

Study on the Influence of Various Types of Taijiquan on Senior Citizens Based on STROOP Color-Word Test

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Abstract: There are various types and diversified forms of Taijiquan. Different types of Taijiquan. differ greatly from one another in the amount and intensity of exercise. This paper conducts Stroop Color-Word Test (CWT) on 120 senior citizens in Yongzhou, Hunan Province after intervention of Taijiquan.in three different periods, and average values and standard deviations are calculated in Excel 2013 with the assistance of SPSS based on the data and indexes collected in each period. Verified by statistics and analyzed by two-way RM ANCOVA, it shows in the study that Stroop has generally been improved after intervention of Taijiquan., and there is no obvious difference in the indexes of both males and females after exercise, but evident differences come out in the results of the three different periods of the 56-form Taijiquan., displaying an more effective effect.

Therefore, through the Stroop CWT on senior citizens after a 12-week exercise of Taijiquan., this paper hopes to provide theoretical foundation for senior citizens more specifically so as to help them prevent cognitive disorder and senile dementia more effectively.

Key Words: various types of Taijiquan.i; senior citizens; Stroop Color-Word Test; differentiation

Introduction

Statistics show that more than 150 countries on the globe are actively promoting the exercise of Taijiquan., and Taijiquan. has also underwent its own transformation from backward village to the whole world. Currently, it is played at every corner of the world, including China. Because Taijiquan. is beneficial to human body, especially beneficial to improve balance of senior citizens, to strengthen their muscles, and to promote their proprioception, it arouses the interest of both scholars at home and abroad to study it. This paper starts from the morbidity and their characteristics of senile diseases and is based on the level of health concerning common cognitive functions of senior citizens aged above 60, with the aim to prescribe scientific and proper Taijiquan. therapy according to how well they are and how long they play it. Various methods, such as literature review, expert interview, experimental test, and mathematical statistics, have been applied to analyze and demonstrate the theoretical foundation and real practices of exercise prescription of different types of Taijiquan.. After analyzing and comparing three different types of Taijiquan., this study finds out the most suitable one for senior citizens. Thus, the situation of exercise in vain and without a correct direction can be prevented. Moreover, beginners can have a quick start and those who play it can receive more effective guidance on health keeping. In this way, a more scientific theoretical base can be provided for senior citizens to play Taijiquan. and the guidance given to them will be more scientific, precise, and effective. It is also hoped to provide an insight for subsequent study on how to select the type of Taijiquan. for senior citizens.

The 24-form Taijiquan., with the aim to promote Chinese cultural legacy and to develop traditional martial arts, is compiled for beginners. Characterized by simple movements, it is the essence of traditional Taijiquan.. Compared with traditional routines, though only with 24 actions, it is simpler, more refined, and more standardized, with a full demonstration of the movement characteristics of Taijiquan.. The 42-form Taijiquan. is

based on Yang Style Taijiquan. and integrates actions from Chen Style, Wu Style, and Sun Style. Having inherited the continuous, light, soft, smooth and natural movements of traditional Taijiquan., it highlights such technical points required in Taijiquan. as body moving with Yi and combing hardness with softness. It is quite difficult for it is heavy loaded and intense. Spiral enwinding features the essence of Chen Style Taijiquan., which is characterized by combing hardness with softness, alternating speed, bouncing and jumping, and slack shakes. The 56-form Chen Style Taijiquan. is a competitive routine refined, compiled and verified by experts and masters organized by Chinese Wushu Association based on traditional routines. It fully embodies Taijiquan.'s traditional characteristics, scientificity and competitiveness, not only catering to Wushu competition rules but also to the needs of amateurs to learn and exercise it for its standard movements, rich techniques and balanced way of exercise.

Therefore, this paper centers on three competitive routines, namely on 24-form Taijiquan., 42-form Taijiquan. and 56-form Chen Style Taijiquan., which represent the elementary, intermediate and advanced stage of Taijiquan., and conducts experiment accordingly.

