

# Original Article: Theory of Cognitive-Social Learning and the Effects of Social Phobia in the Treatment of Anxiety Disorders

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## ABSTRACT

Social phobia evolved from behaviorism, and its spread was the result of a critique of what is called inflexibility and the simplistic ideas of pure behaviorism. Bandura supports the theory that fear and anxiety are learned, but enumerates four social mechanisms for learning: First, fear may be learned through classical conditioning in exactly the same way as described. Second, according to Bandura, the proxy experience can be considered important. This process is also called role modeling. Third, symbolic education, which refers to learning through education, reading, or saying that certain things are threatening, painful, or forbidden. Fourth, Bandura also refers to symbolic logic, which is potentially important in creating anxiety. One may conclude that something is dangerous. This process may be logical or irrational. Therefore, social cognitive learning theories emphasize the importance of combining learning principles with the role of individual thinking and reasoning in causing anxiety disorders. Social phobia is common in all cultures and its six-month prevalence is about 2 to 3 percent.

## Introduction

People with social phobia often worry about evaluating themselves, and this expected anxiety leads to complete avoidant behavior. Avoidance behavior plays a role in the formation of social anxiety and panic with great complexity [1-3]. The extent of avoidance behavior such as not having eye contact is mainly due to avoiding receiving negative feedback from others. Social anxiety is an important criterion in most of the questionnaires

related to interpersonal relationships, and such people with high social anxiety have a high score in general sensitivity. In the "Statistical Diagnostic Guide to Mental Disorders", whenever social anxiety exceeds the normal level, it is considered as a type of anxiety disorder and is defined as "social panic [4-6]. This source of education is considered as one of the treatment methods for this disorder. Unlike other fears, social fear is said to be equally common in men and women and is more closely linked to depression and other psychiatric disorders than other fears [7-9]. People with social phobia

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have problems in all social situations outside the family environment, such as fear of talking and lecturing in public, eating in public, encountering the opposite sex, and fear of vomiting in public. People with a social phobia of flushed face, hand tremors, nausea, and urgency to urinate are tormented, and sometimes the person is convinced that one of the side effects of anxiety is the main problem. Thus, the symptoms of the disease may turn into panic attacks. Avoiding them collectively leads to social isolation in many cases [10-13].

What can be considered as a common factor in all of these explanations? It is anxiety. The frequency of behaviors leading to the social phobia in clinical populations and the importance of the effectiveness of gradual desensitization techniques along with relaxation and daring in the educational, occupational, and social activities of these populations and increasing the adaptability of people in social reflections, the use of gradual desensitization techniques and the need for boldness and social skills training are essential. Clinical research clearly demonstrates the usefulness of gradual desensitization and daring techniques in the treatment of anxiety-related behaviors in patients with social phobia and the reduction of passive, aggressive, anxious, and domineering behaviors [14-17]. Therefore, the use of centers that use effective therapies in the treatment of anxiety-related behaviors of social anxiety disorder, along with addressing the mechanism of such a disorder in the social psychology of the Iranian people for its prevention and treatment is a very undeniable and fundamental necessity [18-21].

### Social Phobia

Social phobia is a type of anxiety that is characterized by extreme fear and anxiety in social situations and disrupts at least part of a person's daily activities. Social anxiety is a very debilitating disorder that can affect many aspects of a person's life. In severe cases, social anxiety can reduce a person's quality of life to a minimum. Some sufferers may not leave home for weeks or give up many social situations, such as work or study [22-24].

Social anxiety can be of a specific type, that is, when only certain social situations cause anxiety, like a public speech or an all-inclusive speech.

