Partial Brain Functions According to the Type of Competition and Its Relationship with the Level of Achievement in Traditional Karate

Assoc. Prof. Doaa Shawkey Mohamed
Associated Professor at the Department of Combat Sports and Individual Sports Training - Faculty of Physical Education for Girls, Zamalek - Helwan University
doaa.shawkey@pef.helwan.edu.eg

Abstract:

The research aims to identify the brain control functions of traditional karate players based on the type of competition (Ipon Shobu, Kogo, Fukugo, Kata, Enbu) and to determine the brain control functions of traditional karate players based on the difference in the type of competition (Ipon Shobu, Kogo, Fukugo, Kata, Enbu) and gender (males, females). Additionally, it aims to explore the relationship between brain control functions and achievement levels in each competition of traditional karate for males and females.

The researcher followed the "survey study" approach with its steps and procedures to achieve the research objectives. The sample was randomly selected and consisted of 100 male and female players above 20 years old. The research tool was applied during the 11th Republic Karate Championship held from October 8-10, 2021. The main data collection tools included the Brain Control Scale for traditional karate players developed by Doaa Shawkey and Hazem El-Roubi.

The main results indicated that the balanced brain control function is predominant in the overall picture for traditional karate players. The balanced brain control function is also dominant in Ipon Shobu, Kogo, Fukugo, and Enbu competitions. The left brain control function is dominant in Kata competition. There is no statistically significant difference in the distribution of the three functions according to gender, while differences appear at the specialization level in some axes. There is no statistically significant relationship between achievement and brain control for traditional karate players in any competition except for Enbu and Kata competitions, where the left-brain function dominates achievement in males.

وظائف نصفى المخ تبعاً لنوع المسابقة وعلاقتها بمستوى الانجاز فى الكاراتية التقليدي

المستخلص :

يهدف البحث الى تحديد انماط السيطرة المخية للاعبى الكاراتية التقليدى تبعا لنوع المسابقة (ايبون شوبو –كوجو – فكوجو –كاتا – انبو)،تحديد انماط السيطرة المخية للاعبى الكاراتية التقليدى تبعا لاختلاف نوعية المسابقة (ايبون شوبو –كوجو – فكوجو –كاتا – انبو) والجنس (ذكور – اناث)،التعرف على العلاقة بين انماط السيطرة الدماغية ومستوى الانجاز فى كل مسابقه من مسابقات الكاراتية التقليدى ذكور – اناث واتبعت الباحثة المنهج " الدراسة المسحية " بخطواتة وإجراءاتة لتحقيق اهداف البحث ، حيث تم اختيار العينة بالطريقة العشوائية وقوامها (١٠٠) لاعب ولاعبة فوق ٢٠ سنة وتم تطبيق اداة البحث على عينة البحث الاساسية وذلك فى الفترة من بطولة الجمهورية الحادية عشر للكاراتية التقليدى من ٨–١٠ اكتوبر ٢٠٢١ وكانت اهم ادوات جمع البيانات مقياس السيطرة المخية للاعبى الكاراتية التقليدى (اعداد دعاء شوقى وحازم الروبى) وكانت اهم النتائج ان نمط السيطرة المخية المسيطر على لاعبى الكاتية التقليدى هو النمط المتوازن فى الصورة العامة ،ونمط السيطرة المخية المسيطر على لاعبى الايبون شوبو والكوجو والفكوجو والانبو هو النمط المتوازن ، نمط السيطرة المخية المسيطر على لاعبى الكاتا هو النمط الايسر ، عدم وجود دالة احصائية فى نسب انتشار الانماط الثلاثة تبعا للجنس فى حين تظهر فروق على مستوى التخصص فى بعض المحاور، لا يوجد علاقه دالة احصائية بين الانجاز والسيطرة المخية للاعبى ولاعبات الكاتية التقليدى فى اى مسابقة من المسابقات عدا مسابقة الانبو والكاتا فان النمط المخى الايسر هو النمط المسيطر على الانجاز عند الذكور.

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Introduction:

The Evolution of Traditional Karate - A Significant Evolution, especially in the Recent Era of the Last Century, Where the Scope of the Game Widened to Include Many Countries Around the World, leading to the Development of Skill and Tactical Performance and, Consequently, Increasing Individuals' Opportunities for Success in Local and International Tournaments.

Tarek Badr Eldin (2016) states that the results of numerous experiments, research, and modern scientific applications in the field of neuropsychology indicate the possibility of understanding human behavior by studying the brain's lateralization and the extent of each side's control over human behavior. (Tarek Badr Eldin, 2016)

Also, Amal Makhouzmi (2002) believes that brain lateralization is the dominant part of the brain responsible for individuals' behavior in processing tasks. Knowing the dominant hemisphere of the brain helps in characterizing and understanding individuals.
(Amal Makhouzmi, 2002)

Ibrahim Abu Haymad (2004) views brain lateralization as the fundamental and necessary concept for understanding the specific functions of each part, as the left hemisphere and the right hemisphere of the brain are specialized for separate and integrated functions at the same time.
(Ibrahim Abu Haymad, 2004)

Tarek Badr Eldin (2016) defines it as the "dominance or control of one of the brain hemispheres during the processing, directing, and utilization of specific motivating information for human behavior."
(Tarek Badr Eldin, 2016)

Kamil Azmi Ghorb (1995) explains that brain control is a concept referring to how the neural centers in one hemisphere affect an individual's behavior. (Kamil Azmi Ghorb, 1995)

Several related studies, including Tarek Badr Eldin (2005), Abdulrahman Jameel (2015), Ghada Omar (2014), Faten Ali Al-Kaki (2011), and Seng Sander (2000), in this field have established main thinking and learning patterns associated with the right and left hemispheres of the brain. These patterns are defined as follows:

- **Left Brain Control:** Individuals with this pattern tend to use language for memorization, sensory analysis, linear sequential processing, and recognizing familiar objects. They focus on parts and details, are more logical and effective in processing verbal and numerical materials, time-related tasks, and problem-solving. They prefer activities that involve research, exploration, organized work, and order.

- **Right Brain Control:** Individuals with this pattern lean towards visual explanations, perceiving holistic changes, and processes that require

the processing of parallel and sequential information. They perceive emotional patterns and enhance complex shapes, emotional movements, and reactions. They face problems in a non-serious manner, prefer to get a general idea of topics, generate ideas intuitively, and enjoy activities that require abstract thinking, composition, and composition.

- **Integrated Brain Control:** Individuals with this pattern tend to use distinctive thinking and learning styles for both the right and left hemispheres equally. (Tarek Badr Eldin, 2005) (Abdulrahman Jameel, 2015) (Ghada Omar, 2014) (Faten Ali Al-Kaki, 2011) (Seng Sander SH2000)

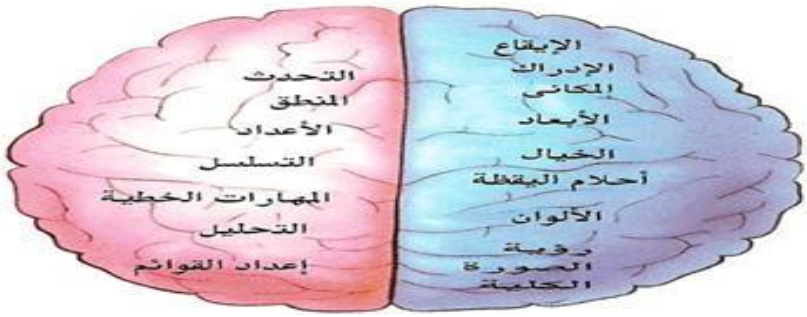

Figure (1)
Functions of the Brain Hemispheres

Samy Abdelkawy (2011) mentions that the largest part of the brain consists of two hemispheres, representing 90% of the brain's volume. These two hemispheres enclose all parts of the brain except the cerebellum, which is located below the two hemispheres in a groove that doesn't completely separate them. The two hemispheres are interconnected by a set of intertwined white fibers known as the corpus callosum, which is one of the largest connecting fibers in the nervous system and facilitates the transmission of nerve messages between the two hemispheres.

There is another group of connecting fibers that link various brain regions, symmetric centers between the hemispheres, and different brain centers. Each brain hemisphere manages the opposite side of the body both in terms of sensation and movement. The right hemisphere controls the left side of the body, and vice versa (Samy Abdelkawy, 2011).

Furthermore, some studies have focused on the impact of the functions of brain hemispheres on the physiological and psychological performance of body organs, thereby affecting social efficiency and

compatibility with capabilities and skills related to social situations (Mohammed Hassan Abdullah, 2005).

Canes explained that the left hemisphere regulates critical thinking and is specialized in reading and language. It also deals with thinking strategies that describe rational and sequential aspects. On the other hand, the activity of the right hemisphere is associated with producing music, art, scientific concepts, and involves intuition, creativity, and innovative processes (Majdi Abdel Karim Habib, 1995).

In recent times, there has been increasing interest in studying brain functions using electroencephalography (EEG). Experiments and scientific research have led to the possibility of inferring and recognizing some of these functions by studying brain wave activity and event-related potentials in its regions (Tarek Mohammed Badr Eldin, 2007).

Traditional karate consists of five competitions, namely:

1- **Ippon Shobu:** A match with a duration of one and a half minutes. The winner is the player who achieves an "ippon" or the highest total score (2 wazaris) within the allowed time.
2- **Kow-Ju Kumi Tae:** Kow-Ju Kumi Tae is a special form of Kumite competition where competitors are designated as attackers or defenders at the beginning of each match.
3- **Foku-Ju:** It is a combination of Kumite and Kihon techniques (a combined model).
4- **Anbu:** A combat match agreed upon by teams or individual (male-male, male-female). They demonstrate attacks and defenses on the field for one minute, plus or minus five seconds, and the winners are determined based on the highest recorded estimates.
5- **Kata:** It is a continuous series of defensive and offensive techniques following an internationally recognized pattern. These defensive and offensive techniques involve blocking, punching, striking, and kicking in different directions and at varying speeds, targeting three levels of the attacker's body or a group of imaginary attackers. This is done while maintaining stable and dynamic balance positions (Ahmed Mahmoud Ibrahim - Atef Mohamed Abaza, 2005).

The researcher believes that each of these competitions has its own skill and tactical performance, and this diversity covers the martial arts in traditional karate. A traditional karate player becomes versatile and diverse in kata competitions and kumite competitions. A traditional karate player

specializes in one of these competitions or some of them, or even all of them.

The Research Problem and Its Importance:

The researcher believes that sports, in general, develop motor skills and integrative mental abilities. Traditional karate, in particular, has a unique training style and diverse competitions that influence the brain control of the players.

Through her experience in sports coaching, the researcher has noticed that both male and female players undergo behavioral changes and experience shifts in their relationships with others and themselves. Significant changes in their willpower and how they handle different situations have also been observed. Furthermore, they perform better than their peers of the same age as they advance in traditional karate training.

According to Gazzanige (2002), one of the most significant benefits of studying brain control in individuals is understanding the processes of perception, imagination, and cognitive operations related to brain control patterns. Additionally, it aids in information processing and recognizing learning patterns that can benefit teachers and those involved in the learning process by determining teaching methods based on the dominant brain control patterns of students. Studying the nature of brain control helps identify the locations of brain sections, their functions, and their roles in mental and motor processes (Gazzanige, M., 2002).

Psychologists in the cognitive behavioral approach have adopted brain lateralization functions to describe and determine the responsibility of each hemisphere for behavioral patterns and cognitive, emotional, and mental functions. This helps unveil the mutual relationships between specialized functions of the brain hemispheres and the accompanying mental processes, such as sensation, attention, perception, visualization, and thinking.
(Abdul Sattar Jabbar Damad, 2000) (Adnan Youssef Al-Atoum, 2004)

Several theories explain how the brain works, including the triune brain theory by Paul MacLean (1952), the theory of the two brain hemispheres by Paul MacLean (1952), the theory of the two brain hemispheres by Roger Sperry (1975), and the fourth-dimensional model of the brain or the compass of thinking by Herman (1988).

Tarek Mohamed Badr Eldin and Omnia Mohamed Hussein (2017) argue that Herman's theory emphasizes that each person predominates in one of the four regions or areas in thinking and communicating with others. Some lean more toward analysis, others toward categorization and logic, some toward discipline and execution, and some toward human meanings, relationships, emotions, and affection.

Tarek Mohamed Badr Eldin also mentions that understanding the dominant brain control pattern in players helps strengthen the capabilities of the dominant hemisphere while also stimulating the capabilities of the non-dominant hemisphere. This leads to balanced development in the functions of the brain hemispheres among players, promoting active integration and increased capacity. Understanding the brain control pattern in young individuals before engaging in various sports activities guides them toward the type of sports activity that aligns with their brain control pattern.

This ensures excellence, success, and long-term commitment to sports practice. Additionally, sports coaches should identify the brain control pattern of players to provide suitable training exercises and strategies that support and develop the functions of the dominant and non-dominant brain hemispheres. This holistic and active development enhances the players' overall performance.

(Tarek Mohamed Badr Eldin and Omnia Mohamed Hussein, 2017)

Mohamed Al-Tikriti (1988) asserts that each individual has a unique brain capable of learning, gaining experience, analyzing information, and solving problems during behavioral situations that align with this uniqueness. When suitable conditions for brain formation are available to an individual according to their brain control pattern, their ability to learn is enhanced by stimulating their nerve cells, forming more neural connections, and facilitating communication between these connections and nerves, resulting in what is known as brain-based learning.

