been an increase in initiatives to establish protocols for applying neurological methodologies in marketing. In addition, developing a registry to record companies that employ neuroimaging for commercial purposes is recommended. Furthermore, an ethics committee should be formed to oversee the research conducted by these companies Javor et al. (2013). The ethical implications of neuromarketing and consumer neuroscience are significant, as they involve using neuroscientific techniques in both commercial and scientific contexts within marketing settings. Javor et al. (2013) emphasize the essential role of neurologists in addressing these ethical concerns and ensuring the well-being and safety of consumers.

Privacy is a crucial aspect of the progress of neurotechnologies. It plays a vital role in safeguarding users' independence, control, and self-expression, thus reducing potential threats. Rainey, Martin, Christen, Mégevand, and Fourneret (2020) suggest that users should possess precise control over the output of these devices and the capability to revoke actions facilitated through brain-controlled devices. Establishing regulatory frameworks is imperative to tackle neurotechnology-specific concerns proactively. These concerns encompass how neurotechnologies are portrayed, their operational mechanisms, and the areas where their usage should be limited. Brain technology developers should forge and sustain robust connections with policymakers to establish appropriate regulations. Performing ethical analysis and formulating policies are essential for establishing the framework for implementing devices that generate this distinction. This guarantees that users possess sufficient authority over their actions (Rainey et al., 2020). Besides that, Fisher, Chin, and Klitzman (2010) highlight the lack of obligation for neuromarketing firms to exhibit transparency and integrity, disregarding the potential risks to consumer autonomy and our comprehension of independence and free will.

The study established seven supplementary ethical guidelines specifically designed for practitioners engaged in conducting neuromarketing research (Hensel, Iorga, Wolter, & Znanewitz, 2017). The initial code prioritizes identifying the optimal number of incentives to prevent any potential distortions in participant response behavior. The second code addresses the prevention of consumer behavior manipulation, explicitly focusing on stealth marketing. The third and fourth codes pertain to safeguarding against marketing exploitation and exercising caution when involving vulnerable groups, such as children and individuals with physical or mental disabilities. The involvement of children is essential due to their underdeveloped neural inhibitory mechanisms, which pose challenges for advertisers seeking to exploit their limited capacity for sophisticated reasoning and self-control. Certain practitioners decline to engage in neuromarketing studies involving children, whereas others insist on obtaining informed consent from their legal guardians. The fifth code pertains to providing participants with a debriefing session when the research design only permits the disclosure of complete information after a certain point. The American Psychological Association advises ensuring participants maintain a positive disposition. However, numerous practitioners proceed to conduct neuromarketing studies after a study. The sixth and seventh codes pertain to the divulgence of instruments and assessment scales and the transmission of neuromarketing findings. Fisher et al. (2010) claim that companies are apprehensive about making premature assertions regarding the ability of neuroscience to predict consumer behavior. To mitigate this, research suggests that private enterprises should disclose their methodology and findings, a potentially contentious matter. Neuromarketing should achieve a harmonious equilibrium between transparently revealing the methods employed in research and the imperative of gaining a competitive edge through exclusive company expertise. Inadequate transparency can impede the progress of the neuromarketing industry and restrict the swift dissemination of valuable knowledge. Hensel et al. (2017) highlight the significance of involving practitioners in the conversation to promote ethical contemplation in neuromarketing research.

Neuromarketing employs neuroimaging techniques to gain insights into consumer preferences, which may threaten individuals' privacy. Marketers can use this technology to focus on particular groups or individuals, potentially exploiting their biological vulnerabilities (Ariely & Berns, 2010). Nevertheless, there are apprehensions regarding infringements on privacy, bias against individuals, and the possible abuse of information. Neuroimaging can also extrapolate brain responses to a vast population, potentially resulting in product harm. Moreover, the neuromarketing industry suffers from a dearth of regulation, and the reaction of the public

need to give more attention to the utilization of neuroimaging could significantly shape their perceptions. According to Ariely and Berns (2010), companies may not prioritize the best interests of consumers over their interests.

However, Alsmadi and Hailat (2021) claim that neuromarketing is a technique that directly accesses a consumer's mind, offering insights into their reactions that conventional marketing research methods cannot provide. Studies suggest that neuromarketing can provide empirical evidence for the underlying factors influencing consumer decision-making, such as the motivations behind brand preferences and the heightened positive response to specific advertisements. It can assist companies in evaluating the efficacy of their advertising, assessing the appeal of their products, selecting appropriate celebrities, and choosing visually appealing logos and brands. Nevertheless, ethical issues have emerged regarding the intrusive techniques employed to manipulate consumer purchasing choices, exploiting consumer emotions, and discovering "buy buttons" that potentially transform consumers into automated buyers (Mileti et al., 2016). Proponents of neuromarketing contend that it solely offers a means to observe the brain rather than exert control over it and aids marketers in enhancing their promotional endeavors by addressing consumer needs. Alsmadi and Hailat (2021) suggest that the primary objective of neuromarketing is to effectuate transformations within companies rather than consumers, thereby assisting marketers in generating superior products. Implementing this approach can result in substantial cost savings for companies by avoiding expenditure on ineffective campaigns. Additionally, it has a noteworthy beneficial influence on society, which has been overlooked by many critics (Alsmadi & Hailat, 2021).

Any attempt to reduce the level of humanity is utterly futile in every aspect of this ongoing controversy. Depriving individuals of their own will, autonomy, and dignity still results in the customer being treated as a human. The central focus should not be on the financial gains of corporations or the efficiency of using natural resources but rather on the fundamental investigation of the role of humans in an environment where their freedom of choice and independence are being controlled. Will the world witness progress if individuals relinquish their autonomy to profit-driven corporations? What if we relinquish control entirely to AI, assuming that it will eventually surpass human computational capabilities, resulting in more efficient and comfortable management for humanity? Will humans, in these circumstances, be relegated to mere objects? Marketing researchers should prioritize and actively promote neuroscientific studies that spark public interest. Academia should consider this as their responsibility.

CONCLUSION

Neuroscience, a multidisciplinary field, has been a subject of ongoing debate due to its potential misuse of data collection from the human body to manipulate human behavior and choices. The ethical implications of neuroscience research are complex and controversial, as it raises questions about the ethical implications of controlling people like robots and influencing their behavior without considering their free choice. The role of neuroscience in human well-being is a subject of ongoing debate, with a comprehensive approach necessary to consider ethical limitations, preserve individual autonomy, and apply scientific progress to benefit humanity. Neuromarketing techniques employ various tools to quantify, chart, and document brain and neural activity during behavior. Methods used in neuromarketing include electroencephalography (EEG), magnetoencephalography (MEG), steady-state topography (SST), functional magnetic resonance imaging (fMRI), and positron emission tomography (PET). These methods provide insights into specific brain and nervous system responses that occur due to exposure to a marketing stimulus. However, these methods have tradeoffs, such as poorer temporal resolution, restrictive application, and higher monetary costs. Neuromarketing can improve the accuracy of predictions regarding consumer behavior, enabling marketers to understand consumer decisions better and make informed marketing decisions. By combining these methods, neuromarketing can enhance the accuracy of predictions regarding consumer behavior, leading to improved marketing predictions and decision-making. The phenomena of neuromarketing and nanotechnology are intricately linked and can potentially augment our comprehension of marketing principles and consumer behavior. Neuromarketing can improve segmentation and target individuals with suppressed or amplified fear and disgust. Nano-marketing devices can analyze physiological and brain indicators, allowing for continuous monitoring of consumer behavior. However, ethical considerations include potential price hikes, promotion of consumerism, and lack of proper supervision. Understanding consumers' perceptions of neuromarketing practices can offer valuable insights for consumer education and regulation in academia and industry. Recommendations for a 'code of ethics' include protecting research subjects from coercion, fully disclosing ethical principles, and accurately representing scientific methods to businesses and the media.