Pervasive social anxiety usually involves a type of intense, chronic, and persistent anxiety that one has about judging others about one's appearance or behavior or being embarrassed and humiliated in the presence of others. While the sufferer usually notices that this feeling of fear and anxiety is irrational or excessive, it is very difficult for him to overcome this fear. A maximum of about 13.3% of people at some point in their lives have criteria of social phobia, which is 2 to 3 in the ratio of men to women. There is chaos and stuttering. Anxiety attacks may also occur in cases of extreme anxiety and fear. Early diagnosis and intervention in this disorder can help to minimize the symptoms and slow its progression and prevent further complications such as severe depression. Some sufferers use alcohol or drugs and psychedelics to reduce fear, increase self-confidence, and improve social functioning [25-27].

Given that this disorder is not well known in many parts of the world and is caused by personality disorders, it is assumed that people with social phobia usually turn to self-medication. Another factor that is effective in this issue is the avoidance of patients to see a doctor due to the disorder itself [28]. These issues increase the risk of drug addiction, psychedelics, and dangerous drug interactions. The person can be treated with medication or psychotherapy, or both. Research has shown that cognitive-behavioral therapy individually or in groups is effective in treating social anxiety [29]. The purpose of this method is to change the mental patterns and physical reactions of the individual in socially anxious situations. Although these methods are widely used today, many patients with severe social anxiety believe that these methods are not effective in more severe cases alone and drug treatments usually lead to better results [30-32].

Attention to the disorder has increased widely in the United States since 1999, after some medications for the treatment of social anxiety disorder were approved and marketed. Some prescription drugs include antidepressants, including selective serotonin reuptake inhibitors such as fluoxetine, paroxetine (not available in Iran), sertraline and citalopram, serotonin, and norepinephrine reuptake inhibitors, and monoamine oxidase inhibitors [33-35]. Other medications commonly prescribed for this purpose include beta-blockers and benzodiazepines, and some newer

antidepressants. Although antidepressants have very few side effects and are very safe and are known as the first line of treatment for social anxiety, there is ample evidence that this group of drugs is ineffective in severe cases [36]. Recently, there has been evidence of a disorder in the dopaminergic system of patients with social anxiety. Many people with social anxiety also consider dopaminergic drugs such as amphetamines to be the most effective drugs in the short-term treatment of this disorder. Benzodiazepines and monoamine oxidase inhibitors have also been reported to be very effective. However, the potential dangers of monoamine oxidase inhibitors make these drugs the last resort in treatment [37-39].

### Symptoms of Social Anxiety

A person with social anxiety has no desire to start a relationship with others and avoids any situation that may be exposed to the judgment of others with a sense of fear. A person's perception of social situations in which his or her personality, appearance, or abilities may be poorly assessed and evaluated by others can be real or imaginary. People with social anxiety are concerned about how they look to others. They are usually aware of their appearance and behavior in general and have high standards for their behavior and performance. The sufferer tries to make a positive impact on others and give a normal appearance, but at the same time, he believes that he is not able to do so. Before confronting an anxious social situation, these people repeatedly imagine the situation mentally and review the potentially anxious issues and situations and how to deal with them. They examine events that may be embarrassing to them, and even their thinking does not end after dealing with that situation, but they examine their behavior until the next few days and usually blame themselves for their mistakes and poor performance [40]. People with pessimistic social anxiety are more than others and interpret normal or vague speech with a negative look. Many studies have shown that these people remember negative memories better than others. Other characteristics of these people include the habit of reading the mindset of others, focusing on negative events, underestimating their strengths, over-generalizing problems, and avoiding intimate relationships. Some of the situations that cause anxiety in patients are as follows: a) Poor judgment

of others, disapproval or criticism by others, b) meeting others for the first time, c) being the center of attention, for example, when entering a house where others are sitting, d) being monitored while doing work, e) inviting others or being invited, f) specific social conditions such as anger and aggression, and g) situation in which one must respond decisively or comment.

