Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 9878 – 9895
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.5600

Neuroplasticity and its Relationship to Thinking Patterns Among a Sample of Educational Counselors in Jordan

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Abstract

The study aimed to uncover neuroplasticity and its relationship to thinking patterns among a sample of educational counselors in Jordan. The study aimed to identify differences according to the variables of gender and social status. The study sample consisted of (216) male and female counselors (114 male and 102 female). They were randomly selected, and to achieve the objectives of the study, two scales were developed: The Neuroplasticity Scale and the Thinking Patterns Scale, and the reliability and stability of the two scales were verified and then applied to the study sample.The results showed that the level of neuroplasticity and the level of thinking patterns of counselors were high, and the results indicated that there were no statistically significant differences in the level of neuroplasticity due to the variables of gender and social status, and the results also indicated that there was no statistically significant correlation in the thinking patterns of counselors.

Keywords: *Neuroplasticity, Thinking Patterns, Educational Counselors, School Education, Psychological and Educational Counseling.*

Introduction

Neuroplasticity is one of the important concepts in psychology and mental health, as it works to prepare the brain for love and happiness and to achieve a high degree of success in work and find meaning in the life of the individual and to develop the self, and enjoy better sleep, and is related to the way of thinking in humans, and the term neuroplasticity and brain reconditioning refers to the concept of neuroplasticity, which is a very general term that indicates a change in the nervous system, which is a continuous process throughout life and includes brain cells other than nerve cells including glial cells and blood vessels, and this can occur due to learning, experience and the formation of intelligence

Thinking is the most sophisticated mental and psychological process that distinguishes humans from other living beings in a sophisticated and sophisticated degree. Thinking represents a process that is independent of the stimuli present or present in the situation, while other mental processes all work through sensory stimulation associated with external stimuli, and thinking is a specific sequence of symbolic concepts raised by a specific issue, which needs a solution of a specific type, and that the individual's endeavor to solve this issue is an indicator and evidence of the existence and importance of thinking to face this issue, as thinking involves internal processing of the elements of the situation on the one hand, and on the other hand, it is based on the individual's processing of his internal stimuli, which are not available in the current cognitive situation, so thinking depends on two mental processes, namely: Induction and deduction, which distinguishes humans from other living beings, but the thinking process is not only human, but it is a process that requires the development and acquisition of distinct efforts from several parties (Al-Obaidi, 2013). There is no doubt about the importance of the thinking process and neuroplasticity at the level of

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the individual's life because of its impact on the educational process, as any impact on the thinking process affects the educational process and neuroplasticity.

Thinking styles refer to the methods and patterns that an individual prefers in using their abilities, acquiring knowledge, organizing and expressing ideas in a way that is appropriate to the tasks and situations facing the individual. Mindset differs from strategy in that mindset is more general and stable for the individual as his unique way of processing information and applies to many situations and psychological issues, while strategy is less general, may apply to some psychological issues and not others, and includes some mental processes that occur sequentially or deliberately in order to achieve a goal or complete a specific task (Abu Al-Maati, 2005).

Recently, many theories and models have emerged that tried to explain the way individuals think and differed from each other in the nature and number of patterns or methods that individuals follow in their thinking, including these models: Bavia's model, which categorized individuals' preferences into two types of thinking patterns: The verbal thinking pattern and the conceptual thinking pattern (Abu Hashim, Ahmed, 2007)

Harrison and Bramson's model, which categorized the ways in which individuals deal with thinking into five patterns: Synthetic, pragmatic, realistic, idealistic, and analytical (Habib, 1995) and Herman's total brain model, which metaphorically divided the brain into four parts, each of which is responsible for different thinking functions from the functions of the different parts, namely: Upper and lower left part, upper and lower right part, and upper and lower right part.

These patterns differ in that they can be acquired through the process of socialization, are preferences for the use of abilities rather than the abilities themselves, and vary according to the dynamics of life. They are best at one time and place, but may not be best at another time or place. Mindsets cannot be judged as good or bad, they are important for the type of work chosen (Abu Jado, 2006).

By referring to previous studies related to the topic of the current study, the researchers found a small number of studies that dealt with the variables of the study in general, but they did not find any study that dealt with the variables of the current study together, so some of these studies will be addressed, as Ben Hassan (2014) came a study that aimed to identify the level of mental flexibility and metacognitive thinking among students at Umm Al-Qura University and the relationship between them, and to achieve the purpose of the study To achieve the purpose of the study, the descriptive-correlational method was used, and the study sample consisted of (309) undergraduate students, including (163) students from scientific colleges and (164) students from theoretical colleges at Umm Al-Qura University in Makkah Al-Mukarramah. To achieve the objectives of the study, the Mental Resilience Scale of Abdul-Wahab (2011) was used. The results showed that the level of metacognitive thinking in the dimensions of knowledge organization and knowledge knowledge knowledge among Umm Al-Qura University students does not differ by academic major, while the level differs in the dimension of knowledge processing in favor of scientific majors, and that there are differences in the level of mental flexibility among Umm Al-Qura University students due to the variable of academic level.

Blair Player, 2014) The study aimed to objectively measure neuroplasticity in the motor cortex using paired associative stimulation (PAS), which leads to changes in short-term neuroplasticity. The study sample consisted of 18 depressed individuals before and after a course of transcranial direct current stimulation (TDCS). The results of this study showed evidence of improved neuroplasticity in the motor cortex after effective treatment, but we cannot provide evidence that this change is generalized in the depressed brain.