(Mohamed Al-Tikriti, 1988)

For instance, when a player engages in learning a new motor skill, new neural connections are generated and built in the brain's cortex. When a player trains to perform a motor skill they have previously learned, the brain increases the density of blood vessels in those neural networks in the cortex (Tarek Mohamed Badr Eldin, 2016).

Based on the previous scientific background, the research problem has emerged, and the researcher believes in the possibility and necessity of using scientific methods that suit the dominant brain pattern of each player. Since each player has a unique brain pattern different from others, the practical activities and training methods should also differ from one player to another, depending on the type of competition in traditional karate and the dominant brain pattern.

Therefore, they can excel in it if their brain control matches the psychological performance requirements of this sport activity. Appropriate training and teaching strategies should be designed to support this brain control, leading to better ways to achieve sports accomplishments.
(Tarek Mohamed Badr Eldin and Omnia Mohamed Hussein, 2017)

This aligns with Herman's (2002) study, which found that students who learn techniques and methods that align with their dominant brain control pattern achieve high results in the processes of teaching, learning, and achievement. Herman emphasizes that every person has a thinking style for problem-solving, information processing, and dealing with data, and this style is determined by the dominant brain control.
(pattern (Herman, N., 2002)

Tarek Mohamed Badr Eldin and Omnia Mohamed Hussein (2017) also agree that there are differences between practitioners and practices of sports activities in terms of their preferred dominant brain control pattern.
Therefore, the researcher believes that studying the functions of the brain hemispheres (right and left) according to the type of competition and gender (male or female) provides coaches with valuable information to help them choose appropriate training and teaching methods according to each pattern. This information can be used to develop players in traditional karate.

Research Objectives:

1- Identifying the brain control patterns of traditional karate players based on the type of competition (Ippon Shobu, Kogu, Fukugu, Kata, Enbu).
2- Determining the brain control patterns of traditional karate players based on the differences in competition type (Ippon Shobu, Kogu, Fukugu, Kata, Enbu) and gender (males, females).

3- Exploring the relationship between brain control patterns and achievement levels in each category of traditional karate competitions for both males and females.

Research Questions:

1- What are the brain control patterns among traditional karate players based on the type of competition (Ippon Shobu, Kojo, Fukojo, Kata, Anbo)?
2- What are the brain control patterns among traditional karate players based on differences in the type of competition (Ippon Shobu, Kojo, Fukojo, Kata, Anbo) and gender (males and females)?
3- What is the relationship between brain control patterns and the level of achievement in each category of traditional karate competitions for both males and females?

These objectives and questions outline the focus of your research on understanding how brain control patterns vary among traditional karate players based on competition type and gender and how these patterns relate to their level of achievement in different categories of traditional karate competitions.

Research Procedures:

1. Research Methodology:

The researcher followed the descriptive approach, known as "survey study," with its steps and procedures to achieve the research objectives.

2. Research Community and Sample

The Community of this research comprises first-degree karate players in the Arab Republic of Egypt, who are registered with the Egyptian Karate Federation. The sample, consisting of 100 male and female players above the age of 20, was selected using a random sampling method. The research tool was applied to the primary research sample during the period from The collection of this data took place during the 11th Republic Championship for the 2020-2021 sports season, in the period from October 8-10, 2021.

The researcher applied the scale to the same sample, as she was the one who developed the scientific coefficients for the scale to construct it. This was done during the period from November 19 to November 29, 2019.

a) The reliability was calculated using three methods: content validity, expert validity, and internal consistency. Consistency was found

between each statement and the total score of the scale, indicating that the scale measures what it was designed for.

b) As for the stability coefficients, they were calculated using two methods: the split-half method and Cronbach's alpha. The statements achieved a high degree of stability and consistency, suggesting that the proposed scale can be relied upon as a standardized measure to identify the brain control patterns of traditional karate players.

The sample is represented in each competition as follows in the following tables:

Table (1)

No	Scale	Males	Females	Total
First Form	General	61	39	100
Second Form	Ippon Shobu	40	22	62
Third Form	Ko-Jo	47	30	77
Fourth Form	Fuko-Jo	37	24	61
Fifth Form	Kata	56	35	91
Sixth Form	Anbo	45	31	76

Table (2)
Statistical Description of the Research Sample in Age, Height, Weight, and Training Age

(N = 100)

Variable	Measurement Unit	Mean $\bar{X}$	Standard Deviation S	Skewness α_3
Age	Years	21.81	1.82	-2.69
Height	Cm	169.42	14.52	4.10
Weight	Kg	67.60	10.32	0.16
Training Age	Years	9.41	1.46	-0.17

Table (2) shows the mean, standard deviation, and skewness of the research sample in the variables of age, height, weight, and training age.

Table (3)
The number and percentage of each response for left hemisphere functions (A) and right hemisphere functions (B) for both males and females
(N = 100)

Females				Males			
A		B		A		B	
F	%	F	%	F	%	F	%
34	97%	5	14%	52	85%	9	15%

* Significance at (P-Value) > (0.05)

Table (3) shows the number and percentage of each response for left hemisphere functions (A) and right hemisphere functions (B) for both males and females.

Data Collection Tools:

The researcher used scale for collecting data in this research, "Brain Control Scale for Traditional Karate Players" by "Doaa shawkey and Hazem El Roby "(attached as١)." Doaa Shawkey ,Hazem El Robey 2023"

Scale Correction Method:

The scale consists of 6 items as follows:

Table (4)

No.	Form	Number of Phrases
1	General Form	34
2	Ippon Shobu	14
3	Ko-Jo	19
4	Fuko-Jo	3
5	Kata	9
6	Enbu	5

- Each paragraph in each image consists of two phrases (A, B).
- Phrases (A) represent the control of the left side of the brain over the player's personal behavior in dealing with sports situations in the player's life when dealing with others. At the same time, it determines the control of the left side of the brain over the player's emotions, responses, thoughts, attitudes, and stimuli that the player deals with during sports situations. The more phrases (A) outnumber phrases (B), the more it indicates the control of the left side of the brain over the player's behavior.
- Phrases (B) represent the control of the right side of the brain over the player's personal behavior in dealing with sports situations in the

player's life when dealing with others. It also determines the control of the right side of the brain over the player's emotions, responses, thoughts, attitudes, and stimuli that the player deals with during sports situations. The more phrases (B) outnumber phrases (A), the more it indicates the control of the right side of the brain over the player's behavior.

- If the number of phrases (A) is equal to the number of phrases (B) or the number of selected phrases (whether A or B) varies within ±2, this means that brain control is balanced or integrated between the two sides of the brain in the player's personal behavior when dealing with sports situations and when dealing with others.
- The overall image of the scale is a fundamental image chosen by the player, followed by choosing any other image according to the competition in which they participate. The overall image is a complementary image to all other images.
- The player answers the image of the competition in which they are participating along with the overall image.
- In the case where the player participates in more than one competition, they answer the scale for the overall image only once, along with the images of the competitions they choose, even if the player selects all five other images.

The statistical analyses used:

The researcher used the SPSS software to calculate the following statistical processes:

- Mean (average) ($\bar{X}$)
- Standard deviation (S)
- Variability coefficient ($\propto_3$)
- Kolmogorov-Smirnov normality test (Z)
- Runs Test for randomness (Z)
- Pearson correlation coefficient (r)
- Cronbach's alpha coefficient
- Test of significance of differences (t-test)

Presenting the results:

Table (5)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" General Form

(١٠٠ = N)

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Repetitions	%	No. Of Repetitions	%			
١	١	I can't do more than one task at a time.	I can do more than one task at a time.	72	72 %	28	28 %	15.52	19.36*	0.00
٢	٢	I prefer to follow a consistent method in training.	The coach's constantly varied training style motivates me most	91	91 %	9	9%	12.25	67.24*	0.00
٣	٣	I arrange my things before training and matches.	It is very difficult to find my important things for training or matches.	41	41 %	59	59 %	20.90	3.24	0.07
٤	٤	I analyze the opponent's performance each time.	I'm sure my different performances will succeed	60	60 %	40	40 %	17.64	4.00*	0.05
٥	٥	I try skills in my own new ways.	I imagine skills in my own new ways of performance.	57	57 %	43	43 %	18.04	1.96	0.16
	٦	Organize my thoughts before matches	Ignore the order of my thoughts before the matches	40	40 %	60	60 %	20.97	4.00*	0.05
whole Axis								34.64	11.18	0.00
٦	٧	Think about the new skills before doing it	Try new skills and move on to others	51	51 %	49	49 %	19.15	0.04	0.84

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
	Left Hemisphere Functions (A)		Right Hemisphere Functions (B)	No. Of Repetitions	%	No. Of Repetitions	%			
٧	٨	I get into the match atmosphere when I stand on the court.	I sometimes see the match events in front of me before it begins	94	94 %	6	6%	11.74	77.44 *	0.00
٨	٩	Understand the coach's instructions when his instructions are defined in points	I still understand the coach	68	68 %	32	32 %	16.24	12.96 *	0.00
٩	١٠	Understand the coach's instructions when his instructions are defined in points	I still understand the coach	67	67 %	33	33 %	16.37	11.56 *	0.00
١٠	١١	I know the importance of training on basic skills first even they are .boring	I discover my passion in each competition I perform in .traditional karate	37	37 %	63	63 %	21.59	6.76*	0.01
١١	١٢	I can describe the opponent's performance in matches	Infer how the opponent plays in matches	45	45 %	55	55 %	20.15	1.00	0.32
١٢	١٣	I can describe the opponent's performance in matches	I deduced how the opponent played the games	45	45 %	55	55 %	20.17	1.00	0.32
١٣	١٤	I guess winning games	I expect to win the games	59	59 %	39	39 %	17.20	50.18 *	0.00
١٤	١٥	Enjoy reciting the five commandments at the beginning and end of each traditional karate training and gathering	Pictures of heroes and their performance motivate me	62	62 %	38	38 %	17.25	5.76*	0.02

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Repetitions	%	No. Of Repetitions	%			
١٥	١٦	I apologize to my team if I make match fouls	Look for excuses for friends when they make mistakes in	83	83 %	17	17 %	13.64	43.56 *	0.00
	١٧	Define convincing reasons when I lose in the competition	I admit defeat in a match without explaining the reasons	65	65 %	35	35 %	16.75	9.00*	0.00
	١٨	I chose the competitions I participated in based on my skill in which I identify	I Adopted in the competitions in which he participated in Sensei	45	45 %	55	55 %	20.19	1.00	0.32
whole Axis								36.66	30.64	0.00
١٦	١٩	I manage my time skillfully before and during matches.	I feel there is no time to achieve the requested tasks.	42	42 %	58	58 %	20.67	2.56	0.11
١٧	٢٠	Follow the coach's instructions during competitions	Act accordingly, even if this is contrary to the instructions of the coach	45	45 %	55	55 %	20.07	1.00	0.32
	٢١	Set up my own formations and games	Quit my own training and irregular matches	62	62 %	38	38 %	17.21	5.76*	0.02
whole Axis								33.99	14.78	0.00
١٨	٢٢	I can understand from the coach's explanation.	I don't remember the coach's words. He should write	84	84 %	16	16 %	13.48	46.24 *	0.00
١٩	٢٣	I plan what I will do in matches.	I imagine what will happen in the match	77	77 %	23	23 %	14.66	29.16 *	0.00
٢٠	٢٤	I prefer thinking in a sitting position before the match	I prefer thinking while lying down before games	54	54 %	46	46 %	18.64	0.64	0.42

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Repetitions	%	No. Of Repetitions	%			
٢١	٢٥	I prefer tranquility during the trip to play games	Hear better music while traveling to play games	62	62 %	38	38 %	17.24	5.76*	0.02
٢٢	٢٦	. I accomplish in training even if .skills aren't related	I can't perform two different unrelated skills	51	51 %	49	49 %	19.12	0.04	0.84
٢٣	٢٧	I kept my cool during the competitions, regardless of the provocation of his rival Li during the matches	Get angry when the opponent is provocative	74	74 %	26	26 %	15.20	23.04 *	0.00
٢٤	٢٨	Follow the coach's instructions as it suits me	Follow the coach's instructions to make the performance fun	66	66 %	34	34 %	16.56	10.24 *	0.00
٢٥	٢٩	I adhere to the coach instructions in all cases.	I don't adhere to the coach instructions whatever my position in the match.	55	55 %	45	45 %	18.49	1.00	0.32
٢٦	٣٠	I remember names of the players in other teams easily even if I saw them only once.	I remember names of faces in other teams easily even if I saw them once.	51	51 %	49	49 %	19.10	0.04	0.84

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
	Left Hemisphere Functions (A)		Right Hemisphere Functions (B)	No. Of Repetitions	%	No. Of Repetitions	%			
٢٧	٣١	I like traditional karate as it makes me feel independent and the coach doesn't give me instructions during the performance as a player according to the law.	I feel confused when the coach leaves me without instructions in matches that makes me confused.	58	58 %	42	42 %	17.95	2.56	0.11
٢٨	٣٢	I can easily count the number of new skills I gain whether in a month or a year.	I can't assure of the number of skills I gain in a month of training.	53	53 %	47	47 %	18.79	0.36	0.55
٢٩	٣٣	Think well before matches	Listen to music before the game	67	67 %	33	33 %	16.37	11.56 *	0.00
٣٠	٣٤	I prefer movement of learning skills partially	I prefer learning motor skills in a holistic way	55	55 %	45	45 %	18.46	1.00	0.32
		whole scale						38.00	53.36	0.00

Significance at (P-Value) > (0.05)

From Table (5) and Figure (2), it is evident that there are statistically significant differences in favor of selecting "left hemisphere functions" in items (1, 2, 4, 8, 9, 10, 14, 15, 16, 17, 21, 22, 23, 25, 27, 28, 33). As for choosing "right hemisphere functions," statistically significant differences are observed in items (6 and 11). There are no statistically significant differences in items (34, 32, 31, 30, 29, 26, 24, 20, 19, 18, 13, 12, 7, 5, 3).