### Clinical Features of Social Phobia

The characteristic of panic disorder is that when a person is exposed to a special situation or something that he is afraid of or even expects to be exposed to them, he feels very anxious. They are prone to panic attacks and experience panic attacks when dealing with a source of fear. The nature of the panic disorder is that the sufferer tries to avoid the situation of the source of fear, and this in itself creates problems for sufferers. Many of these patients seek refuge in alcohol and other ailments as a result of their illness. In examining the patient's mental state, an important finding is the existence of irrational fear and inconsistency that the patient feels about the situation of the source of fear. On the other hand, in some of these patients, there are depressive symptoms and it is generally estimated that one-third of patients with panic disorder also suffer from a major depressive disorder [41].

Fears, especially social fears, are characterized by the onset of severe anxiety when a patient is confronted with a particular situation or object, or even when anticipating exposure to that situation or object. By definition, sufferers of social phobia try to avoid fearful stimuli. Some patients experience a great deal of discomfort in dealing with anxious situations, and as mentioned, another way to avoid panic stress is to find many patients with panic disorders, drug-related disorders, especially alcohol use. About one-third of patients suffer from depression [42].

### Phobic anxiety disorders

In this group of disorders, anxiety appears only or mainly in certain situations or towards certain objects (outside the person), which are usually not dangerous. So, these situations or objects are avoided or tolerated with horror. Phobic anxiety is not mentally, physiologically, or behaviorally distinguishable from other types of anxiety and can range in severity from mild discomfort to panic.

Anxiety may focus on single symptoms, such as palpitations or feelings of weakness, and is often accompanied by secondary fears of death, loss of control, or insanity. Awareness that other people do not consider this situation dangerous or threatening does not reduce anxiety. The mere notion of entering a frightening situation outside of the person implicitly implies that many fears are related to the existence of disease (phobia) and malformation (malformation), which are classified in the category of morbidity itself. But if the fear of disease is prominently and frequently caused by infection or contamination, or simply the fear of psychological methods (injections, surgeries, etc.) or medical center (dental centers, hospitals, etc.), the use of a class (specific fear) will be more appropriate. Phobic anxiety is often associated with depression. Pre-existing phobic anxiety becomes almost constant during a period of severe intermittent depression [43].

Some periods of depression are associated with temporary phobic anxiety, and depressed mood is often seen in some fears, especially transient phobias. Whether or not both diagnoses are phobic and periodic anxiety is determined by whether one of them is clearly dominant at the time of diagnosis. If the criteria for depression should be set, or only one of them, depending on whether one of them was clearly present before the other or the specific depressive disorder existed before the onset of panic symptoms, the first should be of diagnostic priority. Most phobic disorders, other than social phobias, are more common in women. In this classification, a panic attack occurring in a fixed phobic position is considered a manifestation of panic disorder, which should have diagnostic priority. Also, such panic disorders should be considered as the main diagnosis only in the absence of any of the mentioned fears.

### Components of Social Fear (Anxiety)

For the first time, Lang (2014) proposed a three-system model of fear and emotion. He believed that anxiety could not have only one system, but also cognitive, verbal, physiological, and behavioral components. These components can change uniformly and unequally, and each individual's anxiety may result from the involvement of one or all of these systems.

### *Physiological dimension*

The autonomic nervous system (ANS) and the endocrine glands play an important role in anxiety. It can be said that the autonomic nervous system mediates the central nervous system and endocrine glands. The autonomic nervous system in most cases causes the activity of the endocrine glands and the endocrine glands modulate the physiological activity of the nervous system by feedback. The autonomic nervous system function is to keep the body constant in a changing environment.

The activity of the autonomic nervous system and endocrine glands causes symptoms that are very important in the diagnosis of anxiety. When anxiety occurs, restlessness and muscle tension are evident, the person speaks faster, walks, and this intense stress causes a waste of energy and fatigue, which is very much explained by pressure. Feeling of pressure in the forehead and temporal muscles causes a kind of tension headache and the person feels something tightly tied around his head and usually complains of this pain in the forehead. Vibration is more noticeable in anxious patients due to muscle tension, during work, willingness, concentration, and accuracy decrease, leading to the patient's psychological complaints, and the idea that the individual may not have lost his or her mental power is a very pronounced motor manifestation in a state of anxiety. Chronic anxiety is also usually associated with psychosomatic disorders [44].