Applying neuroscience principles to marketing has brought about a paradigm shift, empowering organizations to deliver customized content and advertisements to specific consumers. However, the influence of neuroscience on humans remains contentious due to insufficient research. Neurorobotics, an interdisciplinary field combining neuroscience and robotics, aims to imitate natural processes by employing neural systems to

develop algorithmic solutions for robotic applications. Neuroethics is a critical field in consumer neuroscience, focusing on ethical concerns about consumer privacy and autonomy. Brain-reading technology in marketing has raised concerns about privacy breaches, overconfidence, and premature use. Neuroethical studies primarily focus on the ethical implications of neuroscientific techniques, particularly about consumer privacy and autonomy. Marketers may use collected data for misleading or non-informative advertising, potentially violating consumer autonomy. The growing use of AI in decision-making raises questions about whether artificial intelligence uses neuroscientific findings to manipulate us. A more intimate partnership between neuroethics and AI ethics can result in more robust regulation and improved effectiveness of AI guidelines. Neuromarketing, an expanding discipline within marketing, utilizes neuroimaging tools to gain insights into consumer behavior. However, ethical concerns arise due to the potential to exploit individuals' autonomy and essence. With increasing brain scanning and interpretation sophistication, privacy concerns may escalate, necessitating new legislation and regulations.

Neurologists play a crucial role in understanding the potential impact of neuromarketing on consumers, particularly children, minorities, and individuals with disabilities or disadvantaged backgrounds. Establishing protocols for applying neurological methodologies in marketing and establishing an ethics committee is essential for addressing these ethical concerns. To promote ethical considerations in neuromarketing, marketers should prioritize and actively encourage studies that spark public interest, focusing on the role of humans in a controlled environment. Academia should also consider this as their responsibility in promoting neuroscientific studies that spark public interest.

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FINANCIAL PERFORMANCE RANKING OF NASDAQ FINANCIAL TECHNOLOGY INDEX COMPANIES

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1. INTRODUCTION

Digital innovation is transforming financial services. As a result of this transformation, innovations in financial technology such as mobile money, peer-to-peer credit (P2P), robo-advising, insurance technology (insurtech), artificial intelligence, cloud services, distributed ledger technology (DLT) and crypto assets have emerged. Financial technology provides greater access and convenience to financial services for retail users. This technology is also transforming trading in financial markets as diverse as regulating technology (regtech) and supervising technology (suptech). New companies have emerged to meet customer demand and implement new technologies, and most companies state that digital transformation is a strategic priority. The struggle and competition between traditional banks and finance companies, financial technology companies and big technology (BigTech) companies are rapidly closing the gaps in the digitization of internal processes and customer expectations (Feyen et al., 2021, 2).

The financial sector is undoubtedly of great importance in the daily lives of people around the world. Although this sector has undergone great transformations over the centuries due to changes in politics, geography and legislation, it is stated that a new era has come, especially banking activities, with the innovations in financial technology. These innovations are an underexplored phenomenon and represent a significant challenge for managers in both academia and finance. The abbreviation "FinTech" is used to express financial technology and financial technology companies. FinTech, especially in the press, was stated to be a concept that emerged as a result of the financial sector, information technology (IT) and innovation. The term "FinTech", which is derived from the combination of the words finance and technology, began to be used in the scientific literature in 1972. Since FinTech is also spelled as Fin-Tech or fin-tech, the concept referred to as FinTech in this study is the result of deriving a phrase that describes the connection of web-related technologies such as cloud computing, mobile web, with traditional business activities such as credit, payment, monetary value transfer and various banking transactions. Despite the increasing interest in FinTech, there is still no consensus among scientists and practitioners on its definition and theoretical foundations (Milian et al., 2019, 1). The total value of investments in FinTech companies worldwide between 2010 and 2019 is USD 213.8 billion. However, in 2020, investments of FinTech companies have decreased and the investments are US$ 124.9 billion. In 2021, investments increased again and reached 210.1 billion USD. America has been the region that attracts the most investment in FinTech and accounts for approximately 80 percent of the total investment. As of November 2021, there are 10,755 new FinTech startups in the United States, making it the region with the most FinTech startups world-

wide. There are 9,323 initiatives in the EMEA region (Europe, Middle East and Africa) and 6,268 in the Asia Pacific region (Statista, 2022a; Statista, 2022b).

For businesses, financial performance is a measure of how effectively resources are used, rather than total output. Indicators obtained by measuring financial performance are important for business decision makers and institutions. These indicators serve to guide and influence decisions such as investments, credits, and mergers. Effective measurement of financial performance is also important for these reasons. Although MCDM methods have been developed to select the best among a certain number of alternatives or to rank the alternatives, they can be used to compare or rank businesses in financial performance analysis (Yükçü & Atağan, 2010, 28). Although it is still a matter of debate whether FinTechs will compete with traditional financial companies or act together, FinTech companies are subject to performance measurement like companies in the traditionally expressed financial sector. The objective of this study is to rank the financial performance of FinTechs operating in the KBW NASDAQ Financial Technology Index (KFTX) between 2016 and 2021 using the TOPSIS method, which is a multi-criteria decision making method based on financial ratios. In the introduction part of the study, the concept of FinTech, the number of investments and companies in the world and the aim of the study are given. In the second part of the study, literature review was presented, in the third part, the materials and methods were given and the findings were shared in the fourth part. In the conclusion part, the findings were evaluated together with the literature and suggestions for future studies were shared.

2. LITERATURE REVIEW

Numerous studies use terms such as “digital innovation” or “digital transformation” to try to identify innovative and disruptive technologies. The term ‘digital’ refers to a new technology, process or business model, which requires significant change on the part of those using it, and which can be implemented or enabled by IT. Digital transformation, on the other hand, is the digitisation of analogue machine and service activities, organisational tasks and management processes. The transition point between IT and finance is known as “digital finance”, which describes the digitisation of the financial sector. However, digital finance has undergone continuous change, which can be explained in three distinct phases. In the first phase (1866-1967), globalisation removed the borders between countries in terms of financial links, payments and other financial transactions. The first phase also ended with the invention of the first automated teller machine (ATM) in 1967, when the world witnessed the first convergence of finance and technology. The second phase (1967-2008) saw the introduction

of the first credit cards and the creation of the SWIFT system for interbank financial transactions. This was the beginning of online banking. The third phase, which began in 2008, is the use of innovative technologies in the process of going digital. In the financial sector, which is the main driver of technology, new companies (start-ups), known as FinTech, have started to emerge as an alternative to traditional banking due to the vacuum left by banks during the 2008 financial crisis. Table 1 shows the main business functions of FinTechs in digital finance, influenced by the potential of new technologies and services (Barroso & Laborda, 2022, 2-3).

Table 1. *The FinTech Companies' Main Business Areas in Digital Finance*

Business Function	**Explanation**
Payment services	This fast-growing function can be defined as all payments initiated, processed and received electronically. The adoption of digital payments has many benefits for consumers. Most importantly, they are convenient and fast. In contrast to traditional transactions, new payment services are a deterrent to theft and other cash crimes. Digital payment solutions encompass a variety of innovative forms of payment, in which the Internet acts as an "intermediary" between the bank and the customer: 1. A sub-category of e-payment, mobile banking is access to banking services via mobile phones. 2. Peer-to-peer (P2P) payments also depend on digital payments and allow payments between individuals. 3. The e-wallet as a means to pay without using cash or money is another relevant and innovative concept.
Credit and lending	Online platforms that bring lenders and borrowers together are on the rise. Online funding platforms are known as crowdfunding. The basic idea is to raise money from small investors by offering to lend a small amount on an online platform. There are different types of crowdfunding platforms, such as debt, equity, donation and rewards. The emergence of finance through online platforms reduces transaction costs and increases financial inclusion by providing finance to small businesses.

