# Building a Brain Control Scale for Traditional Karate Players

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## Introduction

The current era has witnessed significant developments in knowledge and technology across all areas of science and life in general, including the field of training and its connection to neuropsychology. This cognitive advancement has sparked a newfound interest in brain research, leading to the emergence of numerous theories and applications related to this field.

The scientific foundation of neuropsychology is built upon two main hypotheses that seek to explain the relationship between behaviour and the brain. These hypotheses are the brain hypothesis and the neuro hypothesis.

The brain hypothesis asserts that the brain serves as the source of behaviour, and each specific region within the brain is responsible for distinct functions. Despite the complexity and diversity of brain regions, there exists a remarkable overlap and communication, leading to harmony and integration of its various functions.

On the other hand, the neuro hypothesis suggests that the human nervous system acts as the controlling mechanism for all the body's different systems, each with its specialized and shared functions. While these systems may differ anatomically or spatially, they collaboratively carry out specific functions. The neurons within the nervous system are interconnected through a "Nerve Net Hypothesis," functioning as a cohesive unit. Any disruption or dysfunction within this nerve network can impact the vital functions of neurons in the brain, subsequently affecting behaviour ( Tarek Mohamed Badr El-Din 2016)

Researchers in psychology have embraced the behavioural approach to understanding the functions of the brain's two hemispheres. Their aim is to determine which hemisphere plays a role in shaping cognitive and emotional behavioural patterns. According to studies, the left hemisphere is responsible for processing information rationally, engaging in analytical thinking, and contributing to overall perception (Sally Springer, 2002)

Since the second half of the nineteenth century, scientists have intensified their research efforts to unravel the functional specialization of the brain's two hemispheres and their respective responsibilities for different types of human behaviour (Rothers, L. 1989) (Goleman, D. 1995)

. Since the second half of the nineteenth century, the topic of brain functions and education and training has captured the attention of researchers in the fields of cognitive psychology and sports psychology. Educational psychologists have indicated that facilitating the education and training of students lies in dealing with individual differences in cognitive functions, focusing on mental methods. (Rothers, L. 1989)

Herman points out that individuals who learn and train using

methods that align with their dominant brain control pattern achieve high results in the training and educational process. In contrast, those individuals who learn and train through methods that are not compatible with their dominant control pattern experience different outcomes. (Herman, N 2005)

Tarek Badr al-Din mentions that our understanding of the dominant brain control pattern in players helps us reinforce the capabilities of the controlled side and, on the other hand, activate the abilities of the non-dominant side. This leads to the balanced development of the brain functions on both sides of the players in an integrated and active manner. Our knowledge of the brain control pattern for young individuals before engaging in sports activities contributes to guiding them towards the type of sports activity that aligns with their brain control pattern. Consequently, we ensure their excellence, superiority, and continuity in sports practice over extended periods.

Furthermore, coaches in the field of sports training need to identify players' brain control patterns to provide training sessions, competitive activities, and suitable teaching, learning, and sports training methods and strategies. These methods aim to support and develop the functions of the controlled side, as well as activate the functions of the non-dominant side. This approach ultimately leads to a balanced development of brain functions on both sides of the players in an integrated manner( Tarek Badr El-Din 2017)

Suleiman Abdulwahid (2010) contends that despite the numerous previous research studies confirming the functional specialization of the brain's hemispheres in football players, the information processing cannot reach the highest level of efficiency without functional integration between different parts of the brain participating in information processing. There are several examples that emphasize that control is not exclusively vested in one hemisphere over the other, supporting the complementary orientation of human brain functions. For instance, individuals can perform multiple tasks simultaneously, and some can use both their right and left hands with equal skill. Academic achievement, in general, relies on the functions of both hemispheres. (Soliman Yousef 2010)

**Table No. (1)**
**Some Scales and Tests Designed for Brain Dominance Control**

| No. | Researcher's Name | Year |
|-----|-------------------|------|
| 1 | PBI Brain Dominance Test by Jacqueline Windor and Pressyl and Donovan, Translated by Ghada Mohamed Omar | 1984 |
| 2 | Torrance Scale, Translated by Qattami | 1987 |
| 3 | Herrmann Brain Dominance Scale, Translated by Mohamed Al-Tikriti | 1988 |
| 4 | Diane Brain Dominance Scale | 2005 |

**Follow Table No. (1)**
**Some Scales and Tests Designed for Brain Dominance Control**

| No. | Researcher's Name | Year |
|-----|-------------------|------|
| 5 | Afana and Al-Jaish Brain Dominance Scale | 2008 |
| 6 | David Sousa's Hemisphere Activity Test | 2009 |
| 7 | Hemisphere Dominance Scale for Female Students by Mona Mokhtar Al-Morsy | 2010 |
| 8 | Brain Dominance Scale for Athletes by Tarek Mohamed Badr El-Din | 2015 |
| 9 | Brain Dominance Scale for Sports Activities (Ages 15-18) by Tarek Nour El-Din, Ghada Omar, and Heba Allah Gaber | 2016 |

In light of the above, a research problem has emerged where the researchers acknowledge the importance and necessity of directing individuals towards physical, social, and mental activities, as well as aligning their academic and scholarly pursuits with their distinctive brain control patterns. This alignment contributes to their excellence and superiority during the practice of traditional karate in various competitions. Therefore, through their current research, the researchers strive to establish a novel objective measurement method for assessing brain control among male and female practitioners of traditional karate.

Through a comprehensive review of numerous studies related to brain control measures, the researchers found various scales and tests for brain dominance. However, they didn't come across any scale specifically tailored for practitioners of traditional karate who are above the age of 20.

**Research Objective:**
Based on this, the researchers have undertaken the current study with the aim of:

- Constructing a brain control scale for male and female traditional karate players aged over 20 years old.

**Research Question:**
Does the scale measure the underlying factors of brain control for traditional karate players aged above 20 years old?

**Concepts and Terminology Used in the Research:**

**1- Brain Control:**

- **Tarek Badr El-Din (2016) defined brain control as:** "The dominance, control, or sovereignty of one hemisphere of the brain during its processing, analysis, guidance, and utilization of specific information for each part, motivating human behaviour." ( *Tarek Badr El-Din 2016)*

**2- The Right Hemisphere of the Brain:**

- **It Defined by Mona Mokhtar (2008) as**: "The part responsible for spatial perception, aesthetic taste, musical awareness, artistic abilities, in addition to certain cognitive processes like imagination and holistic object recognition. It also specializes in analytical thinking for motor skills,

alongside intense emotional responses." (Mona Mokhtar 2008)

**3- The Left Hemisphere of the Brain:**

- **It Defined by Mona Mokhtar (2008) as**: "The part responsible for linguistic functions, planning, performance review, in addition to logical and realistic thinking. It also handles partial object recognition, perception of time, details, and non-cohesive sentences." (Mona Mokhtar 2008)

**4- Ippon Shobu:**

1. **Ippon Shobu,** also known as "One Full Point Match," is a match in which the time duration is one minute and a half. The player who scores an ippon or a cumulative total of two wazaris (minor scores) wins the match within the allowed time. (International Traditional Karate Federation Laws 2022).

**5- Ko-Jo Kumite:**

- **Ko-Jo Kumite** is a specific form of Kumite competitions, in which the competitors are designated as either attackers or defenders at the beginning of each match. (International Traditional Karate Federation Laws 2022)

**6- Fuko-Jo:**

- **Fuko-Jo,** it is a blend of Kumite and Kiti kata techniques (integrated model).

**7- Enbu:**

- **Enbu**, is a pre-arranged combat match between teams or individuals (male-male or male-female) who demonstrate attacks and defences on the field for a duration of approximately one minute, give or take five seconds. The winners are determined based on the recorded assessments. (International Traditional Karate Federation Laws 2022)

**8- Kata:**

- **Kata** is a continuous sequence of defensive and offensive techniques following an internationally recognized pattern. These defensive and offensive techniques involve blocking, striking, and kicking in various directions and at varying speeds, targeting the three levels of the attacker's body or a group of simulated attackers. This is accompanied by adopting static and dynamic balanced positions and various fluid movements. (Ahmed Ibrahim, Atef Abaza 2005).