2 Stroop Color-World Test

Stroop Color-Word Test (CWT) was first used by Stroop in 1953. In the test, the subjects are required to tell the color of designated words rather than pronounce them, but these words --stimulus materials--are contradictory in color and meaning. It turns out that when telling the color, the subjects are interfered by the meaning of the word. As a part of cognitive function, executive function is flexible cognitive neural mechanism which works in the process of which human complete a certain task. As scholars are probing increasingly deep into neural psychology since Stroop has been widely practiced, more and more reports on recognition of light dementia by Stroop appear. After development of more half a century, Stroop has been diversified with different complexity, varying difficulty and sensitivity. Among them, color word interference test is comparatively simple and convenient. To guarantee the completeness, this study analyzes consistency between word and color, contradiction between word and color, and the differences when contradiction arises during test, and it discloses the cognitive process of contradiction.

3. Subjects and method

3.1Subjects

After voluntary registration, 120 subjects aged above 60 in Yongzhou, Hunan province are chosen. They have never exercised Taijiquan. before.

The 120 subjects are from Office of the Elderly, Hunan University of Science and Engineering, Office of Retired Persons, Yongzhou Secondary Vocational School, Yang Zi Tang community in Lingling district, Yongzhou, Yongzhou Lingling District University for the Elderly and Yongzhou Association of Taijiquan.. They are grouped by age and gender into three groups: 24-form Taijiquan. (Group A), 42-form Taijiquan. (Group B) and 56-form Chen Style Taijiquan. (Group C).

Table 1 Subjects

Item	Above 60	
	Male	Female
24-form Taijiquan.	20	20
42-form Taijiquan.	20	20
56-form Taijiquan.	20	20

3.2 Experiment design

Table 2 Duration, frequency and ways of exercise

Week 1-6	week 7-12
3 times per week	5 times per week
60 minutes each time	90 minutes each time
10-minute warm-up	10-minute warm-up
10-minute review	20-minute review
30-minute new lesson	20-minute new lesson
10-minute relaxing	30-minute practice
	10-minute relaxing

From week 1 to 6, Taijiquan. is exercised by these subjects 3 times a week and each time 60 minutes, including warm-up (10 min), review (10 min), new lesson (30 min) and relaxing (10 min). After warm-up, they practice different Taijiquan. under the guidance of the instructor, with 1 min interval between two sessions, each session lasting 2 minutes and 4 sessions in total. From week 7-12, Taijiquan. is practiced 5 times a week and 90 minutes each time. During practice, subjects are required to practice by themselves after watching instructor's demonstration and are given 10 minutes for stretching and relaxing after practice. The warm-up, practice and relaxation are guided by the instructor.

3.3 Measuring method

Stroop test: Four colors (red, green, blue and yellow) and four Chinese characters referring to colors are presented to the subjects, who are arranged in three groups (colors and characters are consistent in group 1; colors are not consistent with characters in group 2; characters are not consistent with colors in group 3). The subjects are required to read the four colors or characters one by one quickly and precisely as soon as the test starts. The time each group use is to be recorded together with the time for making choices (the time recorded in this experiment is accurate to 0.001 second). The indexes to be analyzed including numbers of errors, average response time and difference in response time. The difference between the response time of both consistency in color and meaning and contradiction is one of the measurement indicators in SIE.

1, colors and characters are consistent (yellow, red, blue, green)

2, colors are not consistent with characters (yellow, red, blue, green)

3, characters are not consistent with colors (blue, yellow, green and red)

The test is conducted in 3 different times, before learning Taijiquan., 6 weeks after learning and 12 weeks after it.

3.4 Data processing

To verify this hypothesis, the average values from this experiment are calculated in Excel2013 and SPSS V.22.0, so are the standard deviations. Systematic verification is conducted by two-way RM ANCOVA analysis. All effective values in statistical analysis are session as $\alpha=0.05$.