Insurance services	Companies operating in the insurance sector using the latest technology are referred to as insurance technology (insurtech). As it does not have a significant disruptive effect, the field of research is limited. Instead, it is about improving existing insurance products and services. Another issue is that insurtech companies are entering the market through collaboration with incumbents rather than being a replacement for them. Robo-advice in the insurance industry is one of the disruptive technologies that can have an impact on cost reduction while at the same time improving quality and transparency.
Investment management	Digital investing is about new assets, securities, commodities, etc. It means making investment decisions or managing a portfolio using technological devices. The function of this business includes 1. Mobile trading: a way for investors to invest and manage their portfolios anywhere, anytime via mobile devices. 2. Social trading: enables investment decisions to be made based on information gathered in online communities. 3. Online brokerage: This means offering the same services online as traditional brokerage firms. It is therefore independent of time and space. 4. High Frequency Trading (HFT): This falls under B2B. It refers to traders who use computers to trade securities at extremely short intervals.

Petcharabu & Romprasert (2014) investigated the relationship between the financial ratios calculated from the quarterly financial statement data of companies in the technology sector in the Thailand Stock Exchange and stock returns between 1997 and 2011. Five financial ratios were used as the dependent variable. These are the current ratio, debt-to-equity ratio, inventory turnover, return-on-equity ratio and price-earnings ratio. The least squares (OLS) method was used to test the relationship between financial ratios and stock returns, and only return on equity ratio and price-earnings ratio were found to have a significant relationship with stock returns.

Anghelescu & Tai (2005) examined the accuracy of financial ratios of companies operating in the high technology sector in predicting bankruptcy. The estimation model is based on a sample of 120 companies, 60 bankrupt and 60 non-bankrupt companies, using six financial ratios. Financial ratios are calculated from financial statements one and two years prior to bankruptcy. As a financial ratio; The change in the ratio of trade receivables to total assets, the change in cash flow from operations, the change in cash flow from financing activities, the change in the ratio of stocks to total

assets, the change in the ratio of short-term debts to total liabilities and the change in the ratio of operating expenses to sales are used. They found that these ratios were 85% accurate in predicting bankruptcy.

Pandey & Diaz (2019) examined the effects of current ratio, long-term debt ratio, profitability of sales, company size, return on equity (ROE), debt ratio, fixed assets to total assets ratio on the return on assets (ROA) of US technology and finance companies. Multiple linear panel regression models, including least squares (OLS), fixed effects and random effects models were used in the study. They found that the return on equity ratio has a negative effect on ROA, while the return on sales ratio has a positive effect on profitability for both technology and financial firms. While the current ratio has a positive effect on the return on assets of financial corporations, it was found to have a negative effect for technology corporations. The size of the company has also been found to have a positive effect on the profitability of the technology companies.

Putri et al. (2019) investigated the impact on the profitability of FinTech companies before and after launching financial technology products. The sample of their research consisted of 16 companies with 17 FinTech products in Indonesia, after identifying companies that launched FinTech products and published financial reports. They used paired t-test in their research. The time period in this research is four years, two years before and two years after the companies' launch of their fintech products. They found that there was a significant effect on return on assets, but no significant difference on return on equity.

Izzo et al. (2020) examined the effect of intellectual capital on the performance of European FinTech companies. They aimed to contribute to the existing literature by examining the example of a completely new company operating under Industry 4.0 conditions. They used data from 12 European Fintech companies from 2016 to 2018 in the Value-Added Intellectual Coefficient (VAIC) model to measure intellectual capital. They suggested that firms seeking to achieve good performance should focus on their human capital through a strategy of evaluating the talents, skills and experience of their employees. This conclusion regarding the importance of companies' use of intellectual capital to create value is also supported by the literature.

In their study, Sukhinina & Koroleva (2020) aimed to reveal the main determinants of FinTech performance by acting with a resource-based perspective on entrepreneurship. Using cross-sectional regression models on a data set consisting of 100 FinTechs in Russia, the financial performance of FinTechs, with year-on-year growth in revenues and assets and return on assets, were measured in the 2016-2018 period. They found that self-fund-

ed FinTechs outperformed others. In addition, timely and rapid repayment of debts positively affects the performance of FinTechs. FinTechs with a lower liquidity ratio outperformed other FinTechs.

Açıkgöz & Kılıç (2021) examined the factors of financial performance and market value of Turkey's technology sector companies. In their study, using DuPont Analysis and Multiple Linear Regression model, DuPont analysis investigated the effect of DuPont analysis on financial performance of technology sector companies in terms of profitability, asset efficiency and leverage, and analyzed its correlation in explaining the market value of companies with DuPont Analysis and Multiple Linear Regression method. As a result, they found that the main factors of financial performance of technology companies are profitability and asset performance, but with low explanatory power.

Carbó-Valverde et al. (2022) examined the managerial, corporate and financial drivers of the profitability of FinTech companies and the time taken for these companies to break even. The database they use in their work includes the basic characteristics of the companies, the technological profile of the enterprise and the qualitative factors related to the financing structure. Using 274 of the FinTech startups operating in Spain from 2005 to 2017, most of these companies were founded.

3. SCOPE AND METHODOLOGY

The KBW Nasdaq Financial Technology Index was launched on July 18, 2016. The KBW Nasdaq Financial Technology Index was created to track the performance of publicly traded financial technology companies in the United States. Securities eligible for inclusion in the index belong to companies that offer financial products and services using technology. These firms' distributions are almost entirely electronic, and their income is predominantly fee-based (Nasdaq, 2022).

FinTech companies operating in the KBW NASDAQ Financial Technology Index (KFTX) are within the scope of this study. The examined period for KFTX companies is between 2016 and 2021. Between the years 2016-2021, 23 FinTech companies whose data in their financial statements can be accessed were included in the research. The companies examined within the scope of the study are given in Table 2.

Table 2. *FinTech Companies Examined Within the Scope of the Study*

No	Company	Nasdaq Code
1	CBOE GLOBAL MARKETS	CBOE
2	CME GROUP INC	CME
3	COSTAR GROUP INC	CSGP
4	EURONET WORLDWIDE	EEFT
5	EQUIFAX INC	EFX
6	ENVESTNET, INC	ENV
7	EVERTEC, INC.	EVTC
8	FIDELITY NAT INF SVC	FIS
9	FISERV, INC.	FISV
10	GREEN DOT CORP	GDOT
11	GLOBAL PAYMENTS INC	GPN
12	INTERCONTINENTAL XCH	ICE
13	MASTERCARD INC	MA
14	MOODY'S CORP	MCO
15	MSCI INC	MSCI
16	NASDAQ, INC.	NDAQ
17	PAYPAL HOLDINGS	PYPL
18	SEI INVESTMENTS CO	SEIC
19	S&P GLOBAL INC.	SPGI
20	BLOCK (SQUARE), INC.	SQ
21	SS&C TECHNOLOGIES	SSNC
22	TRANSUNION	TRU
23	VIRTU FINANCIAL CM A	WETF

Financial ratios were used to evaluate the financial performance of FinTech companies. These financial ratios are given in Table 3.

Table 3. *"Financial Ratios Calculated for Financial Performance Evaluation of FinTech Companies"*

Financial ratio	Calculation
Return on assets (ROA)	Net income / Total assets
Return on equity (ROE)	Net income / Total stockholders' equity
Leverage ratio (LR)	(Total current liabilities + Total noncurrent liabilities) / Total Assets
Current ratio (CR)	Total current assets / Total current liabilities
Asset turnover (AT)	Revenues, net / Total Assets
Gross profit margin (GPM)	(Revenues, net - Total cost of revenues) / Revenues, net
Receivables turnover (RT)	Revenues, net / (Current Period's Accounts receivable + Prior Period's Accounts receivable)/2)

The data required for the calculation of the financial ratios were obtained from the financial statements in the SEC Edgar Database.

