

An assessment on rational expectations and perception engineering in the cyber-capitalist age

* Ahmet Efe

* Senior Field Auditor at the International Federation of Red Cross and Red Crescent (IFRC)

ARTICLE INFO

Keywords:

*Rational expectations
Perception engineering
Digital manipulation
Behavioral economics
Cyber capitalism*

ABSTRACT

In recent years, studies in economics have revealed that analyses in psychology, sociology, religion, and ethics have begun to describe trends in the markets, household preferences, entrepreneurships, and investor decisions. These studies are referred to be results of the critical dynamics put forward by the "Rational Expectations Theory." Although conditional rationality is widely assumed in economic analysis, the assumptions of rational expectations as a unique approach allow for new perspectives of bias on the perception engineering which is being realised through social media for both political or economic operations. Perception engineering has become easy and widespread in this new age of cyber-capitalism in which artificial intelligence (AI) based Management Information Systems (MIS) and IoT tend to dominate pervasively for economic, political or religious reasons. This study asserts that investment decisions, political tendencies and economic preferences may not be rational due to exposure to perception engineering through innovative technology of algorithms and social media. Therefore, in today's cyber-capitalist ecosystems, the generation of manipulated social consent has been incredibly enhanced by hacking, collecting, accumulating, changing, controlling, and disseminating information for propaganda and marketing purposes over social media. In this multidisciplinary study, perception engineering that has become a part of artificial intelligence-assisted social engineering processes, is concluded to be the key spoiler of rational expectations of economic agents. In this context, possible measures are developed and suggested.

1. Introduction

Neoliberal policies have brought the flexible labor market approach to cost reduction through wage reductions and depleting of real wages. Low wages of Syrian refugees in Türkiye since 2011 allows the goods and services to be produced relatively cheaply. The decrease in incomes of the producers' goods that will be imported at a lower cost by restricting their production has been a fundamental reason for the disintegration of the developing countries like Türkiye, especially in the agricultural field. However, it is a problem for developing countries to meet the foreign exchange requirement needed for the goods to be imported cheaply. The current foreign account deficit problem is also an indicator of the difficulty in financing imports and is an essential item in terms of short-term capital financing. The high-interest rates used to attract short-term capital, and the foreign currency needed to import the exported goods in this way is costly for the country's economy (Işık, 2013).

The concepts and models studied in behavioral economics have many reflections and echoes in daily life. The causes and consequences of irrational behavior can become much more understandable when examined by including sociological, ethical and psychological factors in the framework. Therefore, making an investment decision solely based on the information herein may not produce results in line with expectations.

It is assumed that social media is effective in perception engineering of masses. We have asserted the existence of a close relationship between rational theory and behavioral economics in setting a framework for policymakers' and entrepreneurs' financial and economic decisions (Künü & Duran, 2021; Serttaş et al., 2022). We try to answer the following questions:

- Is there a relationship between rational expectation theory and perception engineering methodologies?
- If perceptions of both producers and consumers can be shaped and redirected towards less-profitable or less-functional areas or products, can we claim that there is no rational expectations anymore in this cyber-capitalist era?

This study aims to assess the validity of rational expectations with perception engineering in the cyber-capitalist age. To achieve this goal, the study uses literature survey, conceptual and theoretical reasoning methodologies alongside content analysis of sectoral reports. The study is divided into six sections that examine various aspects of the relationship between rational expectations and perception engineering in the cyber-capitalist age.

The first section sets the research problem and establishes the importance of understanding the relationship between rational expectations

* Corresponding author. E-mail address: icsiacag@gmail.com (A. Efe).

Received: 17 February 2023; Received in revised form 25 April 2023; Accepted 27 April 2023

<https://doi.org/10.58251/ekonomi.1252661>

and perception engineering. The second section explores the economic and psychological perspectives of entrepreneurship and how they relate to rational expectations and perception engineering. The third section examines the confusion surrounding rational expectations in the cyber-capitalist age. The fourth section explores the new illusion of cyber capitalism, which is perception engineering of masses. This section looks at how businesses are using perception engineering to shape the way people perceive their products and services. The fifth section examines social capture as a new way of communication, which is being used to shape perceptions in the cyber-capitalist age. The sixth section discusses social media as a new way of perception engineering, which is becoming increasingly more important in the cyber-capitalist age. This section explores the various techniques used by businesses to shape perceptions through social media and the implications of these techniques for rational expectations.

The study concludes by summarizing the key findings and suggesting applicable recommendations to the Turkish government. The study recommends that the Turkish government take prudent measures to promote transparency and accountability in the use of perception engineering techniques by businesses to protect consumers' interests. The study also suggests that policymakers need to stay informed and up-to-date on the latest developments in this area to effectively regulate the market.

2. Research problem setting: validity of rational expectation with perception engineering

Perception engineering activities refer to deliberate efforts by various actors, such as governments, businesses, or media, to shape people's perceptions about economic events, policies, or trends. These efforts can have negative effects on the rational expectations of economic actors, which can in turn have adverse consequences for the economy as a whole. Some of the negative effects of perception engineering activities on the rational expectations of economic actors are:

- **Misinformation:** Perception engineering activities often involve the dissemination of false or misleading information about economic events or policies. This can lead economic actors to form inaccurate beliefs about the state of the economy, which can in turn lead to suboptimal decisions about investments, consumption, and other economic activities.
- **Biases:** Perception engineering activities can also be used to exploit cognitive biases and heuristics that are inherent in human decision-making. For example, fear-mongering about economic risks can trigger an emotional response that leads people to make irrational decisions based on short-term considerations rather than long-term benefits.
- **Distortion of market signals:** Perception engineering activities can also distort market signals by creating artificial demand or supply for particular goods or services. For example, advertising campaigns that promote a particular product can create a perception of scarcity and increase demand beyond what is actually warranted by market conditions. This can lead to price increases and market inefficiencies.
- **Undermining confidence:** Perception engineering activities can also erode the confidence of economic actors in the transparency and integrity of the economic system. This can lead to reduced trust in financial institutions, regulatory bodies, and other economic actors, which can ultimately undermine the functioning of the economy.
- **Inconsistent policies:** Perception engineering activities can also be used to justify inconsistent policies, such as changes in economic policies that are not based on sound economic principles. This can lead to confusion and uncertainty among economic actors, who may have difficulty predicting the future course of the economy and making informed decisions.

Therefore, this study is based on the argument that the perception engineering activities can have negative effects on the rational expectations of economic actors breaking of the balance of rational expectation of households and economic agents. These negative effects can range from misinformation and cognitive biases to distortions of market signals and reduced confidence in the economic system. To mitigate these negative effects, it is important for economic actors to stay informed and critically evaluate the information they receive from various sources. It is also important for governments, businesses, and media to be transparent and honest in their communication about economic events, policies, and trends.