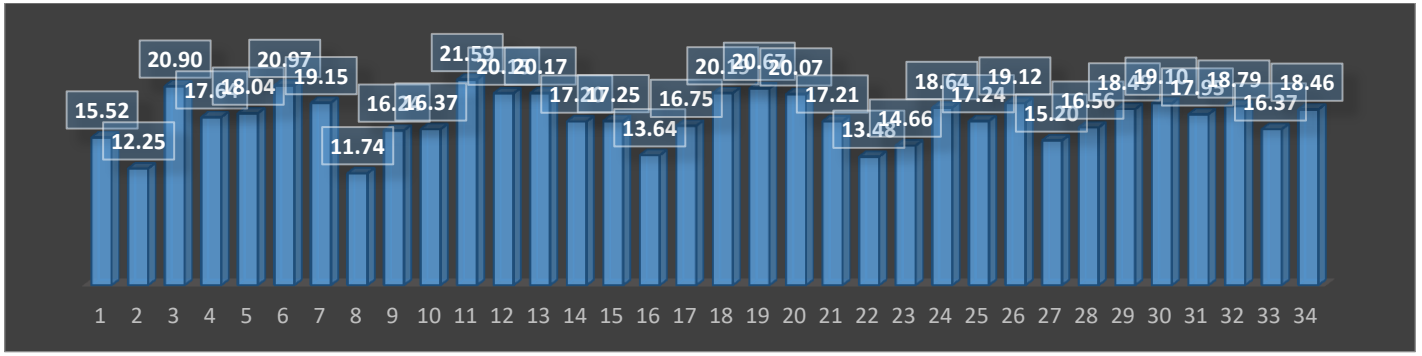

Figure (2)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" General Form

Table (6)
Significance of Differences between Males and Females for Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" General Form

(١٠٠ =N)

Axis	Statements	Females(٣٩)				Males(٦١)				Z	P-(Value)
		A		B		A		B			
		No. Of Repetitions	%	No. Of Repetitions	%	No. Of Repetitions	%	No. Of Repetitions	%		
١	١	24	62%	15	38%	48	79%	13	21%	-1.85	0.06
٢	٢	36	92%	3	8%	55	90%	6	10%	-0.36	0.72
٣	٣	15	38%	24	62%	26	43%	35	57%	-0.41	0.68
٤	٤	22	56%	17	44%	38	62%	23	38%	-0.58	0.56
٥	٥	17	44%	22	56%	40	66%	21	34%	-2.16*	0.03
	٦	15	38%	24	62%	25	41%	36	59%	-0.25	0.80

Axis	Statements	Females(٣٩) A		Females(٣٩) B		Males(٦١) A		Males(٦١) B		Z	P-(Value)
		No. Of Repetitions	%	No. Of Repetitions	%	No. Of Repetitions	%	No. Of Repetitions	%		
whole Axis										-1.68	0.09
٦	٧	17	44%	22	56%	34	56%	27	44%	-1.18	0.24
٧	٨	36	92%	3	8%	58	95%	3	5%	-0.57	0.57
٨	٩	20	51%	19	49%	48	79%	13	21%	-2.85*	0.00
٩	١٠	26	67%	13	33%	41	67%	20	33%	-0.06	0.96
١٠	١١	8	21%	31	79%	29	48%	32	52%	-2.72*	0.01
١١	١٢	14	36%	25	64%	31	51%	30	49%	-1.46	0.15
١٢	١٣	20	51%	19	49%	25	41%	36	59%	-1.00	0.32
١٣	١٤	24	62%	15	38%	35	57%	24	39%	-0.11	0.91
١٤	١٥	18	46%	21	54%	44	72%	17	28%	-2.60*	0.01
١٥	١٦	32	82%	7	18%	51	84%	10	16%	-0.20	0.84
	١٧	26	67%	13	33%	39	64%	22	36%	-0.28	0.78
	١٨	16	41%	23	59%	29	48%	32	52%	-0.64	0.53
whole Axis										-0.33	0.74
١٦	١٩	16	41%	23	59%	26	43%	35	57%	-0.16	0.88
١٧	٢٠	12	31%	27	69%	33	54%	28	46%	-2.28*	0.02
	٢١	24	62%	15	38%	38	62%	23	38%	-0.08	0.94
whole Axis										-1.67	0.09
١٨	٢٢	33	85%	6	15%	51	84%	10	16%	-0.13	0.89
١٩	٢٣	32	82%	7	18%	45	74%	16	26%	-0.95	0.34

Axis	Females(٣٩)					Males(٦١)				Z	P-(Value)
	State ments	A		B		A		B			
		No. Of Repetitions	%	No. Of Repetitions	%	No. Of Repetitions	%	No. Of Repetitions	%		
٢٠	٢٤	21	54%	18	46%	33	54%	28	46%	-0.02	0.98
٢١	٢٥	28	72%	11	28%	34	56%	27	44%	-1.61	0.11
٢٢	٢٦	21	54%	18	46%	30	49%	31	51%	-0.45	0.65
٢٣	٢٧	23	59%	16	41%	51	84%	10	16%	-2.73*	0.01
٢٤	٢٨	28	72%	11	28%	38	62%	23	38%	-0.97	0.33
٢٥	٢٩	25	64%	14	36%	30	49%	31	51%	-1.46	0.15
٢٦	٣٠	21	54%	18	46%	30	49%	31	51%	-0.45	0.65
٢٧	٣١	22	56%	17	44%	36	59%	25	41%	-0.26	0.80
٢٨	٣٢	18	46%	21	54%	35	57%	26	43%	-1.09	0.28
٢٩	٣٣	26	67%	13	33%	41	67%	20	33%	-0.06	0.96
٣٠	٣٤	16	41%	23	59%	39	64%	22	36%	-2.23*	0.03
		whole scale								-1.50	0.13

* Significance at (P-Value) > (0.05)

Table (6) shows statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale in expressions (5-8-10-14-17-23-30), with no statistically significant differences in the remaining expressions of the scale.

Table (7)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Ippon Shobu Form

(٦٢ = N)

Axis	Statements			أ		ب		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Re	%	No. Of Re	%			
١	١	I performed the simple attack to get Wzari or Ibon	The attack was conducted to get Wzari or Ebon	30	48%	32	52%	7.90	0.02	0.90
٢	٤	I expect the organized deception of the opponent	I expect a random disappointment from the opponent	45	73%	17	27%	6.30	11.95*	0.00
٣	٧	I missed my plans before the matches but I'm going to the	I don't usually make plans before matches but I follow matches'	31	50%	31	50%	7.90	0.02	0.90
٤	١١	Organize the rhythm of matches	Discover the rhythm of the games	19	31%	43	69%	9.16	8.67*	0.00
٥	١٢	Describe the difficult positions in	I concluded the difficult positions	37	60%	25	40%	7.10	2.77	0.10
٦	١٤	I focus on the opponent's	I focus on my performance only to	49	79%	13	21%	5.84	20.08*	0.00
٧	١٧	Join the coach's plans	I risk with performing unexpected	41	66%	21	34%	6.75	5.92*	0.01
٨	١٨	Choose the right moment for a counterattack	I turned to the entrance to Taino Sen attack without thinking.	24	39%	38	61%	8.59	2.77	0.10
٩	٢١	I can estimate the remaining time during my performance in	I find it difficult to estimate the remaining time during my	23	37%	39	63%	8.70	3.69*	0.05
١٠	٢٣	I understand my plan based on the	I want to see the motor skills model	27	44%	35	56%	8.25	0.80	0.37
١١	٢٤	I plan what I will do in the	I imagine what I will do in the	36	58%	26	42%	7.33	1.33	0.25
١٢	٣١	Implement the coach's plans	Implement the coach's plans	40	65%	22	35%	6.87	4.74*	0.03
١٣	٣٢	I adjust my plans according to the circumstances of the game	I insisted on my plans no matter what	31	50%	31	50%	7.90	0.02	0.90
١٤	٣٦	I adjust my plans according to the	I insisted on my plans no matter	43	69%	19	31%	6.41	10.25*	0.00
		whole scale						38.00	15.00	10.31

*Significance at (P-Value) > (0.05)

As evident from Table (7) and Figure (3), statistically significant differences are present in favor of selecting "left hemisphere functions" in items (2, 6, 7, 12, 14). For selecting "right hemisphere functions," statistically significant differences are observed in items (4 and 9). There are no statistically significant differences in items (13, 11, 10, 8, 5, 3, 1) for the Ippon Shobu.

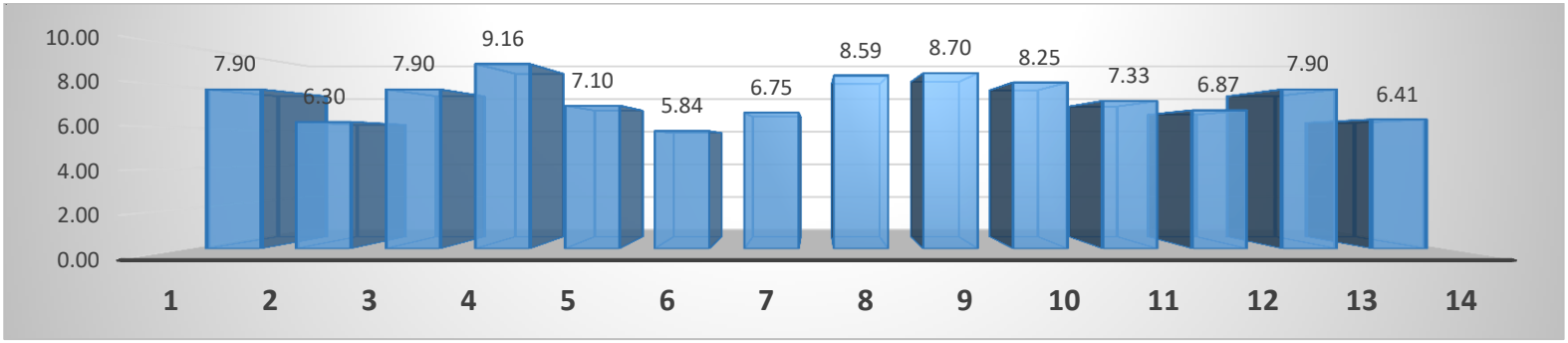

Figure (3)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Ippon Shobu Form

Table (8)
Significance of Differences between Males and Females for Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Ipon Shobu Form

(62 = ن)

Axis	Females) 22(					Males) 40)				Z	P-(Value)
	State ments	A		B		A		B			
		No. Of Repetit	%	No. Of Repetit	%	No. Of Repetit	%	No. Of Repetit	%		
١	1	7	32%	15	68%	23	58%	17	43%	-2.02*	0.04
٤	2	17	77%	5	23%	28	70%	12	30%	-0.67	0.50

Axis	Statements	Females) 22(				Males) 40)				Z	P-(Value)
		A		B		A		B			
		No. Of Repetit	%	No. Of Repetit	%	No. Of Repetit	%	No. Of Repetit	%		
٧	3	10	45%	12	55%	21	53%	19	48%	-0.96	0.34
١١	4	3	14%	19	86%	16	40%	24	60%	-2.20*	0.03
١٢	5	10	45%	12	55%	27	68%	13	33%	-1.27	0.20
١٤	6	21	95%	1	5%	28	70%	12	30%	-2.38*	0.02
١٧	7	13	59%	9	41%	28	70%	12	30%	-1.35	0.18
١٨	8	5	23%	17	77%	19	48%	21	53%	-1.98*	0.05
٢١	9	9	41%	13	59%	14	35%	26	65%	-0.38	0.70
٢٣	10	4	18%	18	82%	23	58%	17	43%	-3.05*	0.00
٢٤	11	18	82%	4	18%	18	45%	22	55%	-2.34*	0.02
٣١	12	11	50%	11	50%	29	73%	11	28%	-2.24*	0.03
٣٢	13	11	50%	11	50%	20	50%	20	50%	-0.43	0.66
٣٦	14	14	64%	8	36%	29	73%	11	28%	-0.87	0.38
		whole scale								-1.82	0.07

* Significance at (P-Value) > (0.05)

Table (8) reveals statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Ippon Shobu form, in the axes (1-11-14-18-23-24-31), with no statistically significant differences in the remaining axes of the scale.