In people with social phobia, physiological symptoms may be exacerbated when they are exposed to a stimulus or a frightening event and they do not experience panic attacks, and when they see a situation as threatening, they may be highly aroused. When an infected person thinks he or she is being evaluated and cared for by others, physical symptoms such as palpitations, sweating, and tremors appear, and general direct autoimmune arousal occurs. One hypothesis that can be hypothesized is that the level of arousal and activity of the autonomic nervous system is more severe in people with panic disorder than in normal individuals, or that they may pay more attention to these changes.

Johnson, (2010) focusing on 34 people with social phobia, showed that people with social phobia are more sensitive to their physiological changes, focusing on the feeling of inner discomfort

and the presence of distressing fears often lead to increased symptoms or long-term anxiety. Such people believe that others pay attention to its physiological symptoms and therefore avoid social evaluation situations. Amiz (2010) reported that individuals with social phobia experience more observable symptoms in their physiological arousal.

### *Behavioral dimension*

In the three-system model, the behavioral component refers to the major behavioral component with real avoidance of the frightening situation. For a person whose job requires him to speak in front of a small or large audience, prolonged avoidance may lead to a lack of progress or job loss. A person who experiences high levels of anxiety in many social situations is more likely to become isolated and depressed as a result of such avoidances. Some socially anxious people may show less avoidant behavior, but in certain situations, it can cause them severe discomfort. In these cases, there is a strong desire to avoid, although behavioral avoidance may reduce anxiety, but as a result, it causes the person to always look down on you and feel guilty. Verbal and non-verbal behaviors shown by people with social anxiety in frightening situations need to be tested. For example, social skills are significantly poor in people with high social anxiety than in people with low social anxiety.

On the other hand, people with social phobia may have the necessary skills, but may not be able to behave appropriately in certain situations. People with social phobia are not able to adequately demonstrate their skills due to the mental preoccupation they have with their fears.

### *Cognitive dimension*

The cognitive component of social phobia reflects individuals' mental perceptions of frightening events, including predictive reactions and post-behavioral evaluation. Blackburn (2010) stated that patterns of social fear and avoidance may depend on the following factors: a) Internal speech, which is one of the phrases that a person expresses to himself and has a debilitating aspect, b) the excessive negative evaluation of social behaviors, c) having high standards for doing things, d) selective attention and memory for negative

information about a person or behavior performed by a person, e) a pathological pattern of documents about the causes of success and social failure.

Cassiope and Merleau and Glass *et al.* (2012) have shown that people with social phobia use more negative self-expression than normal people. These expressions of self-expression are defined as positive if they make it easy to do something, and as negative if they have a deterrent effect. Also, people with the disease have a low sense of self-sufficiency, which makes them feel weak. For example, a person may evaluate his or her performance poorly because they are clearly weak or his or her criteria are too strict and unattainable. Likewise, Abanion (2014) found that people with social phobia evaluate feedback quite negatively. Blackburn and Bishop (2014) consider social fear as the result of how a person is predicted or evaluated in social situations. When a person aims to make a particular impact on others, he or she is therefore concerned about how he/she will affect the evaluators. Similarly, Kahan (2019) stated that an individual's assessment of stressors and threatening factors lead to tendencies or avoidance responses. A positive evaluation causes a tendency response and a negative evaluation leads to avoidant behavior as an adaptive method.