In line with the problem setting and the research questions the following assumptions are considered as valid:

- Rational expectation theory assumes that individuals make economic decisions based on rational information and that these decisions are consistent with their personal goals. However, with the rise of perception engineering, it is possible that individuals' decisions are influenced by factors that do not align with their rational goals.
- Perception engineering is a relatively new phenomenon that is heavily reliant on technology and social media platforms. As such, it is likely that the effects of perception engineering on rational expectations may not have been fully explored in the literature.
- The use of social media as a tool for perception engineering may have significant implications for the economy, as consumers may be influenced to purchase products or invest in areas that are not necessarily profitable or functional.
- There may be a need for greater regulation of social media platforms to prevent the spread of false information and biases, which could lead to a distorted perception of reality.
- The study assumes that the government and opposition parties have a significant role to play in managing perceptions, as they have access to resources and tools that can be used to shape the narratives. However, the study also acknowledges that civil society organizations, international NGOs, tycoons and bigwig individuals can also play a role in shaping perceptions.
- The study assumes that Turkey is facing challenges with perception engineering and biased rational expectations, and that these challenges may be more acute in the context of the cyber-capitalist age.

3. Economic and Psychological Perspectives of Entrepreneurships

Why are some entrepreneurs like Elon Musk, Jack Ma or Selcuk Bayraktar are so successful than others in starting new business? Growing evidence suggests that the answer involves cognitive, political and social factors. Is there perception engineering by political or governmental sponsorship behind these kind of iconic figures? Similarly, successful entrepreneurs appear to be more socially competent and they are interacting effectively with others, and so, they are better at social perception and adapting to new social situations. These results suggest that the principles and assumptions of psychology can be invaluable to researchers in entrepreneurship, providing essential insights into the factors that influence entrepreneurs' success (Baron, 2000). Since the concept of entrepreneurship is a process of creating economic activity it has been

been considered necessary by all countries in recent years that entrepreneurship occurs in a new or existing business by combining risk-taking, creativity, and innovation processes significantly affecting countries' economic and social welfare (Işık et al., 2016, 2019a-b).

Personality characteristics such as the need for success, risk-taking, high control ability, innovativeness, vision, devotion, commitment, flexible behavior, and motivation for new achievements are determined regarding the entrepreneurial characters. Social status, political support, reputation, esteem, honor and also well designed promotion campaigns of mass perception can also influence entrepreneurship.

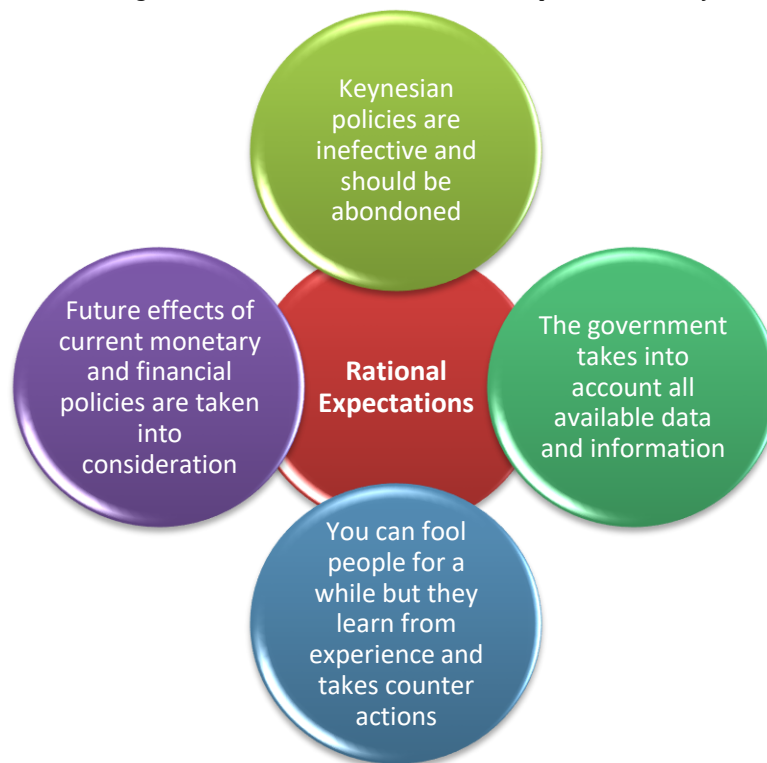
4. Confusing Rational Expectations

Rational expectations theory is an economic theory that won the Nobel Prize in Economics for two economists who developed this theory (Taylor, 1981) based on the hypothesis of rationality in expectations and the openness of markets hypothesis (Karaçor, 2014). According to the theory, since all data are open, decision-makers in the market areas are informed about events and developments. In this case, the market decision-makers anticipate the effects of the measures taken by the government and act accordingly or take an advantage of insider trading. The Rational Expectations Theory argues that individuals will have "rational" expectations and immediately take an active stance against economic policies and try to change the expected results of these policies. Individuals who have these characteristics and information will predict the effects of policy measures and will be able to shape their behavior accordingly, thereby nullifying policy implementations (Cukierman et al., 2020).

Therefore, while the Rational Expectations Theory claims that monetary policy will only affect the general level of prices in the economy in the short and long run, it argues that fiscal policy will have adverse effects on employment and production in the long run (Masca, 2007:52). It is stated that the markets are cleared in the incomplete information model, but the short- and long-term aggregate supply curves may differ due to misperceptions about prices. The Lucas model has three assumptions (Bull & Frydman, 1983):

- Markets are clearing.
- Expectations are rational, and
- Economic agents' knowledge of the economy is incomplete.

Figure 1. Critical attributes of Rational Expectation Theory



Robert Lucas revealed the assumption that "structural parameters do not change according to the policy applied" in the macro-econometric models used to make policy evaluations is invalid. These models accept that individuals form their expectations under adaptive expectations. However, the rational behavior of rational individuals in the face of policy changes can eliminate the effectiveness of policies (Yıldırım & Karaman, 2001). Decisions that determine many macroeconomic variables, especially consumption and investment, are vitally dependent on expectations about the future state of the economy. Lucas has argued that an essential aspect of most policy interventions is to change the way individuals form their expectations about the future (Ökte, 2001). Therefore, if the policy changes, internal expectations will also change, which will affect savings, investment, supply, and demand for labor and goods. These decisions will also change the structural parameters that reflect the relationship between the variables. As a result of the criticisms against active economic policies, it was agreed that monetary policy should be followed according to a previous rule. Discussions about the procedures to be implemented have emerged from the framework of adjustable policies and focused on the types of regulations (Muslümov, Hasanov, & Özyıldırım, 2002:5).