Cloring's study (Cloring, 1964) aimed to compare a first sample consisting of (13) cases suffering from Avasia resulting from injury to their linguistic areas and their language was localized in the right cerebral hemisphere, and a second sample consisting of (13) cases also suffering from the same disorder and their language was localized in the left cerebral hemisphere, in this study they followed the descriptive and

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analytical approach, interviews were conducted with cases for concurrent periods and the researcher remained on the observation of the linguistic behavior of these cases.

Muslim's study (2019) To study the effectiveness of a counseling program to develop the awareness of university youth of NLP with its axes (belief in personal abilities, emotion management, personal flexibility) and self-management with its dimensions (time management, self-confidence) for them, the descriptive and analytical approach and the experimental method were used, the research tools consisted of the general data form, the NLP questionnaire with its axes and the self-management questionnaire with its dimensions. The sample consisted of (480) young men and women from different faculties and at different stages of study belonging to families from different socio-economic levels, from rural and urban areas of Menoufia, Dakahlia and Qalyubia governorates. The results showed a positive correlation between young people's awareness of NLP and their self-management at the significance level (0.01), meaning that the greater the awareness of university youth of NLP, the greater their ability to self-manage. There is a positive correlation between the level of awareness of NLP and their ability to self-manage and some variables of socio-economic level.

Al-Shayeb (2017) aimed to reveal the effectiveness and continuity of a program based on NLP techniques in improving the verbal communication of children in late childhood. The sample consisted of (40) children in the late childhood stage of linguistic disorders whose IQ score ranges between (93-110), and their ages range from (10-11) years of both sexes from the New Dawn Primary School, and Nasser Primary School of the Directorate of Education, both from Shebin Al-Koum, Menoufia Governorate, and none of them suffer from organic diseases that affect speech disorders, and they were divided into two groups equally (experimental-control). The results showed the effectiveness and sustainability of a program based on NLP techniques in improving children's speech communication in late childhood.

Afifi's (2019) study aimed to test the effectiveness of a training program based on NLP techniques in developing professional motivation among employees studying at the National Customs Training Institute, and the research sample consisted of (20) employees who were divided into two equal groups (10) experimental group and (10) control group, and the research used the experimental method and the following tools: Professional Motivation Scale, and the training program to develop professional motivation, which took (12) training sessions, and the results showed that there were statistically significant differences between the average scores of the experimental and control groups after applying the program on the professional motivation scale and its sub-dimensions in favor of the experimental group, and there were statistically significant differences between the average scores of the experimental group in the application of the program on the professional motivation scale and its sub-dimensions in favor of the experimental group, and there were statistically significant differences between the average scores of the control group in the application of the program. There were statistically significant differences between the average scores of the experimental group in the pre and post applications on the scale of professional motivation and its sub-dimensions in favor of the post measurement, and there were statistically significant differences between the average scores of the experimental group in the post and follow-up applications on the scale of professional motivation and its sub-dimensions in favor of the follow-up measurement two months after the application of the program .

Ibrahim's (2009) study aimed to identify the thinking patterns of Al-Quds University students and their relationship with their academic achievement. The sample size amounted to (8789) male and female students distributed among literary and scientific students, and a scale of thinking patterns and academic achievement scale was used, and the results of the study showed that there are differences in thinking among students in literary and scientific colleges, no differences in gender, no relationship between thinking patterns and academic achievement, and differences in thinking attributable to specialization.

The study of Al-Douri and Al-Hakim (2020) aimed to identify the impact of strategic thinking patterns on strategic performance in private Jordanian universities, where (237) questionnaires were distributed. The results of the study showed that there was a significant positive relationship between the comprehensive

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pattern and strategic performance, and a significant positive relationship between the planning pattern and strategic performance.

Zhang's study (2002 Zhang,) aimed to identify the patterns of thinking according to Sternberg's theory among university students in the United States of America and its relationship with models in thinking and academic performance, and the study sample consisted of (212) male and female students from three states and from different colleges, and the results showed a statistically significant correlation between models of learning and thinking styles and Sternberg's thinking styles: The analytical learning and thinking model was associated with the following thinking styles (legislative, executive, global, local, liberal), while the synthetic learning and thinking model was associated with the following thinking styles (legislative, executive, judicial, local, liberal, conservative).

The study of Jilani (2002) aimed to identify the patterns of thinking, control and orientation towards scientific research among students of the faculties of education at the University of Khartoum, the study was conducted on a sample of (380) male and female students from the faculties of education. The study used a scale of thinking patterns and a scale of control and orientation, and the researcher followed the descriptive method, and the results of the study showed the prevalence of scientific and innovative thinking pattern among students of the faculties of education, and there were no differences according to gender in scientific and innovative thinking patterns .

The study of Al-Samarrai (1995) aimed to identify the patterns of thinking among male and female students of the Faculty of Education at the University of Baghdad, the study sample consisted of (255) male and female students from the Colleges of Education Ibn Al-Rushd and the College of Education Ibn Al-Haitham. A scale of thinking patterns prepared by the researcher was used. The results showed the predominance of the scientific and innovative thinking pattern in the study sample.

