



Introducing the Mind Simulation Method and Exploring its Potential in Rapid Treatment of Stuttering and Some Explored Research Areas

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ARTICLE INFO	ABSTRACT
<p>Article History: Received 4 August 2021 Received in revised form 20 November 2021 Accepted 26 December 2021 Available online 29 December 2021</p>	<p>Objective: This article introduces and reviews the research on the mind simulation method in the treatment of language stuttering and various other behavioral areas. Introduction: The mind simulation method is a behavior-based learning approach that aims to modify or establish desired behavior. It teaches the reference behavior to the participant by selecting essential behaviors tailored to individual needs. This method, characterized by its unique features, includes speed in behavior modification or personalized training. The originator of this method is Mr. Bigdelli, and it was legally registered in 2009. Research: Numerous studies have been conducted on this method, and their results have been documented (Bigdelli, 2017; Kamarzarin, 2021; Falahi, 2021; Zamiri, 2021; Akbari, 2020; Bigi, 2021; Ghorbani, 2021). The mentioned research indicates that the mind simulation method has significant effects on the treatment of language stuttering and associated issues in a relatively short period, including rapid football training. Conclusion: Considering the findings of research on the described method in the treatment of communication disorders, such as stuttering, football training, interpersonal growth, stress reduction, and individual and social adaptation, the mind simulation method has proven to be highly effective in reducing symptoms of communication disorders with a psychological foundation. In another study, fMRI data in brain imaging before and after treatment have been reported significantly (Kamarzarin, Ghorbani, 2021). Further research in this field is recommended for various degrees of stuttering and other psychological areas.</p>
<p>Keywords: Keywords: Mind Simulation Method, Behaviorism, Rapid Treatment</p>	

1. INTRODUCTION

Language stands as one of the most efficient and effective tools for expressing human thoughts. As a high-level function of the human mind, language has been the subject of numerous scientific research endeavors. The growth and development of language skills encompass phonetic, lexical, syntactic, semantic, and pragmatic knowledge. Attaining fluent speech is essential for effective communication [1]. Stuttering, a relatively common speech disorder, is widely observed in society, affecting nearly one percent of the population [2]. Stuttering occurs when, during

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natural speech, a sudden and unnatural interruption arises due to repetitions, prolongations, interjections, and occasional locking of the mouth. It is sometimes accompanied by associated behaviors [3]. Most children between the ages of 2 and 5, experiencing a rapid expansion of their vocabulary, may encounter some form of speech disorder. This disorder occurs when a child struggles to produce words while coordinating sounds. Stuttering is one of several speech disorders that persist and become chronic. The prevalence in children ranges from 5% to 10%, with a ratio of 2:1 for boys to girls. However, due to a higher rate of recovery in girls, the male-to-female ratio in adulthood becomes 4:1. Humans typically exhibit varied responses to emotional and environmental stressors, limitations, and pressures, including behavioral and psychological disorders, and even physical disabilities. It is natural for individuals with speech disorders to show heightened sensitivity to these issues. These sensitivities and pressures impede mental tranquility, leading to psychological disturbances, muscle tension, anxiety, and exacerbation of speech disorders.[4]

As previously mentioned, from 1910 until the present, speech therapy systems have been presented to alleviate and mitigate stuttering. The provided methods, such as Camperdown, prolongation, segmentation, breath-holding, relaxation, and others, have been unable to normalize the speech rhythm of individuals with stuttering. Instead, they have led to the creation of an unnatural form in the speech of these individuals. Consequently, these methods lack practical applicability for communication in society, draw attention to the speech of individuals with stuttering, and elevate stress levels in these individuals. This underscores the necessity for a novel and practical therapeutic approach with a high improvement rate (as cited in Bigdeli, 1396).

2. CERTIFICATION DOCUMENTS

In the year 2005, after the invention of Mind Simulation by Mr. Bigdeli, a breakthrough was achieved in developing a definitive method for treating stuttering. This method involves the identification of the constitutive elements of speech models in normal individuals through simulation. The fundamental nature of fluent and normal speech was discovered through this process. In the subsequent stage, through designed exercises imparted to individuals with stuttering, normal speech patterns were transferred to the minds and brains of these individuals. Within a short period, typically two to three sessions, the speech of these individuals was rectified to a fluent and stutter-free form.