**Research Procedures:**

**1- Research Methodology:**

- The researchers adopted a descriptive-analytical methodology, following its steps and procedures to achieve the research objectives.

**2- Research Community and Sample:**

- The community of this research includes first-degree players in the Arab Republic of Egypt . The sample was selected using random sampling, consisting of 100 male and female players aged over 20 years. The purpose of this selection is to standardize the brain control scale currently under research and determine its scientific parameters. This data collection took place between ١٩ November -29 November2019.

**Table No. (2)**

**Sample Table and its Division by Country and Gender**

| No | Country | Number by Gender | |
|----|---------|------|--------|
| | | **Male** | **Female** |
| 1 | Egypt | **61** | 39 |

The sample was represented in each competition as follows in the following table:

**Table No. (3)**

| 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 No. (4)**

**Statistical Description of the Research Sample: Age, Height, Weight, and Training Age (N = 100)**

| Variable | Measurement Unit | Mean $\overline{X}$ | Standard Deviation $S$ | Skewness $\alpha_3$ |
|----------|------------------|---------------------|------------------------|---------------------|
| 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 (4) illustrates the mean, standard deviation, and skewness for the research sample in the variables of age, height, weight, and training age.

**Table No. (5)**

**The count and percentage for each response (Left Hemisphere Functions (A) - 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% |

**\*The significance at a value of (P-Value) > (0.05)**

From Table (5), it is evident that the frequency and percentage for each response (Functions of the Left Hemisphere (A) - Functions of the Right Hemisphere (B)) are presented for both males and females.

**3- Data Collection Tools:**

The researchers utilized the following methods for data collection:

1- Analysis of documents, including scientific references and research papers.

2- Personal interviews with specialized professors in sports psychology.

3- Surveying the opinions of experts among the faculty members in the departments of sports psychology in the most prominent universities worldwide (see Appendix 1).

4- Surveying the opinions of traditional karate coaches from around the world (see Appendix 2).

**Through these methods, the researchers identified six versions of the scale. They are as follows:**

1- General Scale: Consisting of 42 statements in its initial form.

2- Ippon Shobu Scale: Consisting of 21 statements in its initial form.

3- Ko-Jo Kumite Scale: Containing 21 statements in its initial form.

4- Fuko-Jo Kumite Scale: Comprising 4 statements in its initial form.

5- Kata Scale: Consisting of 9 statements in its initial form.

6- Overall Scale: Containing 5 statements in their initial form.

These versions were determined based on expert opinions, coaches, and sports psychology professors, as well as international regulations related to the sport of traditional karate.

**4- Steps for Scale Creation:**

**Initial Scale Structure:**

**A- Defining the Scale Dimensions:**

Through the study, analysis of references, research papers, and personal interviews with specialized professors, the researchers identified three fundamental functions of the brain:

1. Functions of the Right Hemisphere of the Brain.

2. Functions of the Left Hemisphere of the Brain.

3. Balance between the Hemispheres of the Brain.

This initial categorization formed the basis for constructing the scale.

**Table No. (6)**

| Hemispheric Brain Functions | Definition |
| --- | --- |
| Right Hemisphere Functions | Responsible for spatial perception, aesthetic taste, music, art, imagination, holistic object perception, analytical thinking for motor skills, and intense emotional responses. |
| Left Hemisphere Functions | Responsible for language functions, planning, performance review, partial perception, time perception, details, unrelated sentences, and complex mathematical processes. |
| Balance between Hemispheres | Responsible for perceiving both the whole picture and details. Individuals possess full verbal skills to convey emotions, spatial abilities, and flexibility in thinking to succeed in various fields. |

Likewise, 40 axes have been identified for each hemisphere of the brain.

**Table No. (7)**

| No. | Functions of the Left Hemisphere | Functions of the Right Hemisphere |
|---|---|---|
| 1 | Dealing with one thing at a time | Dealing with multiple things at once |
| 2 | Fixed things | Variable things |
| 3 | Adventurous | Spontaneous |
| 4 | Organized | Random |
| 5 | Analytical | Imaginative |
| 6 | Experimental | Imaginative |
| 7 | Orderly | Chaotic |
| 8 | Realistic | Intuitive |
| 9 | Specific instructions | Non-specific instructions |
| 10 | Expectation | Imagination |
| 11 | Organization | Discovery |
| 12 | Description | Inference |
| 13 | Experimental | Visualization |
| 14 | Improvement of things | Innovation |
| 15 | Expectation | Guessing |
| 16 | Verbal | Gestures and signs |
| 17 | Committed | Uncommitted |
| 18 | Logical | Intuitive |
| 19 | Rational | Irrational |
| 20 | Gradual or sequential | Sudden insight |
| 21 | Recognizing the importance of time | Not sensing time |
| 22 | Organized | Chaotic |
| 23 | Remembering verbal explanations | Remembering images |
| 24 | Planning | Imagination |
| 25 | Realistic | Risk-taking |
| 26 | Thinking while sitting | Thinking while lying down |
| 27 | Experimental | Discovery |
| 28 | Prefers quietness | Enjoys music |
| 29 | Understanding connected things | Not understanding unconnected things |
| 30 | Non-emotional | Emotional |
| 31 | Managing emotions | Regulating emotions |
| 32 | Leans towards logical things | Leans towards enjoyable things |
| 33 | Flexible | Controlled |
| 34 | Performance review | One-time performance |
| 35 | Committed | Risk-taking |
| 36 | Remembering names | Remembering faces |
| 37 | Independent | Dependent |
| 38 | Complex arithmetic operations | Poor in arithmetic operations |
| 39 | Doesn't perceive space | Spatial perception |
| 40 | Partial perception | Complete perception |

And the axes were presented to the experts, and the results were as follows:

**Table No. (8)**

**Percentage distribution of experts' opinions on the axes of the "Brain Control of Traditional Karate Players" scale, general form in its preliminary form (N=18)**

| No. | Right Hemisphere Functions | Left Hemisphere Functions | Percentage | Number of Agreeing | No. | Right Hemisphere Functions | Left Hemisphere Functions | Percentage | Number of Agreeing |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Dealing with one thing at a time | Dealing with multiple things at once | 18 | 100% | 21 | Recognizes the importance of time | Not sensing time | 18 | 100% |
| 2 | Fixed things | Variable things | 18 | 100% | 22 | Organized | Chaotic | 18 | 100% |
| 3 | Adventurous | Sudden | 18 | 100% | 23 | Remembers verbal explanations | Remember images | 18 | 100% |
| 4 | Organized | Random | 18 | 100% | 24 | Planning | Imagination | 18 | 100% |
| 5 | Analytical | Imaginary | 18 | 100% | 25 | Realistic | Risks | 18 | 100% |
| 6 | Experimental | Imagination | 18 | 100% | 26 | Thinking while sitting | Thinking while lying down | 18 | 100% |
| 7 | Arrangement | Chaotic | 18 | 100% | 27 | Experimenting | Discovery | 18 | 100% |
| 8 | Realistic | Intuitive | 18 | 100% | 28 | Calmness-loving | Love for music | 18 | 100% |
| 9 | Specific instructions | Undefined instructions | 18 | 100% | 29 | Understands unrelated things | Not understanding unrelated things | 18 | 100% |
| 10 | Expectation | Imagination | 18 | 100% | 30 | Not emotional | Emotional | 18 | 100% |
| 11 | Organization | Discovery | 18 | 100% | 31 | Emotional management | Emotional regulation | 3 | 17% |
| 12 | Description | Conclusion | 18 | 100% | 32 | Inclines toward logical things | Inclines toward enjoyable things | 18 | 100% |
| 13 | Experimentation | Visualization | 18 | 100% | 33 | Flexible | Cohesive | 18 | 100% |
| 14 | Improving things | Innovation | 17 | 94% | 34 | Reviewing performance | One-time performance | 5 | 28% |
| 15 | Expectation | Guesswork | 18 | 100% | 35 | Committed | Risks | 18 | 100% |
| 16 | Verbal | Signals and gestures | 18 | 100% | 36 | Remembers names | Remember faces | 18 | 100% |
| 17 | Committed | Uncommitted | 18 | 100% | 37 | Independent | Dependent | 18 | 100% |
| 18 | Logical | Intuitive | 18 | 100% | 38 | Complex mathematical operations | Doesn't excel in complex mathematical operations | 18 | 100% |
| 19 | Rational | Irrational | 18 | 100% | 39 | Doesn't perceive location | Spatial perception | 18 | 100% |
| 20 | Gradual or sequential | Sudden insight | 18 | 100% | 40 | Partial perception | Complete perception | 18 | 100% |

Table (8) illustrates the percentage of agreement by experts on the dimensions of the scale 'Brain Control of Traditional Karate Players' general form. Axes number (31-34) should be deleted, resulting in a total of (38) axes.