Al-Dardiri's (2004) study aimed to identify the relationship between Sternberg's thinking styles and some personality characteristics. The study sample consisted of (176) male and female students from Qena University and South Valley University. The researcher used the list of thinking styles prepared by Sternberg and Weaver, and the list of five personality factors prepared by Tom Buchanan, and the results showed a significant positive relationship between thinking styles (legislative, judgmental, global, critical, national, royal, external, extroversion and aggressive behavior), and a significant positive relationship between openness and conscientiousness and thinking styles (executive, local, conservative).

Al-Hammouri (2009) conducted a study that aimed to uncover the relationship between thinking styles according to Sternberg's mental self-power theory and irrational thoughts among Yarmouk University students according to the gender variable. The study sample consisted of (358) male and female undergraduate students. The results of the study showed that the most common thinking styles among bachelor's students at Yarmouk University are the (liberal, legislative) style, while the minority thinking style ranked last, and the results also showed that there is an effect of gender in some thinking styles if it is observed that females use the legislative, executive, hierarchical, external, and liberal thinking styles more than males, while no statistically significant difference was observed in favor of the male group on any of the previous thinking styles.

Al-Zoubi and Al-Shurayda (2007) study in Jordan aimed to reveal the common thinking styles of students at Al-Hussein Bin Talal University and their relationship with gender, faculty and academic level. The study sample consisted of (140) randomly selected male and female students, and to achieve the objective of the study, Sternberg and Wagner's Thinking Styles Inventory was used in the data collection process. The results of the study showed that realistic thinking ranked first, followed by analytical thinking, idealistic, ordinal, and finally pragmatic thinking, and the results also showed that there were no statistically significant differences in the dominant thinking patterns due to the variables (gender, college, and academic level).

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Commentary on Previous Studies

Due to the scarcity of Arab and foreign studies on the variable of neuroplasticity related to the psychological and educational aspect, especially with a descriptive approach, the researcher resorted to one of the studies that are closely related to the study variable, which is mental flexibility.

Some foreign studies also addressed neuroplasticity with the aim of objectively measuring neuroplasticity in the motor cortex using paired associative stimulation (PAS) (Player, 2014), as well as a study aimed at assessing whether BDNF levels are associated with improved depression (Brunoni, 2008). Some Arab and foreign studies dealt with thinking patterns with the variables of academic achievement and strategic performance, such as the study of Al-Hakim (2020) and Ibrahim (2009). The study of (Zhang, 2002), which aimed to identify the relationship between thinking styles, thinking models and academic performance, and the study of (Al-Waabi, Al-Sharida, 2007), which aimed to reveal thinking styles and their relationship with gender, college and academic level, and the study of (Al-Dardiri, 2004), which aimed to identify the relationship between thinking styles and personality characteristics, and the study of (Al-Douri, Al-Hakim, 2020), which aimed to identify the impact of strategic thinking styles on strategic performance

What distinguishes the current study from previous studies is that it examined the relationship between neuroplasticity and thinking styles, which were not addressed collectively in any of the previous studies, in addition to dealing with the sample of counselors in Jordan, unlike previous studies. To the best of the researcher's knowledge, there is no foreign or Arab study that studied the variables of this study together in one study, and this study is also the first Arab and foreign study, especially in the psychological and educational field, that dealt with neuroplasticity, and based on this, it is expected that this study will have a significant position among previous studies, and an incentive for more studies and research within these variables and within this sample.

Problem of the Study

The highly complex process called neuroplasticity refers to the lifelong ability of the human brain to change and adapt in response to the amount and type of stimulation it receives Like all changes that occur, depending on the circumstances, positive or negative responses can be beneficial or unhelpful. Teachers or counselors need to be well versed in current thinking about neuroplasticity and be fully aware of the implications for their teaching. Factors that help promote positive change are: Social interaction, exercise, sleep hygiene, and a healthy diet (Pagliano, 2017).

Neuroplasticity and thinking patterns are considered one of the finest mental processes that characterize the human being, and it may be considered an unlimited process by which the mind organizes its experiences in a way that enables it to solve its issues and realize the relationship between things, and thinking and mental flexibility is a mental activity that works to modify, change and adapt both structure and function throughout life and in response to experience to solve an issue facing it, as individual differences contribute to the observed variation in the structure and function of the brain, and neuroplasticity mechanisms and thinking patterns show great variation between individuals.

Since most traditional medical, educational, and psychological studies have focused on studying the negative aspects and effects of traumatic events and situations, this study came to focus on the positive effects and methods that an individual can obtain to help him recover, psychological development, and mental health from the situations and issues that he may face or that may benefit and help in forming a more solid and strong personality with high psychological qualities.

After the researcher reviewed several researches that dealt with the experiences of counselors, but previous studies did not investigate neuroplasticity and its relationship with personality styles among a sample of counselors in Jordan. Thus, the study attempts to answer the following main question: What is the degree of neuroplasticity and thinking styles among a sample of counselors in Jordan?

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Study Questions

What is the degree of neuroplasticity among educational counselors in Jordan?

What is the degree of thinking patterns among educational counselors in Jordan?

Are there statistically significant differences at the significance level (0.05a=) for the neuroplasticity and thinking patterns of educational counselors in Jordan due to the variables (gender, social status)?

Is there a statistically significant correlation at the level of significance (0.05a=) between neuroplasticity and thinking styles among educational counselors in Jordan?