Table (9)

Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Kogo Form

(٢٧ = N)

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Re	%	No. Of Re	%			
١	١	I prefer attack directly without	I prefer to be fooled before the	28	36%	49	64%	12.08	5.73*	0.02
٢	٢	I prefer to rely on offensive skills set for a disk and Azari or Ebony	It was based on different offensive skills for Azeris, Azari or Ibon	32	42%	45	58%	11.55	2.19	0.14
٣	٣	I neglect the opponent's plans	I change the performance or the	18	23%	59	77%	13.34	21.83*	0.00
٧	٤	Organize my thoughts during the	I don't arrange my thoughts before	39	51%	38	49%	10.69	0.01	0.91
8	٥	I exercised a lot on defensive	I perform defensive skills as I feel.	31	40%	46	60%	11.69	2.92	0.09
١١	٦	The style of disappointment	Discover the style of	66	86%	11	14%	7.24	39.29*	0.00
13	٧	Try moving from one skill	I imagine moving from one skillful	44	57%	33	43%	10.03	1.57	0.21
14	٨	I focus on playing only when I'm a lawyer	The attacker is obliged to line up in a line by actions that the referee	58	75%	19	25%	8.21	19.75*	0.00
	٩	I focus on playing only when I'm	The attacker is obliged to line up in	43	56%	34	44%	10.06	1.05	0.31
15	١	I get into matches knowing that I	I guess winning games	44	57%	33	43%	18.20	11.25*	0.00
17	١	Join the coach's plans	Do not stick to the coach's plans	59	77%	18	23%	10.05	1.57	0.21
18	١	Apply the new plans on which	Modify the plans for which you	42	55%	35	45%	8.16	21.83*	0.00
19	١	Know that unintentional injuries	I lose my temper if my opponent	45	58%	32	42%	9.88	2.19	0.14
٢٠	١	I acted with his spontaneity to go	I turned from attack to defense or	47	61%	30	39%	9.66	3.75*	0.05
21	١	I can count the 10 seconds before the referee announces that.	I can't count the 10 seconds before the referee announces that.	27	35%	50	65%	12.16	6.87*	0.01
٢٧	١	Set up defensive skills	Look for new defensive skills	50	65%	27	35%	9.26	6.87*	0.01

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Re	%	No. Of Re	%			
32	١	I implement the coach's plans because it suits my thinking	Implement the coach's plans because he makes the performance enjoyable	35	45%	42	55%	11.19	0.64	0.43
35	١	I adhere the match plans	I risk with performing unexpected .plans	62	81%	15	19%	7.74	28.69*	0.00
39	١	I adhere the match plans	I risk with performing unexpected	56	73%	21	27%	8.52	15.91*	0.00
		whole scale						21.00	31.31*	0.00

* Significance at (P-Value) > (0.05)

It is evident from Table (9) and Figure (4) that there are statistically significant differences in favor of selecting functions of the left hemisphere of the brain in statements (6-8-10-12-14-16-18-19) and in favor of selecting functions of the right hemisphere of the brain in statements (1-3-15). There are no statistically significant differences in statements (2-4-5-7-9-11-13-17).

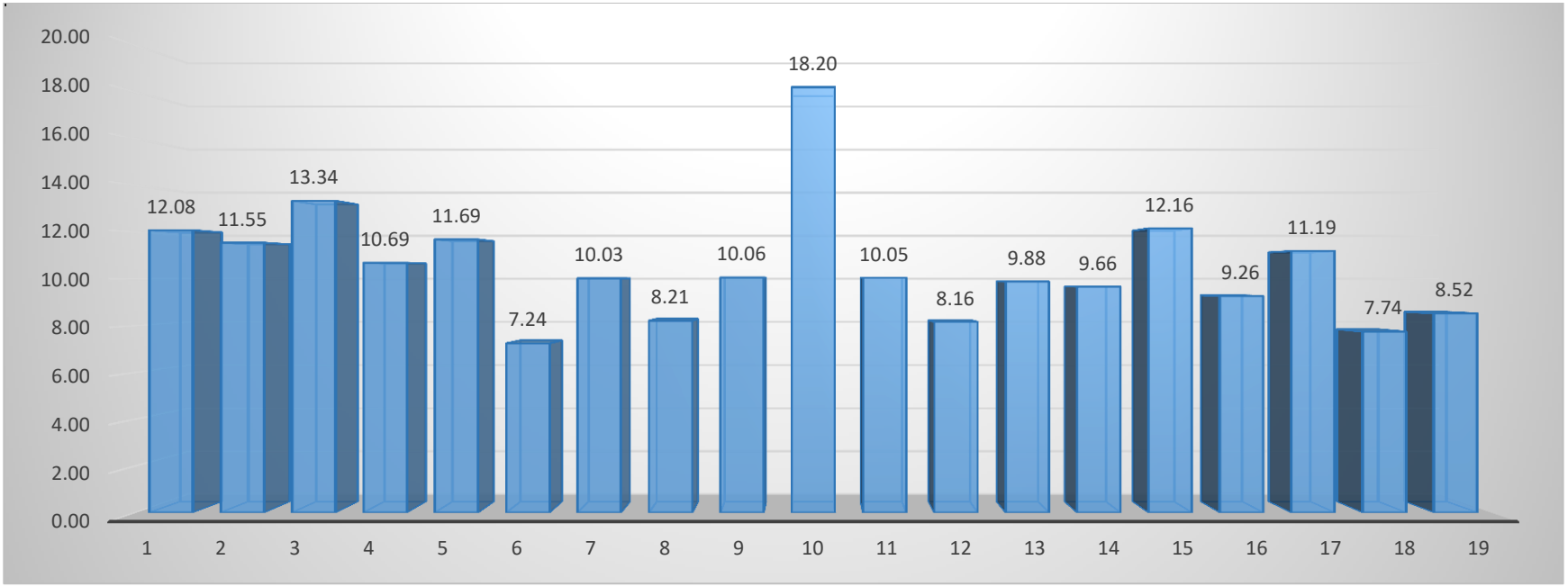

Figure (4)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Kogo Form

Table (10)
Significance of Differences between Males and Females for Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Kogo Form

(N=77)

Axis	(٣٠) Females					(٤٧) Males				Z	P-(Value)
	Statements	A		B		A		B			
		No. Of Repetiti	%	No. Of Repetiti	%	No. Of Repetiti	%	No. Of Repetiti	%		
١		10	33%	20	67%	18	38%	29	62%	-0.44	0.66
٢	٢	12	40%	18	60%	20	43%	27	57%	-0.22	0.83
٣	٣	10	33%	20	67%	8	17%	39	83%	-1.64	0.10
٧	٤	19	63%	11	37%	20	43%	27	57%	-1.77	0.08
8	٥	15	50%	15	50%	16	34%	31	66%	-1.38	0.17
١١	٦	22	73%	8	27%	44	94%	3	6%	-2.46*	0.01
13	٧	17	57%	13	43%	27	57%	20	43%	-0.07	0.95
14	٨	21	70%	9	30%	37	79%	10	21%	-0.86	0.39
	٩	16	53%	14	47%	27	57%	20	43%	-0.35	0.72
15	١٠	18	60%	12	40%	26	55%	21	45%	-0.40	0.69
17	١١	23	77%	7	23%	36	77%	11	23%	-0.01	0.99
18	١٢	20	67%	10	33%	22	47%	25	53%	-1.70	0.09
19	١٣	18	60%	12	40%	27	57%	20	43%	-0.22	0.83
٢٠	١٤	15	50%	15	50%	32	68%	15	32%	-1.58	0.11
21	١٥	7	23%	23	77%	20	43%	27	57%	-1.71	0.09
٢٧	١٦	17	57%	13	43%	33	70%	14	30%	-1.21	0.23
32	١٧	16	53%	14	47%	19	40%	28	60%	-1.10	0.27
35	١٨	23	77%	7	23%	39	83%	8	17%	-0.68	0.50
39	١٩	19	63%	11	37%	37	79%	10	21%	-1.47	0.14
		whole scale								-0.02	0.98

* Significance at (P-Value) > (0.05)

Table (10) demonstrates statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional

Karate Players" scale, Kogo form, in axis (11), with no statistically significant differences in the remaining axes of the scale.

Table (11)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Fukugo Form

(61 =N)

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Repetitions	%	No. Of Repetiti	%			
٧	١	I Know my role before the matches and organize the number of roles knowing the number of times that the comet and the kata	I showed a lack of interest in the number of roles in which he will play Comet or Kata	**38**	**62%**	**23**	**38 %**	**1.97**	**3.69***	**0.05**
٣٢	٢	Play fokogu because it combines kata and comet, which makes sense in the traditional sport of karate	Play Fokogu because it combines kata and comet and it's fun in the traditional sport of karate	**34**	**56%**	**27**	**44 %**	**2.07**	**0.80**	**0.37**
٣٣	٣	I turned from kumite to kata easily	I turned from kumite to kata difficulty	**38**	**62%**	**23**	**38 %**	**1.97**	**3.69***	**0.05**
		whole scale						**4.00**	**6.74**	**0.08**

* Significance at (P-Value) > (0.05)

As evident from Table (11) and Figure (5), there are statistically significant differences in favor of selecting functions of the left hemisphere of the brain in statements (1-3), and there are no statistically significant differences in statement (2) in the fukugo (composite) form.

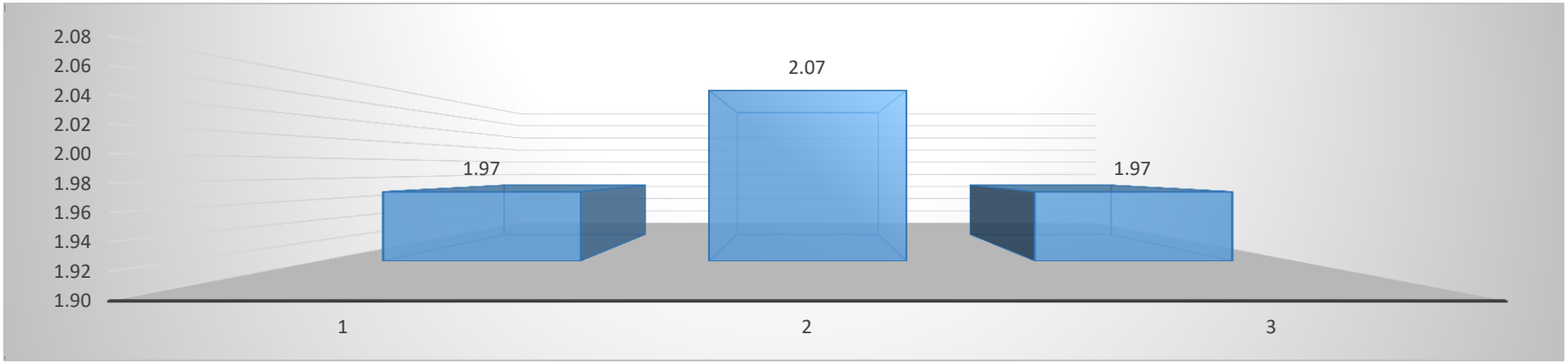

Figure (5)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Fukugo Form

Table (12)
Significance of Differences between Males and Females for Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" fukugo Form

(N=61)

Axis	Statements	(٢٤) Females				(٣٧) Males				*Z*	P-(Value)
		A		B		A		B			
		No. Of Repetitio	%	No. Of Repetiti	%	No. Of Repetiti	%	No. Of Repetiti	%		
7	1	14	58%	10	42%	24	65%	13	35%	**-0.51**	0.61
32	2	11	46%	13	54%	23	62%	14	38%	**-1.24**	0.21
33	3	12	50%	12	50%	26	70%	11	30%	**-1.58**	0.11
		whole scale								**-1.65**	0.10

* Significance at (P-Value) > (0.05)

Table (12) shows no statistically significant differences for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Fukogo form.

Table (13)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Kata Form

(91 = N)

Axis	Statements			A		B		Relative Importance	χ^2	A
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Repet	%	No. Of Repet	%			
٣	١	I like to play Kata the opponent don't expect it from me	I change the kata at the last minute	72	79%	19	21%	4.02	30.87*	0.00
٦	٢	I try to perform the kata in new ways of my own	I imagine the performance of the kata in a new way	58	64%	33	36%	4.66	8.01*	0.00
٧	٣	I arrange my thoughts before the matches so that I know what Kata will play in the preliminary stages and if possible in the final stages before going to the championship	I walk according to match conditions and do not fix my thoughts	57	63%	34	37%	4.76	5.81*	0.02
٨	٤	I apologize to my team if mistakes are made in the collective kata.	Look for excuses for your colleagues when they make mistakes in the kata	37	41%	54	59%	5.75	3.18	0.07
١٣	٥	Set up a training method	I imagine more than a way to play	55	60%	36	40%	4.86	3.97*	0.05
١٧	٦	Follow the instructor's instructions for kata performance	I perform Kata my own way even if it goes against instructions of the coach.	70	77%	21	23%	4.12	26.38*	0.00
١٨	٧	Follow the coach's instructions as it suits me	I execute what I feel with during the performance.	53	58%	38	42%	4.96	2.47	0.12

Axis	Statements			A		B		Relative Importance	χ^2	A
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Repet	%	No. Of Repet	%			
٣٧	٨	I can record the number of moves at each kata that I see easily	The number of movements in each kata has never been calculated	**31**	**34%**	**60**	**66%**	**6.04**	**9.24***	**0.00**
٣٨	٩	It ended with a point other than the one from which it started, unless it is indicated at the beginning	Finished at the starting point without touching them	**70**	**77%**	**21**	**23%**	**4.12**	**26.38***	**0.00**
		Whole Scale						**10.00**	**30.46***	**0.00**

* Significance at (P-Value) > (0.05)

Table (13) and Figure (6) show statistically significant differences in favour of choosing the functions of the left hemisphere of the brain in expressions (1-2-3-5-6-9) and in favour of choosing the functions of the right hemisphere of the brain in expression (8). There are no statistically significant differences in expressions (4-7) in kata