4. Results and analysis

4.1(s) Characters in consistency with colors

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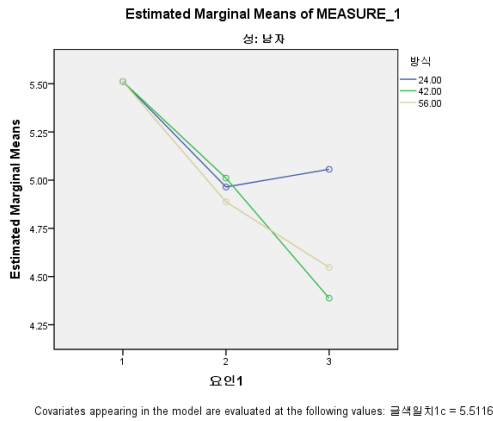


Figure 1

1st time > 2nd time 2nd time > 3rd time* (male)

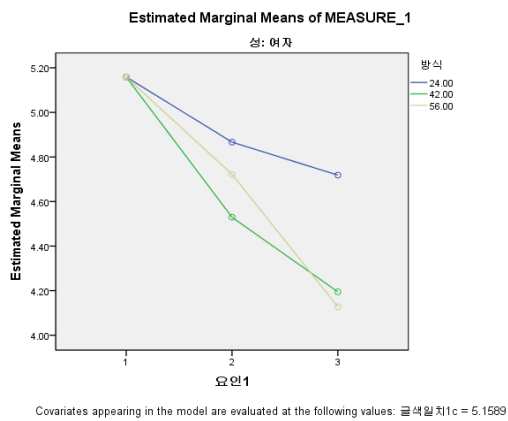


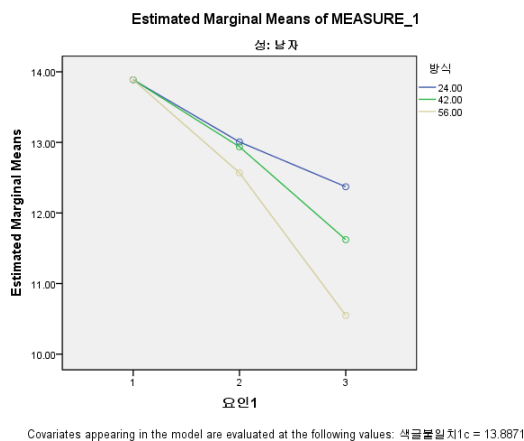
Figure 2

1st time > 2nd time 2nd time > 3rd time* (female)

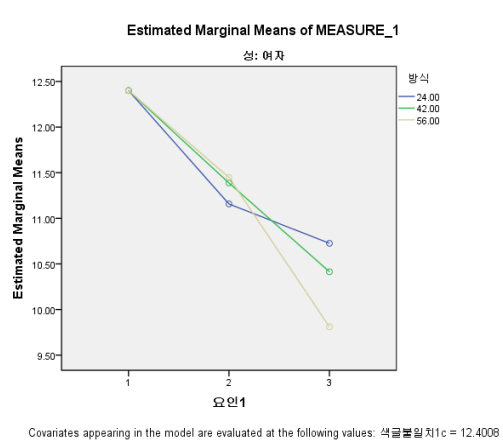
From the results of male senior citizens (characters in consistency with colors) in Figure 1, it is easy to find that there emerges a significant difference ($F=10.940, p=.001$) in the durations of practice. As for comparison between internals, the 2nd time is longer than the 3rd time. But there is no significant difference in ways of exercise ($F=1.309, p=.279$).

From the results of female senior citizens (characters in consistency with colors) in Figure 2, it is easy to find that there emerges a significant difference ($F=44.497, p=.001$) in the durations of practice. As for comparison between internals, the 2nd time is longer than the 3rd time, showing a downward trend. It also presents a significant difference in ways of exercise ($F=6.385, p=.003$).