Importance of the Study

The importance of the study is evident in the following two aspects:

The importance of the theoretical study comes as it is a cognitive addition to the theoretical literature regarding neuroplasticity and its relationship with thinking patterns, as the study examines an important set of variables and concepts, where Arab studies and research were rare in general and local studies in particular, and it is considered one of the first studies at the Arab and foreign level in the psychological and educational field, especially the concept of neuroplasticity as it is often accessible to the medical side, and the study provides workers in the field of counseling and positive psychology with more information regarding neuroplasticity and its role in thinking patterns among a sample of counselors in Jordan. The study attempts to highlight the relationship between neuroplasticity and thinking patterns in light of the variable of gender and social status, and the consequent difference in the relationship between neuroplasticity and thinking patterns among counselors in Jordan.

As for the applied aspect, it is important for awareness programs, psychotherapy, and mental health workers because of its importance and effective role in alleviating traumas and obstacles and reducing the consequences thereof, and through this study, more studies related to these variables can be conducted and the application of counseling and training programs in facing obstacles and increasing psychological development and programs to develop and increase neuroplasticity and improve thinking patterns and increase and design courses for psychological counselors. This study will provide measurement tools that can be used by counselors, psychotherapists, family therapists, or institutions concerned with counselors in Jordan, and used in future studies related to these variables.

Objectives of the Study

The current study aims to:

Measuring the degree of neuroplasticity and thinking patterns of educational counselors in Jordan.

Identify the nature of the relationship between neuroplasticity and thinking styles among educational counselors in Jordan.

To reveal the nature of the differences between the level of neuroplasticity and thinking patterns of educational counselors in Jordan due to the variables (gender and social status).

Limitations of the study:

Spatial boundaries: The study was applied in the Ministry of Education in Jordan.

Human Limits: The study was applied to educational counselors in the Ministry of Education in Jordan.

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Time limits: The study was applied during the second semester of the academic year 2022/2023.

Terminology of the Study

Neuroplasticity: It is the brain's ability to adapt, and refers to the physiological changes in the brain, which occur as a result of interactions with the environment, and is called neuroplasticity (Hodge, M, 2010). It is defined procedurally as the score obtained by the examinee in the neuroplasticity scale currently used in the study.

Thinking patterns: It is a process by which many things are known, remembered, understood, and accepted (Hilali, 2021). It is defined procedurally as the score obtained by the examinee in the neuroplasticity scale currently used in the study.

Method and Procedures

This section describes the study methodology and personnel, the instruments used, the study procedures, and the statistical treatments .

Study Methodology

The current study followed the descriptive-correlational approach, as it examined neuroplasticity and its relationship with thinking patterns, and tested the differences according to the variables of gender and marital status of counselors in neuroplasticity and thinking patterns.

Study Population

The study population consisted of counselors in Jordan during the year 2023 AD, which amounted to about (2046) male and female counselors, according to the statistics of the Jordanian Ministry of Education (Ministry of Education, 2022).

Study Sample

The sample was selected by simple random method by analyzing the original community of the study sample, and this is done by searching for the characteristics and proportions of each characteristic in this community, and then random selection based on the characteristics of the original community. The number of sample members amounted to about (216) male and female counselors.

Table (1). The Distribution of the Study Sample According to the Study Variables

variable	Categories	Repetition	ratio
Sex	male	114	53%
	female	102	47%
	the total	216	100%
marital status	bachelor	61	28%
	married	142	66%
	absolute	11	5%
	widower	2	1%
	the total	216	100%

Tools of the Study

To achieve the objectives of the current study, two scales were used to measure both: Neuroplasticity and Thinking Styles:

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Thinking patterns: The scale was developed after referring to studies and theoretical literature, including the study of (Sharab, 2018; Al-Ameri, 2022) so that the scale consists of (24) paragraphs distributed in the following areas: Objective rational (7) paragraphs, executive (5) paragraphs, post-creative unconventional (5) paragraphs, and liberal (5), and were answered using a five-point scale (always, often, sometimes, rarely, rarely, and never), corresponding to the scores.(5-1)

Significance of the reliability of the scale

The researcher checked the validity of the scale by presenting it to a group of arbitrators specialized in educational psychology, measurement and evaluation to judge the paragraphs in terms of their suitability for thinking patterns and clarity of wording, Based on the opinions of the arbitrators, some amendments were made to some of the paragraphs, and the construct validity was confirmed by calculating Pearson correlation coefficients for the paragraphs of the instrument and the total score of the scale by finding the extent of the correlation of each paragraph with the total score of the scale to which it belongs in the study sample, where the results showed the existence of internal consistency between the fields of study and the total instrument, where the correlation coefficients ranged (. 254-.604) and were statistically significant at the level of significance, and correlation coefficients were found for the scores on each domain of the scale and the total score on the domain as shown in Table:(2)

Table (2). Correlation Coefficients Between Paragraphs, Total Score and Domain to Which It Belongs to the Objective Rational Thinking Scale

Paragraph number	Correlation coefficient with domain	Correlation coefficient with the tool	Paragraph number	Correlation coefficient with domain	Correlation coefficient with the tool
1	.415	.385	13	.254	.230
2	.450	.404	14	.397	.367
3	.342	.290	15	.450	.473
4	.404	.307	16	.474	.308
5	.276	.313	17	.532	.577
6	.453	.346	18	.537	.610
7	.470	.404	19	.553	.516
8	.416	.386	20	.604	.595
9	.335	.430	21	.523	.559
10	.333	.462	22	.498	.582
11	.343	.375	23	.553	.579
12	.303	.467	24	.447	.316

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Table (2) shows that all correlation coefficients were acceptable and statistically significant, and it is noted from the construct indicators that the correlation coefficients with the domain ranged between (.230-.610), and the correlation coefficients with the instrument ranged between (.254-.604), which is an indication of the construct validity of the scale.