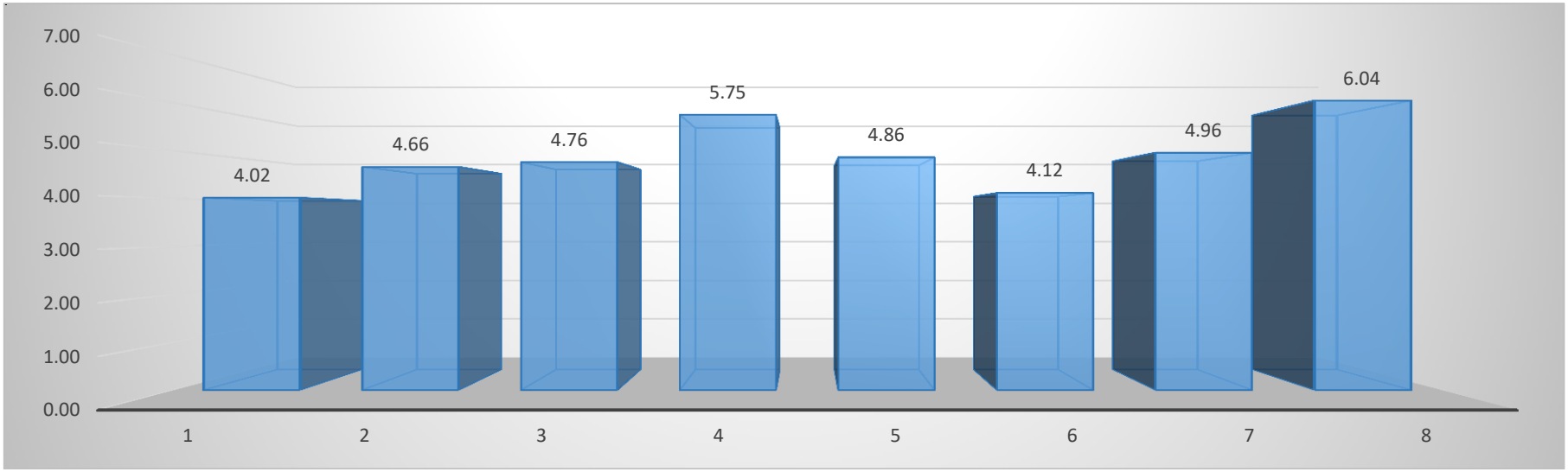

Figure (6)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Kata Form

Table (14)
Significance of Differences between Males and Females for Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Kata Form

(N=91)

Axis	Statements	(٣٥) Females				(56) Males				*Z*	P-(Value)
		A		B		A		B			
		No. Of Repetitio	%	No. Of Repetiti	%	No. Of Repetiti	%	No. Of Repetiti	%		
٣	١	**32**	**91%**	**3**	**9%**	**40**	**71%**	**16**	**29%**	**-2.27***	**0.02**
٦	٢	**21**	**60%**	**14**	**40%**	**38**	**68%**	**18**	**32%**	**-0.76**	**0.45**
٧	٣	**20**	**57%**	**15**	**43%**	**37**	**66%**	**19**	**34%**	**-0.85**	**0.39**
٨	٤	**13**	**37%**	**22**	**63%**	**24**	**43%**	**32**	**57%**	**-0.54**	**0.59**
١٣	٥	**15**	**43%**	**20**	**57%**	**40**	**71%**	**16**	**29%**	**-2.70***	**0.01**
١٧	٦	**26**	**74%**	**9**	**26%**	**44**	**79%**	**12**	**21%**	**-0.47**	**0.64**
١٨	٧	**20**	**57%**	**15**	**43%**	**33**	**59%**	**23**	**41%**	**-0.17**	**0.87**
٣٧	٨	**16**	**46%**	**19**	**54%**	**15**	**27%**	**41**	**73%**	**-1.84**	**0.07**
		whole scale								**-0.28**	**0.78**

* Significance at (P-Value) > (0.05)

Table (14) illustrates statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Kata form, in the axes (3-13), with no statistically significant differences in the remaining axes of the scale.

Table (15)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Anbo Form

(76 = N)

Axis	Statements			A		B		Relative Importance	χ^2	P-(Value)
		Left Hemisphere Functions (A)	Right Hemisphere Functions (B)	No. Of Re	%	No. Of Re	%			
3	١	I do not put the performance of my colleague / colleague in my calculations in correspondence Al-Anbo	Surprise my colleague / colleague in performing new skills in Anbo games	34	45%	42	55%	3.28	0.84	0.36
5	٢	I analyze Kata and Bunkai actions and I rearrange them when requested to form a part of Anbo.	I imagine new actions when requested to form a part of Anbo	58	76%	18	24%	2.49	21.05*	0.00
18	٣	I apologize to my colleague / colleague for any mistakes in the agreed execution	Seeking an apology for my colleague / colleague if he fails to deliver the agreed service	45	59%	31	41%	2.92	2.58	0.11
29	٤	I find it easy to save Alnbo even if his movements are not yet connected	I have trouble saving the Anabu before the interconnected movements are combined	26	34%	50	66%	3.55	7.58*	0.01
31	٥	The performance in the Anabo method is better in the logical sequence of skills	Performance The Anbo method is a better performance when the aesthetic taste of skills	50	66%	26	34%	2.76	7.58*	0.01
		whole scale						6.00	17.68*	0.00

* Significance at (P-Value) > (0.05)

evident from Table (15) and Figure (7) that there are statistically significant differences in favor of selecting functions of the left hemisphere of the brain in statements (2-5), and in favor of selecting functions of the right

hemisphere of the brain in statement (4), with no statistically significant differences in statements (1-3) in the Anbo (composite) form.

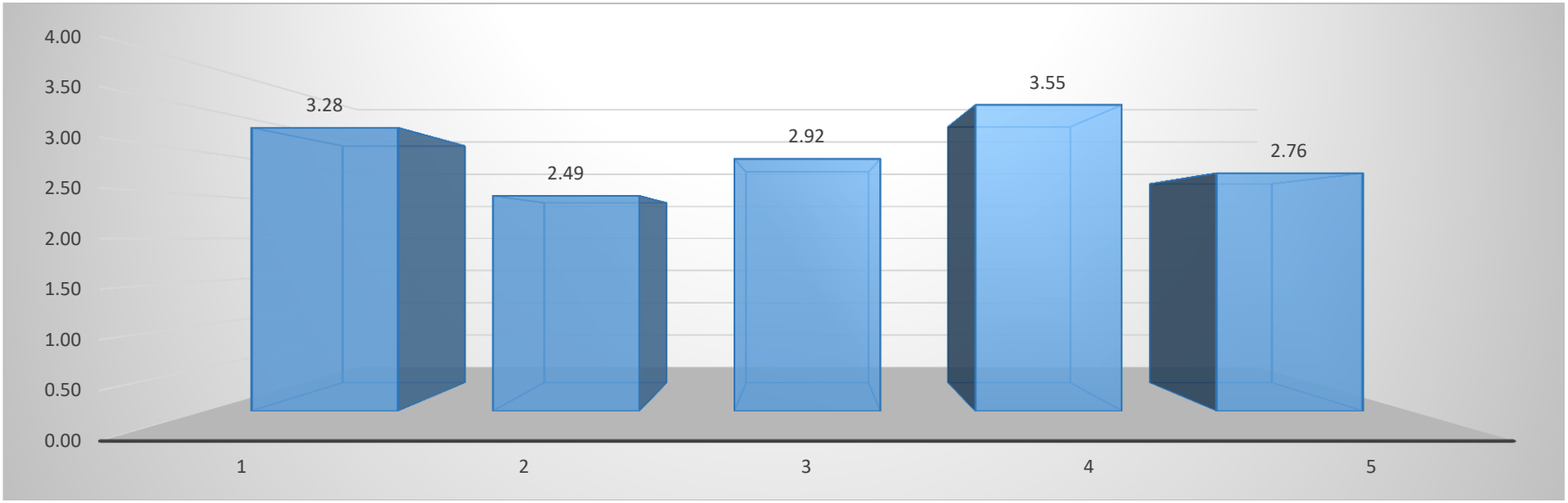

Figure (7)
Significance and Relative Importance of Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Anbo Form

Table (16)
Significance of Differences between Males and Females for Each Response (Left Hemisphere Functions - Right Hemisphere Functions) of the "Brain Control Scale for Traditional Karate Players" Anbo Form

(76 = N)

Axis	(٣١) Females					(٤٥) Males				*Z*	P-(Value)
	Statements	A		B		A		B			
		No. Of Repetitio	%	No. Of Repetiti	%	No. Of Repetiti	%	No. Of Repetiti	%		
3	١	12	39%	19	61%	22	49%	23	51%	-0.87	0.38
5	٢	18	58%	13	42%	40	89%	5	11%	-3.09*	0.00
18	٣	18	58%	13	42%	27	60%	18	40%	-0.17	0.87
29	٤	12	39%	19	61%	14	31%	31	69%	-0.68	0.50
31	٥	18	58%	13	42%	32	71%	13	29%	-1.17	0.24
		whole scale								-1.81	0.07

١* Significance at (P-Value) > (0.05)

Table (16), it becomes evident that there are statistically significant differences between males and females in response to every item (left hemisphere functions - right hemisphere functions) in the "Brain Control of Traditional Karate Players" scale in the category of "Enbu" in the axis (5). There are no statistically significant differences in the other dimensions of the scale .

Table (17)
Correlation Coefficient between Achievement Levels and Each Response of (A) Left Hemisphere Functions - (B) Right Hemisphere Functions of the "Brain Control Scale for Traditional Karate Players" Ipon Shobu Form for Both Females and Males

(N=16)

No.	Achievement Levels	Females (8)			Achievement Levels	Males (8)		
		Number (A)	Number (B)	The Difference between them		Number (A)	Number (B)	The Difference between them
1	First	7	7	0	First	8	6	2
2	Second	3	11	8	Second	8	6	2
3	Third	3	11	8	Third	8	6	2
4	Fourth	8	6	2	Fourth	8	6	2
5	Fifth	4	10	6	Fifth	6	8	2
6	Sixth	5	9	4	Sixth	5	9	4
7	Seventh	7	7	0	Seventh	6	8	2
8	Eighth	5	9	4	Eighth	6	8	2
r		-0.18	0.18	0.18		0.81*	-0.81*	-0.25
P-(Value)		0.67	0.67	0.67		0.02	0.02	0.56

Table (17) shows a statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain and an inverse statistically significant relationship between achievement levels and each response in (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Ippon Shubo form, for males. There is no statistically significant relationship between achievement levels and any response in the scale for females.

Table (18)
Correlation Coefficient between Achievement Levels and Each Response of (A) Left Hemisphere Functions - (B) Right Hemisphere Functions of the "Brain Control Scale for Traditional Karate Players Kogo Form for Both Females and Males

(N=16)

No.	Achievement Levels	Females (8)			Achievement Levels	Males (8)		
		Number (A)	Number (B)	The Difference between them		Number (A)	Number (B)	The Difference between them
1	First	10	9	1	First	8	11	4
2	Second	13	6	7	Second	6	13	8
3	Third	9	10	1	Third	11	8	2
4	Fourth	9	10	1	Fourth	9	10	2
5	Fifth	7	12	5	Fifth	13	6	5
6	Sixth	9	10	1	Sixth	8	11	4
7	Seventh	10	9	1	Seventh	8	11	4
8	Eighth	14	5	9	Eighth	13	6	5
r		0.٢٧	-0.٢٧	0.٤٤		-0.42	0.42	0.١٢
P-(Value)		0.٥٢	0.٥٢	0.٢٨		0.30	0.30	0.٧٨

* Significance at (P-Value) > (0.05)

Table (18) shows no statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain - (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Kogou form, for both females and males.

Table (19)
Correlation Coefficient between Achievement Levels and Each Response of (A) Left Hemisphere Functions - (B) Right Hemisphere Functions of the "Brain Control Scale for Traditional Karate Players" Fukugo Form for Both Females and Males

(N=16)

No.	Achievement Levels	Females (8)			Achievement Levels	Males (8)		
		Number (A)	Number (B)	The Difference between them		Number (A)	Number (B)	The Difference between them
1	First	1	2	1	First	2	1	1
2	Second	2	1	1	Second	2	1	1
3	Third	2	1	1	Third	2	1	1
4	Fourth	0	3	3	Fourth	2	1	1
5	Fifth	1	2	1	Fifth	2	1	1
6	Sixth	2	1	1	Sixth	2	1	1
7	Seventh	2	1	1	Seventh	2	1	1
8	Eighth	3	0	3	Eighth	1	2	1
r		-0.٥١	0.٥1	-0.٣8		0.58	-0.58	-
P-(Value)		0.2٠	0.٢٩	0.٣٦		0.13	0.13	-

* Significance at (P-Value) > (0.05)

Table (19) shows no statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain - (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Fukojou form, for both females and males.

Table (20)
Correlation Coefficient between Achievement Levels and Each Response of (A) Left Hemisphere Functions - (B) Right Hemisphere Functions of the "Brain Control Scale for Traditional Karate Players Kata Form for Both Females and Males

(N=16)

No.	Achievement Levels	Females (8)			Achievement Levels	Males (8)		
		Number (A)	Number (B)	The Difference between them		Number (A)	Number (B)	The Difference between them
1	First	3	5	2	First	٧	1	٦
2	Second	5	3	2	Second	3	5	2
3	Third	3	5	2	Third	4	4	0
4	Fourth	6	2	4	Fourth	3	5	2
5	Fifth	3	5	2	Fifth	3	5	2
6	Sixth	3	5	2	Sixth	5	3	2
7	Seventh	4	4	0	Seventh	4	4	0
8	Eighth	4	4	0	Eighth	4	4	0
r		-0.١٠	0.١٠	0.٦٢		0.٠٠	0.٠٠	0.٦٤
P-(Value)		0.٨١	0.٨١	0.١٠		١.٠٠	١.٠٠	0. ٠٨

* Significance at (P-Value) > (0.05)

Table (20) shows no statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain - (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Kata form, for both females and males.