The word “rational” means mind-based, measured, reasonable and affordable. The term “irrational” is opposed to be not based on a reason and unmeasured. Here are the questions that stir our minds from a spiritual or moral context (Yıldırım, 2001):

- If the goods, money, fame, and career are all temporary and will undoubtedly leave us in a day, why are we not rational and searching for eternal goods and long-lasting life alongside with the worldly?
- If we have rational behavior, do not we have to spend one hour of life in the most important capital of our lives at least once a day for the Hereafter?

The theory does not seek explanations that envision beyond mortality to answer such quintessential questions, but rather until the end of worldly life. The rational expectations theory is solely considered economical, because all the data are explained. Market decision-makers are informed about events and developments as much as those who manage the economy. In this case, market decision-makers anticipate and act according to the effects of measures taken by the economic actors. Suppose the government has decided increasing consumption to stir economic development. In line with this decision, the central bank has increased the money supply more than the economic growth rate. Market decision-makers then expect that this approach will create inflation and increase the sales prices of their products. The Central Bank began to use the monetary policy instruments to reach the inflation target. Those who can decide on investment, production, entrepreneurship, purchases, wage bargains, or pricing in the economy will act according to the expectation that inflation will fall. These behaviors will lead to a fall in inflation. One day an increase in risks starts due to various reasons and the effect of the reflection on the exchange rate, the inflation will be rising again. At the same time, this situation continues while the political power, despite the legal regulations brought by the Central Bank, reduces the interest rate by half. Markets consider this demand to be irrational, as in the current situation of the monetary government. If the Central Bank reduces the interest rate by subduing political pressure, the market perceives irrational behavior will replace rational behavior. In this case, the expectation of hiking inflation will increase, and if the decisions taken by the decision-makers change in this direction, the inflation will also increase. However, as the central government considers high interest rates as immoral or against religious obligations, the decisions taken are considered very rational in terms of their assumptions. They usually argue that there is a perception engineering over economic expectations, so it is legitimate to gauge some settings of policies and practices with close oversight in line with moral and religious context.

While the supporters of the opposition constantly and systematically believed that a large reserve of 128 billion US dollars was stolen by the government via irrational monetary decisions, the government bodies and the supporters of the government have always argued that there is no question of a lost reserve money and irrationality. At this point, there is no doubt that there is information pollution as a result of multilateral and comprehensive perception engineering and the negative impact of rational expectations. In this case, rational expectations are being replaced by unjustified expectations that increase investment risks in all real sectors. In other words, really or artificially irrational approaches are becoming so widespread that markets can predict that the decision coming from political power is foolish. In this case, the opposite can be realized in the direction of the decision. For example, even if the Central Bank lowered the interest rate, banks do not lower their interest rates because they predicted that this decision would increase the credit and real interest risks and hence inflation. Under normal circumstances, such an approach creates a shock effect and market distortions. However, this approach has become a routine in many areas, not only in this area, so the shock effect is not too significant if the irrational methods are to be expected. Although there is a market fluctuation, this effect does not last long. In a sense, people and markets are rationalizing irrationalism because they expect that there will always be irrational approaches. This can be called the theory of unreasonable expectations.

5. The New Illusion in Cyber Capitalism: Perception Engineering of Masses

Expectations are mainly driven by perceptions of economic actors on the policy development, systematic fluctuations and possible behaviors within the free markets. Getting a better understanding of the current globalization system requires a new conceptual framework that captures different formations of globalization, ranging from the embodied to the disembodied. The multiple disjunctive relationships that have developed among and within these formations shape the morphology of the current globalization system and cast a long shadow on its future dynamics (Steger & James, 2020).

Every day new concepts and inventions are beginning to enter our lives. One of these is social engineering to change perceptions. Although it is not a new concept, its awareness has increased recently. Social engineering is a concept in the field of study and research of sociology, anthropology, political philosophy, and also economics (due to its relationship with shaping economic decisions). Social or community engineering takes its roots from the theory of hegemony that requires convincing people to take them under submission without brute force. Thus, since they do not consent to hegemony and take the front, the dynamism and variability of hegemony cannot reveal “*hegemony*.” As a result of their ideological struggles, they can demonstrate the new hegemony they are in and believe that they have their wishes or result from “*misleading consciousness*.” They are connected to the newly formed hegemony with more enthusiastic consent and become their defenders by acquiring habits. This result emerges, which can be called a hegemonic environment. This madness, which has “*fuel power*” in its tank, is perhaps an indispensable phenomenon caused by power for humanity (Wheatley et al., 2012).

Even bubbles, in many markets, are consistent with rationality, that phenomena such as runaway asset prices and market crashes are consistent with rational bubbles (Blanchard & Watson, 1982). Perception management in markets combines facts, projection, deception, and psychological operations to some extent supporting financial bubbles. According to this definition, the attitudes, behaviors, logic, and emotions of groups are affected and shaped by perception management done by powerful rulers and capitalists. In other words, perception management includes all the activities carried out to influence the target audience's views. Therefore, the Machiavellian approach is valid in perception management and similar concepts that the philosophy of “*everything is permissible on the way to the goal*” is based.

Successful perception management practices consist of essential elements such as reflecting the facts using various methods, providing operational security, concealing and distorting the truth, and managing psychological operations. In this context, perception management strategies have an important role in manipulating information for specific interests and directing the target audience. When considered in this context, states, capitalist cartels or groups that can control the flow of information in their favor or the political parties they are affiliated also hold the economical, political, psychological and social advantage. In this respect, the perception management process stands before us as a power struggle over manipulation or fabrication of data, information and knowledge. The “*number of weapons and soldier*,” which was a tool of

of intimidation in the pre-modern era and accepted as a strategic power in challenging the world, is considered insufficient for states to form a public opinion in their favor today. If we accept that there is a successful perception management available in the markets and societies via troll accounts and artificial intelligence bots, then the question that “*is it possible so talk about rationality and rational expectations*” remains unanswered.

Since the classical methods are also worn out in the new period, hegemonical or monolithic structure of economic or political power centers take refuge in several mechanisms for perception management:

- Trolls from professional groups and bots with legitimacy and prestige are used both in the new media and in the mainstream media, disinformation is made through these trolls, the production of consent or rebellion is triggered by shaping the perceptions of the masses.
- As is practiced in Russia, blogs or some social media influencers are bought and controlled,
- Censorship and legal prosecution,
- Penal and monetary sanctions or blackmailing and intimidations when they come to the power,
- Bureaucratic sanctions are frequently preferred,
- Media organizations and artificially intelligent bots are purchased or sponsorship is provided for certain referrals,
- Education curricula, scientific publications and reputable persons or institutions can be used as tools.