Table (3). Correlation Coefficients Between the Domains With Each Other and the Total Score

The field	objective rational thinking	Executive Thinking	Creative thinking	liberal thinking	Total score
objective rational thinking	1				
Executive Thinking	.456**	1			
Creative thinking	.477**	.218**	1		
liberal thinking	.501**	.242**	.536**	1	
Total score	.813**	.590**	.802**	.759**	1

Table 3 shows that the intercorrelation coefficients between the domains of the Thinking Styles Scale, between the dimensions and the scale as a whole amounted to (.218**-.813**), which is statistically significant, and this is an indication of the construct validity of the scale.

Scale Stability

To estimate the internal consistency stability of the scale, the stability of the scale was calculated by the test-retest method by applying them to an exploratory sample from outside the study sample, with a time interval of two weeks between the two tests, and the internal consistency coefficient of the scales was extracted using the Cronbach's alpha coefficient.

Table (4). Cronbach's Alpha Internal Consistency Coefficient

The field	Cronbach's alpha	Replay stability (Test - Retest)
objective rational thinking	.791	.826
Executive Thinking	.862	.874
Creative thinking	.814	.841
liberal thinking	.812	.839
Total score for thinking styles	.726	.783

It is clear from Table (4) that the value of the internal consistency stability of the Thinking Styles Scale (726), and the value of the repetition stability of the scale.(783.)

Neuroplasticity: The scale was built after referring to books, published scientific articles, studies and theoretical literature, and the scale consisted of (19) paragraphs, does not contain dimensions, and was answered using five alternatives for the answer (always, often, sometimes, a little, never), and corresponds to the scores (5-1). The level of responses was categorized using the following range formula: Highest score - lowest score / number of levels = 5-1/3 = 4/3 = 1.33

Arithmetic mean (less than 2.33) is a low score.

Arithmetic mean (2.34-3.67) is a medium score.

Arithmetic mean (3.68 and above) is a high score.

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The researcher verified the validity of the scale by presenting it to a group of arbitrators specialized in educational psychology, measurement and evaluation to arbitrate the paragraphs in terms of their suitability for neuroplasticity and clarity of wording, Based on the opinions of the arbitrators, some amendments were made to some of the paragraphs, and the researcher also checked the validity of the construct by calculating Pearson correlation coefficients for the paragraphs of the instrument and the total score of the scale by finding the extent of the correlation of each paragraph with the total score of the scale to which it belongs in the study sample, as the results showed the existence of internal consistency between the fields of study and the total instrument, where the correlation coefficients ranged from (0. 5-.69) and were statistically significant at the level of significance, and the correlation coefficients were found for the scores on each domain of the scale and the total score on the domain as shown in Table:(5)

Paragraph number	Correlation coefficient with domain	Correlation coefficient with the tool	Paragraph number	Correlation coefficient with domain	Correlation coefficient with the tool
1	.61	.66	11	.62	.63
2	.43	.50	12	.61	.62
3	.48	.59	13	.20	. 50
4	.59	.65	14	.47	.48
5	.56	.58	15	.53	.58
6	.54	.61	16	.48	.53
7	.47	.51	17	.64	.69
8	.56	.64	18	.40	.52
9	.51	.60	19	.49	.54
10	.51	.55			

It is clear from Table 5 that all correlation coefficients were acceptable and statistically significant, and it is noted from the construction indicators that the correlation coefficients with the domain ranged between (.20-.64), and the correlation coefficients with the instrument ranged between (0.5-.69), which is an indication of the construct validity of the scale.

Table (6). Correlation Coefficients Between the Domains and The Total Score

The field	Neuroplasticity	Total score
Neuroplasticity	1	.937**
Total score	.937**	1

Table (6) shows that the intercorrelation coefficients between the domains of the neuroplasticity scale, between the dimensions and the scale as a whole amounted to (**.937), which is a statistically significant value, which is an indication of the construct validity of the scale.

Scale Stability

To estimate the internal consistency stability of the scale, the stability of the scale was calculated by the test-retest method by applying them to an exploratory sample from outside the study sample, with a time interval between the two tests of two weeks, and the internal consistency coefficient of the scales was extracted using Cronbach's alpha coefficient (Cronbach's alpha).

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ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.5600

Table (7). Cronbach's Alpha Internal Consistency Coefficient for the Neuroplasticity Scale

The field	Cronbach's alpha	Replay stability (Test - Retest)
Neuroplasticity	.810	.921

It is clear from Table (7) that the internal consistency reliability of the neuroplasticity scale amounted to (.810). The reproducibility value of the scale amounted to.(921)

Results of the Study

This part of the study includes the results obtained, organized according to the order of the study questions . The results of the first question, which states: What is the degree of neuroplasticity among counselors in Jordan?

To answer this question, the arithmetic means and standard deviations of all the items of the study scale were extracted, and the table below shows this.