Within the limits of what the researchers have clarified regarding the experts' acceptance rate, an agreement of at least 75% was reached for the acceptance of dimensions. Axes 31 and 34 have been reintegrated since they did not reach the acceptable threshold of agreement. Consequently, the total number of scale dimensions becomes 38.

## B- Defining Statements for Each Dimension:

The researchers formulated statements under each dimension, totaling 38 statements in alignment with their respective concepts.

## C- Scale Psychometrics:

The researchers distributed the 38-statement scale across six versions, one for each of the five competitions within traditional karate, along with a general version for the overall scale. The statements were randomly arranged within each version. Two statements were placed under each dimension, representing the left hemisphere of the brain (A) and the right hemisphere (B). The instruction page was then created to extract the psychometric properties for each version individually.

## First: Reliability Coefficient:

The researchers employed various methods to calculate reliability, including:

## 1. Content Validity:

They analyzed research papers and scientific references to define dimensions and propose statements under each dimension.

## 2. Expert Validity:

The researchers presented the scale in its six forms to 18 experts, including professors of sports psychology and experts in traditional karate training. The details are as provided in the following table:

**Table No. 9**

**The percentage distribution of experts' opinions on the phrases of the "Brain Control of Traditional Karate Players' " scale in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percent age |
|---|---|---|---|---|---|
| 1 | 1 | I cannot perform more than one task at a time. | I can perform more than one task at the same time. | 18 | 100% |
| 2 | 2 | I prefer to follow a consistent training method. | A constantly changing training method by the coach motivates me more. | 17 | 94% |
| 3 | 3 | I take risks by trying new performances in tournaments. | I surprise my coaches with different performances. | 18 | 100% |
| 4 | 4 | I organize my belongings before training and matches. | I have great difficulty finding my important items for training or matches. | 18 | 100% |

**Follow Table No. 9**
**The percentage distribution of experts' opinions on the phrases of the "Brain Control of Traditional Karate Players' " scale in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|---|---|---|---|---|---|
| 5 | 5 | I analyse opponents' performances each time. | I'm confident that my different performances will excel. | 18 | 100% |
| 6 | 6 | I experiment with skills using unique approaches. | I imagine skills using new performance approaches specific to me. | 18 | 100% |
| 7 | | I think about trying new skills before performing them. | I try new skills and move on to the next. | 18 | 100% |
| 8 | 7 | I arrange my thoughts before matches. | I neglect arranging my thoughts before matches. | 18 | 100% |
| 9 | 8 | I get into the match mindset when I step onto the field. | Sometimes, I see match events in front of me before they start. | 15 | 83% |
| 0 | 9 | I understand the coach's instructions when they are given as specific points. | I understand the coach in all situations. | 18 | 100% |
| 1 | 10 | I predict what will happen in the match. | I imagine what will happen in the match. | 18 | 100% |
| 2 | 11 | I recognize the importance of training on basic skills first, even if they are boring. | I discover my passion in every competition I participate in traditional karate. | 13 | 72% |
| 3 | 12 | I can describe the opponent's performance in matches. | I deduce the opponent's playing style in matches. | 18 | 100% |
| 4 | 13 | I try the coach's instructions multiple times before executing them in matches. | I mentally perform the coach's instructions before executing them in matches. | 18 | 100% |
| 5 | 14 | I always improve my methods to achieve the best results in matches. | My stress and anxiety give me confidence in myself in any competition. | 18 | 100% |
| 6 | 15 | I expect to win in matches. | I guess the outcome of matches. | 15 | 83% |
| 7 | 16 | I enjoy reciting the five maxims at the beginning and end of each traditional karate training and gathering. | Images of champions and their performances motivate me. | 18 | 100% |
| 8 | 17 | I follow the coach's instructions in competitions. | I act according to the situation, even if it contradicts the coach's instructions. | 17 | 94% |
| 9 | 18 | I apologize to my team if I make mistakes in matches. | I seek excuses for my teammates when they make mistakes in matches. | 18 | 100% |

**Follow Table No. 9**
**The percentage distribution of experts' opinions on the phrases of the "Brain Control of Traditional Karate Players' " scale in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|---|---|---|---|---|---|
| 0 | | I identify convincing reasons when I am defeated in competition. | I admit defeat in matches without explaining the reasons. | 18 | 100% |
| 1 | | I choose competitions to participate in based on my exceptional skills. | I rely on my feelings when choosing competitions to participate in. | 18 | 100% |
| 2 | 19 | I take defeat seriously. | I blame myself for the defeat. | 18 | 100% |
| 3 | 20 | I learn the easy skills first. | I learn the important skills first. | 18 | 100% |
| 4 | 21 | I manage my time skilfully before and during matches. | I feel that there's not enough time to complete the required tasks. | 18 | 100% |
| 5 | 22 | I organize my personal belongings for training and matches. | I leave my personal belongings for training and matches disorganized. | 18 | 100% |
| 6 | | I regularly practice at the beginning of learning motor skills. | I practice irregularly at the beginning of learning motor skills. | 18 | 100% |
| 7 | 23 | I can understand the explanation given by the coach. | I don't remember the words the coach says, instructions should be written for me. | 18 | 100% |
| 8 | 24 | I plan what I will do in the matches. | I imagine what will happen in the match. | 18 | 100% |
| 9 | 25 | I inform the coach about my fatigue before matches. | I take risks in playing despite feeling tired. | 18 | 100% |
| 0 | 26 | I prefer to think calmly while sitting before the match. | I prefer to think while lying down before matches. | 18 | 100% |
| 1 | 27 | I try various methods to identify my strengths. | I easily discover my strengths and weaknesses in matches. | 14 | 78% |
| 2 | 28 | I prefer to stay calm while traveling to perform in matches. | I prefer listening to music while traveling to perform in matches. | 18 | 100% |
| 3 | 29 | I complete training even if the skills are not connected. | I can't perform two unrelated skills. | 15 | 83% |
| 4 | 30 | I keep my nerves calm during competitions, regardless of the opponent's provocation during matches. | I get angry when the opponent provokes me. | 16 | 89% |

**Follow Table No. 9**
**The percentage distribution of experts' opinions on the phrases of the "Brain Control of Traditional Karate Players' " scale in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percent age |
|---|---|---|---|---|---|
| 5 | 31 | I execute the coach's instructions as they suit my thinking. | I follow the coach's instructions because they make the performance enjoyable. | 18 | 100% |
| 6 | 32 | I adapt my performance methods based on the opponent's strengths. | I never change my performance style, but I study the opponent well. | 18 | 100% |
| 7 | 33 | I follow the coach's instructions in all situations. | I don't adhere to the coach's instructions regardless of my situation in the match. | 18 | 100% |
| 8 | 34 | I remember the names of players in most teams. | I remember the faces of players in most teams. | 18 | 100% |
| 9 | 35 | I love traditional karate because it makes me feel independent, as the coach doesn't give instructions during the performance as per the rules. | I dislike not receiving instructions from the coach during matches, which makes me confused and unsure. | 17 | 94% |
| 0 | 36 | I can easily calculate the number of new skills I acquire, whether monthly or yearly. | I can't verify the number of skills I acquire in one month of training. | 13 | 72% |
| 1 | 37 | I calmly contemplate before matches. | I listen to music before the match. | 18 | 100% |
| 2 | 38 | I prefer learning motor skills partially. | I prefer to learn motor skills holistically. | 18 | 100% |

The table (9) presents the percentage of agreement among experts on the statements of the "Brain Control for Traditional Karate Players" scale, General Form. This indicates the content validity of the scale. Experts suggest rephrasing statements (20 for the left half, 35 for the right half). The table includes 38 axes and 42 statements as an initial version.