Perception engineering, global powers, governmentality, opposition, hegemony and propaganda are intertwined concepts where one cannot exist without the other. Although these relations have been used extensively throughout the ages, their usage varies from age to age. However, perception management plays a central role in seizing power or producing the policies desired by the interests. In order to seize the power, to demolish or capture the power, to establish hegemony, creating perception on the masses and the management of the created perception appear as reality (Bayrakci, 2021).

Community or mass engineering is a concept in political science for the efforts of state power or private groups to directly or indirectly affect the attitudes and social behaviors of a large part of society. Here are the questions that stir our minds:

- Can social engineering successfully format and change human behavior for economic and political purposes?
- What kind of social engineering is done on advertisements and media to keep people in the pursuit of temporary pleasures by giving their requirements for the comfort of their worldly life?
- How should we protect ourselves from the drawbacks of social engineering and perception alteration?

Economic and political relations, which became increasingly dirty, have begun to look for new ways to increase their impact on society. Community engineering is a term used in political science for studies that affect the cultural and social habits of a large part of society by governments or particular communities. This concept is confused with the concepts of brainwashing, misinformation, disinformation and indoctrination. Humans use behavioral synchrony to promote neural synchrony and, thus, social bonding. This reverse-engineering of social connection is an important innovation likely underlying this distinctively human capacity to create large-scale social coordination and cohesion (Wheatly et al., 2012).

Social engineering may work to a certain degree on perception management without living examples that guide people to the truth and realities. Suppose people do not believe that their rulers and government officers act with justice and devotion, in that case, their perception are corrupted or self-interest seekers, then that becomes impossible to guide them to the right path. In addition, global tools such as social media, simultaneous news broadcasts around the world, internet and ease of news preparation. In terms of business, it is possible to manage or direct the societies or target audiences covering the field of businesses with tools that can help perception management such as communication, feedback and motivation (Bakan & Keefe, 2012). It would not be wrong to say that “information” and “knowledge” are used or abused wisely for political or economic gains. Although it is important to analyze the issue of who is doing it and for what purpose, it is a very complex and difficult task. In this context, it is a good approach to focus especially on the public relations policies of international companies and political parties. When these structures are examined, it is seen that while they think globally in their perception management studies, they have different views locally. It is seen that religious and ethnic communities have very impressive and attractive emphasis on their cultures. Perception management with words like; “Think globally, act locally”, “End the one-man regime”, “Those who keep silent against injustice are the dumb devil”, “Those who do not drive out the thief are criminals”, “One must fight fascism” and “palace gangs” are very effective. However, it is clearly seen how important a function of moral values, common sense and prudence are (Erbay & Arslan, 2019). Because the essence of perception management is “*persuasion activities*.” global powers of cyber capitalism try to ensure the legitimacy of their power and policies to increase their reputation and maximize their benefits. Institutions and individuals sought ways and methods to persuade their target audiences and enable them to see the world from their own eyes, and developed various strategies in this regard. Still, in recent years, these concepts sound better with the thought that these concepts have negative connotations in public, such as public diplomacy, soft power, reputation management, image management, public relations. In other words, information wars based on manipulation between actors have started to be constructed over the digital world. Generally accepted that these practices’ general purpose is to voluntarily persuade a particular audience and create a perception in the desired direction. In this respect, perception management is defined as a communication discipline to deceive the target audiences in line with their interests and turn them into elements that they will use in line with their own goals (Wheatly et al., 2012).

Although perception management is used in daily life, even at more limited points, from the advertising sector to the health sector, its use in shaping social events and political preferences inevitably necessitates it to be considered within the scope of psychological operations in perception management. All societies witness the practices that can be considered as a part of social engineering that will make this issue of secondary importance. This supports Industry 4.0 and Society 5.0 perception engineering requirements. Psychological warfare is the use of information in order to change the feelings, thoughts and behaviors of the masses in both war and peace environments. Among the goals of psychological warfare are;

- to weaken the enemy’s combat power and resiliency,
- to break the will of the defeated enemy to fight,
- to create a sense of obedience/disobedience,
- to mislead the public,
- to discredit key figures,

- to open the gap between the administration and the people, and
- to provide cultural change.

Today, although normal wars have become very common as low-intensity conflicts, psychological warfare has become a constant practice as one of the most transformative aspects of societies today. The following psychological techniques are being used for perception engineering (Gürsoy, 2020):

- Gaslighting Manipulation: It is a method of ignoring reality with sentences such as “this has never happened”, “you are dreaming of it” in order not to make you feel the reality and to confuse it.
- Projection Technique: Mental depression is a method of convincing the desired community by reflecting the bad features in perception and creating the impression that it is a real part of them.
- Purposeless Monologues: It is the creation of monologues that do not provide any benefit in order to destroy the perception and tire the mind, especially to facilitate the manipulation phase. The audience listens to monologues under dictation.
- Generalized Disqualifications: It is a method in which intellectual appearance and uncertainty are preserved and the target message is generalized by using general and ambiguous expressions. Examples of sentences using this method are “everything bothers you”, “you always want to be right”.
- Deep Insult Shallow Compliment: It is a method in which real hatred and sarcasm are cast into shadow by creating the impression that they are complimenting the target individual or audience. To give an example, in this perception that the target audience is told “You are more virtuous than what we know so far”, the mental breakdown will be perceived positively and favorably by the person or persons to whom it is intended. In reality, however, the target audience was either “you weren’t brave before” or “I didn’t think you were brave before.” contains the message.
- Manipulation of Facts: It is a method of replacing facts with needed facts in order to turn the truth in its favor and push the target audience to question.
- Alleged Insufficient Dialogue: It is a method of creating a syndrome on the target audience by saying that it is impossible to speak to the target audience and that it is not spoken effectively and correctly. Thus, the syndrome is created and the target audience is prevented from talking about the problem.
- Intellectual Harassment: It is the technique of non-stop argument generation by making distorted reasoning through different information and facts in order to emotionally exhaust the target audience or accelerate the mental breakdown in perception.
- Use of Irony and Bad Humor: It is a method of making ironic analogies and bad humor in order to belittle the target audience, to make them accept psychological superiority and to disperse the subject in addition to psychological pressure.
- Mask of Not Being Understood: This method, which is widely used regardless of the type of discussion, is also used when it is desired to create a mental breakdown in perception. It is claimed that the expressions and perceptions of the target audience cannot be understood in order to devalue and make meaningless the expressions and perceptions of the target audience.
- Hiding the Purpose: The strategy of hiding the purpose is to hide the perception in mental depression. In other words, it is aimed to change the current perception by producing false purpose. They usually hide misinformation or falsification in a pile of fact-based information. While the purpose is hidden, it is aimed to make the newly changed truths accepted at the organizational stage of the mental collapse in perception and to take action in the direction of these truths.