The TOPSIS method, which is a MCDM, was used to calculate the financial performance rankings of KFTX listed companies. In this method, it is to create a positive ideal solution and a negative ideal solution. That is, the basic principle of the method is based on ranking the alternatives according to the ideal solution. By making a ranking starting from the alternative that is relatively close to the ideal solution; the relative closeness of the other alternatives, respectively, is determined (Feng & Wang, 2001, 465). The calculation steps of the TOPSIS method are given in the equations below.

Step 1: Creating a decision matrix

The decision matrix is an *nxm* dimensional matrix created by the decision maker after the decision options and evaluation criteria are determined. Here, n and m are the number of decision options and evaluation criteria, respectively.

$$D = \begin{bmatrix} d_{11} & d_{12} & d_{1m} \\ d_{21} & d_{22} & d_{2m} \\ d_{n1} & d_{n2} & d_{nm} \end{bmatrix} \quad (1)$$

The rows of the decision matrix D, defined by the expression in step 1 above, show the decision options and the columns show the criteria.

Step 2: Creating the standard decision matrix (normalized matrix)

The standard decision matrix is obtained by taking the square root of the sum of the quadratic values of each criterion in the decision matrix (the sum of the quadratic values in the column) and dividing the corresponding element in the column by that result. If the value of any element of the decision matrix is 0, the value of the relevant element in the standard decision matrix is also 0. The normalized decision matrix can be defined as follows.

$$R = \begin{bmatrix} r_{11} & r_{12} & r_{1m} \\ r_{21} & r_{22} & r_{2m} \\ r_{n1} & r_{n2} & r_{nm} \end{bmatrix} \qquad (2)$$

The elements of the standard decision matrix R are calculated in Equation 3.

$$r_{ij} = \frac{d_{ij}}{\sqrt{\sum_{k=1}^{n} d_{kj}}}, \; i = 1,2,\ldots\ldots n \,, \; j = 1,2,\ldots.m \qquad (3)$$

Step 3: Creating a weighted standard decision matrix

Weight values (w_i , $i = 1, 2\ldots\ldots,m$) for evaluation criteria are determined. The weighted standard decision matrix, V, is formed by multiplying the elements of the R matrix by their respective weight values.

$$V = \begin{bmatrix} w_1 r_{11} & w_2 r_{12} & w_m r_{1m} \\ w_2 r_{21} & w_2 r_{22} & w_m r_{2m} \\ w_1 r_{n1} & w_2 r_{n2} & w_m r_{nm} \end{bmatrix} = \begin{bmatrix} v_{11} & v_{12} & v_{1m} \\ v_{21} & v_{22} & v_{2m} \\ v_{n1} & v_{n2} & v_{nm} \end{bmatrix} \qquad (4)$$

Step 4: Obtaining positive ideal and negative ideal solution values

Using the V-matrix, depending on the purpose of the evaluation criterion of interest, positive and negative ideal solution sets are obtained for each criterion. If the evaluation criterion is utility, the positive ideal solution is the largest value of the columns of matrix V, and the negative ideal solution is the smallest value of the columns of matrix V. If the evaluation criterion is cost, the positive ideal solution is the smallest value of the columns of matrix V, and the negative ideal solution is the largest value of the columns of matrix V.

Positive ideal solution set is $V^* = \{V_1^*, V_2^*, \ldots\ldots\ldots\ldots V_M^*\}$ and

Negative ideal solution set is $V^- = \{V_1^-, V_2^-, \ldots\ldots\ldots\ldots V_M^-\}$.

Step 5: Determination of the distance values to the positive ideal solution values and the negative ideal solution values.

The deviations of the evaluation criteria for each decision option from the positive ideal and negative ideal solution values are determined using the Euclidean approach. Equations 5 and 6 are used to calculate the distance values. Thus, there are as many distance values calculated as there are decision options.

$$S_i^* = \sqrt{\sum_{j=1}^{m}(v_{ij} - v_i^*)^2} \ , i = 1,2, \dots\dots\dots, n \qquad (5)$$

$$S_i^- = \sqrt{\sum_{j=1}^{m}(v_{ij} - v_i^-)^2} \ , i = 1,2, \dots\dots\dots, n \qquad (6)$$

Step 6: Calculating the relative closeness coefficients to the ideal solution

The relative closeness coefficients of each decision option to the ideal solution are calculated from the distances from the positive and negative ideal solution values. With Equation 7, relative closeness values are calculated for each decision option.

$$C_i^* = \frac{S_i^-}{S_i^* + S_i^-} \ , i = 1,2, \dots\dots\dots\dots, n \qquad (7)$$

Microsoft Excel was used for the calculation of financial ratios and the application of the TOPSIS method.

4. FINDINGS

Step 1: Normalizing the Decision Matrix

According to the TOPSIS Method, it will start with the normalization process of the decision matrices shown in the table below. Normalization of decision matrix; It is found by dividing each value in the columns by the square root of the sum of the squares of the values in the relevant column and reducing it to a single denominator. The normalized decision matrix is given in Table 4.

Table 4. *Normalized Decision Matrix*

Company Code	ROA	ROE	LR	CR	AT	GPM	RT
CBOE	1,009	8,378	0,031	0,260	15,856	0,073	1,072
CME	0,570	0,626	0,173	0,241	2,582	0,137	1,353
CSGP	0,115	0,630	0,012	4,918	0,007	0,252	1,052
EEFT	0,094	0,084	0,145	0,253	0,000	0,035	0,904
EFX	0,731	0,878	0,088	0,036	0,011	0,142	0,757
ENV	0,006	0,026	0,088	0,167	0,000	0,182	2,497
EVTC	5,670	1,861	0,182	0,339	0,001	0,123	0,355
FIS	0,064	0,074	0,042	0,095	0,000	0,048	0,234
FISV	0,019	0,078	0,141	0,107	0,044	0,146	0,474
GDOT	0,208	0,169	0,145	0,080	0,001	0,048	6,406
GPN	0,183	0,144	0,069	0,120	0,000	0,132	1,489
ICE	0,375	0,105	0,223	0,097	0,005	0,156	0,722
MA	27,763	10,566	0,192	0,229	0,005	0,115	0,697
MCO	28,299	3,376	0,292	0,263	0,002	0,063	0,208
MSCI	11,719	2,604	0,317	0,380	0,002	0,258	0,208
NDAQ	0,357	0,349	0,133	0,120	0,024	0,171	1,553
PYPL	0,611	0,533	0,137	0,056	0,000	0,010	32,798
SEIC	2,159	10,717	0,013	1,688	0,004	0,031	0,390
SPGI	303,747	9,286	0,182	0,253	0,005	0,083	0,323
SQ	0,001	0,030	0,141	0,057	0,000	0,035	1,121
SSNC	0,035	2,024	0,133	0,091	0,000	0,098	0,180
TRU	1,132	0,840	0,150	0,247	0,000	0,177	9,485
WETF	4,717	0,370	0,060	0,011	0,000	0,023	8,480

Step 2: Weighting the Normalized Decision Matrix

The weighted decision matrix of each criterion is calculated by multiplying the standard matrix criteria with the weighting coefficients (W). The weight values of the criteria are determined by the decision maker. In this study, the weights were determined equally (w_i = 1/8 = 0,125). The weighted decision matrix is given in Table 5.