4.2.(s) Colors not in consistency with characters



1st time > 2nd time 2nd time > 3rd time* (male)

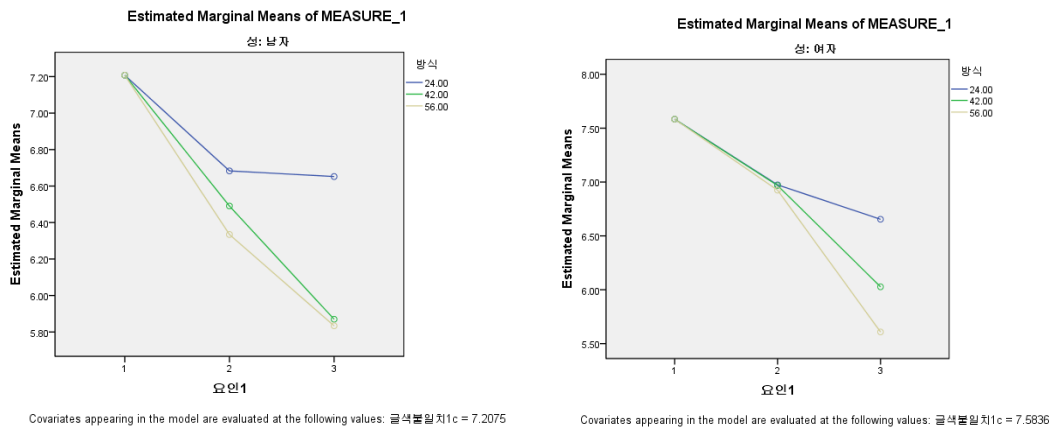


1st time > 2nd time 2nd time > 3rd time* (female)

As shown in Figure 3, for male senior citizens (colors not in consistency with characters), the durations are significantly different ($F=13.918, p=.001$) in statistics. According to comparison between intervals, the 2nd time is longer than the 3rd time. Moreover, it is also discovered that there is a significant difference in ways of practice ($F=8.830, p=.001$).

As shown in Figure 4, for female senior citizens (colors not in consistency with characters), the durations are significantly different ($F=21.341, p=.001$) in statistics. According to comparison between intervals, the 2nd time is longer than the 3rd time. However, it is discovered that there is no significant difference in ways of practice ($F=.863, p=.428$).

4.3 Characters not in consistency with colors



1st time>2nd time 2nd time>3rd time* (male) 1st time>2nd time 2nd time>3rd time* (female)

From Figure 5 it can be seen that for male senior citizens (characters not in consistency with colors) the durations are significantly different ($F=7.278, p=.001$) in statistics. According to comparison between intervals, the 2nd time is longer than the 3rd time. Moreover, it is also discovered that there is a significant difference in ways of practice $F=5.205, p=.009$).

From Figure 6 it can be seen that for female senior citizens (characters not in consistency with colors) the durations are significantly different ($F=13.045, p=.001$) in statistics. According to comparison between intervals, the 2nd time is longer than the 3rd time. However, it is discovered that there is no significant difference in ways of practice ($F=2.364, p=.103$).

5. Conclusion

From the analysis of the data collected from Stroop test conducted before the experiment, 6 weeks after it starts and 12 weeks after it starts on the randomly grouped subjects, 120 senior citizens aged above 60 with no experience of learning Taijiquan. before, who are in 3 groups of different styles of Taijiquan., namely 24-form, 42-form and 56-form and learn and practice Taijiquan. as an intervention for 12 weeks, it can be concluded as follows:

First, generally all subjects make improvement on Stroop test in general, with 56-form practitioners showing a more effective trend.

Second, as is indicated in the indexes of characters in consistency with colors, there is a significant difference in the durations of practice between male and female senior citizens. According to comparison between intervals, the 2nd time is longer than the 3rd time. But as for way of practice, there is no significant difference between male senior citizens, but a significant difference emerges in female senior citizens ($F=6.385, p=.003$).

Third, as is indicated in the indexes of colors not in consistency with characters, there is a significant difference in the durations of practice between male and female senior citizens. According to comparison between intervals, the 2nd time is longer than the 3rd time. But as for way of practice, there is a significant difference between male citizens ($F=8.830, p=.001$), and a significant difference emerges in female senior citizens ($F=.863, p=.428$).

Fourth, as is indicated in the indexes of characters not in consistency with colors, there is a significant difference in the durations of practice between male and female senior citizens. According to comparison between intervals, the 2nd time is longer than the 3rd time. But as for way of practice, there is a significant difference between male citizens ($F=5.205$, $p=.009$), while there is no significant difference between female senior citizens.

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