6. Social Capture as A New Way of Communication

The 21st century is almost at the peak of innovative digital technology. Although we currently use the technology as consumers, we can probably use it for different purposes in the future, such as human hacking. Society engineering aims to take some actions and instill biased information to people. Community engineers have succeeded in changing/altering society’s perception, or the individual’s perception, with various advertisements, techniques, directions, and repetitions using social media and artificial intelligence (AI). AI algorithms can be used to process vast amounts of data and identify patterns that are not immediately apparent to humans. This ability can help economic agents to make better decisions based on accurate and timely information. For example, AI-powered financial analytics tools can provide investors with real-time insights into market trends and help them identify potential opportunities for investment (Gencoglu & Hancer, 2020).

AI can also be used for perception engineering, which refers to the deliberate manipulation of people’s perceptions through the use of various techniques, including social media. Social media platforms are often used to influence public opinion and shape perceptions of products, services, and political ideologies. AI-powered social media analytics tools can analyze vast amounts of user-generated data to identify patterns in public opinion and sentiment, allowing marketers and political campaigns to create targeted messaging and campaigns (Gao et al., 2021).

The impact of AI on perception management is significant. The use of AI in perception management can help organizations to better understand their audiences and tailor their messaging accordingly. However, it also raises concerns about the ethics of using AI to manipulate public opinion. The use of AI-powered deepfakes, for example, can create realistic but entirely fabricated video and audio content that can be used to manipulate public opinion (Wang et al., 2021). The authorities and giant companies have been hacking societies for a long time and now in a different dimension. Hackers are more intelligent than they are in the past with the application of AI tools and techniques. They no longer write a lot of code or malware instead of using available ones directly through automated tools and techniques. The living information (social DNAs) of a social system, which we call culture, is recorded in the human brain and the relations of production (historically formed) between the people who source them. Thus, the change of connections between the elements of society and the elements of the system is related to the realization of new relations of production in that society based on new knowledge and technology, which is a task that no social engineer can accomplish with a voluntary effort from top to bottom. In the information age we live in, the power of mass media and especially social media is unquestionably accepted. Thanks to technological developments, the masses are faced with an intense information bombardment, and often they cannot distinguish what is real and what is fiction. This tremendous speed allows for the dissemination of a large amount of information that cannot be verified and creates information pollution. What we will watch on which radio and television channel, what we will read in which

newspaper or magazine, are determined within today's capitalist relations and our perceptions can be shaped (Utma, 2018).

The more one uses social media, and the more one thinks they are an excellent way to connect with others (perceived intimacy). The more one is likely to be happy, the more feels associated with others (Pittman, 2018). Social anxiety and happiness vary significantly by social media addiction. (Baltaci, 2019). New power structures are being reproduced within the new communication practices on these networks. The processes and experiences of commodification on networks have led to understanding the capitalist economy since the 90s. Here are the questions that stir our minds:

- Do social media make people alienated and asocials?
- Is social media addiction a prominent feature of cyber capitalism?
- Why do people hesitate to communicate directly with each other, even though there are excessive communication possibilities?
- What are the relations of production on which social media platforms are based?

Communication, however, has to be perceived as more than interpersonal communication, even more than a capitalist economy. Communication networks carry the information of the collapse of capitalism and the knowledge of the development of the capitalist economy. Communication networks that expand the capitalist economy and produce new power structures carry the information they need in the processes of understanding and making sense of the world, which establish the social relations of production or, in other words, live within the given social links. User satisfaction or social media communication mainly emphasizes the subjectivity and psychological well-being of the users, privacy and resolution of the private sphere, and social media. However, social media platforms are a part of the market and are commercial structures. Priority of their missions are capital accumulation, which requires us to remember that they are a commercial company, analyze them as a technology, and see social relations as activators. Such a view establishes the media as a dynamic area of struggle between the audience (labor) and the media owners (capital). It emphasizes that it has become a process of surplus value through the media in its free time.

More time in the day can be spent on Facebook by communicating and socializing. Self-surveillance technologies, such as Foursquare or Facebook Locations, keep users close to friends by expanding the duration of their active presence in the social network. Furthermore, the information gathered about the viewer is much more precise and distinct. For this reason, social media users have the unique ability to run in the process of capital accumulation to be based on information production through communication and sociality. This explanation of the social relations of the Internet and social networks is striking. It critiques all approaches that address social media only as part of participation, freedom of expression, and democratization. Because, within the social relations of production, it requires re-thinking labor and enables us to understand the Internet and social media as the basis for developing the cyber-capitalist economy and the platforms containing the knowledge of capitalism's destruction.

Social media with innovative tools, inputs, and outputs has become an intersection of social culture, psychology, pedagogical education, criminal law, religion, and behavioral economics. It can be virtual or online, but if it contains immoral elements that disrupt public order or deliberately upset their work/social friends, they can sometimes turn into heavy baggage that is very difficult to carry spiritually. What is missed for young people now and for future generations is that all searches in social media channels should be based on seeking the best morality and living humanly. On the other hand, social media, which represents the pinnacle of innovative technology, can suddenly become the center of cruelty and insobriety while being aware of and persecuting (i.e., a moral stance). Just like a scalpel that saves lives in the surgeon's hands or is a murder tool in the hands of the killer.