Table 5. *The Weighted Decision Matrix*

Company Code	ROA	ROE	LR	CR	AT	GPM	RT
CBOE	0,126	1,047	0,004	0,032	1,982	0,009	0,134
CME	0,071	0,078	0,022	0,030	0,323	0,017	0,169
CSGP	0,014	0,079	0,001	0,615	0,001	0,031	0,132
EEFT	0,012	0,011	0,018	0,032	0,000	0,004	0,113
EFX	0,091	0,110	0,011	0,004	0,001	0,018	0,095
ENV	0,001	0,003	0,011	0,021	0,000	0,023	0,312
EVTC	0,709	0,233	0,023	0,042	0,000	0,015	0,044
FIS	0,008	0,009	0,005	0,012	0,000	0,006	0,029
FISV	0,002	0,010	0,018	0,013	0,005	0,018	0,059
GDOT	0,026	0,021	0,018	0,010	0,000	0,006	0,801
GPN	0,023	0,018	0,009	0,015	0,000	0,017	0,186
ICE	0,047	0,013	0,028	0,012	0,001	0,020	0,090
MA	3,470	1,321	0,024	0,029	0,001	0,014	0,087
MCO	3,537	0,422	0,037	0,033	0,000	0,008	0,026
MSCI	1,465	0,325	0,040	0,048	0,000	0,032	0,026
NDAQ	0,045	0,044	0,017	0,015	0,003	0,021	0,194
PYPL	0,076	0,067	0,017	0,007	0,000	0,001	4,100
SEIC	0,270	1,340	0,002	0,211	0,001	0,004	0,049
SPGI	37,968	1,161	0,023	0,032	0,001	0,010	0,040
SQ	0,000	0,004	0,018	0,007	0,000	0,004	0,140
SSNC	0,004	0,253	0,017	0,011	0,000	0,012	0,023
TRU	0,141	0,105	0,019	0,031	0,000	0,022	1,186
WETF	0,590	0,046	0,007	0,001	0,000	0,003	1,060

Step 3: Identifying Positive and Negative Ideal Solutions

In the weighted decision matrix, ideal and negative ideal solution sets are created by choosing ideal values for the ideal solution and negative ideal values for the negative ideal solution from each column. Positive and negative ideal solution sets are given in Table 6.

Table 6. *The Positive and Negative Ideal Solution Sets*

	ROA	ROE	LR	CR	AT	GPM	RT
Positive ideal solution	0,126	1,047	0,004	0,032	1,982	0,009	0,134
Negative ideal solution	0,071	0,078	0,022	0,030	0,323	0,017	0,169

Step 4: Determination of positive ideal and negative ideal solution values

Using the V-matrix, depending on the purpose of the evaluation criterion of interest, positive and negative ideal solution sets were obtained for each criterion. Positive and negative ideal solutions are given in Table 7.

Table 7. *The Positive and Negative Ideal Values*

Company Code		
CBOE	38,055	2,247
CME	38,162	0,371
CSGP	38,233	0,628
EEFT	38,244	0,098
EFX	38,164	0,159
ENV	38,236	0,291
EVTC	37,553	0,747
FIS	38,257	0,017
FISV	38,259	0,046
GDOT	38,165	0,779
GPN	38,226	0,167
ICE	38,212	0,090
MA	34,792	3,713
MCO	34,745	3,562
MSCI	36,802	1,501
NDAQ	38,202	0,184
PYPL	37,970	4,078
SEIC	37,970	1,380
SPGI	4,558	37,986
SQ	38,254	0,119

SSNC	38,254	0,251
TRU	38,015	1,177
WETF	37,582	1,194

Step 6: Calculation of the coefficients of the relative closeness to the ideal solution

The rankings of FinTech companies according to the closeness coefficients calculated according to their positive and negative ideal values are given in Table 8.

Table 8. *The Ranking of FinTech companies by Ideal Solution*

Company Code				**Rank**
CBOE	38,055	2,247	0,056	5
CME	38,162	0,371	0,010	13
CSGP	38,233	0,628	0,016	12
EEFT	38,244	0,098	0,003	20
EFX	38,164	0,159	0,004	18
ENV	38,236	0,291	0,008	14
EVTC	37,553	0,747	0,019	11
FIS	38,257	0,017	0,000	23
FISV	38,259	0,046	0,001	22
GDOT	38,165	0,779	0,020	10
GPN	38,226	0,167	0,004	17
ICE	38,212	0,090	0,002	21
MA	34,792	3,713	0,096	3
MCO	34,745	3,562	0,093	4
MSCI	36,802	1,501	0,039	6
NDAQ	38,202	0,184	0,005	16
PYPL	37,970	4,078	0,097	2
SEIC	37,970	1,380	0,035	7
SPGI	4,558	37,986	0,893	1
SQ	38,254	0,119	0,003	19
SSNC	38,254	0,251	0,007	15
TRU	38,015	1,177	0,030	9
WETF	37,582	1,194	0,031	8

The top five companies according to the value of FinTech companies are as follows; SPGI, PYPL, MA, MCO and CBOE. According to the value of FinTech companies, the last five companies are as follows; FIS, FISV, ICE, EEFT and SQ.

CONCLUDES

The purpose of this study, 23 FinTech companies traded in the KFTX index were ranked according to the TOPSIS method in the financial ratio criteria. In the study, 7 financial ratios used in the financial performance measurement of FinTech companies were determined. These financial ratios are return on assets (ROA), return on equity (ROE), leverage ratio (LR), current ratio (CR), asset turnover (AT), gross profit margin (GPM) and receivables turnover (RT). In the ranking made according to these financial ratios, the companies that are at the top have especially high ROA values. Studies in the literature also support that ROA is effective on company performance. In the ranking made in this study, besides ROA, it is noteworthy that ROE is also the determinant of company performances. It has been concluded that the other financial ratios (LR, CR, AT, GPM and RT) selected as criteria in the TOPSIS method do not have a great effect in determining the ranking. Equal weight was given to each criterion in this study. In future studies, ROA and ROE can be given more weight and the subject can be investigated with different multi-criteria decision making methods. Thus, the subjectivity of the TOPSIS method can be reduced. It will be useful to use income statement items and ratios other than ROA and ROE in studies on the profitability of FinTech companies. In addition, the effect of intangible asset items on company performance for FinTech companies can also be included in the research models.

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EFFECTS OF ONLINE DISINHIBITION ON INDIVIDUALS BEHAVIOR IN THE DIGITAL WORLD

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1. Introduction

Communication has been a concept intrinsic to life since the existence of humanity, continually evolving over time. According to the definition by the Turkish Language Association (TDK) (https://sozluk.gov.tr/, accessed 2023), communication is the transmission of emotions, thoughts, and information to other beings through the means of correspondence and communication. This transmission process, which commenced with smoke signals and wall inscriptions in the dark ages, has transitioned over time to words and mass communication tools. Such a significant shift in the nature of communication has consequently influenced the evolution and development of individual behaviors over time.

As words acquired new meanings and writing emerged, interpersonal communication remained rather superficial, but with the advancement of technology, one-way communication has given way to multifaceted interactions. This versatility has laid the groundwork for changes in individual behavior and emotional states. Moreover, technological advancements from the past to the present have made the digital world accessible, thereby allowing it to be used by everyone, independent of time and space. The presence of individuals on various digital platforms has at times also led to their representation in the digital world through different identities (Köksal, 2021). Particularly, social networks are used by everyone in society as environments that offer a realm of freedom. The presence of people of every age and thought on these platforms and their ability to engage in activities with new identities have paved the way for the development of different forms of expression and interactions among individuals. It can be said that tradition has given way to modernism. Especially the presence of new media has facilitated this change to reach its zenith.

In today's world, social media applications (such as WhatsApp, Instagram, Twitter, recently known as X, etc.), which are among the primary tools of individual and societal communication, enable individuals to bridge distances and easily adopt new identities. One of the concepts that best explains this phenomenon is the online disinhibition effect.

According to Suler (2004), online disinhibition is the phenomenon where individuals feel detached or exempt from social norms and expectations in the internet environment. In this context, individuals can think and act as they wish in the online space. In other words, online disinhibition refers to individuals expressing themselves differently in their internet interactions compared to the norms and expectations of the real world. Pseudonyms used in the digital world and various digital platforms are among the elements that encourage this disinhibition. For example, Twitter (X) allows individuals to express their thoughts uncensored, while Instag-

ram encourages users to share whatever image they desire. In this context, different platforms bring out different actions and personality diversities. The display of characteristics by individuals in the cyber environment that differ from their offline personalities and statuses amplifies the effect of disinhibition.