**Table No. 10**
**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Ippon Shobu, in its initial form**
**(N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|---|---|---|---|---|---|
| 1 | 1 | I execute a simple attack to score Wazari or Ippon. | I execute a compound attack to score Wazari or Ippon. | 18 | 100% |
| 2 | 2 | I adhere to my own technique in all situations. | I train on different techniques, but I execute others in matches. | 18 | 100% |
| 3 | 3 | I overlook the opponent's plans from my calculations. | I change my plans at the last moment. | 18 | 100% |
| 4 | 4 | I anticipate the opponent's planned deception. | I anticipate random deception from the opponent. | 18 | 100% |
| 5 | 7 | I organize my plans before matches as I know exactly what I will do. | I neglect arranging my plans before matches but adapt according to match circumstances. | 18 | 100% |
| 6 | 11 | I control the pace of the matches. | I discover the rhythm of the matches. | 18 | 100% |
| 7 | 12 | I describe challenging situations in the match. | I infer challenging situations in the match. | 18 | 100% |
| 8 | 13 | I try more than one plan. | I visualize more than one plan. | 18 | 100% |
| 9 | 14 | I focus on the opponent's performance to catch their mistakes. | I focus solely on my performance to excel in it. | 18 | 100% |
| 0 | 16 | I prefer an opponent who uses vocalization before attacking (e.g., loud breathing). | I prefer to use the Taino-San entry in my performance. | 18 | 100% |
| 1 | 17 | I stick to the coach's plans. | I forget the coach's plans. | 17 | 94% |
| 2 | 18 | I choose the appropriate time for a counterattack. | I act spontaneously to transition to counterattack. | 18 | 100% |
| 3 | 19 | I understand that unintended injuries might occur from the opponent. | I lose my composure if the opponent causes me an injury, even if unintentional. | 18 | 100% |
| 4 | 21 | I can estimate the remaining time in the match while fully engaged in my performance. | I can't estimate the remaining time for me in matches while fully engaged in the performance. | 18 | 100% |

**Follow Table No. 10**
**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Ippon Shobu, in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|---|---|---|---|---|---|
| 5 | 23 | I understand my plan from the coach's verbal explanation. | I want to see the kinetic model of the skill to understand the plan. | 18 | 100% |
| 6 | 24 | I plan what I will do in matches. | I imagine what I will do in matches. | 18 | 100% |
| 7 | 27 | I try to learn new defensive skills. | I seek to learn new defensive skills. | 18 | 100% |
| 8 | 32 | I execute the coach's plans because they suit my thinking. | I execute the coach's plans because they make the performance enjoyable. | 18 | 100% |
| 9 | 33 | I adjust my plans according to the match circumstances. | I insist on my plans no matter what happens. | 18 | 100% |
| 0 | 35 | I adhere to the coach's plans. | I take the risk of executing unexpected plans. | 18 | 100% |
| 1 | 39 | I fall into the trap of Gogai Jodan. | I enjoy moving along the Gogai line. | 18 | 100% |

Table (10) illustrates the percentage agreement among experts on the statements of the "Brain Control for Traditional Karate Players" scale, Ippon Shobu form. Experts suggest rephrasing statements for axes (3-21) for the left half (2-7-17-18-21) and the right half. This indicates the content validity of the scale. The table includes 21 axes and 12 statements as an initial version

**Table No.11**
**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Ko-Jo, in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|---|---|---|---|---|---|
| 1 | 1 | I prefer a direct attack without deception. | I prefer to deceive before attacking. | 18 | 100% |
| 2 | 2 | I prefer to rely on consistent attacking skills to score waza-ari or ippon. | I rely on different attacking skills to score waza-ari or ippon. | 18 | 100% |

**Follow Table No.11**

**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Ko-Jo, in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|---|---|---|---|---|---|
| 3 | 3 | I neglect the opponent's plans when I am in a defensive position. | I change my performance or plans at the last moment. | 18 | 100% |
| 4 | 6 | I try new attacking skills. | I imagine new attacking skills. | 18 | 100% |
| 5 | 7 | I organize my thoughts when attacking the opponent. | I become spontaneous when attacking the opponent. | 18 | 100% |
| 6 | 8 | I know that I possess strong defensive skills. | I suggest strong defensive skills. | 14 | 100% |
| 7 | 10 | I anticipate what will happen in the match. | I imagine what will happen in the match. | 18 | 100% |
| 8 | 11 | I devise deceptive strategies. | I discover deceptive strategies. | 18 | 100% |
| 9 | 13 | I experiment with transitioning from one skill performance to another. | I visualize transitioning from one skill performance to another. | 18 | 100% |
| 0 | 14 | I focus only on the game when I am in a defensive position. | I focus on the attacker's rhythm to disrupt it using subtle movements unnoticed by the referee. | 18 | 100% |
| 1 | | I enhance my defensive skills to unsettle the opponent. | I devise defensive skills to confuse the opponent. | 17 | 78% |
| 2 | 15 | I anticipate winning in matches. | I guess the victory in matches. | 15 | 83% |
| 3 | 17 | I adhere to the coach's plans. | I do not adhere to the coach's plans. | 18 | 100% |
| 4 | 18 | I apply the new plans that I have trained on. | I change the trained plans according to the changing situation. | 18 | 100% |
| 5 | 19 | I am aware that unintended injuries might occur from the opponent. | I lose my temper if the opponent causes me injury, even if unintentionally. | 18 | 100% |
| 6 | 20 | I transition from defence to offense. | I act spontaneously to transition from defence to offense. | 18 | 100% |
| 7 | 21 | I can count to ten seconds before the referee announces it. | I cannot time the 10 seconds before the referee announces it. | 18 | 100% |
| 8 | 27 | I try to learn new defensive skills. | I search for learning new defensive skills. | 18 | 100% |
| 9 | 32 | I execute the coach's plans because they align with my thinking. | I execute the coach's plans because they are enjoyable. | 16 | 100% |
| 0 | 35 | I stick to the game plans. | I take risks with unexpected execution of my plans in the match. | 18 | 89% |
| 1 | 39 | I fall into the trap of gogai. | I enjoy moving along the gogai line. | 18 | 100% |

Table (11) illustrates the percentage of experts' agreement on the statements of the scale "Brain Control of Traditional Karate Players," Ko-Jo form. The experts suggest rephrasing the statements for dimensions (8-15) for the left half (7-8-17-20) for the right half, indicating the credibility of the scale's content. It contains a total of 20 dimensions and 21 statements in an initial form.

**Table No.12**

**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Fuko-Jo, in its initial form (N=18)**

| No. | Axis | A | B | Number of Agreeing | Percent age |
|-----|------|---|---|--------------------|-------------|
| 1- | 1 | I dislike Fuko-Jo because I transition from kata to kumite and vice versa in the same competition. | I enjoy Fuko-Jo because I transition from kata to kumite and vice versa in the same competition. | 18 | 100% |
| 2- | 7 | I understand the tournament structure before the matches and arrange the number of rounds, knowing how many times I will compete in kumite and kata. | I don't pay much attention to the number of rounds I will compete in kumite or kata. | 16 | 89% |
| 3- | 32 | I play Fuko-Jo because it combines kata and kumite, which makes sense in traditional karate sport. | I play Fuko-Jo because it combines kata and kumite, which is enjoyable in traditional karate sport. | 18 | 100% |
| 4- | 33 | I can easily transition from kumite to kata. | Transitioning from kumite to kata is challenging for me. | 15 | 83% |

Table (12) illustrates the percentage of agreement among experts on the statements of the scale "Brain Control of Traditional Karate Players" with the form of Fuko-Jo, indicating the content validity of the scale. It contains a total of 4 dimensions and 4 statements in an initial form.