Table (8). Arithmetic Means and Standard Deviations of the Degree of Neuroplasticity in A Sample of Counselors, in Descending Order

Rank	The number	Paragraphs	Arithmetic mean	Standard deviation	Level
.1	7	I work hard to achieve my goals.	4.28	.833	high
.2	3	I have the ability to engage in positive social interactions.	4.20	.785	high
.3	15	I seek out life experiences because they give me a variety of ideas.	4.14	.715	high
.4	10	Able to engage in dialogue and discussion with others in a smooth manner.	4.12	.801	high
.5	14	I develop my ideas to suit the situations I face.	4.12	.766	high
.6	19	I make my decisions based on preference.	4.12	.760	high
.7	16	I can overcome the difficulties I face in life.	4.05	.694	high
.8	18	Look at difficult situations from more than one angle.	4.00	.813	high
.9	1	Accomplish tasks in different ways.	3.99	.786	high
.10	12	I feel stressed about not getting my work done.	3.92	.906	high
.11	9	I practice the new response (thinking, knowledge) repeatedly until it becomes ingrained.	3.75	.923	high
.12	5	I mentally train myself to do positive activities.	3.73	1.003	high
.13	6	I practice mental training strategies, such as: (meditation, mental and physical relaxation, creative thinking skills, mental focus).	3.50	1.112	middle
.14	13	I practice mental imagery to solve my problems.	3.50	1.091	middle
.15	4	I like to play mind games, such as: (chess, crossword puzzles, and puzzles).	3.44	1.090	middle
.16	8	I do physical activity like walking and jogging to calm my nerves.	3.44	1.140	middle

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DOI: https://doi.org/10.62754/joe.v3i8.5600

Rank	The number	Paragraphs	Arithmetic mean	Standard deviation	Level
.17	17	I feel powerless to change things in difficult situations.	3.00	.925	middle
.18	2	Look at things from a single, fixed perspective.	2.95	1.136	middle
.19	11	I turn to music to calm my nerves.	2.50	1.272	middle
Total score			3.72	.430	high

It can be seen from the above that the arithmetic averages of the responses of the study sample members to the degree of neuroplasticity among counselors in Jordan came at a high level, and as for the paragraphs constituting this area, paragraph (7) "I strive to achieve my goals" ranked first at a high level, with a mean arithmetic mean of (4.28) and a standard deviation of (0. Paragraph (11) "I resort to listening to music to calm my nerves" came last, with a mean arithmetic mean of (2.50) and a standard deviation of (1.272). This study also agrees with the study of (Ben Hassan, 2014), which indicated that the level of mental flexibility and thinking and saw knowledge indicates that there are differences in the level of mental flexibility due to the variable of study level, and (Muslim, 2019), which indicated that NLP came at a high level.

It is noted that the counselors showed a high degree of neuroplasticity, and this is attributed to: Mentors realize the importance of neuroplasticity in practical and social life, as the methods used by the mentors are employed in a correct way, and also due to the changes and development that occur to them and their thinking since they joined the profession of mentoring, and that individual changes at this stage require a deeper understanding of life and a greater understanding of what it is, it requires him to develop and grow in neuroplasticity, and this may also be due to the intellectual and cultural diversity in which Western society in general and Jordanian society in particular live, which in turn affects the results of the study, which in turn may have affected the results of the study, which in turn may have affected the study .

The results of the second question, which states: What is the degree of thinking styles of counselors in Jordan?

To answer this question, the arithmetic means and standard deviations of all the items of the study scale were extracted, and the table below shows this.

Dimension of Thinking Patterns of Thinking

Table (9). Arithmetic Means and Standard Deviations for The Dimension of Thinking Patterns in Descending Order

Rank	The number	Paragraphs	Arithmetic mean	Standard deviation	Level
.1	7	Be accurate and factual.	4.18	.782	high
.2	1	I can pinpoint the cause of the problem when it occurs.	4.09	.676	high
.3	2	I have a high ability to modify events.	3.76	.780	high
.4	5	I feel that the laws should be strictly enforced.	3.70	.991	high
.5	6	I have a distinct knowledge of scientific and technical subjects.	3.53	.851	middle
.6	3	I think work is much more important than human feelings.	2.87	1.317	middle
.7	4	I like things that are unpredictable.	2.84	1.152	middle
Total score			3.56	.537	middle

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DOI: https://doi.org/10.62754/joe.v3i8.5600

Table (9) shows that the arithmetic mean of the thinking styles dimension came at a moderate level, with an arithmetic mean of (3.56) and a standard deviation of (0.537). As for the paragraphs that make up this dimension, paragraph (7) "I am keen on accuracy and facts" ranked first with a high level, with an arithmetic mean of (4.18) and a standard deviation of (0.782), while paragraph (4) "I like things that are unpredictable" ranked last, with an arithmetic mean of (2.84) and a standard deviation of (0. Paragraph (4) "I like things that are unpredictable" came last, with a mean of (2.84) and a standard deviation of (1.152). This result agreed with Jilani's (2002) study of high thinking styles, and disagreed with Ibrahim's (2009) study that there is no relationship between thinking styles and academic achievement.

The researcher attributes the high thinking styles to providing an environment that helps counselors to learn and improve the skills they possess, which pushes them to think, and increases their ability to help them achieve their goals. Taking into account external stimuli, and the ability of the school administration to provide the appropriate atmosphere and encourage and motivate the guides to engage in thinking with the aim of developing plans and strategies to solve issues in an effective manner in which there is a type of thinking.