3. MIND SIMULATION

Mind simulation is a knowledge domain aimed at accessing human mental information. Simulating the mind involves replicating mental information and converting it into tangible and physical information. This process allows for the observation of skills in individuals and the retrieval of essential codes for learned behaviors. These can then be taught to interested or needy individuals. Through this knowledge, access to mental information is possible, and most changes in the mind can be created more rapidly. Normal human beings are equal in terms of physical abilities, and the differentiating factor lies in their mental and neural capabilities. Some of these mental and neural abilities are genetically inherent, while others are acquired. In both cases, specific algorithms determine the functioning of the mind and brain. Both scenarios share a commonality in the algorithms that define how the mind and brain operate. These algorithms have been developed over a relatively long period and are the result of numerous error trials. Some of these errors are genetically transmitted, products of past generations, while others are acquired and developed over extended time intervals after frequent error trials. In both cases, evolved patterns determine how the mind and brain function, leading to the formation of more intelligent, complex, and faster behaviors. These evolved patterns are the primary source of human progress and evolution. Individuals possessing these patterns are often unaware of their nature and lack complete access to them. Identifying and simulating these algorithms could potentially increase the speed of the learning process across various domains, multiply human capabilities and talents, and cultivate extraordinary individuals with exceptional abilities and skills.

The analogy of a computer with identical hardware is often used to explain the limitations of simply observing and imitating skilled individuals. In this analogy, if specific software is installed on one computer, it gains superiority over the other computer lacking this software. However, copying the installed files and transferring them to another computer won't enable the execution of the software. This is because the data needs to be defined (installed) for the computer, requiring the installation or setup files. Therefore, it is impossible to acquire the skills and talents of proficient individuals through mere observation and imitation. Behaviors observed in talented individuals are merely

the outputs and products of their mental and neural algorithms. What is needed are the software or algorithms that construct these behaviors. Throughout the centuries, many talented and elite individuals have come and gone, yet no one has been able to replicate their abilities to enhance the progress of humanity. Mind simulation provides a method to access and observe the functioning of the mind and brain. Through this approach, it is possible to create a version of human mental and neural algorithms and transfer them to other individuals. In this method, a program is designed to decipher the workings of the mind and brain. Using a communication language constructed, similar to a computer, the program communicates with the mind and brain, allowing immediate observation of the results. This process enables the rapid creation of desired changes in the functioning of the mind and brain.

To perform any task, a neural circuit is required, where each neuron circuit defines the shape of behavior and movement. In the mind, this takes the form of a command referred to as the "primary code." This code is an electromagnetic command that is decrypted in the brain, transforming into informational bits, which constitute the elements of neural or neuron circuits. Creating a neural circuit depends on its simplicity or complexity, requiring a specific timeframe. Simple behaviors like grabbing an object, opening a bottle cap, climbing stairs, etc., can be achieved in a short period. However, complex behaviors such as driving, executing professional musical or sports techniques may take months or even years. Behaviors based on innate abilities are unattainable through imitation. While they might be imitated once, creating these behaviors is impossible since their source is inaccessible and non-transferrable. According to the theory of mind simulation, all skills and abilities fundamentally consist of specific neural circuits that determine the functioning of our brain and mind. For the brain and mind, it doesn't matter when a neural circuit or neuron is formed, or whether it is genetic or acquired. By identifying the algorithms governing the functions of the mind and brain and simulating them in another individual's mind and brain, the desired neural circuit can be rapidly created in a short time. This allows for the replication and simulation of skill-based behaviors or talents in a short timeframe.