### *Conclusion*

The cognitive patterns used to describe different anxiety disorders have common features: First, it is assumed that people become anxious in response to certain stimuli because they interpret them as much more dangerous than they really are. Second, these unrealistic interpretations persist because patients engage in cognitive-behavioral strategies to prevent frightening events. Because these fears are unrealistic, the main effect of these strategies is to prevent the rejection of their negative beliefs. Third, in many anxiety disorders, the symptoms of anxiety are sources of a perceived danger that produces a series of vicious cycles, vicious cycles that contribute more to the persistence of the disorder. They provide a cognitive model for community phobia. Based on early experience, patients with social phobia form a series of assumptions about themselves and their social status. For example, "Even though they do not like me in appearance, they do not like me. Although the love of others includes me, I am worthless. If I express my

anxiety, others think I am abnormal, they will reject me. These assumptions will cause them to interpret social interactions negatively and see them as a sign of danger. For example, if a person with social phobia is talking to someone at a party and the person looks out the window in front of a glance, the phobic person may think, "I'm boring." This interpretation activates the anxiety program. In this way, they feel themselves in a closed system in which the information system is embedded, reinforces the belief in the danger of negative judgment, and neglects and avoids opportunities to invalidate that belief. Nevertheless, the distress of "community fears" is not limited to times when they are in a social situation. Many people with social phobia experience significant anxiety while waiting for a social interaction and also report a range of negative emotions after the event.

## References

- [1] S.M.S. Mirnezami, F. Zare Kazemabadi, A. Heydarinasab, *Progress in Chemical and Biochemical Research*, **2021**, *4*, 191-206. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [2] S.A. Khoddami, A. Esfandiari, A. Samimi, *International Academic Journal of Science and Engineering*, **2016**, *3(1)*, 91-99. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [3] F.E. Sadr, Z. Abadi, N.E. Sadr, M.M. Fard, *Ann. Romanian Soc. Cell Biol.*, **2021**, *25*, 6839. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [4] T.A. Izadi, A. Borjali, A. Delavar, H. Eskandari, *Danesh-e-Entezami*, **2009**, *11(344)*, 182-207. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [5] E. Amouzad Mahdiraji, M. Sedghi Amiri, *Journal of Engineering in Industrial Research*, **2020**, *1(2)*, 111-122. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [6] E. Amouzad Mahdiraji, *Signal Processing and Renewable Energy*, **2020**, *4(3)*, 67-80. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [7] E. Amouzad Mahdiraji, N. Ramezani, *International Academic Journal of Science and Engineering*, **2016**, *3(9)*, 1-12. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [8] E.A. Mahdiraji, N. Ramezani, *International Journal of Science and Engineering Investigations (IJSEI)*, **2020**, *9(96)*, 24-28. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [9] E. Amouzad Mahdiraji, N. Ramezani, *Signal Processing and Renewable Energy*, **2020**, *4(1)*, 37-50. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [10] E.A. Mahdiraji, N. Ramezani, *International Journal of Science and Engineering Investigations (IJSEI)*, **2020**, *9(96)*, 35-42. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [11] E. Amouzad Mahdiraji, M. Sedghi Amiri, *Journal of Engineering in Industrial Research*, **2021**, *2(1)*, 7-16. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [12] E. Amouzad Mahdiraji, *Electronic and Computer Engineering*, **2020**, *6*, 245-250. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [13] E. Amouzad Mahdiraji, A. Yousefi Talouki, *Journal of Chemical Reviews*, **2021**, *3(1)*, 40-49. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [14] E. Amouzad Mahdiraji, *Computational Research Progress in Applied Science & Engineering*, **2020**, *6*, 238-244. [[Google Scholar](#)], [[Publisher](#)]
- [15] E. Amouzad Mahdiraji, *Gazi Mühendislik Bilimleri Dergisi (GMBD)*, **2020**, *6(2)*, 138-144. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [16] E. Amouzad Mahdiraji, *Journal of Chemical Reviews*, **2021**, *3(2)*, 147-159. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [17] E. Amouzad Mahdiraji, M. Amiri, *Journal of Engineering Technology and Applied Sciences*, **2020**, *5(3)*, 133-147. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [18] E. Amouzad Mahdiraji, *Journal of Scientific Perspectives*, **2020**, *4(4)*, 245-254. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [19] E. Amouzad Mahdiraji, M. Sedghi Amiri, *International Journal of Smart Electrical Engineering*, **2020**, *09(01)*, 13-21. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [20] E. Amouzad Mahdiraji, S.M. Shariatmadar., *Advanced Journal of Science and Engineering*, **2020**, *1(1)*, 27-31. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [21] E. Amouzad Mahdiraji, S. Shariatmadar, *International Journal of Smart Electrical Engineering*, **2019**, *08(04)*, 143-148. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [22] E. Amouzad Mahdiraji, A. Yousefi Talouki, *Journal of Chemical Reviews*, **2020**, *2(4)*, 284-291. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]