**Table No.13**

**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Kata, in its initial form(N=18)**

| No. | Axis | A | B | Number of Agreeing | Percent age |
|-----|------|---|---|--------------------|-------------|
| 1 | 3 | I show disinterest in any kata my competitor will perform. | I change the kata at the last moment. | 18 | 100% |
| 2 | 6 | I try to perform the kata in new ways that are unique to me. | I imagine performing the kata in new ways that are unique to me. | 18 | 100% |

**Follow Table No.13**
**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Kata, in its initial form(N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|-----|------|---|---|--------------------|------------|
| 3 | 7 | I organize my thoughts before matches; I know which kata I will perform in the preliminary rounds and which ones in the finals before I go. | I adapt according to match circumstances and don't organize my thoughts. | 18 | 100% |
| 4 | 8 | I apologize to my team if I make mistakes in team kata. | I seek excuses for my teammates when they make mistakes in team kata. | 18 | 100% |
| 5 | 13 | I try multiple ways of performing. | I visualize multiple ways of performing. | 18 | 100% |
| 6 | 17 | I adhere to the coach's instructions in kata performance. | I forget the coach's instructions in kata performance. | 18 | 100% |
| 7 | 18 | I follow the coach's instructions because they suit my thinking. | I follow the coach's instructions because they make the performance enjoyable. | 18 | 100% |
| 8 | 37 | I can easily memorize the number of movements in each kata. | I never calculate the number of movements in each kata. | 18 | 100% |
| 9 | 38 | I end up at a different point from where I started unless I spot the starting point. | I finish at the point I started from without noticing it. | 18 | 100% |

The table (13) illustrates the percentage of expert agreement on the statements of the scale "Brain Control of Traditional Karate Players" regarding the kata form. The experts recommend rephrasing the statements for axes (3) from the left side (17-18) to the right side, indicating the content's validity for the scale. The scale comprises 9 axes and 9 statements in an initial form.

**Table No.14**
**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Enbu, in its initial form(N=18)**

| No. | Axis | A | B | Number of Agreeing | Percentage |
|-----|------|---|---|--------------------|------------|
| 1 | 3 | I do not consider my teammates' performance in my calculations during kata competitions. | I surprise my teammate with new skill performance in kata competitions. | 18 | 100% |
| 2 | 5 | I utilize analytical thinking when assigned to compose a part of the kata. | I use imaginative thinking when assigned to compose a part of the kata. | 18 | 100% |

**Follow Table No.14**

**The percentage distribution of experts' opinions on the statements of the "Brain Control for Traditional Karate Players" scale, Enbu, in its initial form(N=18)**

| No. | Axis | A | B | Number of Agreeing | Percent age |
|---|---|---|---|---|---|
| 3 | 18 | I apologize to my teammate if they make a mistake in the agreed-upon performance. | I seek excuses for my teammate if they make a mistake in the agreed-upon performance. | 18 | 100% |
| 4 | 29 | I find it easy to memorize kata even if its movements are not yet interconnected. | I find it challenging to memorize kata before the movements are interconnected into a sequence. | 18 | 100% |
| 5 | 31 | My performance of kata improves when I analyze the skills. | My kata performance improves when I aesthetically appreciate the skills. | 18 | 100% |

Table (14) illustrates the percentage of expert agreement on the statements of the scale "Brain Control of Traditional Karate Players" regarding the Enbu form. The experts suggest rephrasing the statements for axis (5), indicating the content's validity for the scale. The scale comprises 5 axes and 5 statements in an initial form.

**3. Internal Consistency Reliability:**

To assess the extent to which the statements of the Brain Control scale represent and correlate with each other and with the entire scale, as well as the correlation of each factor with the overall scale, correlation coefficients were calculated between the score of each statement and the score of the factor. Correlation coefficients were also calculated between the factor score and the total scale score for each of the six forms of the scale.

**Table No.15**

**The correlation coefficient between each statement and the overall scale is used to evaluate the initial internal consistency reliability of the "Brain Control of Traditional Karate Players" scale (N=100)**

| No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | - | - | 2 | - | - | 3 | - | - | 4 | - | - | 5 | - | - |
| Total Scale | 0.21* | 0.04 | | 0.28* | 0.01 | | 0.06 | 0.58 | | 0.33* | 0.0· | | 0.20* | 0.05 |
| 6 | 0.73* | 0.00 | 7 | 0.72* | 0.00 | 8 | - | - | 9 | - | - | 10 | - | - |
| Total Scale | 0.50* | | | 0.00 | | 0.30* | 0.00 | | 0.23* | 0.02 | | 0.39* | 0.00 | |
| 11 | - | - | 12 | - | - | 13 | - | - | 14 | - | - | 15 | - | - |

**Follow Table No.15**
**The correlation coefficient between each statement and the overall scale is used to evaluate the initial internal consistency reliability of the "Brain Control of Traditional Karate Players" scale (N=100)**

| No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Scale | 0.29* | 0.00 | | 0.34* | 0.00 | | 0.٠5 | 0.60 | | 0.53* | 0.00 | | 0.41* | 0.00 |
| 16 | - | - | 17 | - | - | 18 | - | - | 19 | 0.50* | 0.00 | 20 | 0.69* | 0.00 |
| Total Scale | 0.28* | 0.01 | | 0.٢7* | 0.0١ | | 0.13 | 0.19 | | 0.51* | | | 0.00 | |
| 21 | 0.65* | 0.00 | 22 | - | - | 23 | - | - | 24 | - | - | 25 | 0.72* | 0.00 |
| Total Scale | | | | 0.٠7 | 0.45 | | 0.٠2 | 0.84 | | 0.34* | 0.00 | | | |
| 26 | 0.70* | 0.00 | 27 | - | - | 28 | - | - | 29 | - | - | 30 | - | - |
| Total Scale | 0.21* | 0.04 | | 0.٢6* | 0.01 | | 0.٢0* | 0.04 | | 0.10 | 0.32 | | 0.35* | 0.00 |
| 31 | - | - | 32 | - | - | 33 | - | - | 34 | - | - | 35 | - | - |
| Total Scale | 0.15 | 0.12 | | 0.34* | 0.00 | | 0.29* | 0.00 | | 0.39* | 0.00 | | 0.26* | 0.01 |
| 36 | - | - | 37 | - | - | 38 | - | - | 39 | - | - | 40 | - | - |
| Total Scale | 0.42* | 0.00 | | 0.12 | 0.24 | | 0.42* | 0.00 | | 0.22* | 0.03 | | 0.21* | 0.04 |
| 41 | - | - | 42 | - | - | | | | | | | | | |
| Total Scale | 0.33* | 0.00 | | 0.39* | 0.00 | | | | | | | | | |

**\*Significance at (p) value > (0.05)**

The results from Table (15) indicate statistically significant correlation coefficients between some statements and the total scale, as well as between some axes' totals and the overall scale. This suggests the validity of the scale. It is necessary to remove axes (3-12-17-19-20-25-27-32), resulting in a total of 30 axes and 34 statements.