4. MIND SIMULATION METHOD IN THE TREATMENT OF STUTTERING

This method is based on the theory of behaviorism - it can also be thought of as reverse engineering of desirable behavior to create that behavior in a person in need - that is, creating favorable changes in speech and replacing them with undesirable behaviors taken from the behavioral models of normal and ordinary people as well as the behaviors of successful people in the field of speech and it is a technique of expression. This method has identified the main and important differences in the behavior of normal people compared to people with stuttering and found out the main structure of speech of normal people. He also found out what elements make up fluent and problem-free speech and how to transfer the speech models of normal people to the minds and brains of people with stuttering. The basis of this method is mind simulation, which is based on computer programming languages, especially object-oriented languages, and its combination with psychology has succeeded in achieving the knowledge of mind simulation and mind language. This method has succeeded in designing a language of communication with the mind and brain, through which the necessary programs can be designed and transferred to the mind and brain through education. In the basic principles of occupational therapy, 1- Stuttering is more affected by the problem of verbal learning and speech imbalance. 2- Its techniques do not depend on culture, age, degree of stuttering and specific language and are applicable to all people in need. In this method, more than ten speech techniques - mostly phonetic and movement - have been developed, including 1- Speech Rhythm Technique 2- U Technique 3- Rotation Technique 4- Linear Technique 5- Smile Technique 6- Sleep Technique 7- Pain and Moan Technique 8- Loud Technique 9- Vocal Technique 10- Speech Technique that by practicing and implementing these techniques, a person with stuttering can achieve smooth and natural speech.[6]

The set of these techniques causes the formation of speech skills in people with stuttering. When a person reaches the skill, he can control his speech naturally in any situation like normal people. The number of sessions required by each person is between 5-10 sessions, the interval between each session is one month for adults and two months for children under seven years old. So far, more than a thousand people have been completely cured with this method. Research has shown that all those who attended the course and practiced the exercises and techniques achieved a speech rate of over 90% in 3 months of treatment and 3 months of follow-up treatment and can speak easily in any place and situation [7]. In Akbari's study (2019), the people who participated in the study were among those who went to the psychological office for stuttering treatment, and among them, 30 people who were eligible to participate in the study through available sampling, without physical and mental diseases, were included in the subject group.

And after matching, adults of similar age with moderate to severe degree of stuttering and determining the degree of stuttering through clinical interview and implementation of standard 4-SSI test were voluntarily selected. In this research, the treatment sessions and subsequent follow-ups were conducted online in order to comply with health protocols to prevent contracting the Corona virus, and the results were obtained according to the tables and graphs below.

Table 1. Scores of Speeches Errors, Speech Pauses, and Body Movements During Speech in Adults With Stuttering Based on the Stuttering Severity Instrument (SSI-4)

Severity Level	Total Score Range
Very Mild	10–12, 13–17
Mild	18–20, 21–24
Moderate	25–27, 28–31
Severe	32–34, 35–36
Very Severe	37–46

Table No. 1 shows the scores of speech errors, speech pauses, and body movements during speech in adults with stuttering based on the SSI-4 speech stuttering tool, and according to these scores, the scores obtained in the research are graded.