With the online disinhibition effect, individuals can share their emotions and thoughts with strangers in the virtual environment without any restrictions (Gümüş, 2022; Sayar 2013; Çalıcı and Öztürk, 2013). Things that are not expressed in traditional communication can easily be articulated on digital platforms, hence the emergence of the online disinhibition effect. Generally, online disinhibition involves individuals displaying behaviors in the virtual space that they wouldn't in their daily life by presenting themselves in different identities. In this context, individuals can not only portray different identities but also exhibit and introduce varying statuses and styles.

The digital world, being a platform where digital technologies are extensively utilized, leads people to conduct numerous activities such as communication, interaction, and accessing information through online environments. Therefore, through different digital platforms like social media, individuals communicate with each other, share information, and engage in interactions. In this context, the effective use of technology by individuals has resulted in different platforms in the digital world having varied impacts on human behaviors. Online disinhibition is one of these effects. Accordingly, in this context, the study has evaluated the concept of online disinhibition, its types, causes, and effects on people.

2. Types of Online Disinhibition

When observing the causes and consequences of the online disinhibition concept, it can be seen that it can be grouped in two ways. As Ertürk (2016) also points out, for effective communication, it is necessary to give clear messages that the receiver can understand, use the correct language, benefit from gestures and facial expressions, establish eye contact, listen, provide feedback, and empathize. In internet forums, most of these factors are absent, which leads to a more unhealthy communication environment. In this context, a negative, toxic disinhibition effect emerges. As indicated by Lapidot-Lefler and Barak (2012), the negative online disinhibition effect refers to individuals engaging in negative actions and statements on the internet that they would not do in the "real world." Users, with the anonymity and invisibility offered by the online environment, become rude, disrespectful, and merciless, increasing the negative disinhibition effect. In this concept, individuals damage only their own image and that of other users without any personal development. Suler (2004) views toxic disin-

hibition as a purposeless catharsis experienced by individuals. As users repeatedly shout their hatred in the online environment, they are actually expending futile effort because they are in a cycle where no one develops, only satisfying their own bad emotions. The culture of toxic communication, with the presence of disinhibition, causes individuals to enter an ouroboros (a snake eating its own tail in mythology) cycle. Another reason for the purposeless catharsis of toxic disinhibition is shown as individuals experiencing a "psychological blow" in the online or offline world, feeling bad. Internet users are turning to every channel they can transfer their pain and anger with disinhibition.

As Williams and Skoric (2005) have indicated, the environments where negative online disinhibition is most commonly observed include online gaming and game sites, hate sites, pornographic sites, all social media applications where cyberbullying can occur, the comment and direct message (DM) sections of social media applications, and sites with political formations. In this context, it can be said that online disinhibition is among the causes of cyberbullying. With the disinhibition effect in the virtual world, individuals do not restrain their behavior in the cyber environment, which means they can become cyberbullies themselves and might also encourage others to engage in such behavior.

As Öztürk and Çalıcı (2018) also mentioned, the disinhibition effect does not always signify a negative connotation. The display of sincere, polite, considerate, and helpful behaviors by individuals on the internet is regarded as a positive online disinhibition effect. In the case of positive disinhibition, individuals feel happier and more comfortable on social media. Users share their curiosities, fears, loneliness, secret emotions, personal details about their lives, and desires with each other. As a result, they receive support and assistance. Moreover, as the number of online environment users increases, so does the diversity of voices and cyber identities. Among the positive effects of disinhibition are individuals engaging in volunteer activities, helping each other in business or educational fields, demonstrating social responsibility, collectively responding to social events, and making positive progress on various issues through support groups. Thus, every segment of society finds a space to express their thoughts. Additionally, as a result of positive disinhibition, individuals achieve a social outcome by engaging in solidarity and mutual assistance.

In positive disinhibition, individuals display their behaviors on online platforms with fewer restrictions. For instance, it's easier for individuals with special needs to socialize in online environments. Conversely, negative disinhibition involves an individual acting more freely in the online environment, engaging in aggression and threatening behaviors (Suler, 2004). These individuals might think that the behaviors they exhibit in

digital environments will not come to light, are not criminal, or they might be aware of the nature of their actions but refuse to accept responsibility. Consequently, as they cannot foresee the consequences of their actions, their ability to empathize may diminish.

When we look at both types of online disinhibition, it can be said that individuals act under significant influences. With disinhibition, individuals do not hesitate to support or lynch people they know or do not know. Often, they act according to the community or their desires without thinking about the consequences of their actions.

3. Proximity Effect in Online Disinhibition

Through social media, the most significantly altered societal control mechanisms are traditional norms and values. At this point, the differentiation and transformation of social relationships, along with individual and group behaviors, are defined as societal change. The increased use of social media applications has added a new dimension to individuals' socialization and forms of communication. The ability to communicate with other users online only has enabled individuals to present themselves as they wish through behaviors of anonymity and invisibility. Simultaneously, social media has allowed individuals to unite in the same emotions and thoughts even if they may never physically see each other. As Gümüş (2022) has stated, individuals creating a discourse chain on the internet on every subject generates public opinion.

When considering the effect of online disinhibition, the significance of the concept of the proximate public emerges at this point. According to Suler (2004), the proximate public is formed when individuals in online environments feel a closeness to each other due to sharing similar thoughts and emotions. In this context, acts of trust and self-disclosure increase. The preservation of the proximate public allows individuals to compensate for the lack of closeness they feel in the offline world, overcome events they experience, and satisfy feelings of friendship, partnership, or curiosity. With the effect of the proximate public, people who meet on common values strengthen the act of living and existing together socially.

What renders a public space a "proximate public space" is the sharing of a worldview and emotional knowledge derived from a broadly common historical experience by the individuals or consumers present in that space (Berlant, 2008). Consequently, individuals desire to remain unified in the future through the shared history and cultural heritage.

Individuals, influenced by the proximity of the public, find consolation, development, and a platform for debate in their online communications, and can even establish an emotional connection. The sincerity and

longevity of this bond can be measured by the individuals' distancing from the effect of online disinhibition. The presence of the proximate public effect can be considered a step towards translating virtuality into physicality.

The socialization of users, the acquisition of certain behaviors and habits, and the formation of identities according to the social media tool are among the examples of the experienced change (Bakıroğlu, 2013: 1047). In this context, people who exchange ideas on every subject contribute to societal change through development and transformation. Moreover, in today's world, individuals from every generation spend considerable time on the internet. The reasons behind individuals' gravitation towards social media include the internet's functions that simplify life, the necessity of internet usage in the flow of life, psychological disorders, bad mood, good mood, and feelings of loneliness.

Hunt et al. (2018) indicate that feelings of loneliness draw individuals to social media. According to their research, individuals alleviate their feelings of loneliness in daily life by interacting with users on social media. Those who feel lonely tend to be more friendly and talkative on online platforms. Conversely, Leung (2002) suggests the opposite, stating that feelings of loneliness make individuals more irritable and deceptive. They are deceptive because they try to influence other internet users in an attempt to end their loneliness. They are irritable because they feel left alone in offline life. When these effects combine with disinhibition, a toxic scenario emerges.

Shensa et al. (2015) found that the more time users spend on social platforms, the less perceived social support they have. In this context, individuals spend more time on social media attempting to fill the void of emotional support. The fact that individuals can expose themselves so much and spend such time in the public sphere of the internet underscores the significant role of social media and disinhibition in social life.

The "Proximate Public Effect" also signifies that an individual's online behavior in the digital world reaches a broader audience in society. When disinhibition is considered alongside the Proximate Public effect, it is observed that various impacts emerge, such as social activism, awareness-raising, hate speech and harassment, shaking societal norms, well-intentioned sharing, threats to individuals' privacy, group dynamics, and the follower effect. These impacts include social activism and awareness-raising, hate speech and harassment, disruption of societal norms, well-intentioned sharing, threats to privacy, group dynamics, and follower influence (Gümüş, 2022). In social activism, individuals raise awareness about societal issues on online platforms. Additionally, the anonymity of individuals can increase tendencies towards hate and harassment. Thus,

a wide range of individuals can be positively or negatively affected by this situation. Furthermore, individuals on online platforms often deviate from societal norms. This leads to the emergence of radical thoughts and lifestyles on different subjects. On online platforms, individuals can also engage in different well-intentioned sharing, such as inspirational content or calls for help.