7. A Discussion on Social Media as A New Way of Perception Engineering

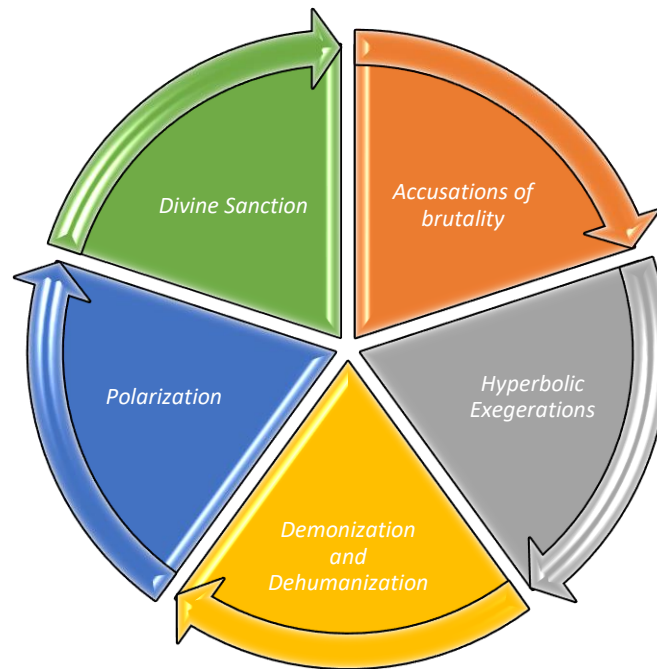
Perception carries the meaning of being aware, understanding and recognizing. Perception begins with the sensing process. At the same time, the data perceived through the senses are shaped according to the experiences and knowledge of the person. In this sense, the perception process may show individual differences. Perceptions of people are tried to be directed through the perception formation process. Today, new communication technologies are frequently used for perception creation and perception management. In this way, it is possible to reach large masses in a short time. Thanks to new communication technologies, access to the masses has become easier and certain strategies have been developed to direct the target audiences (Saydam, 2005). Regardless of the name of the effort to direct the kits in the historical process, there has always been and will always be an effort to direct the masses towards predetermined targets by manipulating the information applied to the target audience. In this way, the masses left under the influence of information will begin to change their attitudes and behaviors as desired (Arğın, 2021).

Thanks to the current advanced technology, the messages desired to be conveyed can be delivered to the target audiences more efficiently by using perception management techniques through social media tools. The impact of these messages on people may vary in proportion to their wishes and needs and the level of social media use. Twitter, Instagram and Facebook are the leading social media platforms where perception management is done the most. Without checking the accuracy of their content, the news that comes before people spreads rapidly, and fake comments or support can be made. Since disinformation means false, biased or inaccurate information and intentionally spread, this misinformation spreads faster than factual information because it is tailored to be interesting. Especially during the first year of coronavirus epidemic, there were a lot of online rumors and fake news. Fake news contains information that is quite surprising or triggers people's anxiety compared to accurate information because fake news aims to attract people's attention. As a different dimension of perception management on social media, we can give an example of the presidential elections held in the USA in 2016. It was revealed that Cambridge Analytica had accessed confidential information on 50 million Facebook accounts to influence the presidential election at the time of the election. In doing so, Cambridge Analytica used an algorithm that extracts the psychological profiles of users interacting with Facebook. They classified people according to their personality traits. Profiles of Facebook users were created according to the content they liked, their shares, the videos and photos they commented on (Wallin, 2013). Cambridge Analytica worked with Donald Trump's campaign before the 2014 elections and used user data. Therefore, each share and like/unlike on social media gives a clue about who we are. However, for any content shared on social media, the message that each person receives and perceives is not the same. People's past life experiences, social lives, cultural differences, and moral structures can also affect the message they receive. In other words, people from different cultures may tend to interpret the same message

quite differently. We may all have been exposed to perception management in a way that we did not realize while browsing social media. We overlooked a situation in a video we watched, or any visual or written text we saw may have caught our attention. We may have shown a positive tendency towards it.

In the same way, with the advertisement of a product that we do not even think to buy, we may consider buying that product and even find ourselves clicking on the product and paying. Another event of perception management is subliminal messages that try to change your choices and decisions. A subliminal message is a sign or message embedded in another object. They are designed to not be noticed easily. Some subliminal messages can be used in advertisements, especially for products whose sales are desired to be increased, and people may attempt to buy those products without realizing it. As a result, social media tools and perception management techniques can ensure that the messages desired to be given can be delivered to the targeted people and turn to the targets determined in line with their wishes. Human psychology, which is open to external factors by nature, can effectively manage perceptions and the psychological power of social media on communities. For this reason, it is necessary to be skeptical of the information read and obtained in social media and diversify the information channels. It will only be possible for people to reach the true meaning of the messages they access when evaluated with reliable, straightforward, evidence-based information (Aksakalli, 2020).

Figure 2. Main Techniques used in social media for perception engineering



Some of the Perception Management techniques they have stated as “*Accusations of brutality, Hyperbolic Inflatons, Demonization and Dehumanization, Polarization and Divine Sanction*” in their book “*War and Counter-War*” by Toffler (1995) can be applied on social media:

Accusations of brutality

The other party is accused of committing immoral and brutal acts with this method. Thus, the opponent is shown as someone who shockingly commits inhuman acts. E.g.;

- Make propaganda that exploitations of children or young activists, women, and the elderly.
- A pervert’s crime is generalized to a whole community due to physical intimacy, and his crime is shown as the community’s crime.
- Give different news about immorality of corruption of political leaders to instigate social dissent.

The most important and striking example in this regard is the accusations made against the late Prime Minister Adnan Menderes of Tukey in the Yassada courts after the 1960 coup that he slaughtered young people in a meat grinder. During the trial until that time, a committee was formed on this subject, but no evidence was found. This perception created before the coup was a perception operation to legitimize the coup. No evidence was found on these issues during the proceedings. The same situation applies to Libya, Iraq and other middle east countries.

Hyperbolic Inflatons:

This method is used to exaggerate the beliefs or actions of the other party and make them terrible. A small mistake anyone can always make is magnified, and exaggerated generalizations are made about the person. E.g.;

- Some innocent words and behaviors of the other party are deliberately exaggerated and shown as treason.
- Based on some personality traits, it is claimed that the other party is a dictator.

The counter-power uses intense methods to create public opinion in this way. In recent years, Turkey’s perception operations have revealed that an institution with a security and media component of law enforcement origin can be created that can counter-operate in this regard.

Demonization and Dehumanization

With this method, all the other party’s actions are portrayed as bad, as if there is no hope of salvation or transformation. The person on the other end is stubbornly and persistently compared to demonized figures of the past. E.g.;

- The other side’s name is cruel. Hitler is constantly mentioned side by side with rulers.

- Every word or action of the other community or party is constantly described as disgusting, dishonorable, and abominable.
- Propaganda is made that the Antichrist is the person on the other side.

Polarization:

It is claimed that the other side is constantly wandering in opposite poles. His beliefs, words, and deeds are reflected as opposite to his followers. It is constantly shown that he is not like us and has different beliefs, morals, and experiences. Those who use this method present themselves as good heroes and the other side as terrible guys. E.g.;

- It is constantly emphasized that he cooperated with terrorism, abused religion, or sold the country.
- Clothing that contrasts with the person's dressing style representing the other party or family is propagated.

The republican period is full of this perception of danger discourse. The May 27, 1960 coup and the following ones had the aim of crushing reactionism, and the society was kept in a state of being against each other.