The Dimension of Executive Thinking

Table (10). Arithmetic Means and Standard Deviations of The Executive Thinking Dimension in Descending Order

Rank	The number	Paragraphs	Arithmetic mean	Standard deviation	Level
.1	2	I prefer to use appropriate methods to solve any problem I encounter.	4.14	.783	high
.2	4	I prefer to work with projects that have a specific goal and plan.	4.14	.814	high
.3	5	I prefer to follow specific rules or instructions when solving problems or performing a task.	3.87	.866	high
.4	1	I prefer to approach my problems in specific ways.	3.75	.875	high
.5	3	Enjoy doing things that are done under specific instructions.	3.75	.957	high
Total score			3.92	.602	high

Table (10) shows that the arithmetic mean of the executive thinking dimension came at a high level, with an arithmetic mean of (3.92) and a standard deviation of (0.602), as for the paragraphs constituting this dimension, paragraph (2) "I prefer to use appropriate methods to solve any issue facing me" ranked first with a high level, with an arithmetic mean of (4.14) and a standard deviation of (0.783), and paragraph (3) "I enjoy performing things in light of specific instructions" ranked last with a high level, with an arithmetic mean of (3.75) and a standard deviation of (0.95). Paragraph (3) "I enjoy performing things that are performed in light of specific instructions" came in last place, with a high level, an arithmetic mean of (3.75) and a standard deviation of (0.957). This result agreed with the study of Dardiri (2004) that there is a positive significant relationship between openness and conscientiousness and thinking styles (executive, local, conservative), and disagreed with the study of Al-Hammouri (2009) that no statistically significant difference was observed in favor of males on any of the thinking styles

The researcher attributes the high executive thinking dimension to providing an environment that helps guides to adhere to the specific tasks, rules and laws, and that guides embrace the values of honesty and dedication in their work and people appreciate them for their clear advice and guidance, and guides have some methods that bring them closer to people.

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Table (11). Arithmetic Means and Standard Deviations of The Unconventional Creative Thinking Dimension in Descending Order

Rank	The number	Paragraphs	Arithmetic mean	Standard deviation	Level
.1	2	I hate routine and I always love change	4.04	.924	high
.2	4	I have a sense of humor.	3.88	.854	high
.3	7	I am passionate about goals and devote all my time and effort to them.	3.72	.925	high
.4	3	I like to work on more than one thing at a time.	3.48	1.095	middle
.5	1	I intuitively perceive many things without thinking deeply about them.	3.47	.969	middle
.6	6	I like unusual ideas that others call crazy ideas.	3.23	1.149	middle
.7	5	People describe me as adventurous.	3.18	1.180	middle
Total score			3.56	.670	middle
Rank	**The number**	**Paragraphs**	**Arithmetic mean**	**Standard deviation**	**Level**
.1	4	I prefer to change my routine patterns in order to improve the way I perform the task.	3.84	.855	high
.2	3	I prefer to do things in new ways that others haven't done in the past.	3.70	.871	high
.3	2	When I face a problem, I prefer to follow new methods and strategies to solve it.	3.69	.771	high
.4	1	I prefer to challenge traditional ways of solving problems and look for new and better ways to solve them.	3.66	.864	middle
.5	5	I prefer to address past problems and find new ways to solve them.	3.50	.988	middle
Total score			3.67	.662	high

Table (11) shows that the arithmetic mean of the unconventional creative thinking dimension came at a moderate level, with an arithmetic mean of (3.56) and a standard deviation of (0.670), and paragraph (2) "I hate routine and always love change" came first at a high level, with an arithmetic mean of (4.04) and a standard deviation of (0.969), while paragraph (5) "People describe me as adventurous" came last, with a mean of (3.18) and a standard deviation of (1.180). Paragraph (5) "People describe me as adventurous" came last, with a mean arithmetic mean of (3.18) and a standard deviation of (1.180), and this study agreed with the study of Al-Samarrai (1995) and disagreed with the study of Al-Zoubi and Al-Sharida (2007), and the results showed no statistically significant differences in the dominant thinking patterns due to the variables of gender, college and academic level

The researcher attributes the high dimension of unconventional creative thinking to providing an environment that helps male and female counselors to provide good ideas that can be used, which increases the confidence of male and female counselors in themselves and their ideas and their contribution to improving their work and providing the best solutions by providing good solutions to the daily requirements and issues that the individual is exposed to, whether on a personal or professional level.

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DOI: https://doi.org/10.62754/joe.v3i8.5600

Emancipated Thinking Dimension

Table (12). The Arithmetic Means and Standard Deviations of The Liberal Thinking Dimension in Descending Order

Domain/Thinking Patterns	Link	Neuroplasticity
objective rational thinking	Correlation coefficient r	.534**
	Statistical significance	.000
	number	216
Executive Thinking	Correlation coefficient r	.387**
	Statistical significance	.000
	number	216
Creative thinking	Correlation coefficient r	.522**
	Statistical significance	.000
	number	216
liberal thinking	Correlation coefficient r	.535**
	Statistical significance	.000
	number	216
Total score	Correlation coefficient r	.666**
	Statistical significance	.000
	number	216

Table (12) shows that the arithmetic mean of the liberal thinking dimension came at a high level, with an arithmetic mean of (3.67) and a standard deviation of (0.662). As for the paragraphs of the dimension, paragraph (4) "I prefer to change the patterns of routine methods in order to improve my way of performing the task" ranked first with a high level, with an arithmetic mean of (3.84) and a standard deviation of (0.855), while paragraph (5) "I prefer to address previous issues and find new ways to solve them" ranked last, with an arithmetic mean of (3.50). 84) and a standard deviation of (0.855), while paragraph (5) "I prefer to address previous issues and find new ways to solve them" came last, with a mean of 3.50 and a standard deviation of (0.988), and this study agrees with the study of Ibrahim (2009) and differs with the study of Zheng (2009(

The researcher attributes the high liberal dimension to helping mentors using new and unfamiliar strategies in solving issues and this makes mentors perform tasks in new and unconventional ways and methods and seek to improve task performance.