Online disinhibition increases the tendency of individuals to share their personal information and emotional content in response to various needs. Another effect is that individuals' behaviors become more influential and efficient under the influence of group dynamics. Individuals united in the same emotions and thoughts can more comfortably perform their actions. In this context, the "Proximate Public Effect" enables individuals' behaviors to be seen and influenced by a broader audience.

4. Factors Influencing Online Disinhibition

Advancements in technology and the widespread access to the internet have enabled individuals to form a new identity in virtual spaces outside of their daily lives or continue to manifest their real-life identities online. In this context, Suler (2004) identifies six factors that influence online disinhibition. These are anonymity, asynchronicity, invisibility, dissociative imagination, minimization of authority, and solipsistic introjection. If we examine these concepts:

4.1. Anonymity

One of the greatest opportunities that social media offers to individuals is the ability to remain anonymous. While using these applications, individuals can create accounts with their real names and social identities, or they can craft a profile with a desired set of characteristics. In this context, both positive and negative social behaviors can be facilitated, and social connections can be strengthened. As Suler (2004) points out, the more individuals separate their real identities from their virtual ones, the more their self-disclosure and sharing tend to increase.

Users creating fake identities and thinking in terms of "you don't know me" amplify the effect of disinhibition (Gedikoğlu and Atalay, 2021: 113; Suler, 2004 cited in Özgür and Çalıcı, 2018). Individuals on social media, by becoming anonymous, can feel detached from societal norms, rules, and expectations. In this context, they do not feel responsible for the negative, derogatory, judgmental, and hate-filled sentences or actions they establish on the internet. Thanks to the anonymity of social media, an individual who can be anyone or anything can exhibit behavior reflective of either toxic or positive disinhibition. Additionally, users, thinking they

won't be seen or found, can comfortably disclose sensitive moments of their lives, traumatic experiences, and uncensored thoughts. According to Lapidot-Lefler and Barak (2012), anonymity is the greatest factor enabling the emergence of the disinhibition effect because becoming completely identity-less, opposite to physicality and recognizability, is possible through anonymity.

Dissociative anonymity is defined as the degree to which an individual perceives the ability to conceal or alter their real identity in an online environment (Cheung et al., 2020; Suler, 2004). In this context, everyone can easily conform to a single type or take on entirely different characters.

Online anonymity can reduce personal awareness, facilitate positive social behavior, and strengthen online connections (Morahan-Martin and Schumacher, 2003). Online anonymity also allows individuals to present themselves in more ambiguous ways and express themselves differently (Yan and Tan, 2012). One of the best experiments illustrating the effect of anonymity and disinhibition is the Milgram experiment conducted by Zimbardo (1969). The results of the experiment demonstrated that individuals could easily engage in behaviors contrary to their moral values in "real life" under the influence of anonymity and authority. This experiment, showing how easily anonymity can be manipulated, indicates that users in online environments are likely to harm others without hesitation, even without knowing or seeing each other.

4.2. Asynchronicity

The digital world provides an environment that brings individuals together, even if they are geographically distant from each other. Therefore, everyone can communicate and interact with each other at the time and place of their choosing. This means that the virtual world offers users the opportunity to communicate comfortably 24/7 without time constraints. Communicating with each other in a digital environment enables them to easily display topics or behaviors they are hesitant about face-to-face.

In everyday life, or offline environments, interpersonal communication most often occurs face-to-face or in close proximity and is synchronous. In this context, joys and tensions are experienced instantaneously, but due to the lack of physical space on the internet, communications can be spread over longer periods. This is because communication channels such as emails and chats are sent without knowing when the recipient will see them. Consequently, individuals cannot interact synchronously. Feedback in a communication process can take hours, days, or even months. As Suler (2004) pointed out, the feedback to a message sent in online environments can take hours, weeks, or days. In this context, individuals' reactions to

events and their perceptions of situations change. The asynchronicity of the internet establishes a new communication order. In this order, the inability to receive instantaneous feedback and the lack of necessity for individuals to communicate urgently can lead to disinhibition.

Edmondstone (2016) notes that in online messaging, as individuals' discomfort increases, so does the amount of information and messages they share. In this context, the asynchronous feature of the internet can also hinder communication. Individuals can respond to the communications they desire whenever they want. The often lack of instantaneous reactions on social media not only disrupts communication but also leads to an increase in the effect of disinhibition.

4.3. Invisibility

The element of invisibility empowers individuals to venture into areas they wouldn't dare to in the digital world and to be bold about things they wouldn't normally do. In communication channels such as chat and messages, individuals can know who you are, but they cannot see each other. Even though everyone's identity may be visible in the digital environment, the lack of physical visibility enhances the effect of disinhibition. Individuals can more comfortably express behaviors in digital environments through invisibility that they wouldn't communicate or demonstrate in face-to-face interactions (Suler, 2004 cited in Özgür and Çalıcı, 2018).

In face-to-face communications, individuals are fully visible and must pay attention to their attire, gaze, gestures, and facial expressions. However, in online environments, except for video calls, the reactions given are invisible. Individuals may pretend not to like something they enjoy, or conversely, they can continue their communications without showing their displeasure in situations they dislike. In this context, the invisibility offered by the internet allows individuals to be freer in their speech and behavior. Due to the effect of invisibility in online environments, individuals are not hesitant to take their actions further. Users, while finding it difficult to access violent or pornographic content and publications in normal life, can more easily turn to these in the internet.

In conditions of invisibility, even if individuals' identities are known, they find it easier to communicate online. When their identities are unknown, the transmission of information and sharing in the online environment becomes even easier because they know they can block the profile of anyone they wish at any moment. Additionally, being invisible means they become untraceable once they leave the online environment, which liberates their actions. The disinhibition effect increases when the physical presence involved in interpersonal communication is eliminated. According

to the study by Lapidot-Lefler and Barak (2012), the lack of eye contact is the most significant factor leading to online disinhibition. As long as there is no eye contact, individuals can freely express their thoughts without empathy or falling into worries.

4.4. Dissociative Imagination

Individuals believe that virtual characters exist in the digital world and that they live in a world different from the real one. With dissociative imagination, individuals understand that their online lives are shaped by rules different from everyday life norms. However, when they return to their daily lives from the digital world, they believe they will leave their virtual identities behind. Therefore, it can be said that the norms and rules online and offline differ (Gedikoğlu and Atalay, 2021).

Individuals having different identities in offline and online environments leads them to view the two spaces as separate areas of life. People, when on the internet, think they are in a place separate from the responsibilities of daily life. The online environment has its own set of rules and new responsibilities.

As Gedikoğlu and Atalay (2021) state, internet users see social media as a playground away from the rules and norms of the offline world, under the influence of dissociative imagination. According to these individuals, the entire reality of the cyber environment ends the moment they turn off their computers. Therefore, it can be said that online and offline life have different characteristics.

As Suler (2004) states, the dream world is the personal space where individuals feel most comfortable. In this context, they want to think that they are flirting with people they like and having arguments with people they are angry with, in which they feel justified. Individuals also think about giving the role they want to anyone they want on the internet. When individuals communicate with people they do not know online, they can assign a voice and image to that person in their minds. Therefore, an unreal emotional world causes disinhibition to emerge.

4.5. Weakening of Authority

The weakening of authority and decrease in social norms in the digital environment is another cause of disinhibition. Digital environments are platforms where social norms and expectations in daily life are less. Therefore, individuals feel more free in these environments. This enables individuals to act more confidently and comfortably.