Table (21)
Correlation Coefficient between Achievement Levels and Each Response of (A) Left Hemisphere Functions - (B) Right Hemisphere Functions of the "Brain Control Scale for Traditional Karate Players" Anbo Form for Both Females and Males

(N=16)

No.	Achievement Levels	Females (8)			Achievement Levels	Males (8)		
		Number (A)	Number (B)	The Difference between them		Number (A)	Number (B)	The Difference between them
1	First	2	3	1	First	3	2	1
2	Second	3	2	1	Second	3	2	1
3	Third	2	3	1	Third	3	2	1
4	Fourth	2	3	1	Fourth	3	2	1
5	Fifth	2	3	1	Fifth	2	3	1
6	Sixth	2	3	1	Sixth	2	3	1
7	Seventh	3	2	1	Seventh	2	3	1
8	Eighth	2	3	1	Eighth	2	3	1
r		0.00	0.00	-		0.87*	-0.87*	-
P-(Value)		1.00	1.00	-		0.00	0.00	-

* Significance at (P-Value) > (0.05)

Table (21) shows a statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain and an inverse statistically significant relationship between achievement levels and each response in (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Anbo form, for males. There is no statistically significant relationship between achievement levels and any response in the scale for females.

From Table (5) and Figure (2), it is evident that there are statistically significant differences in favor of selecting "left hemisphere functions" in items (1, 2, 4, 8, 9, 10, 14, 15, 16, 17, 21, 22, 23, 25, 27, 28, 33). As for choosing "right hemisphere functions," statistically significant differences are observed in items (6 and 11). There are no statistically significant differences in items (34, 32, 31, 30, 29, 26, 24, 20, 19, 18, 13, 12, 7, 5, 3).

Based on the above, it is evident that there are statistically significant differences in favor of selecting "left hemisphere functions" in 17 responses, which is the highest among the responses.

Following that, there are no statistically significant differences in 15 responses, indicating a similarity in responses between the right and left hemispheres, which achieves a balanced pattern. The responses favoring "right hemisphere functions" are the least, with only 2 responses showing statistically significant differences. This is in the general form of the scale.

As evident from Table (7) and Figure (3), statistically significant differences are present in favor of selecting "left hemisphere functions" in items (2, 6, 7, 12, 14). For selecting "right hemisphere functions," statistically significant differences are observed in items (4 and 9). There are no statistically significant differences in items (13, 11, 10, 8, 5, 3, 1) for the Ippon Shobu.

Furthermore, it is clear that there are no statistically significant differences in 7 responses, indicating an equality of responses between the right and left hemispheres, which achieves a balanced pattern. The highest number of responses falls under this category.

Following that, there are statistically significant differences in 5 responses in favor of "left hemisphere functions," and the responses favoring "right hemisphere functions" are the least, with only 2 responses showing statistically significant differences. This is in the context of Ippon Shobu for the scale.

It is evident from Table (9) and Figure (4) that there are statistically significant differences in favor of selecting functions of the left hemisphere of the brain in statements (6-8-10-12-14-16-18-19) and in favor of selecting functions of the right hemisphere of the brain in statements (1-3-15). There are no statistically significant differences in statements (2-4-5-7-9-11-13-17).

Thus, it is clear that there are statistically significant differences in favor of choosing statements related to the functions of the left hemisphere of the brain, which amount to (8) responses, equal to the absence of statistically significant differences in (8) responses related to the right hemisphere of the brain, indicating an equal response between the statements of the right and left-brain hemispheres, achieving a balanced pattern. Following them are the least responsive statements, which are the statements related to the right hemisphere of the brain, with (3) responses, as shown in the Kogu scale.

As evident from Table (11) and Figure (5), there are statistically significant differences in favor of selecting functions of the left hemisphere of the brain in statements (1-3), and there are no statistically significant differences in statement (2) in the fukugo (composite) form. As mentioned earlier, there are statistically significant differences in favor of choosing statements related to the functions of the left hemisphere of the brain, with a total of (2) responses, which is the highest number of responses. Following them are the absence of statistically significant differences in (1) response, indicating an equal response between statements of the right and left-brain hemispheres, achieving a balanced pattern. Lastly, the least responsive statements are those related to the right hemisphere of the brain, with (0) responses, as shown in the fukugo (composite) form of the scale.

It is also evident from Table (15) and Figure (7) that there are statistically significant differences in favor of selecting functions of the left hemisphere of the brain in statements (25-), and in favor of selecting functions of the right hemisphere of the brain in statement (4), with no statistically significant differences in statements (1-3) in the Anbo (composite) form.

As mentioned earlier, there are statistically significant differences in favor of choosing statements related to the functions of the left hemisphere of the brain, with a total of (2) responses, which is the highest number of responses. Following them are the absence of statistically significant differences in (2) responses, indicating an equal response between statements of the right and left brain hemispheres, achieving a balanced pattern. Lastly, the least responsive statements are those related to the right hemisphere of the brain, with (1) response, as shown in the Anbo (composite) form of the scale.

According to the researcher, based on the correction key for this scale, which states: if the number of statements (A) equals the number of statements (B) or the number of selected statements in either A or B ranges within (±2), this means that Brain control is balanced or integrated between the two sides of the brain in personal behavior in sports situations and in interactions with others. Therefore, the researcher believes, based on the previous results, that the balanced or integrated pattern is the most common among players in general and for players of (Ippon Shobu, Kogu, Fukugo, Anbo).

The researcher attributes this result to the fact that the dominant pattern among Ippon Shobu players is the balanced pattern between the two brain hemispheres. This is because Ippon Shobu competition is highly specialized with very strict rules and requires a lot of control, mastery, and strong technical skills

from the players. There are not many opportunities in this competition, as there is only one Wazari or Ippon, and no more than that. This puts the player under constant intense pressure, leading them to use balanced strategies between offense and defense. The points lost by the player may not be recoverable, so training in Ippon Shobu requires both mental and psychological balance, as well as precision in choosing the right time for offense and defense.

Additionally, Kogu is a competitive sport with its own unique rules. In Kogu, players switch between defensive and offensive roles. The player chosen (Aka) starts with the offense, while the other player remains in a defensive role until, they switch to offense. This switch happens at the beginning of each attack and lasts for 10 seconds, determined by the referee. This unique feature of the competition teaches players to execute the appropriate offensive techniques (Sanbon, Juno San, Taino San) and trains them in these skills. It also helps stimulate higher cognitive processes such as attention, reaction time, and more.
The "Fukugo" competition combines kata and kumite, incorporating mental, psychological, and physical abilities. This makes it a comprehensive competition and develops a traditional karate player in line with the philosophy of traditional karate.

As for "Inbo," it is a showcase-style combat competition for two players representing the same team, competing against other players. They practice traditional karate techniques used in various kumite competitions, which are rarely used. This is in accordance with the law. Inbo players and their coaches create their own kinetic phrases, stimulating areas of creativity and innovation, as well as experimenting with new things.

The researcher attributes these results to the fact that traditional karate practitioners focus on training motor skills, which aligns with the performance analysis in traditional karate. It also aligns with what Mahmoud Ahmed El Sherbini mentioned in 2007, stating that karate is characterized by rapid and continuous changes in different playing positions. This is due to the diversity of technical styles and the abundance of basic skills. The structural framework consists of basic skills (single and compound) and competitive fights called "kata" and "kumite."

Additionally, it is consistent with the results of a study by Miada Mohamed in 2018, which found that the majority of players with the three cognitive control styles (left, right, integrated) exhibit different behaviors that vary according to the

functions and characteristics of each cognitive style. Each style has specific functions and characteristics that affect players' physical and skill performance. These factors influence their ability to adapt to their surrounding conditions, maintain mental and physical relaxation, control stress, build confidence, and exhibit flexible performance and flexible interaction with game plans. (Miada Mohamed 2018)

Furthermore, the common pattern for exceptional players is the common pattern, which is related to the players' positions and the quality of their skill performance (Ahmed Allam, Ahmed Farag 2022).

Freedman (2007) indicates that individuals with a balanced pattern are characterized by their ability to use both the right and left hemispheres of the brain simultaneously in learning and thinking. They excel in using both hemispheres equally in executing cognitive skills, which means they possess the characteristics and abilities found in individuals who predominantly use either the right or left hemisphere (Freedman, E. 2007).

These findings align with the results of a study by Saeed Salem (2018), which suggests that those with the integrated pattern exhibit the characteristics and abilities found in individuals with both the right and left hemispheres (Saeed Salem 2018).

Suleiman Youssef (2010) mentions that the functions of the two hemispheres depend on the different information processing styles of learners. The functions of the left hemisphere include dealing with words and analytical and sequential thinking, processing information sequentially and continuously, and dealing with facts and reality. In contrast, the functions of the right hemisphere involve dealing with images, imagination, holistic thinking, processing information in parallel and synchronously, and dealing with imagination, creativity, and invention (Suleiman Abdulwahid Youssef 2010).

Samy Abdelkawi (2011) states that some functions are concentrated in one hemisphere over the other and are performed through it. However, there is no absolute dominance but rather relative dominance because each hemisphere has its role in an individual's behavior (Samy Abdelkawi 2011).

Suleiman Abdulwahid Youssef (2007) mentions that the concept of brain control is used to express the division of labor between the two brain hemispheres (Suleiman Abdulwahid Youssef 2007).

In this context, Kristen Temple (2002) points out that brain control refers to the dominance of one hemisphere of the brain, or the more dominant hemisphere at certain times. The right hemisphere may have a higher ability in specific skills, while the left hemisphere predominates in other functions. However, the idea of dominance or non-dominance of one hemisphere has been challenged, and the focus has shifted to the concept of the dominance of specific regions in relation to specific functions (Kristen Temple 2002).

Fatah Al-Zayat (1998) explains that one hemisphere out of the two can influence or govern behavior through various aspects. Each hemisphere of the brain can perform its cognitive functions (perception, awareness, learning, and memory) independently of the other hemisphere. He believes that the brain, particularly the right hemisphere, is organized into relatively independent functional units that work in balance.

The left hemisphere takes the initiative in everything related to the visual aspect. Both hemispheres can read, but consonants are analyzed in the left hemisphere because they require quick perception, whereas vowels are analyzed in both hemispheres together (slow perception). Mental objects with semantic components, such as letters and shapes, are used in the left hemisphere (Azat Mahmoud Al-Kashif 1991).

Suleiman Abdulwahid Youssef (2010) mentions that in light of the brain's dynamic function, the interaction between the two brain hemispheres as an integrated concept becomes more acceptable than the binary functional specialization of each hemisphere separately. The integrative theory assumes that there is a complementary nature to the two cerebral hemispheres in the brain, and they do not work in isolation from each other but operate as a highly integrated system (Suleiman Abdulwahid Youssef 2010).

In this context, Nadia Suleiman Ibrahim (2004) states that the brain operates as a whole and sometimes works in a right hemisphere or left hemisphere pattern, but it is in its best state when it operates in the integrated pattern where the brain branches out to equalize and connect the operations of both the right and left hemispheres (Nadia Suleiman 2004).

Waheed Mujawwib Jassim (2002) indicates that although each hemisphere of the brain has specific functions, the brain hemispheres are connected at a starting point. The activities of the brain hemispheres are not limited to one spherical half, but they complement each other, especially when presenting

different patterns of information, each of which corresponds to a specific spherical half. This leads to a distribution of processing load between them (Waheed Mujawwib Jassim 2002).

Lavaach (1991) mentions that there is cumulative evidence suggesting that the boundary between left and right learning patterns is at least semi-permeable. People are capable of using both because they complement each other. Recent studies also indicate flexibility in the human brain's development, with functions not clearly isolated but interconnected and shared across multiple areas and both hemispheres (Lavaach 1991).

Suleiman Abdulwahid Yousef (2010) points out that despite previous research and studies confirming the functional specialization of the brain hemispheres, it is not appropriate to separate the integrative function of both hemispheres. Information processing cannot reach the highest level of efficiency without functional integration between different brain parts and participation in information processing. There are many examples that confirm that control is not absolute for one hemisphere over the other, and they support the integrative direction of the functions of the human brain, allowing them to perform more than one task at the same time (Suleiman Abdulwahid Yousef 2010).

Ahmed Mohammed Abdel-Moneim and Ahmed Mohammed Ali (2022) refer to Martinez when discussing the functions of the brain in the sports field. The left hemisphere can be referred to as the analyst and is used in learning new skills and correcting errors. It provides the learner with information for each step while accompanied by verbal instructions that help guide the body's movements and their type and sequence. As for the right hemisphere, it can be called the integrator and is responsible for controlling how the learner links the vocabulary that makes up the skill in a holistic and complex framework.