Divine Sanction

In general, this method is used by so-called clergy who claim to represent religion. Whatever he does, he tries to convince people that he is doing everything according to Allah's will and that it is not possible for him to do anything wrong. However, the other party has the same belief, his own religious leader's political, etc. He tries to show that he is superior and holy to his leader. E.g.;

- They constantly repeat the comments in magazines and newspapers, which reveal that all the actions and words of the other party are unjust, but that every word and action of their religious leader is wise.

In this context, people do not always act with cost-profit calculations. While there is sometimes a rational choice in religious devotion, other factors irrationalities may come into play. The fundamental question here is: "*Can the demand for religious life be measured, or how can it be measured?*" Such a measurement can be made indirectly only by identifying the fundamental human problems that religion can answer. Although religious commodification is not new, the economic model of religion has been criticized for treating the concept of religion as a commercial commodity. This tendency is argued by Turkish opponent political parties against the ruling powers to have mobilized critical religious figures, communities, and institutions to support government policies. Those who approach religion economically use the language of the economy as a helpful tool when describing people's religious behavior. On the other hand, the economization of the language of religion is a game, a deception of late modernity.

The ruling powers of global economy criticize that everything should not be handled solely within the framework of radical rational and materialistic approaches in the form of homo-economicus; since solidarity, devotedness, frugality, and sincerity are expected to be the critical essence of sustainable societies. Although the rational choice theory seems to be suitable to be applied to the religious backed economic choices, it does not consider the existing structures, historical and socio-cultural contexts. In other words, it is the opposite of real life when viewed in a realistic sense. Suppose rational choice theory applies the reality of human life, temporary and transient structures, and the possibility of winning everlasting capital. In that case, it can be reasonable to consider religion and faith in assessing decisions based on rational choices.

8. Conclusions and Recommendations

Perception engineering activities can have negative effects on the rational expectations of economic actors, leading to misinformation, cognitive biases, distortions of market signals, reduced confidence, and inconsistent policies. These effects can impact the overall functioning of the economy, potentially creating market inefficiencies and undermining trust in economic institutions. To counter these negative consequences, it is crucial for economic actors to stay informed and critically evaluate information, while governments, businesses, and media should prioritize transparency and honesty in their communications about economic events, policies, and trends.

In the context of entrepreneurship and rational expectations theory, it is essential to consider the influence of social, cultural, religious and psychological factors on economic decision-making, as well as the potential impact of perception engineering on the formation of rational expectations. Social media has become an effective and efficient virtual public space, and just as acts against public order are sanctioned in the actual general area, the same should be valid for social media which is constantly growing and renewing itself via innovative AI based algorithms. AI has the potential to change perceptions of economic agents and impact perception management in significant ways. While AI-powered tools can help organizations make better decisions based on accurate and timely information, the use of AI in perception management via social media raises ethical concerns and requires careful consideration of the potential risks and benefits.

Therefore, Turkey can deal with perception engineering and biased rational expectations with the reasonable measures. Here are some prudent suggestions developed for policy makers and governments to address the challenges posed by perception engineering and its impact on rational expectations:

- *Encourage transparency and honest communication:* Governments, businesses, and media should be transparent and honest in their communication about economic events, policies, and trends. This can help reduce misinformation and cognitive biases that may distort rational expectations.
- *Promote critical thinking and media literacy:* Encourage people and economic actors to stay informed and critically evaluate the information they receive from various sources. This can help them make better decisions based on accurate information and reduce the impact of perception engineering.
- *Regulate social media platforms:* Implement greater regulation of social media platforms to prevent the spread of false information and biases, which could lead to distorted perceptions of reality and undermine rational expectations.
- *Strengthen diplomatic relations and strategic communication:* Maintaining strong diplomatic relations and engaging in strategic communication can help mitigate the negative effects of perception engineering and biased rational expectations.
- *Foster fact-based narratives:* Promote fact-based narratives in public discourse to counteract the influence of perception engineering and help maintain rational expectations among economic actors.
- *Monitor and address the impact of perception engineering on entrepreneurship:* Recognize the potential influence of perception engineering on entrepreneurs and work to create an environment that supports genuine innovation and economic growth, rather than one that is manipulated by perception engineering activities.

- *Encourage consistency in economic policies*: Ensure that economic policies are based on sound economic principles to reduce confusion and uncertainty among economic actors, which can result from inconsistent policy changes driven by perception engineering.

By addressing these issues, policy makers and governments can help mitigate the negative effects of perception engineering on rational expectations and foster a more stable and transparent economic environment.

Data availability: The datasets generated and analyzed during the current study are available in the World Bank Indicator, Materialflows.net, World Intellectual Property Organization repository.

Conflicts of Interest: The authors declare no conflict of interest.

Compliance with ethical standards

Competing interests: The authors declare that they have no competing interests.

Ethics approval and consent to participate: Not applicable.