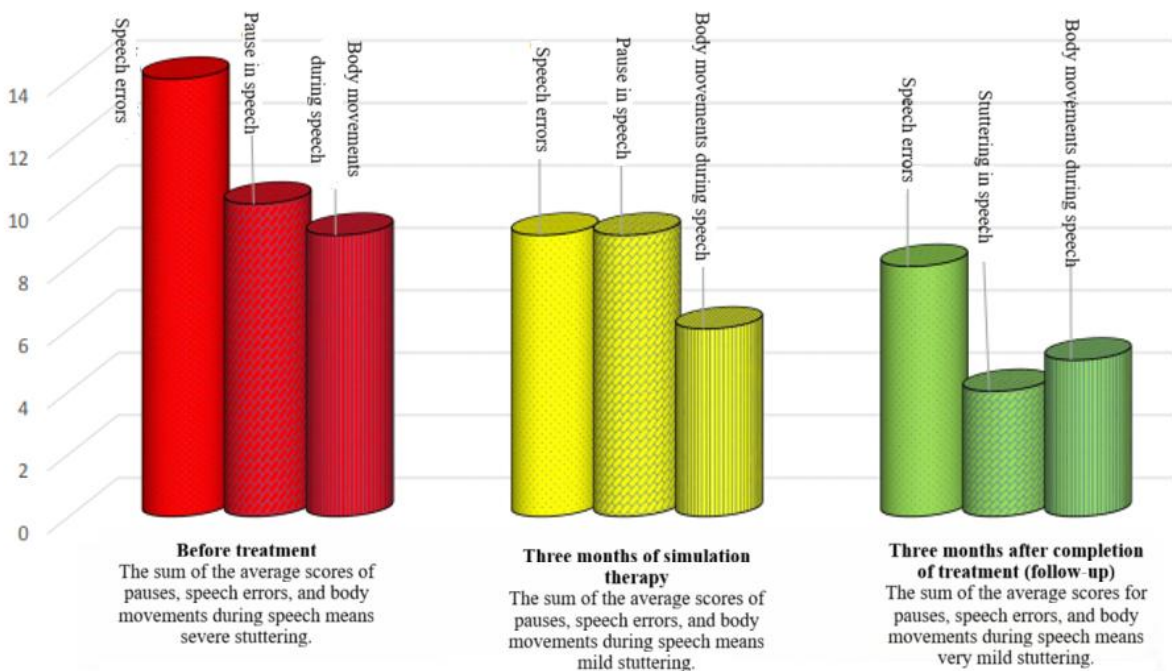


Fig. 1. Graph of the mean scores of speech errors, pauses and body movements during speech in the pre-treatment stage, three months of simulation treatment and three months after treatment in the follow-up period based on the SSI-4 test.

As can be seen in Figure (1), the mean scores of speech errors, pauses and body movements during speech in the pre-treatment stage based on the 4-SSI test were at a severe level in terms of intensity, which after receiving mind simulation techniques during After 3 months of treatment, the mean of the relevant scores after evaluation shows a noticeable decrease, which means mild stuttering, Also in terms of proving the stability of the treatment with mind simulation, 6 months after the start of the treatment, in the follow-up phase, again during the tests, the mean of the

relevant scores has decreased again in comparison with the previous stage, which, based on the diagnostic level of the SSI-4 test, means very mild stuttering, based on these scientific data, it is possible to successfully treat and also confirm the correction of speech patterns through mind simulation. It was found in clients with stuttering.

Table 2. Mean Scores of Speech Errors, Speech Pauses, and Physical Movements During Speech in Adult Clients With Stuttering Based on the Stuttering Severity Instrument (SSI-4)

Therapy Stage	Speech Errors	Speech Pauses	Physical Movements During Speech	Total SSI-4 Score (Severity Level)
Before Therapy	14	9	10	33 (Severe Stuttering)
After 3 Months of Simulation-Based Therapy	9	6	9	24 (Mild Stuttering)
3 Months After Therapy Completion (6 Months After Treatment Initiation)	8	5	4	17 (Very Mild Stuttering)
N	30	30	30	

Table number (2) shows the average number of speech errors, speech pauses and body movements during speech in adult patients with moderate to severe stuttering disorder based on the SSI-4 test. As you can see, at the pre-treatment stage, the total number of scales is 33, which is 4-SSI in the table of stuttering severity levels, which means severe stuttering. In the next row, i.e., after 3 months of treatment with the method of mind simulation, the average total score is 24, which means mild stuttering. And finally, at the stage of 3 months after the end of the treatment (6 months after the start of the treatment follow-up), the total average score is 17, which indicates the level of very mild stuttering in the relevant test table and shows the treatment with the mind simulation method. It was successful and also the stabilization and stability of the treatment is evident [8].

In another study conducted by Fallahi (2021) with the aim of investigating the effectiveness of mind simulation therapy on reducing stuttering and the level of communication attitude in children and adolescents aged 7 to 16 years with stuttering, a group of 30 children and adolescents with stuttering (21 boys and 9 girls) referred to the Center for Psychological Services of Mind and Soul in 2019 were selected through available sampling and clinically interviewed to ensure that they were not affected by any specific disease. In the pre-test phase, the subjects' stuttering severity and communication attitude were measured using the 4-SSI test and the revised test of communication attitude. Then the subjects underwent mind simulation treatment for three months. At the post-test stage, stuttering severity and communication attitude were measured again. In the follow-up stage, stuttering severity and communication attitude were measured again and the results were obtained: The results of data analysis showed that between the pre-test, post-test and follow-up scores in stuttering at the level of ($=0.0001$) p) and communication attitude at the level of ($p=0.0001$) there is a significant difference and the stuttering of people in the follow-up and post-test has decreased compared to the pre-test and the communication attitude has also increased in the post-test compared to the pre-test. In addition, it was found that there was no significant difference between age groups ($p=0.09$) and gender ($p=0.43$) in mind simulation treatment. According to these results, it was found that mind simulation therapy helps to improve stuttering and communication attitudes [9].