**Table (16)**
**The correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Ippon Shobu form in its initial form (N=62)**

| No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | r | P-(Value) | No. | r | P-(Value) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | - | - | 2 | - | - | 3 | - | - | 4 | - | - | 7 | - | - |
| The overall scale | 0.34* | 0.01 | | 0.15 | 0.27 | | 0.20 | 0.13 | | 0.25* | 0.05 | | 0.44* | 0.00 |
| 11 | - | - | 12 | - | - | 13 | - | - | 14 | - | - | 16 | - | - |
| The overall scale | 0.60* | 0.00 | | 0.35* | 0.01 | | 0.٠7 | 0.57 | | 0.28* | 0.03 | | 0.01 | 0.92 |

**Follow Table (16)**

**The correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Ippon Shobu form in its initial form (N=62)**

| No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | r | P-(Value) | No. | r | P-(Value) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | - | - | 18 | - | - | 19 | - | - | 21 | - | - | 23 | - | - |
| The overall scale | 0.33* | 0.01 | | 0.60* | 0.00 | | 0.03 | 0.79 | | 0.35* | 0.01 | | 0.39* | 0.00 |
| 24 | - | - | 27 | - | - | 32 | - | - | 33 | - | - | 35 | - | - |
| The overall scale | 0.35* | 0.01 | | -0.02 | 0.91 | | 0.25* | 0.05 | | 0.25* | 0.05 | | 0.17 | 0.20 |
| 39 | - | - | | | | | | | | | | | | |
| The overall scale | 0.49* | 0.00 | | | | | | | | | | | | |

**\*Significance at a (p) value > (0.05)**

The results of Table (16) indicate statistically significant correlation coefficients between some statements and the overall scale, indicating the scale's validity. Axes (2-3-13-16-19-27-35) should be removed, resulting in a total of (14) axes and (14) statements.

**Table (17)**

**Correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Ko-Jo form in its initial form (N=77)**

| No. | R | P-(Value) | No. | R | P-(Value) | No. | R | P-(Value) | No. | r | P-(Value) | No. | r | P-(Value) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | - | - | 2 | - | - | 3 | - | - | 6 | - | - | 7 | - | - |
| The overall scale | 0.31* | 0.01 | | 0.65* | 0.00 | | 0.44* | 0.05 | | -0.12 | 0.29 | | 0.39* | 0.00 |
| 8 | - | - | 10 | - | - | 11 | - | - | 13 | - | - | 14 | 0.74* | 0.00 |
| The overall scale | 0.54* | 0.01 | | 0.03 | 0.83 | | 0.30* | 0.01 | | 0.41* | 0.00 | | | |
| 14 | 0.87* | 0.00 | 15 | - | - | 17 | - | - | 18 | - | - | 19 | - | - |
| The overall scale | 0.36* | 0.00 | | 0.42* | 0.00 | | 0.25* | 0.03 | | 0.29* | 0.01 | | 0.24* | 0.04 |
| 20 | - | - | 21 | - | - | 27 | - | - | 32 | - | - | 35 | - | - |
| The overall scale | 0.25* | 0.03 | | 0.40* | 0.00 | | 0.46* | 0.00 | | 0.36* | 0.00 | | 0.24* | 0.03 |
| 39 | - | - | | | | | | | | | | | | |
| The overall scale | 0.33* | 0.00 | | | | | | | | | | | | |

\*Significance at a (p) value > (0.05)

The results of Table (17) indicate statistically significant correlation coefficients between some statements and the overall scale, indicating the scale's validity. Axes (6-10) should be removed, resulting in a total of (18) axes and (19) statements.

**Table (18)**

**Correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Fuko-Jo form in its initial form (N=61)**

| No. | R | P-(Value) |
|---|---|---|
| 1 | - | - |
| The overall scale | 0.15 | 0.26 |
| 7 | - | - |
| The overall scale | 0.56* | 0.00 |
| 32 | - | - |
| The overall scale | 0.80* | 0.00 |
| 33 | - | - |
| The overall scale | 0.62* | 0.00 |

*Significance at a (p) value > (0.05)

The results of Table (18) indicate statistically significant correlation coefficients between some statements and the overall scale, indicating the scale's validity. Axis (1) should be removed, resulting in a total of (3) axes and (3) statements.

**Table (19)**

**Correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Kata form in its initial form (N=91)**

| No. | R | P-(Value) |
|---|---|---|
| 3 | - | - |
| The Overall Scale | 0.53* | 0.00 |
| 6 | - | - |
| The Overall Scale | 0.52* | 0.00 |
| 7 | - | - |
| The Overall Scale | 0.45* | 0.00 |
| 8 | - | - |
| The Overall Scale | 0.07 | 0.52 |

**Table (19)**
**Correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Kata form in its initial form (N=91)**

| No. | R | P-(Value) |
|---|---|---|
| 13 | - | - |
| The Overall Scale | 0.42* | 0.00 |
| 17 | - | - |
| The Overall Scale | 0.54* | 0.00 |
| 18 | - | - |
| The Overall Scale | 0.38* | 0.00 |
| 37 | - | - |
| The Overall Scale | 0.22* | 0.04 |
| 38 | - | - |
| The Overall Scale | 0.21* | 0.05 |

*Significance at a (p) value > (0.05)

The results of Table (19) indicate statistically significant correlation coefficients between some statements and the overall scale, indicating the scale's validity. Axis (8) should be removed, resulting in a total of (8) axes and (8) statements.

**Table (20)**
**Correlation coefficients between each statement and the overall scale for assessing the internal consistency reliability of the "Brain Control of Traditional Karate Players" scale, Enbu form in its initial form (N=76)**

| No. | R | P-(Value) |
|---|---|---|
| 3 | - | - |
| The overall scale | 0.62* | 0.00 |
| 5 | - | - |
| The overall scale | 0.40* | 0.00 |
| 18 | - | - |
| The overall scale | 0.66* | 0.00 |
| 29 | - | - |
| The overall scale | 0.66* | 0.04 |
| 31 | - | - |
| The overall scale | 0.23* | 0.04 |

*Significance at a (p) value > (0.05)

The results of Table (20) indicate statistically significant correlation coefficients between all statements and the overall scale, indicating the scale's validity. As a result, the total number of axes is (5) and the number of statements is (8).

**Secondly: The Reliability Coefficients:**

The researchers calculated the reliability coefficients using two methods: Cronbach's alpha coefficient and the split-half method.

**A - Cronbach's Alpha Coefficient:**

**Table (21)**

**Cronbach's Alpha Coefficient for assessing the reliability of the "Mental Control of Traditional Karate Players" scale, General form, Ippon Shobu, Ko-Jo, Fuko-Jo, Kata, and Enbu forms in their final forms**

| Form | N | Number of statements | Cronbach's Alpha Coefficient |
|------|---|---------------------|------------------------------|
| General | 100 | 34 | 0.77 |
| Ippon Shobu | 62 | 14 | 0. 67 |
| Ko-Jo | 77 | 19 | 0. 70 |
| Fuko-Jo | 61 | 3 | 0. 77 |
| Kata | 91 | 8 | 0. 63 |
| Enbu | 76 | 5 | 0. 71 |

The results of Table (21) indicate that the Cronbach's Alpha coefficient values for the "Brain Control of Traditional Karate Players" scale are all above 60% for the General form, Ippon Shobu form, Ko-Jo form, Fuko-Jo form, Kata form, and Enbu form, indicating the reliability of the scale.

**B- Split-Half Reliability Coefficient:**

**Table (22)**

**Split-Half Reliability Coefficient for assessing the reliability of the "Brain Control of Traditional Karate Players" scale, General form, Ippon Shobu, Ko-Jo, Fuko-Jo, Kata, and Enbu forms**

| Form | N | First Half | | Second Half | | R | P-(Value) |
|------|---|-----------|---|------------|---|---|-----------|
| | | $\bar{X}$ | S | $\bar{X}$ | S | | |
| General | 100 | 45.18 | 5.11 | 44.12 | 4.58 | 0.57* | 0.00 |
| Ippon Shobu | 62 | 20.10 | 2.68 | 20.55 | 2.50 | 0.27* | 0.05 |
| Ko-Jo | 77 | 27.55 | 3.69 | 27.03 | 3.02 | 0.44* | 0.05 |
| Fuko-Jo | 61 | 4.40 | 1.13 | 4.00 | 0.91 | 0.43* | 0.00 |
| Kata | 91 | 12.24 | 1.49 | 12.24 | 1.60 | 0.65* | 0.00 |
| Enpu | 76 | 7.62 | 1.71 | 6.97 | 1.18 | 0.53* | 0.00 |

*Significance at a (p) value > (0.05)

The results of Table (22) indicate a statistically significant correlation coefficient between the first half and the second half of the "Brain Control of Traditional Karate Players" scale for the General form, Ippon Shobu form, Ko-Jo form, Fuko-Jo form, Kata form, and Enbu form, indicating the reliability of the scale.