Consent for publication: Not applicable

Funding: Not applicable

References

- Aksakallı G., (2020) Sosyal Medya Algimizi Nasıl Yönetiyor?, <https://www.guvenliweb.org.tr/blog-detay/sosyal-medya-almimizi-nasil-yonetiyor?>. Access on 15 January 2023.
- Arğın, E. (2021). Algi, Sosyal Algi ve Algi Yönetiminin Sosyal Medyada Kullanımı, *Iksad publications*, Isparta Türkiye.
- Bakan, İ. & Kefe, İ. (2012). Kurumsal Açından Algi ve Algi Yönetimi . *Kahramanmaraş Sütçü İmam Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 2 (1), 19-34. Retrieved from <http://iibfdergisi.ksu.edu.tr/tr/pub/issue/10264/125884>.
- Baltacı, Ö. (2029). The Predictive Relationships between the Social Media Addiction and Social Anxiety, Loneliness, and Happiness, *International Journal of Progressive Education*, v15 n4 p73-82 2019, <https://eric.ed.gov/?id=EJ1224299>
- Baron, A. R. (2000). Psychological Perspectives on Entrepreneurship: Cognitive and Social Factors in Entrepreneurs' Success *Current directions in psychological science*, 9(1), 15-18, <https://doi.org/10.1111/1467-8721.00050>.
- Bayrakçı, O. (2021). Perception Management in the Relationship of Power and Hegemony. *Van Yüzüncü Yıl University the Journal of Social Sciences Institute*, 52, 93-108
- Blanchard, O. J. & Watson M. W. (1982). *Bubbles, Rational Expectations and Financial Markets*. Crises in the Economic and Financial Structure, Paul Wachtel, editor, pp. 295-316. Lexington, MA: D.C. Heathand Company,
- Bull, C., & Frydman, R. (1983). The Derivation and Interpretation of the Lucas Supply Function. *Journal of Money, Credit and Banking*, 15(1), 82-95. <https://doi.org/10.2307/1992142>
- Cukierman A., Lustenberger T. & Meltzer A. (2020). The Permanent-Transitory Confusion: Implications for Tests of Market Efficiency and for Expected Inflation During Turbulent and Tranquil Times. In: Arnon A., Young W., van der Beek K. (eds) Expectations. *Springer Studies in the History of Economic Thought*. Springer, Cham. https://doi.org/10.1007/978-3-030-41357-6_12
- Elsbach, K.D., (2003). Organizational Perception Management, Research in Organization Behavior, 25, 297-332.
- Erbay, Muhammet & M. Mert Aslan (2019) "Algi Yönetiminde Sosyal Değerlerin Etkisi". *Ulakbilge*, 38 (Temmuz): s. 497-504. doi: 10.7816/ulakbilge-07-38-04.
- Gao, H., Xu, Y., Xu, S., & Mao, K. (2021). Social Media Analytics with Artificial Intelligence: A Review. *IEEE Transactions on Computational Social Systems*, 8(3), 607-620.
- Gencoglu, O., & Hancer, C. (2020). Artificial intelligence in finance: A review. *International Journal of Financial Engineering*, 7(4), 2050020.
- Gürsoy, B. G. (2020). Algi Yönetimi Türü olarak Algıda Zihinsel Çöküntü ve Toplumsal Ayırışmada Beklentiyönetimi, Master Thesis, Police Academy, Gazi.
- Işık, C. (2013). The importance of creating a competitive advantage and investing in information technology for modern economies: An ARDL test approach from Turkey. *Journal of the Knowledge Economy*, 4, 387-405.
- Işık, C. & Türkmenadağ, T. (2016). Atatürk Üniversitesi turizm fakültesi öğrencilerinin bireysel yenilikçilik algılarının belirlenmesi. *Gazi Üniversitesi Turizm Fakültesi Dergisi*, (1), 70-99.
- Işık, C., Küçükaltan, E. G., Çelebi, S. K., Çalkın, Ö., Enser, İ., & Çelik, A. (2019a). Tourism and entrepreneurship: A literature review. *Journal of Ekonomi*, 1(1), 1-27.
- Işık, C., Küçükaltan, E. G., Çelebi, S. K., Çalkın, Ö., Enser, İ., & Çelik, A. (2019b). Turizm ve girişimcilik alanında yapılmış çalışmaların bibliyometrik analizi. *Güncel Turizm Araştırmaları Dergisi*, 3(1), 119-149.
- Karaçor, Z. (2014). Rasyonel Beklentiler Kuramında Enflasyon. *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi*, 1 (3), 143-150. <https://dergipark.org.tr/tr/pub/selcuksbmyd/issue/11289/134928>
- Künü, S. & Duran, S. (2021). Understanding COVID-19 virus pandemic in terms of behavioral economics in terms of how people think and learn. *Journal of Ekonomi*, 3(2), 111-118.
- Serttaş, A., Sarıkaya, T. & Ünğan, E. (2022). Sustainability as a communication policy created by the economic system. *Journal of Ekonomi*, 4(2), 74-81.
- Masca, M. (2007) "Keynes Sonrası", 1-166, http://www2.aku.edu.tr/mmasca/iddt_XIII_hafta_keynessonrasi.PPT 09.08.2007.
- Müslümov, A., Hasanov, M. & Özyıldırım, C. (2002). Döviz Kuru Sistemleri ve Türkiye'de Uygulanan Döviz Kuru Sistemlerinin Ekonomiye Etkileri, *TÜGIAD Ekonomi Ödülleri*, 1-29.
- Ökte, K. (2011). Makro İktisatta Son Gelişmeler: Çok Hızlı Bir Hatırlatma Dersi . *İstanbul Üniversitesi Siyasal Bilgiler Fakültesi Dergisi* , 0 (23-24) , 225-240 . <https://dergipark.org.tr/tr/pub/ijsiyasal/issue/610/6159>
- Pittman M. (2018). Happiness, Loneliness, and Social Media: Perceived Intimacy Mediates the Emotional Benefits of Platform Use, Vol. 7 NO. 2 The Journal Of Social Media In Society, <https://thejsms.org/index.php/JSMS/article/view/384>.

- Saydam, A., (2005). İletişimin Akıl ve Gönül Penceresi Algılama Yönetimi, Rota Yayınları, İstanbul.
- Steger M. & James P. (2020) Disjunctive Globalization in the Era of the Great Unsettling , Theory, Culture & Society <https://doi.org/10.1177/0263276420957744>.
- Taylor, J. B. (1981). Estimation and Control of a Macroeconomic Model with Rational Expectations. Rational Expectations and Econometric Practice, Volume 2 (Lucas, Robert E. and Thomas J. Sargent, editors). Minneapolis, MN: University of Minnesota Press.
- Toffler, A. & Toffler, H. (1995). War and Anti-War: Making Sense of Today's Global Chaos, Grand Central Publishing
- Utma, S. (2018). Dijital Çağda Medyanın Psikolojik Gücü: Algı Yönetimi Perspektifinden Kuramsal Bir Değerlendirme. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 2903-2913. <https://dergipark.org.tr/tr/pub/ataunisobil/issue/42067/510493>
- Wallin, M. (20013). The Challenges of the Internet and Social Media in Public, <https://t.ly/rEWp>
- Wang, Y., Li, H., Li, Y., & Li, C. (2021). Deepfake detection using AI and blockchain. *Computer Communications*, 174, 1-8.
- Wheatley T., Kang O., Parkinson C. & Looser C. E., (2012). From Mind Perception to Mental Connection: Synchrony as a Mechanism for Social Understanding, <https://doi.org/10.1111/j.1751-9004.2012.00450.x>
- Yıldırım, K. D. (2001). Makroekonomi, Eğitim, Sağlık ve Bilimsel Araştırma Çalışmaları Vakfı, Yayın No:145, Eskişehir.



Ahmet Efe, Ph.D. (**ORCID ID: 0000-0002-2691-7517**) is a Senior Field Auditor at the International Federation of Red Cross and Red Crescent (IFRC), based in Ankara, Turkey. He holds a Bachelor's degree in Economics, a Master's degree in Macro-economics, and a Ph.D. in Public Administration. Efe has extensive experience working in inspection, internal audit, procurement and logistics coordination for various organizations, including the Ministry of Forestry and the Ankara Development Agency. He is also a part-time lecturer at several universities on cyber security, IT audit and MIS domains and has published many multidisciplinary articles. Efe is a member of ISACA, PMI, and IIA and holds several international professional certifications, including CISA, CRISC, and PMP.