Martinez maintains that when learning a skill, the left hemisphere determines the working muscles, times their contractions, and gradually forms a mental plan on how to perform the skill. The player then practices, with the analyst's assistance in identifying and correcting errors according to the pre-formed plan. The right hemisphere takes the step-by-step instructions described by the left hemisphere and transforms them into a single image. At this stage, the brain requires one process instead of a complex series of verbal operations. The importance of mental visualization becomes evident in guiding and instructing the right hemisphere in the same way that the left hemisphere guided with verbal self-instructions. It can be said that the left hemisphere is responsible for teaching and

developing skills, while the right hemisphere controls the performance of learned skills. Focus shifts more on previous performance and planning for the next performance, which are the tasks of the left hemisphere. When the player learns the skill, the analytical aspect must be used. However, when the player performs the skill in competition, the integrative aspect must be summoned, even if there is a need for analytical periods during the limited time or inter-competition abilities (Ahmed Abdel-Moneim and Ahmed Farag 2022).

Tarek Mohamed Badr El-Din (2016) points out the differences in the functions of brain hemispheres during the performance of certain skills and psychological activities. Recent scientific research results, as well as research related to the functions of the brain's hemispheres during sports activities, indicate that the left hemisphere of the brain plays an important role in learning skills related to spatial awareness, touch, motor coordination, and visual aspects. The right hemisphere, on the other hand, plays an essential role in learning creative thinking, musical taste, and skills requiring repeated movements. The right hemisphere perceives the skill holistically when it is first learned, while the left hemisphere specializes in analysing the skill into its constituent parts (Tarek Badr El-Din 2016).

Despite the specialization of each hemisphere and each region of the brain in specific functions and cognitive patterns, this does not negate or invalidate the brain's work as a whole and its unified nature. When receiving knowledge and experiences, mental processes that occur involve the simultaneous activity of both hemispheres and the participation of all brain regions in an integrated manner (Tarek Badr El-Din 2016).

McManus (2002) points out that we often consider the two brain hemispheres as distinct entities, each with its independent personality. However, the truth is that each of them collaborates with the other to form a unique and distinct personality (McManus, C. 2002).

Abdul Sattar Jabbar Al-Damad (2004) believes that the right hemisphere's use in analytical thinking before or after athletic performance, especially in closed skills, repetitive movements, and activities directly influenced by the opponent, such as gymnastics and diving, can be positive. It is used before and sometimes after specific movements or at any time, regardless of the available time interval between thinking and performance or the difficulty of the subsequent activity (Abdul Sattar Jabbar Al-Damad 2004).

Hebah Allah Jabir (2016), citing Mohammed Al-Arabi Shamoun (1996), regarding the timing of using the brain hemispheres in sports, suggests that the right hemisphere can be used positively in analytical thinking or after sports performance in closed skills, repetitive movements that are not directly influenced by competition. It can be used positively before specific movements, sometimes after them, or at any time, regardless of the available time interval between thinking and performance, and without considering the difficulty of the subsequent activity. On the other hand, the left hemisphere can be used in all long and short skills, facing performance at a specific time, and skills that lead to a positive direction (Hebah Allah Jabir Mahmoud 2016).

Table (13) and Figure (6) show statistically significant differences in favour of choosing the functions of the left hemisphere of the brain in expressions (1-2-3-5-6-9) and in favour of choosing the functions of the right hemisphere of the brain in expression (8). There are no statistically significant differences in expressions (4-7) in kata. It is clear from the above that there are statistically significant differences in choosing expressions related to the functions of the left hemisphere of the brain, with a total of (6) responses, which is the highest in the number of responses, followed by the absence of statistically significant differences in (2) responses, indicating equal response between the expressions of the right and left hemispheres of the brain, achieving a balanced pattern. The least response is in the expressions of the right hemisphere of the brain with (1) expression, in the kata scale.

From this, we can conclude that kata players prefer to use the left hemisphere control pattern more than the balanced pattern and more than the right hemisphere control pattern. The researcher believes that these results align with the nature of kata training, especially given its sequential and organized nature, which includes katas and bunkais, and this sequence and organization are functions of the left hemisphere of the brain." (Ahmed Ibrahim, Atef Abaza 2005)
Both Ahmed Mahmoud Ibrahim and Atef Mohamed Abaza (2005) maintain that the kata, which is a series of connected movements consisting of defensive and offensive techniques performed in a regulated international sequence against imaginary opponents, is executed in different directions and variations with speed and strength.

This is what was revealed by the study conducted by Hebah Allah Jabir Mahmoud (2016): Karate practitioners prefer the executive control pattern B (the lower left part of the brain), followed by the subjective control pattern A (the upper left part of the brain). This indicates the dominance of the left hemisphere of the

brain. This suggests that karate practitioners prefer the executive thinking style along with the subjective thinking style (Hebah Allah Jabir Mahmoud 2016).

This aligns with what was mentioned by Mohammed Al-Arabi Shamoun (1996) that athletes use the left cerebral hemisphere in sports when learning new skills and training on how to perform them step by step, accompanied by verbal instructions that help guide their bodies to the type and sequence of movements required (Mohammed Al-Arabi Shamoun 1996).

Hober (1995) emphasizes the use of both brain hemispheres, noting that performance efficiency is significantly associated with the left part of the brain because performance efficiency requires a continuous and sequential thinking process (Mona Khaled Mahmoud Ayad 2008).

Tarek Mohamed Badr El-Din, Tarek El-Sayed Omar, and Nabilah Ahmed Mahmoud (2006) also emphasize the importance of distinguishing between the functions of the left hemisphere of the brain and their role in acquiring skills and preparing for competitions. The timing of using the brain hemispheres during sports activities varies depending on the type of motor performance during the sports activity (Tarek Badr El-Din, Tarek Omar, and Nabilah Mahmoud 2006).
Furthermore, "Sobhi Hassanein" and "Magdy Shahat" (2002) add that the left hemisphere gradually processes information once it becomes encoded in fixed neural patterns and is expressed in the form of mental concepts (Sobhi Hassanein and Magdy Shahat 2002).

Ilaf Haroun and Rashid Shaloul (2019) also agree that students are characterized by accuracy and the ability to deal with problems more logically. They tend to think more rationally, and emotions do not affect their thinking or problem-solving processes. They prefer logic, order, and following traditional methods in thinking and step-by-step problem-solving. They are inclined towards systematic thinking and following conventional approaches in their thinking. They also complete their tasks within the specified time frame and the appropriate working environment. Additionally, they prefer a stable and consistent environment. Therefore, the left hemisphere brain pattern is prevalent among practical students (Ilaf Haroun and Rashid Shaloul 2019).

This aligns with what Suleiman Abdulwahid Yusuf (2010) suggests about the functions of the left hemisphere of the brain. It deals with words, symbols, abstraction, requires organization and order, and utilizes analytical thinking. It processes information sequentially, logically, and critically during reading,

focusing on details, and handling digital and mathematical information (Suleiman Abdulwahid Yusuf 2010).

The left hemisphere of the brain is considered dominant in the majority of people (85-90%) who use their right hand for writing (Reem Mustafa Mohamed 2012).

Tarek Badr El-Din, Tarek El-Sayed Omar, and Nabilah Ahmed Mahmoud (2006) also emphasize the importance of distinguishing between the functions of the left and right hemispheres of the brain and their roles in acquiring skills and preparing for competitions. The timing of using both brain hemispheres during sports activities varies depending on the type of motor performance (Tarek Badr El-Din, Tarek Omar, and Nabilah Mahmoud 2006).

This study differs from the one conducted by Saleh Alaa Al-Din (2015), who believes that the right hemisphere is more common in the sports field (Saleh Alaa Al-Din 2015).

Based on the above, the researcher concludes that when athletes are in the early stages of learning and training in a sports activity, they primarily use the left hemisphere (analyser) in all their mental processes, which aids in learning and training. However, when they begin to perform the skill, including various techniques, changing situations, and innovative compositions such as plans and decision-making, the right hemisphere takes control. Therefore, the more advanced and experienced the athlete is, the more likely they are to have a balanced pattern, unless the nature of the specialized specialization imposes a specific pattern.

And this answers the first question, which states:

- **What are the brain control patterns among traditional karate players based on the type of competition (Ippon Shobu, Kojo, Fukojo, Kata, Anbo)?**

Table (6) shows statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale in expressions (5-8-10-14-17-23-30), with no statistically significant differences in the remaining expressions of the scale.

Table (8) reveals statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the

right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Ippon Shobu form, in the axes (1-11-14-18-23-24-31), with no statistically significant differences in the remaining axes of the scale.

Table (10) demonstrates statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Kogo form, in axis (11), with no statistically significant differences in the remaining axes of the scale.

Table (12) shows no statistically significant differences for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Fukogo form.

Table (14) illustrates statistically significant differences between males and females for each response (functions of the left half of the brain - functions of the right half of the brain) for the "Brain Control of Traditional Karate Players" scale, Kata form, in the axes (3-13), with no statistically significant differences in the remaining axes of the scale.

From Table (16), it becomes evident that there are statistically significant differences between males and females in response to every item (left hemisphere functions - right hemisphere functions) in the "Brain Control of Traditional Karate Players" scale in the category of "Enbu" in the axis (5). There are no statistically significant differences in the other dimensions of the scale.

The percentage for axis (5) (Analysis - Imagery) for females was (62% for the left side and 38% for the right side), while for males, it was (66% for the left side and 34% for the right side) in the general form. In the "Enbu" category, axis (5) showed percentages of (58% for the left side and 42% for the right side) for females and (89% for the left side and 11% for the right side) for males. This result indicates that both males and females tend to be more analytical than imaginative in the general form and the "Enbu" category.

This aligns with what Tarek Badr El-Din (2016) mentioned about thinking styles based on brain functions, where the logical or deductive style, one of its characteristics, is located in region A, which is in the upper left part of the brain.

Individuals with this style tend to be logical, analytical, factual, and avoid imagination when solving problems and facing crises.

This is precisely what the researcher observes in the general behaviour of traditional karate players. As for "Enbu," it involves a choreographed combat between two players who apply traditional karate skills realistically and theatrically. This makes the player automatically analyse the skills when creating an "Enbu" sequence with their coach, then rearrange them into a new, innovative sequence. Therefore, the researcher emphasizes the importance of analysis in general for karate players and specifically for "Enbu" players.

These findings are consistent with Mahmoud El-Sharbini (2007), who described karate as a sport characterized by rapid and continuous adaptation to different playing situations. This is due to the diversity of technical styles and the multitude of basic skills. The structural framework of karate consists of basic skills (individual and combined), kata, and kumite matches, both simulated and full contact.

This aligns with Kamal El-Din Abdel-Rahman Darwish, Qadri Saeed, and Emad Abbas (2006), who suggest that in sports activities, players should perform skills under the most challenging conditions and with a high degree of consistency to ensure that the skill is always available to the player. Effectiveness is related to the ability to focus and self-positivity in controlling and possessing the skill.

For axis 8 (Realistic - Intuitive) for females (51% for the left side and 49% for the right side) and for males (79% for the left side and 21% for the right side) in the general form, this means that female players tend to lean roughly equally toward the realistic and intuitive sides, making them closer to the integrated pattern. However, males lean towards the realistic side in the overall image. For axis 18 (Logical - Intuitive) (23% for the left side and 77% for the right side) for females and (48% for the left side and 53% for the right side) for males in the Ippon Shobu image, this means that females tend to be more intuitive, while males tend to have a balanced pattern between logical and intuitive thinking.

The researcher believes that women, in general, are more inclined towards intuition and use intuition in traditional karate. Some of the attacking inputs rely on anticipation and intuition, such as "Tai no Sen" (timing) and mental balance, due to changing and rapid match conditions, have pushed karate players to a balance between realism and intuition.

This is consistent with the findings of Mohamed Lotfy Taha and Wajia Ahmed Shamandi (1994) that a karate player undergoes momentary, rapid, and

changing challenges, requiring decisive and accurate decisions within a fraction of a second to determine the match outcome.

Doaa Shawkey (2017) states that among the characteristics of the attacking inputs, there is a sense of the opponent's attack type, reaction speed, and accurate timing of the attack.

Mustafa Gumu (2016) believes that coordination, intuition, timing, quick thinking, and decision-making are crucial, as they contribute to health, speed, agility, flexibility, balance, reactions, coordination, and intuition.

For axis (10) (Expectation - Imagination) (21% for the left side and 79% for the right side) for females and (48% for the left side and 52% for the right side) for males, this means that females tend to lean towards imagination, while males tend to have expectation and imagination converge. In the overall image, the researcher believes that imagination is crucial for traditional karate players, especially in some competitions like kata, where players must imagine an opponent or multiple opponents from different directions and fight them with the same efficiency and strength as real opponents.

Bhandeo and Mishra (2012) suggest a positive correlation between the activation of the right hemisphere of the brain and the ability to perform intellectual imagination tasks.

Tariq Badr al-Din agrees with it in 2016 that the thinking style associated with the upper right part of the brain, symbolized by the letter "D," is characterized by being entirely imaginative, creative, and visionary. These are important traits for karate players. He also believes that one of the distinctive characteristics of individuals with the creative pattern "D" (the upper right part of the brain) is that they view things and events in a holistic way. They possess creativity and innovation in their social and sports life situations. They are interested in discovery and adventure. Their decisions are quick and impulsive, and they have a wide imagination (Tariq Muhammad Badr al-Din 2016).

For axis (14) (improvement - innovation), the percentage was 46% for females on the left side and 54% on the right side, while it was 72% on the left side and 28% on the right side for males. In the case of Ippon Shobu, the percentage was 95% on the left side and 5% on the right side for females and 70% on the left side and 30% on the right side for males. The researcher believes that these results indicate a tendency for females to innovate, while males tend to improve things in

the general form. However, both males and females tend to improve things more in Ippon Shobu, which is consistent with the nature of Ippon Shobu competitions. In Ippon Shobu, the player acts in rapidly changing situations, makes quick decisions in an instant.