**The final version of the Brain Control Scale:**

It consists of six forms: General form, Ippon Shobu, Ko-Jo, Fuko-Jo, Kata, and Enbu.

**Table (23)**
"**A Player Brain Control Measure Traditional karate "General**

| Measure | | Axis | |
| --- | --- | --- | --- |
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| I can do more than one task at a time. | I can't do more than one task at a time. | 1 | 1 |
| The coach's constantly varied training style motivates me most. | I prefer to follow a consistent method in training. | 2 | 2 |
| It is very difficult to find my important things for training or matches. | I arrange my things before training and matches. | 3 | 3 |
| I'm sure my different performances will succeed excellently. | I analyze the opponent's performance each time. | 4 | 4 |
| I imagine skills in my own new ways of performance. | I try skills in my own new ways. | 5 | 5 |
| Ignore the order of my thoughts before the matches | Organize my thoughts before matches | 6 | |
| Try new skills and move on to others | Think about the new skills before doing it | 7 | 6 |
| I sometimes see the match events in front of me before it begins. | I get into the match atmosphere when I stand on the court. | 8 | 7 |
| I still understand the coach | Understand the coach's instructions when his instructions are defined in points | 9 | 8 |
| I still understand the coach | Understand the coach's instructions when his instructions are defined in points | 10 | 9 |
| I discover my passion in each competition I perform in traditional karate. | I know the importance of training on basic skills first even they are boring. | 11 | 10 |

**Follow Table (23)**
**"A Player Brain Control Measure Traditional karate "General**

| Measure | | | Axis |
|---|---|---|---|
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| Infer how the opponent plays in matches | I can describe the opponent's performance in matches | 12 | 11 |
| I deduced how the opponent played the games | I can describe the performance of competitors in match | 13 | 12 |
| I expect to win the games | I guess winning games | 14 | 13 |
| Pictures of heroes and their performance motivate me | Enjoy reciting the five commandments at the beginning and end of each traditional karate training and gathering | 15 | 14 |
| Look for excuses for friends when they make mistakes in matches | I apologize to my team if I make match fouls | 16 | 15 |
| I admit defeat in a match without explaining the reasons | Define convincing reasons when I lose in the competition | 17 | |
| I Adopted in the competitions in which he participated in Sensei | I chose the competitions I participated in based on my skill in which I identify | 18 | |
| I feel there is no time to achieve the requested tasks. | I manage my time skillfully before and during matches. | 19 | 16 |
| Act accordingly, even if this is contrary to the instructions of the coach | Follow the coach's instructions during competitions | 20 | 17 |
| Quit my own training and irregular matches | Set up my own formations and games | 21 | |
| I don't remember the coach's words. He should write instructions for me. | I can understand from the coach's explanation. | 22 | 18 |
| I imagine what will happen in the match. | I plan what I will do in matches. | 23 | 19 |

**Follow Table (23)**
**"A Player Brain Control Measure Traditional karate "General**

| Measure | | | Axis |
|---|---|---|---|
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| I prefer thinking while lying down before games | I prefer thinking in a sitting position before the match | 24 | 20 |
| Hear better music while traveling to play games | I prefer tranquility during the trip to play games | 25 | 21 |
| I can't perform two different unrelated skills. | I accomplish in training even if skills aren't related. | 26 | 22 |
| Get angry when the opponent is provocative | I kept my cool during the competitions, regardless of the provocation of his rival Li during the matches | 27 | 23 |
| Follow the coach's instructions to make the performance fun | Follow the coach's instructions as it suits me | 28 | 24 |
| I don't adhere to the coach instructions whatever my position in the match. | I adhere to the coach instructions in all cases. | 29 | 25 |
| I remember names of faces in other teams easily even if I saw them once. | I remember names of the players in other teams easily even if I saw them only once. | 30 | 26 |
| I feel confused when the coach leaves me without instructions in matches that makes me confused. | 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 | 31 | 27 |
| I can't assure of the number of skills I gain in a month of training. | I can easily count the number of new skills I gain whether in a month or a year. | 32 | 28 |
| Listen to music before the game | Think well before matches | 33 | 29 |
| I prefer learning motor skills in a holistic way | I prefer movement of learning skills partially | 34 | 30 |

**Table (24)**
**"A Player Brain Control Measure Traditional karate"**
**Ippon Shubo Competitions**

| Measure | | | s |
|---|---|---|---|
| Right Hemisphere Functions (B) | Left Hemisphere Functions (A) | | |
| The attack was conducted to get Wzari or Ebon | I performed the simple attack to get Wzari or Ibon | 1 | 1 |
| I expect a random disappointment | I expect the organized | 4 | 2 |
| I don't usually make plans before matches but I follow matches' circumstances. matches'scircumstances o o | I missed my plans before the matches but I'm going to the matches | 7 | 3 |
| Discover the rhythm of the games | Organize the rhythm of | 11 | 4 |
| I concluded the difficult positions | Describe the difficult positions | 12 | 5 |
| I focus on my performance only to | I focus on the opponent's | 14 | 6 |
| I risk with performing unexpected plans. | Join the coach's plans | 17 | 7 |
| I turned to the entrance to Taino Sen attack without thinking. | Choose the right moment for a counterattack | 18 | 8 |
| I find it difficult to estimate the remaining time during my performance in a match. | I can estimate the remaining time during my performance in matches. | 21 | 9 |
| I want to see the motor skills model until I understand the plan | I understand my plan based on the verbal explanation of the trainer | 23 | 10 |
| I imagine what I will do in the matches | I plan what I will do in the matches | 24 | 11 |
| Implement the coach's plans because he makes the performance enjoyable | Implement the coach's plans because this fits my thinking | 31 | 12 |
| I insisted on my plans no matter what | I adjust my plans according to the circumstances of the game | 32 | 13 |
| I like to move on the jugai line | Take control of jugai | 36 | 14 |

**Table (25)**
**"A Player Brain Control Measure Traditional karate" KU-go Kumite Competitions**

| Measure | | | s |
|---|---|---|---|
| Right Hemisphere Functions (B) | Left Hemisphere Functions (A) | | |
| I prefer to be fooled before the attack | I prefer attack directly without cheating | 1 | 1 |
| It was based on different offensive skills for Azeris, Azari or Ibon | I prefer to rely on offensive skills set for a disk and Azari or Ebony | 2 | 2 |

**Follow Table (25)**
**"A Player Brain Control Measure Traditional karate" KU-go Kumite**
**Competitions**

| Measure | | | S |
|---|---|---|---|
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| I change the performance or the plans at the last minute | I neglect the opponent's plans when I am a lawyer | 3 | 3 |
| I don't arrange my thoughts before attacking the opponent. | Organize my thoughts during the opponent's attack | 7 | 4 |
| I perform defensive skills as I feel. | I exercised a lot on defensive skills I will do in matches. | 8 | 5 |
| Discover the style of disappointment | The style of disappointment | 11 | 6 |
| I imagine moving from one skillful performance to another | Try moving from one skill performance to another | 13 | 7 |
| The attacker is obliged to line up in a line by actions that the referee | I focus on playing only when I'm a lawyer | 14 | 8 |
| Defend the defensive skills to | I prefer defensive skills to | | 9 |
| I guess winning games | I get into matches knowing that I will win at the end. | 15 | 10 |
| Do not stick to the coach's plans | Join the coach's plans | 17 | 11 |
| Modify the plans for which you have been trained according to the evolution of the situation | Apply the new plans on which you have been trained | 18 | 12 |
| I lose my temper if my opponent hurts me, even if it wasn't on purpose | Know that unintentional injuries may occur from the competitor | 19 | 13 |
| I turned from attack to defense or vice versa without pre-arrangement for attacking. | I acted with his spontaneity to go from defense to attack | 20 | 14 |
| I can't count the 10 seconds before the referee announces that. | I can count the 10 seconds before the referee announces that. | 21 | 15 |
| Look for new defensive skills | Set up defensive skills | 27 | 16 |
| Implement the coach's plans because he makes the performance enjoyable | I implement the coach's plans because it suits my thinking | 32 | 17 |
| I risk with performing unexpected plans. | I adhere the match plans | 35 | 18 |
| I like to move on the Jugaii line | Take control of Jugai | 39 | 19 |