Internet communications are rife with many online disinhibition effects. It can be said that the effect of hierarchy in interpersonal communication has decreased considerably with the independence of new media from time and place, the regulations within the applications and the social change of generations Y and Z. As Öztürk and Çalıcı (2018) state, the social rules and values of the online and offline world are different from each other. One of the biggest factors that create this environment is the Y (1980-1999) generation, which is the most active user of the internet, and the Z (2000-2020) generation, known as the social media generation. People of this period have created a new digital habitat with both different thoughts and unconventional lifestyles. It seems impossible not to be affected by the details of this life that is active 24/7.

Individuals become more free and equal in this new habitat. In this context, while they are hesitant to defy authority figures and express their true thoughts in offline environments, they can act more comfortably in virtual environments where authority is weakened.

A 2003 study states that status, prestige, class and glamor are absent in the online environment, creating a safe and low-risk environment for interacting with others (Morahan-Martin and Schumacher, 2003). Communication in online environments proceeds like peer communication. Therefore, forms of mockery such as trolling are also increasing.

The fact that people are more willing to speak and behave inappropriately in environments where authority is minimized is defined as "the weakening of status and authority" (Gedikoğlu and Atalay, 2021). Since internet users do not need the elements of effective communication in online environments, they can talk without considering the status of the people they are talking to. In this context, the disinhibition effect increases.

4.6. Solipsistic Introjection

One of the effects of online disinhibition is that individuals think of online users as similar to someone they know during communication, since they do not see the person they are talking to in internet communication or do not know them personally. Thus, users can adapt themselves to conversations more easily. At the same time, individuals visualize the voices and images of the people they talk to on the internet. After a while, these conversations may turn into internal monologues. This further increases the disinhibition effect because individuals find it safer and more satisfying to talk to themselves rather than to other people. As Suler (2004) states, as the duration of solipsistic introversion increases, the individual becomes more introverted and may experience psychological problems such as overthinking and creating fictions.

One of the factors that cause disinhibition is the solipsistic "solipsistic introjection", which causes the written messages to be thought of as a mutual dialogue (Gedikoğlu and Atalay, 2021:114). Solipsism is an expression that means that a person does not know anything other than his own existence and thoughts (Oxford Dictionaries, 2014). Solipsistic thinking represents a situation in which individuals accept only their own thoughts as reality, focus only on what they feel, and argue that something that the individual does not know cannot exist outside.

Online text communication can become a psychological tapestry that a person's mind weaves, often unconsciously and in a largely disinhibited manner (Suler, 2004). As users continue to engage in dialogue with the people they communicate with or think about them, the more they think they are real. In this context, internet users can visualize this even if they do not talk to individuals online or offline.

In order to talk about the existence of an online disinhibition effect, the presence of at least one or two of these concepts is sufficient. In some cases, concepts are intertwined or may be the cause and effect of each other.

5. Consequences of Online Disinhibition and Its Impact on Individuals

In order for healthy interpersonal communication to occur, there must be physical cues as well as words. However, in today's internet age transmission network, physicality is replaced by the comfort of the virtual world. Features of this comfortable environment, such as anonymity and asynchrony, affect the personality and cyber life practices of the users. The rate at which internet users are affected by online disinhibition is directly proportional to their character and how much they are exposed to environmental variables. When individuals encounter the freedom and anonymity opportunities of the internet, they begin to express their true personalities, the person they want to be, or the emotions they have suppressed much more easily. Suler (2004) states that disinhibition can lead individuals astray and disintegration in personality may occur.

With the widespread use and frequent use of digital environments, some changes have occurred in individuals' behavior. Individuals express themselves by feeling more comfortable and free on different platforms, especially in online environments. However, the behaviors they display from time to time by hiding behind the different identities they create have caused online disinhibition to emerge. In online environments, individuals show bolder, more aggressive or more sincere communication behaviors than in daily life. Additionally, anonymity and lack of space in the digital

world are factors that change individuals' behavior. Therefore, it emerges in a more open, riskier and different way in the digital world.

There are significant changes in the behavior of individuals online. These situations create many effects such as aggression and hostility, more open and sincere communication, and risky behavior. With the decrease in anonymity and social norms in the digital world, people may behave differently on online platforms.

Since online disinhibition increases people's tendency to communicate more openly and sincerely, they can express themselves more easily due to the lack of physical distances between individuals and anonymity. In this context, in the digital world, people can more easily share topics that they feel embarrassed or shy about. In addition, online environments enable more intimate relationships to be established between individuals.

Online disinhibition in the digital world also increases the likelihood of individuals engaging in risky behavior. For reasons of disinhibition, people may turn to dangerous and irresponsible behavior on online platforms. For example, they may commit shopping fraud, download malware, or participate in illegal activities on these platforms. They may even show suicidal tendencies because their irresponsible and brave behavior affects their ability to cope with emotional difficulties (Kurek et al., 2019; Demirtaş Madran, 2021). These risky behaviors also cause negative behaviors that people may encounter in the digital world.

Individuals may tend to be aggressive in order to hide their identities in digital environments. Therefore, this situation can lead to discussions in online environments quickly turning into fights or behavior such as hate speech and harassment. One of the social control mechanisms that change the most with social media is social norms (Gedikoğlu and Atalay, 2021). The decrease in social norms and the lack of face-to-face communication in daily life of individuals may cause them to exhibit more aggressive behavior.

Online disinhibition also causes relationship problems for individuals. Since they feel more courageous in the virtual environment and can communicate directly, it also causes misunderstandings and conflicts between people (Chan, 2021; Antoniadou, 2019). Due to lack of communication between people, emotional expressions between them are misunderstood, relationships deteriorate and some problems may arise.

One of the effects of online disinhibition is internet addiction. Because they exhibit risky behaviors due to the need for anonymity and acceptance on digital platforms, their frequent use of social media leads people to

technology addiction. Therefore, disinhibition can affect daily life and disrupt social relationships.

Cyber bullying also occurs as the effect of online disinhibition on the behavior of individuals in society. The fact that cyberbullying provides anonymity, that is, the bullies have different power and control by hiding their identities, gives them courage (Demirtaş Madran, 2021). Therefore, people bully, harass and threaten each other in online environments. In this context, in addition to creating negative psychological effects on individuals' behavior, people's emotional health is also negatively affected.

6. Conclusion

The spread of technology and people's frequent use of digital platforms have led them to different behaviors. The fact that individuals act freely on the online platform by hiding their identities has led to the emergence of the concept of online disinhibition. Anonymity in the digital world, lack of spatial boundaries, and decrease in social norms are among the reasons for disinhibition. Online disinhibition causes individuals to exhibit risky behavior, suicidal tendencies, technology addictions, relationship problems, and aggressive behavior. In addition to these behaviors, disinhibition also has a positive aspect. In online environments, individuals can gain opportunities to more easily reach the emotions and desires they feel they lack in the outside world. The magical world of cyberspace has given everyone the opportunity to create the characters and avatars they want, allowing them to establish more open and sincere relationships with each other. Therefore, from time to time, communication in online environments can cause misunderstandings and cause relationship problems between individuals.

A few individual and social suggestions can be made to reduce online disinhibition. First of all, awareness can be raised in society on this issue. Individuals can be made to be more careful and responsible in online environments. Training programs can be organized so that people on the digital platform can review their speaking styles, sharing and interactions in these environments. In the training program, the necessary behaviors to recognize risky behaviors and adapt to online norms to develop positive skills can be explained. Informative content can be presented regarding this behavior. Therefore, individuals can communicate more healthily after becoming aware of the harms of online disinhibition. It is also recommended to organize training and awareness campaigns to raise awareness. Through campaigns to raise awareness among internet users, individuals should be told how to behave in the digital world by emphasizing the various causes and effects of disinhibition. Additionally, some arrangements can be made via social media platforms. Individuals' identity checks can be audited through social media because social media platforms play an important role in reducing disinhibition. In this context, negative consequences can be minimized by individuals making more conscious decisions in their online behavior.

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