In another research conducted by Zamiri Shalkohi (2021), the effectiveness of mind simulation technique in reducing stuttering and improving personal and social adaptation of adults with stuttering was investigated. The statistical population was all adults with stuttering (18-40 years old, male and female) who were referred to the Mental and Mental Psychology Service Center in 1400, and a total of 26 people were selected as a sample using the available sampling method. The Stuttering Severity Instrument (SSI-4) and Bell's Compatibility Questionnaire were used for data collection. Stuttering severity and adaptation level of the participants were measured in pre-test (before treatment), post-test (three months after treatment) and one month follow-up. The effectiveness of the treatment method on people's adaptation was examined in five levels: home adaptation, occupational adaptation, emotional adaptation, health adaptation, and social adaptation. The results of the research showed that the mind simulation treatment was effective in reducing the severity of stuttering and in reducing overall adaptation, occupational adaptation, and emotional adaptation ($\alpha = 0.01$). It was also found that there was no significant difference in home adaptation, social adaptation, and health adaptation after the application of this treatment method ($\alpha = 0.01$).

Conclusion: Based on these results, it was found that the mind simulation method was effective in reducing stuttering and improving individual and social adaptation [10]. Research has been conducted in other areas of this method, which will be discussed below.

5. MIND SIMULATION TECHNIQUE IN FUNCTIONAL MAGNETIC RESONANCE IMAGING (fMRI) AND VALIDATION OF SIMULATION THERAPY

Ghorbani's (1400) research was conducted with the aim of investigating the effectiveness of the mind simulation technique in functional magnetic resonance imaging (fMRI) of patients before and after stuttering treatment. The research method was experimental and in the form of a case study with pre-test and post-test. One subject (Aileen, 9 years old, 3rd grade) referred to Mind and Psyche Service Center, Tehran city in 1400 was selected by available sampling method. The type of stuttering was determined using the Stuttering Severity Measurement Tool (SSI-4) and clinical interview, and the variables of physical disorders and intelligence were controlled to enter the treatment. Before the therapeutic intervention, the subject underwent fMRI, and 2 months after the therapeutic intervention, the patient underwent another imaging and the activity in different parts of the brain was checked using the same criteria as in the first imaging. Data analysis was performed by the National Brain Mapping Laboratory (NBML) using FSL software. Data analysis in the stage before and after treatment, the activated areas include the five general areas of angular and supramarginal gyrus, limbic areas that are functionally related to memory and learning, parts related to speech that include Wernicke's areas in the temporal lobe and Broca's area are in the pars opercularis area in the frontal lobe, and the movement areas are in the central nervous system. The results of this research are as follows: The obtained results showed that after the mind simulation treatment, the BOLD level signal increased in the areas related to speech, memory and learning, which indicates an increase in blood supply to the target areas and, as a result, the patient's clinical response to the treatment. As a result, according to the research findings, the mind simulation technique was effective in the treatment of stuttering [11].