**Table (26)**
**A Player Brain Control Measure Traditional karate Fokogo Competitions**

| Measure | | | s |
|---|---|---|---|
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| I showed a lack of interest in the number of roles in which he will play Comet or Kata | I Know my role before the matches and organize the number of roles knowing the number of times that the comet and the kata | **7** | 1 |
| Play Fokogu because it combines kata and comet and it's fun in the traditional sport of karate | Play fokogu because it combines kata and comet, which makes sense in the traditional sport of karate | **32** | 2 |
| I turned from kumite to kata difficulty | I turned from kumite to kata easily | **33** | 3 |

**Table (27)**
**A Player Brain Control Measure Traditional karate Kata Competitions**

| Measure | | | Axis |
|---|---|---|---|
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| I change the kata at the last minute | I like to play Kata the opponent don't expect it from me. | 1 | 3 |
| I imagine the performance of the kata in a new way | I try to perform the kata in new ways of my own | 2 | 6 |
| I walk according to match conditions and do not fix my thoughts | 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. | 3 | 7 |
| Look for excuses for your colleagues when they make mistakes in the kata | I apologize to my team if mistakes are made in the collective kata. | 4 | 8 |
| I imagine more than a way to play | Set up a training method | 5 | 13 |
| I perform Kata my own way even if it goes against instructions of the coach. | Follow the instructor's instructions for kata performance | 6 | 17 |
| I execute what I feel with during the performance. | Follow the coach's instructions as it suits me | 7 | 18 |
| The number of movements in each kata has never been calculated | I can record the number of moves at each kata that I see easily | 8 | 38 |
| Finished at the starting point without touching them | It ended with a point other than the one from which it started, unless it is indicated at the beginning | 9 | 38 |

**Table (27)**
**A Player Brain Control Measure Traditional karate EnBu competitions**

| Measure | | | s |
|---|---|---|---|
| **Right Hemisphere Functions (B)** | **Left Hemisphere Functions (A)** | | |
| Surprise my colleague / colleague in performing new skills in Alnbo games | I do not put the performance of my colleague / colleague in my calculations in correspondence Al-Anbo | 3 | 1 |
| I imagine new actions when requested to form a part of Anpo. | I analyze Kata and Bunkai actions and I rearrange them when requested to form a part of Anpo. | 5 | 2 |
| Seeking an apology for my colleague / colleague if he fails to deliver the agreed service | I apologize to my colleague / colleague for any mistakes in the agreed execution | 18 | 3 |
| I have trouble saving the Anabu before the interconnected movements are combined | I find it easy to save Alnbo even if his movements are not yet connected | 29 | 4 |
| Performance The Anabou method is a better performance when the aesthetic taste of skills | The performance in the Anabu method is better in the logical sequence of skills | 31 | 5 |

**The scale's correction method is as follows:**

**- The General form:** it contains 34 items, with each item having two statements (A and B).

**- The Ippon Shobu form:** it contains 14 items, each with two statements (A and B).

**- The Ko-Jo form:** it includes 19 items, each with two statements (A and B).

**- The Fuko-Jo form:** it consists of 3 items, each with two statements (A and B).

**- The Kata form:** it contains 9 items, each with two statements (A and B).

**- The Enbu form:** it has 5 items, each with two statements (A and B).

The statements (A) represent the control of the left hemisphere of the brain on the athlete's personal behavior in dealing with sports situations and interactions with others. These statements also indicate the influence of the left hemisphere on emotions, reactions, thoughts, attitudes, and stimuli during sports situations. Conversely, statements (B) represent the control of the right hemisphere of the brain on the athlete's behavior and reactions.

The athlete's responses determine the dominance of one hemisphere over the other in influencing their behavior. If the number of statements (A) is greater than the number of statements (B), it indicates the dominance of the left hemisphere, and vice versa. When the numbers are approximately equal or differ by no more than ±2, it suggests balanced or integrated brain control

over the athlete's personal behavior in sports situations and interactions with others.

The General form serves as the fundamental form, and the athlete selects it first before choosing any of the other forms based on the competition, they are participating in. The athlete answers the General form along with the form of the specific competition they're participating in. If an athlete competes in multiple events, they answer the General form only once, along with the chosen competition forms, even if all five other forms are selected.

**The statistical analyses used:**

The researchers used the SPSS software to calculate the following statistical analyses:

- Mean
- Standard deviation (SD)
- Skewness
- Kolmogorov-Smirnov normality test (Z)
- Runs Test for randomness (Z)
- Pearson correlation coefficient (r)
- Cronbach's alpha (α)
- Independent samples t-test for significance testing (t)

**Discussion of the Results:**

The current research aimed to develop a scale for assessing cognitive control among traditional karate players aged above 20 years. The results are as follows:

1-    The cognitive control scale for traditional karate players aged above 20 years was successfully developed. It consists of 38 dimensions and 6 forms that allow us to identify the dominant cognitive pattern among traditional karate players.

2-    The number of statements comprising each form is as follows:

**Table (28)**

| 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 |

3- The scale is distinguished by high validity and reliability coefficients, making it a dependable tool for identifying cognitive control patterns among traditional karate players.

4- Validity was assessed using three methods: content validity, expert validity, and internal consistency validity. The high consistency between each statement and the total score of the scale indicates that the scale effectively measures what it was intended to measure.

5- The reliability of the scale was calculated using two methods: split-half reliability and Cronbach's alpha coefficient. The high stability and consistency of the statements demonstrate that the proposed scale can be relied upon as a valid tool for

identifying cognitive control patterns among traditional karate players.

**Recommendations:**

Based on the research findings, the following recommendations are proposed:

1- Utilize the scale along with a specific form in the relevant competition, in addition to the general form, to identify cognitive control patterns among participants in that competition.

2- Investigate the differences in cognitive control patterns between male and female players.

3- Examine the variations in cognitive control patterns among players in each competition separately.

4- Encourage sports psychologists to focus on athletes' cognitive control patterns to enhance their athletic achievements.

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**References:**

5- Ahmed Mahmoud Ibrahim, Atef Mohamed Abaza (2005): Training Programs for the Kata Movement in Karate, Maaref Foundation, Alexandria.

6- Goleman, D. (1995): Emotional Intelligence: Why It Can Matter More Than IQ, New York, Bantam Books.

7- Herman, N: The Creative Brain, Retrieved from HBID.com, 2005.

8- International Traditional Karate Federation Laws (2022).

9- Mona Mokhtar El-Morsy (2008): Hemisphere Functions and Their Relationship to Learning Styles "VAK" among Female Students of the faculty of Physical Education, Published Research in the Scientific Journal of Physical Education and Sports, Egypt.

10- Rothers, L. (1989): A Biological Perspective on Empathy American Journal of Psychiatry, Vol. 146, p.

11- Sally Springer, George Deutsch (2002): The Left Brain and the Right Brain, translated by Sayed Abu Shaishaa, Nahda Al-Sharq Publishing, Cairo.

12- Soliman Abdulwahid Yousef (2010): Cognitive Neuropsychology (A Neo-Cognitive Psychological Perspective on Cognitive Mental Processes), Itrac, Cairo.

13- Tarek Mohamed Badr El-Din (2016): Applications of Sports Psychology, Arab Thought House – Cairo.

14- Tarek Mohamed Badr El-Din (2017): Cognitive Control Patterns of Practitioners in Some Sports Activities from the Perspective of the HBDI Brain Dominance Theory, Published Research in the Scientific Journal of the faculty of Physical Education for Girls, Issue 54, Alexandria University.