

Leisure Activities for the Elderly—The Influence of Visual Working Memory on Mahjong and Its Video Game Version

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Abstract. Mahjong is not only a traditional game for recreation but an important leisure activity for elderly people in Chinese society. In this study, 8 elderly people of age 65 in average are selected as testees, their visual senses are sufficiently capable to continuously play mahjong for more than 1 hour. In addition, the testees all have more than one year of experience in playing mahjong. Also, a self-developed working memory inspection system is used to detect the influences of the working memory corrective ratio of version for elderly people under 350 Lux, the mahjong play duration as the variable. The study also may serve as a reference in designing environmental illumination and the duration for elderly people while playing mahjong.

Keywords: mahjong, working memory, entertainment, illumination.

1 Introduction

By the help of medical caring and economic conditions, the length of people life is going to increasing. According to the definition of WHO (World Health Organization, WHO), the society is called high-age society while the percentage of 65 aged people reaches 7%. In Taiwan, the population whose age is more than 65 years old has already reached 7.1% in 1993. Taiwan has become the so called high-age country already and becomes worse. All problems come accompany with the high-age problems such as health caring, service institutions, physiological problems, psychological problems and the social problems need a huge of cost. Therefore, how to deal with these high-age society problems has become an important task of country, not only in Taiwan but in many countries also.

Long living stands more leisure time, but it is not equal more healthy or happy living. Long living time might cause many negative consequences if the time is not spent on good things to approve the health of their own. To avoid the negative influences, everyone must aware of what kind of leisure is suitable for him. Ruled leisure activities, maintain a relaxed mood, keep good social life are the important

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keys to active aging. A research showed that for the elder people they take 9 hours in sleep, 4 hours in daily living, and the rest 11 hours in leisure living[8][9]. Regular leisure activities are good for retired living or aged living. It is found that the activities of aged people can be classed into static and dynamic activities. The so called dynamics such as Tai-Chi-Chane, Yun-Chi dance, mountaineering, and invigorating walk. The so called statics such as chat, chess, Mahjong game are the favorites of aged people.

In addition to personal factor, the following factors all influence the vision ability[1] they are brightness (contrast), levels, and movement(the subject or the viewer moves). Also, when the subjects move with a fast speed, it will affect the vision[10] [11] [12]. When the subjects move speeds over 60 degrees per second the vision will deteriorate sharply[5]. After the optical stimulation to the retina of the eyes, there are three physical properties accompany with three kinds of psychological properties, there are hue (color), brightness and saturation. Color is decided by the length light, that is, different wavelengths of light will cause a different feeling. Amplitude of the light determines the luminosity of the light, the larger of amplitude the stronger of luminosity[3][4]. Purity of light determines the saturation of psychological properties. The so-called purity of light is by a stimulus light source containing different kinds of wavelength number, the less of type the better purity of light.

1.1 Goal of Research

To explore the effects of visual attention of the aged people engaged in leisure Mahjong 1 hour later.

2 Method

2.1 Object of Research

The Object of this study is the aged people whose age is over 65 years old. Eight aged peoples help the experiment to be testees. Some of them had taken mahjong as their leisure. The average age of them is 71.25(5.36) years old.

2.2 Process of Experiment

In the experiments, the test of vision including before and after play the game and the analysis data are based on the corrective rate.

The first step is to fill the table of each testee and told them about the steps and contents of experiments. The subjects was asked to familiar the soft of mahjong games[7]. They practiced then finished the attention test before formal played. After 60-minutes play period, the testees were asked to do the after-testing of attention. The state of attention of testees were analysis by using well done rate appeared on the soft of Vision Attention Soft.

2.3 Tools of Experiment

Self-developed tool called Visual attention system ver. 2.0 is used to do visual attention test[1]. Code figures series was black, font style was Arial, font size was 72,

string length was 3 codes, appear on the screen with a white background on the 14-inch laptop screen. Target of stimulus was random string of numbers and was used to identify.

Table 1. Configuration parameters for working memory inspection

VDT pixels	Background color	Code color	Font size	Display duration	Code number	font	Inspection duration
1152×864	White	Black	72	0.5	3	Arial	10 Minutes

2.4 Data Analysis

Windows for SPSS12.0 statistical software package was used for statistical analysis, verification tests whether there are differences within the set to homogeneous, paired sample t test verification answer rate within the set is different, between factor (between factor) for the before and after the test's correct rate of significant level is Alpha = .05.

3 Results and Discussions

3.1 Results and Discussions

3.1.1 T-Test of Well Done for 1 Code, 2 Codes, 3 Codes

In the experiments all 3 codes appear is the standard, but in the experiments recorded 1, 2 and 3 code (all correct) number of questions answered correctly at the same time. The results show in 1, 2 and 3 codes well done before and after the test has not reached significant levels.

Table 2. T-test for 1 code, 2 codes, 3 codes

Variable	M	SD	df	t	P
1 code	.250	2.816	7	.251	.089
2 codes	-.125	2.997	7	-.118	.909
3 codes	-1.125	4.454	7	-.714	.498

* $p < .05$

3.1.2 The Age and Well Done 1, 2 and 3 Codes Single-Factor Analysis of Variance

Over 65 years of age and well done 1, 2 and 3 codes of single-factor analysis of variance found that age and well done 1 code (* $p < .05$), age and well done 2 codes (* $p < .01$), age and well done 3 codes (* $p < .001$) have reached significant levels. From the results that age is proportional to the character codes (1-3) number, and the more yards appeared, (3 codes), the more significant of test.

Tables 3. ANOVA for Ages within corrective codes

Variable		SS	df	MSS	F	<i>p</i>
1 code	Model	161.75	6	26.96	3.79	.036
	Error	64.00	9	7.111		
	Corrected total	225.75	15			
2 codes	Model	410.69	6	68.45	9.98	.002
	Error	61.75	9	6.86		
	Corrected total	472.44	15			
3 codes	Model	819.94	6	136.66	11.13	.001
	Error	110.50	9	12.28		
	Corrected total	930.44	15			

* $p < .05$

3.2 Conclusions

Regular leisure activities are positive influences for retired people and aged people. Those leisure activities of community for the aged people mainly are group activities such as Tai-Chi-Chane, YunChi dancing, and mountaineering are much enjoyed by aged persons of dynamic items. For statics, party chat, chess, mahjong games are the favorites especially mahjong. In Taiwan, there is more than 10% of population exceed 65 years old, July 2007. For such a huge group of aged people, proper leisure activities and the much safety activities has become the important topic to study.

Although this mahjong leisure activities study only in one hour and it will not affect the visual attention and the fatigue of the aged but the affection will increase while the play time is increasing[1][2]. It is known that the time spent in playing mahjong always exceed than one hour in fact. Therefore, to maintain good vision to pay attention to the environment and to avoid the dangerous is the most important thing.

Especially, several researches have told that working memory ability will decrease while the age increased [2]. In orient society, to study the optimal period that the aged people can play mahjong and still can keep their good vision abilities will be a worthy work in the future.

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