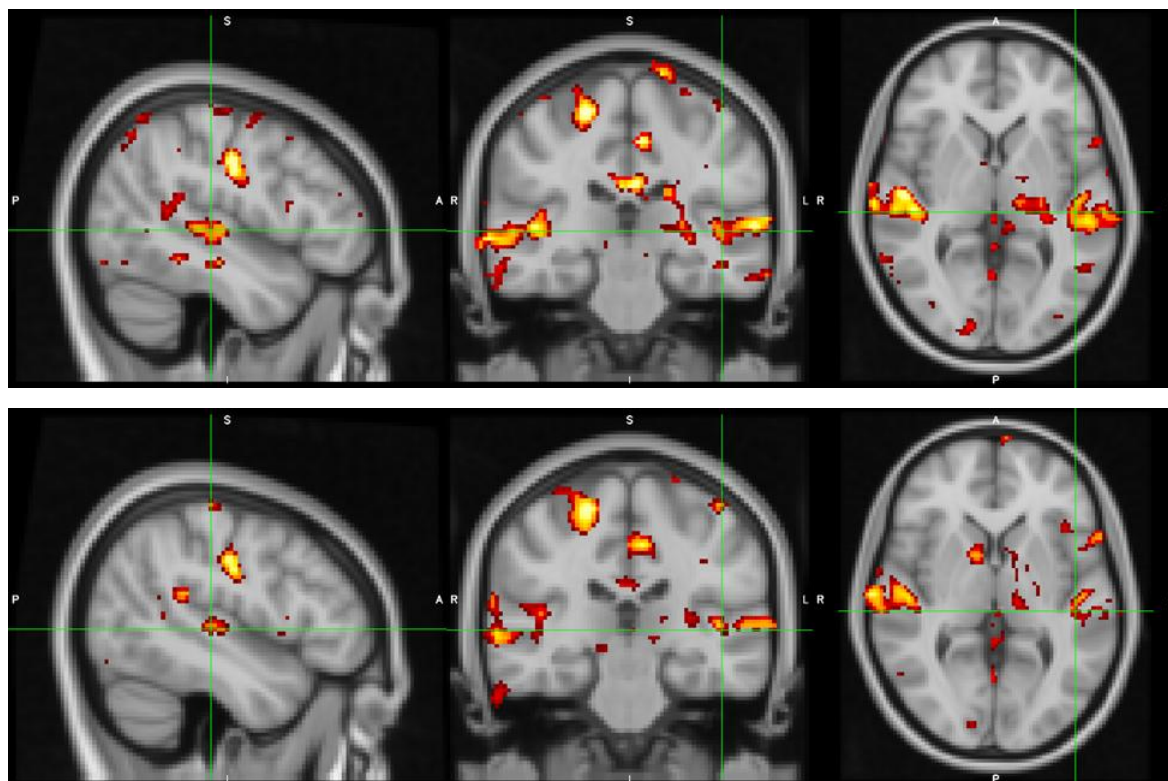


Fig. 2. Activated Regions in the Posterior Part of the Superior Temporal Gyrus

The top image is the pre-treatment image and the bottom image is the post-treatment image - the activated areas are located in the superior temporal gyrus (posterior part) and in the superior posterior part of the temporal lobe and are primarily involved in understanding words and through neural pathway 1 is related to Broca's area and it is the place where auditory codes and the meaning of words are stored. As can be seen in the figure above, in this area, after the treatment, we see an increase in blood supply and more activity compared to the stage before the treatment.

6. MIND SIMULATION TECHNIQUE IN FOOTBALL SKILL TRAINING

In another research, Begi (1400) investigated the effectiveness of this method on soccer skills. The purpose of his research was to investigate the effectiveness of the mind simulation technique on soccer skill training in adolescents, which was done in a semi-experimental way with a pre-test-post-test design with one group. For this purpose, 20 teenagers from soccer schools, aged 12-19 years, were selected by purposive sampling. First, their soccer skills were assessed in the pre-test phase. Then, they were taught soccer skills for 90 minutes through mental simulation. In the next step, the skills were measured with a retest. The data were analyzed using the Wilcoxon test through SPSS-24 software. The results of the findings showed that there was a significant difference between the scores of soccer skills after the mind simulation training and before. There was a significant difference between the scores of ball rotation, ball height, scoring and total scores of exercises at a significant level ($P < 0.0001$), as well as soccer throwing skills at a significant level ($P < 0.005$). Therefore, based on the results obtained from the data, it can be said that the use of mind simulation technique is effective in teaching soccer skills and can accelerate the training process in a shorter period of time and with higher efficiency [12].

7. THE REASON FOR THE IMPORTANCE OF SIMULATION METHOD IN HUMANITIES

The view that a person knows the beliefs, desires, intentions, and feelings of other people by some simulation or repetition of them has existed for a long time, but in cognitive science in the 1980s as a competitor to the view that a person knows the mentality of other people. developed. This phenomenon shows clear evidence that in some cases it actually obtains a kind of copy of a person's mental states, and the work is done not only in the imagination, but in layers of the brain, in the fired patterns of the body from the same nerve cells that they fire when doing or witnessing what someone else is doing, a phenomenon called mind simulation [13]. This motor neuron firing is a simulation response that is in sharp contrast to a theoretical response. For motor neurons certainly do not reflect, and their firing does not represent beliefs or other types of propositional attitudes using concepts. This leads to the question of how much understanding can be achieved [13]. The main principle underlying the body-simulation hypothesis is an old and prominent hypothesis. Its meaning is that when people use the power of language, they first form their mental experiences about what they want to find out or interact with. Mental access to concepts causes the activation of perceptual, effective and motivating inner experiences. The second branch of works that have been formed around the simulation of the body originates from cognitive semantics. This hypothesis of linguistics is an analysis that helps to describe and explain the modeling of language based on experience and concrete knowledge. Cognitive semantics states that meaning is equivalent to conceptualization. It is a mental phenomenon in which a person uses his extensive experience to choose the right words.[14] In addition to these, it should be noted that stuttering has a great impact on performance, behaviors and characteristics, all of which are related to psychological symptoms and mental abilities.