This is in line with Nakayama (1977), who stated that karate fighters can shift from defence to a decisive rapid attack in less than 1/1000 of a second without errors. Timing is crucial, as well as rhythm or cadence, which is necessary for taking the initiative during this part of the time when executing or not deciding to execute.

This aligns with Cristina Muñiz et al. (2016), who found that elite female athletes have a greater ability to work hard, and sports, in general, affect their innovation capabilities.

For axis (17) (committed - non-committed), the percentage was 31% on the left side and 69% on the right side for females and 54% on the left side and 46% on the right side for males. This result means that females tend to be less committed, while males tend to be more committed in the general form. Commitment is crucial for performance in karate competitions, which is consistent with the findings of Heba Allah Gaber (2016), stating that karate players tend to have an executive style, meaning they perform motor skills and plans in the same way they were taught by the coach.

For axis (23) (verbal explanation recall - visual recall), the percentage was 59% on the left side and 41% on the right side for females and 84% on the left side and 16% on the right side for males. This indicates that females and males tend to favour verbal explanation recall in the general form. In the case of Ippon Shobu, the percentage was 18% on the left side and 82% on the right side for females and 58% on the left side and 43% on the right side for males. This result means that females tend to recall forms more, while males lean toward verbal explanation recall in Ippon Shobu.

Adil Deniz (2018) found that for elite karate players, brain regions involved in movement planning and visual perception have higher connectivity values. These differences in results are believed to arise from the acquired advancement over several years of training required to become an elite karate player.

For axis (30) (non-emotional - emotional), the percentage was 41% on the left side and 59% on the right side for females and 64% on the left side and 36%

on the right side for males. This indicates that females tend to be more emotional, while males tend to be less emotional in the general form.

This aligns with what Tariq Muhammad Badr al-Din and Omnia Muhammad Hussein (2017) mentioned, that the preferred style of practitioners of sports activities, in general, is the lower right part of the brain, the "emotional human upper zone" (c). Studying the characteristics and qualities of this section reveals that it relates to communication, building good relationships with others, emphasizing feelings and social and humanitarian meanings, helping others, influencing them, accepting criticism and guidance, and the ability to recognize gestures and facial expressions of others and deal with them.

All these characteristics align with the nature and traits of sports practice, which are nothing but a reflection and result of the impact of sports practice on behaviour (Tariq Muhammad Badr al-Din, Amina Muhammad Hussein 2017).
Additionally, Obaidat and Abu Al-Samid (2005) affirmed that individuals with the right hemisphere excel in remembering faces and responding to visual and motor instructions better than verbal instructions.

This is in line with what Nakayama (1981) mentioned, that a player's ability to focus places them on high regard in the world. When a player maintains their balance and controls their thoughts and abilities, they earn respect (Nakayama 1981).

For axis (1) (dealing with one thing at a time - dealing with multiple things at the same time), the percentage was 32% on the left side and 68% on the right side for females, and 58% on the left side and 43% on the right side for males in the case of Ippon Shobu. This result indicates that males prefer dealing with one thing at a time more, while females prefer dealing with multiple things at the same time more. This aligns with the nature of females, as this result suggests that men tend to be more dominant in the thinking style and behaviour of the lower left pattern B (the executive organizer).

This aligns with what Tariq Muhammad Badr al-Din (2016) mentioned, according to Herman's theory of cognitive dominance. The cognitive control abilities and features of pattern B include sequential processing, where individuals cannot deal with everything simultaneously but rather prioritize tasks.

This also coincides with a study by Anthony F. Jorm (2023) and a study by Virginia A. Mann and Sumiko Sasanuma et al. (2004), which found that women

and men differ in cognitive ability. After analysing factors affecting cognitive ability, such as balancing multiple tasks simultaneously, women outperform men in this regard (Anthony F. Jorm 2023, Virginia A. Mann, Sumiko Sasanuma et al. 2004).

This aligns with what Fajr Judah al-Nuaimi (2019) mentioned, that women can handle multiple roles at the same time, which is essential for them to fulfil their human, social, and family roles to the fullest. They are naturally endowed with this ability, and the brain processes these complex operations smoothly without any disruption (Fajr Judah al-Nuaimi 2019).

For axis (11) (time management - exploration), the percentage was 14% on the left side and 86% on the right side for females, and 40% on the left side and 60% on the right side for males in the case of Ippon Shobu. This result indicates that traditional karate players, both males and females, tend to favour exploration more in Ippon Shobu, as it is a competition with rapidly changing situations that require quick reactions. In the case of Kojok, the percentage was 73% on the left side and 27% on the right side for females, and 94% on the left side and 6% on the right side for males.

This means that females and males tend to prioritize time management more in Kojok, as it has a unique nature where competitors switch roles every 10 seconds between attacker and defender. Therefore, trainees for this competition must excel in performance under this pressure and with mental organization.

This result is consistent with what David Sousa (2009) mentioned, that there are no significant gender differences in general cognitive performance. However, many females perform better in tests related to specific skills such as perceptual speed, language proficiency, the ability to identify object positions (sequencing), and accuracy in manual tasks.

On the other hand, many males excel in tasks related to spatial abilities, such as mental rotation of three-dimensional objects, as well as their ability to perform motor skills aimed at achieving a specific goal, identifying the positions of objects in complex layouts, and solving mathematical problems at higher levels of thinking (David Sousa 2009).

For axis (24) (Planning - Imagination) (82% for the left side and 18% for the right side) for females and (45% for the left side and 55% for the right side) for males, the form of the Ippon Shubo suggests that females tend to plan, while males

tend to imagine. This indicates a preference for planning in females and a preference for imagination in males. These results indicate differences between males and females in sports activities participants in terms of the brain control pattern (executive B).

This aligns with what Ahmed Amin Fouzi (2006) mentioned regarding differences between males and females in cognitive abilities, where girls excel in certain cognitive abilities over boys. (Ahmed Amin Fouzi 2006)

For axis (31) (Tends toward logical things - Tends toward enjoyable things) (50% for the left side and 50% for the right side) for females and (73% for the left side and 28% for the right side) for males, the form of the Ippon Shubo suggests that females tend toward logical things while enjoying performance simultaneously. On the other hand, males tend more toward logical things than enjoying during performance. Individual sports players focus on training all motor skills during the activity.

Hiba Allah Jaber Mahmoud (2016) believes that all practitioners of martial arts are similar in their preference for brain control pattern (B) executive more than the other three brain control patterns (A) objective, (C) emotional, (D) creative. (Hiba Allah Jaber Mahmoud 2016)

As for the results for females, they align with what Tarek Mohamed Badr El-Din (2016) mentioned about individuals with the (C) emotional pattern, the lower right part of the brain, that they care about their relationships with others, attend to the needs of others, have quick intuition, and their decisions primarily depend on human feelings and meanings, and they tend to be calm. (Tarek Mohamed Badr El-Din 2016)

For axis (3) (Adventurous - Unexpected), the percentage was (91% for the left side and 9% for the right side) for females and (71% for the left side and 29% for the right side) for males in the form of Kata. This means that both males and females lean more towards adventure than surprise during performance in Kata matches in safe environmental conditions, as Kata involves a specific sequence of movements that the player performs in a defined time and order.

For axis (13) (Experimental - Imaginative), the percentage was (34% for the left side and 57% for the right side) for females and (71% for the left side and 29% for the right side) for males in the form of Kata. This means that female Kata

players tend to be more imaginative than experimental, while males tend to be more experimental than imaginative.

These results align with the findings of Robert Zenhausern in 2013, indicating that the dominance of the right brain hemisphere and deductive thinking style are associated with the imaginative style (Robert Zenhausern - Imagery, 2013).

These results suggest that each competition has a different brain control pattern for both males and females, with differences in the pattern's lateralization in the brain for both genders.

This aligns with the results of a study by Fouad Taha Talafha and Emad Abdel-Rahim El-Zaghlool in 2009, which showed no statistically significant differences in the prevalence of the three patterns among the sample based on gender, while differences were observed at the specialization level (Fouad Taha Talafha, Emad El-Zaghlool, 2009).

And this answers the second question, which states:

- **What are the brain control patterns among traditional karate players based on differences in the type of competition (Ippon Shobu, Kojo, Fukojo, Kata, Anbo) and gender (males and females)?**

Table (17) shows a statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain and an inverse statistically significant relationship between achievement levels and each response in (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Ippon Shubo form, for males. There is no statistically significant relationship between achievement levels and any response in the scale for females.

Table (18) shows no statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain - (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Kojou form, for both females and males.

Table (19) shows no statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain - (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Fukojou form, for both females and males.

Table (20) shows no statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain - (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Kata form, for both females and males.

Table (21) shows a statistically significant relationship between achievement levels and each response in (A) left hemisphere functions of the brain and an inverse statistically significant relationship between achievement levels and each response in (B) right hemisphere functions of the brain for the "Brain Control of Traditional Karate Players" scale, Anbo form, for males. There is no statistically significant relationship between achievement levels and any response in the scale for females.

From the above, it is evident that there is no statistically significant relationship between achievement levels and any response in the scale for females in the five forms (Ippon Shubo, Kojou, Fukojou, Kata, Anbo), and there is no statistically significant relationship between achievement levels and any response in the scale for males in (Kojou, Fukojou, Kata), meaning that cognitive control does not affect achievement.

The researcher attributes these results to the homogeneity of the research sample in terms of age and years of training, as well as their affiliation with the same sports clubs and their training from the beginning of learning various skills and game plans to achieve athletic success.

This aligns with Ahmed Amin Fouzi (2006), who states that youth during different age stages become capable of mastering fundamental motor skills, enabling them to execute various playing techniques and achieve victory. It is essential for the player to perform basic skills effectively (Ahmed Amin Fouzi 2006).

This is in line with what Mohamed Al-Araby Shamon and Magda Ismail (2001) mentioned, that the skill development of a player requires integration between the mind and body, working towards discovering and showcasing the hidden potential and capabilities of successful athletes in the sports field (Mohamed Al-Araby Shamon and Magda Ismail 2001).

Bhando and Misra (2016) conducted a study in India aiming to explore the impact of cognitive control. The results showed no effect of cognitive control on achievement (Ilaaf Haroon and Rashid Shaloul 2019).

This aligns with Karam Rashid's study (2021), which concluded that there are no differences in the number of goals scored attributed to the cognitive control pattern (Karam Rashid 2021).

However, this does not align with the study conducted by Ahmed Alam and Ahmed Farag (2022), which suggests that the common pattern for exceptional players is the complementary pattern (Ahmed Alam, Ahmed Farag 2022).

The presence of statistically significant differences between achievement levels and each response in (A) left hemisphere functions of the brain in (Ippon Shubo and Anbo) for males may be indicative of the fact that for males, there is a connection between achievement levels and Ippon Shubo, which involves combat based on a single point that the player either scores or does not.

Traditional Karate philosophy also strongly emerges in Anbo, which relies on mutual respect and emphasizes that combat must be quickly resolved, even if the agreement is in place. Players know that when entering a fight, they must engage in decisive and rapid combat, which concludes with mutual respect.

This aligns with what Hind Abdel Fattah Ahmed (2005) and Sherif El Awadi (2004) point out about the rules and techniques of performance, especially in terms of attack and combat in Karate. It includes a competitive style during combat and the requirements of quick attack, accurate targeting of the opponent's body openings, along with strength, control, and balance during performance.

It also involves anticipation, reaction speed during attack and defense, and counterattacks. Among the distinctive features of combat in Karate is the diversity of defensive and offensive techniques, including striking and kicking, which require various physical, skillful, and strategic abilities, as well as mental skills to enhance performance effectiveness.

These mental skills include focusing narrow external attention on the opponent and broad external attention, which makes the player aware of various stimuli such as the opponent, the referee, the field boundaries, the coach's instructions, and vigilance during matches to translate any visual stimuli into proper and timely responses. This positively affects the speed of decision-making and reduces hesitation during performance (Hind Abdel Fattah Ahmed 2008).

Huber Lee also asserts that competence in the performance process is significantly related to the left side of the brain, as efficient performance requires

sequential and consecutive thinking processes (Mona Khaled Mahmoud Ayad 2008).

Based on the above, the researcher concludes that there is no statistically significant relationship between achievement and cognitive control for both male and female traditional Karate players in any competition, except for Anbo and Kata for males, where the left hemisphere pattern is associated with achievement.

And this answers the third question, which states:

- **What is the relationship between brain control patterns and the level of achievement in each category of traditional karate competitions for both males and females?**

Conclusions:

- The dominant brain control pattern for traditional Karate players is a balanced pattern in the general form.
- The dominant brain control pattern for Ippon Shubo, Kojou, Fukojou, and Anbo players is a balanced pattern.
- The dominant brain control pattern for Kata players is the left pattern.
- There is no statistically significant difference in the distribution of the three patterns based on gender, but differences appear at the specialization level in some axes.
- There is no statistically significant relationship between achievement and cognitive control for male and female traditional Karate players in any competition, except for Anbo and Kata, where the left hemisphere pattern dominates achievement in males.

Recommendations:

Based on the previous results, the researcher recommends the following:

1- Conduct applied studies based on the brain control pattern to enhance performance in all traditional Karate competitions.
2- Coaches in traditional Karate should utilize these results when developing various programs for each competition individually, taking into account the gender of the players.
3- Utilize other practical psychological skills, such as cognitive visualization, based on the findings of this study.
4- Conduct further studies to create a cognitive profile for traditional Karate players.

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