Findings related to the third question, which states: Is there a statistically significant correlation at the significance level (0.05a=) between neuroplasticity and thinking styles of counselors in Jordan?

To answer this question, Pearson's correlation coefficient was calculated for the fields of study, and the total score of the tool according to the variables, and the table below shows this.

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Table (13). Pearson Correlation Coefficient (Pearson Correlation Coefficient) To Reveal the Relationship Between Neuroplasticity and Thinking Styles

Source of variance	sum of squares	degrees of freedom	Mean squares	value f	Statistical significance
Neuroplasticity	12.546	37	.339	.780	.813
	10.431	37	.282	1.156	.264
	7.252	37	.196	.554	.982
	36.832	37	.995	1.539	.035
Error	77,380	178	.435		
	43.402	178	.244		
	62.952	178	.354		
	115.126	178	.647		
the total	938,000	216			
	522,000	216			
	760,000	216			
	1399,000	216			

*Statistically significant at the significance level (a=0.05)

**Statistically significant at the significance level (a=0.01)

Table (13) shows that there is a strong and statistically significant relationship between neuroplasticity and thinking styles (rational-objective thinking, objective thinking, executive thinking, creative thinking, and liberal thinking), and this is consistent with the study of Al-Hammouri.(2009)

The reason can be attributed to the correlation between the two concepts, as neuroplasticity needs the individual's ability to think in its different patterns, and the ability to think needs neuroplasticity and happiness in his personal life, as both belong to positive emotions, and thinking is the first component of neuroplasticity, as flexible thinking is one of the ways that help us face the difficulties of life and solve issues early is one of the secrets of neuroplasticity.

Findings related to the fourth question, which states: Are there statistically significant differences at the level of significance (0.05a=) for neuroplasticity and thinking patterns among counselors in Jordan due to the variables (gender, marital status)?

To answer this question, a multiple analysis of variance (MANOVA) was conducted for the variables (gender, age, marital status, educational level), and the table below shows this.

Table (14). Multiple Analysis of Variance (MANOVA) Of Neuroplasticity in A Sample of Counselors in Jordan Attributed to The Variables (Gender, Marital Status)

Source of variance	Areas	sum of squares	degrees of freedom	Mean squares	value f	Statistical significance
Sex	objective rational thinking	.194	1	.194	.724	.396
	Executive Thinking	2.258	1	2.258	6.917	.009
	Creative thinking	.902	1	.902	2.145	.145
	liberal thinking	.619	1	.619	1.419	.235

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marital status	objective rational thinking	.264	3	.088	.328	.805
	Executive Thinking	1.226	3	.409	1.252	.293
	Creative thinking	3.998	3	1.333	3.170	.026
	For free thinking	.116	3	.039	.089	.966
Error	objective rational thinking	45,589	170	.268		
	Executive Thinking	55.486	170	.326		
	Creative thinking	71,478	170	.420		
	For free thinking	74.108	170	.436		
the total	objective rational thinking	2811.06	216			
	Executive Thinking	3411.96	216			
	Creative thinking	2848.63	216			
	For free thinking	3019.04	216			

Table 14 shows that there are no statistically significant differences at the level of significance (a=0.05) attributed to the variables (gender, marital status) for neuroplasticity among a sample of counselors in Jordan.

The researcher attributes this to the similarity of the roles assigned to all male and female counselors, as well as the fact that all male and female counselors can acquire skills, knowledge, flexibility, thinking in different styles, and using counseling methods without separating them by gender and educational level .

Table (15) Multiple analysis of variance (MANOVA) of the thinking styles of a sample of counselors in Jordan in relation to the variables (gender, marital status)

Table (15) shows that there are no statistically significant differences at the level of significance (a=0.05) due to the variables (gender, marital status) in the thinking patterns of a sample of counselors in Jordan and agrees with the study of Al-Hammouri (2009), and differs with the study of Ibrahim.(2009)

The researcher attributes this to the fact that work conditions, dissatisfaction factors, and motivating factors towards happiness and achievement are relatively different for both male and female educational counselors, and the factors of gender and marital status are different for male and female counselors, so the results of the research showed that there are differences between male and female counselors in thinking patterns.

Recommendations and Suggestions

Conducting studies on the topic of neuroplasticity as it is important nowadays, and linking it to variables such as: Duration of using personality styles, marital compatibility, and self-efficacy.

Conducting counseling and preventive programs to improve and maintain the level of thinking patterns and neuroplasticity among male and female counselors.

Creating activities and initiatives for students and faculty that help increase and maintain the level of neuroplasticity, thinking patterns, and neuroplasticity

Studying the neuroplasticity variable on other samples and variables.

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