8. CURRENT PERFORMANCE AND CURRENT LEGAL STATUS OF THE METHOD

The mind simulation method is currently available at the Mind and Mind Psychology Service Center under the license number M992 of the Psychology System, in person and online with the registration number of the invention of Mr. Bigdali 7561 in the name of its creator Mr. Bigdali and the official announcement in the Official Gazette number 20349 on the date 02/03/2014, is implemented in this center to correct communication problems including psychologically based stuttering with the mind simulation technique based on behaviorism under the responsibility of the following executive team:

1. Dr. Hamid Kamarzarin: Doctor of psychology and scientific director of the collection.
2. Mojtaba Bigdeli Shamloo: Master's student in psychology and the original creator of the mind simulation treatment method.

9. GOALS AND HORIZONS

According to what has been mentioned, using a method that can reproduce the abilities and excellence of elite and skilled people in others will have a significant impact on the future of humanity. Also, according to the researches done so far, some of which were presented in the previous part, the mind simulation treatment has been effective in reducing stuttering and related problems. Also, this method is used in various fields, including soccer skills [15]. Other areas in which the effect of this method is being studied include: mental anorexia, rapid driving training, phobia treatment, etc., which is being done with the support of the Center for Psychological Services and Counseling of Mind and Mind. According to what has been said, and considering that all people want to minimize their limitations and increase their abilities, it seems useful to use an effective treatment method that will improve people's abilities.

10. CONCLUSION

According to the above material, it can be concluded that the use of mind simulation technique is a practical method that can be used in various fields, including stuttering treatment and teaching skills to different age groups, with great results. Based on the scientific findings of Bigdali 2017, Kamarzarin 2021, Fallahi 2021, Zamiri 2021, Akbari 2019, Beigi 2021 and Ghorbani 2021) it has been shown that simulation is a reliable solution to reduce stuttering, depression, anxiety and stress caused by it and increase social communication and improve individual and social adaptation as well as football skills training. The current method of mind simulation has significant effects on stuttering in children, adolescents and adults who suffer from stuttering, so it can be used as an effective method to improve stuttering.

11. SUGGESTION

Finally, it is suggested that children with stuttering should be treated at the same age as children, because the treatment is effective at a younger age and the destructive effects of stuttering on communication and adaptation of people increase during adolescence and youth.

- Due to the fact that the effectiveness of mind simulation treatment on the severity of stuttering has been confirmed, it is suggested that this method be considered by counseling centers and psychological services, psychological and psychiatric clinics, as well as speech therapy centers to improve stuttering.

- Comparison of degrees and types of stuttering and effectiveness of treatment in them is another suggestion that seems useful and practical in future researches and their results.

- Conducting similar research among children with stuttering before elementary school and investigating the effectiveness of the mental simulation treatment method among them, since stuttering is more common in this age group, makes it possible to conduct research with a larger sample.

-To conduct more research on the effects of mind simulation on other psychological problems, skills, and abilities, including sleep problems, anxiety, etc.

-It is also suggested to use this technique in football centers, football schools and related clubs. It is worth mentioning that using the mind simulation method in all sports can lead us to a better future. Therefore, coding and using the mind simulation technique and its application in all sports seems to be effective.

Support and declaration of cooperation

We hereby announce the support of this collection to all researchers of institutions and private individuals and investors interested in research in this field and we are ready for any cooperation in conducting research, expansion and scientific development of this effective and indigenous scientific method.

Transparency Statement

The data supporting this study are available upon reasonable request to the corresponding author, subject to ethical and confidentiality considerations.

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Declaration of Interest

The authors declare that they have no competing interests.

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