- [23] E. Amouzad Mahdiraji, S. Shariatmadar, *International Journal of Smart Electrical Engineering*, **2019**, 08(02), 51-58. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [24] E.A. Mahdiraji, N. Ramezani, 2nd *International Conference on Knowledge-Based Engineering and Innovation (KBEI)*, Tehran, Iran, 2015, 405-411, [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [25] E. Amouzad Mahdiraji, S. Shariatmadar, *International Journal of Smart Electrical Engineering*, **2019**, 08(03), 99-104. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [26] E. Amouzad Mahdiraji, M. Sedghi Amiri, *Quantum Journal of Engineering, Science and Technology*, **2021**, 2(2), 1-15. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [27] E.A. Mahdiraji, N. Ramezani, *International Journal of Mechatronics, Electrical and Computer Technology (IJMEC)*, **2015**, 5(18), 2585-2600. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [28] E. Amouzad Mahdiraji, S. Mohammadi Shah Kilah, A.S. Hosseini, *ÖRGÜTSEL DAVRANIŞ ARAŞTIRMALARI DERGİSİ*, **2018**, 3(2), 2528-9705. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [29] E. Amouzad Mahdiraji, M. Sedghi Amiri, *Advanced Journal of Science and Engineering*, **2021**, 2(1), 42-50. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [30] E. Amouzad Mahdiraji, *Journal of Engineering in Industrial Research*, **2021**, 2(3), 178-193. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [31] M. Sedghi Amiri, E. Amouzad Mahdiraji, *Journal of Science and Technology Research*, **2021**, 1(1), 11-19. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [32] E. Amouzad Mahdiraji. *Journal of Science and Technology Research*, **2021**, 1(1), 40-47. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [33] R. Kolbadinezhad; E. Amouzad Mahdiraji, *Journal of Science and Technology Research*, **2021**, 1(2), 75-82. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)].
- [34] E. Amouzad Mahdiraji, M. Sedghi Amiri, *Journal of Science and Technology Research*, **2021**, 1(2). [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [35] R. Kolbadinezhad, E. Amouzad Mahdiraji, *Journal of Science and Technology Research*, **2021**, 1(3), 131-141. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)].
- [36] E. Amouzad Mahdiraji, R. Kolbadinezhad, *Journal of Science and Technology Research*, **2021**, 1(3), 142-149. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [37] E. Amouzad Mahdiraji, *Journal of Engineering in Industrial Research*, **2021**, 2(4), 202-209. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [38] S.M. Shariatmadar, E. Amouzad Mahdiraji, *Journal of Engineering in Industrial Research*, **2021**, 2(4), 210-217. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [39] K. Amouzad Mahdiraji, E. Amouzad Mahdiraji, *Journal of Engineering in Industrial Research*, **2021**, 2(4), 228-233. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [40] E. Amouzad Mahdiraji, *Journal of Engineering in Industrial Research*, **2021**, 2(4), 234-251. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [41] E. Amouzad Mahdiraji. *Journal of Science and Technology Research*, **2021**, 1, 4, , 234-241. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [42] S.S. Mehr, A. Ramezani, M.A. Kashi, S. Krimpali, *Journal of Materials Science*, **2018**, 53(20), 14629-14644. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]
- [43] S.S. Mehr, A. Ramazani, M.A. Kashi, *Journal of Materials Science: Materials in Electronics*, **2018**, 29(21), 18771-18780. [[Crossref](#)], [[Google Scholar](#)], [[Publisher](#)]