

## INSIGHTS ON TEACHING CHESS TO ELDERLY CITIZENS

### *PERCEPÇÕES SOBRE O ENSINO DE XADREZ PARA PESSOAS IDOSAS*

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**Abstract:** The purpose of this study was to explore how elderly citizens react to chess instruction. Underlying this inquiry was the belief that chess training could be useful in the care of older people by helping to maintain the cognitive vitality of seniors and reducing the likelihood of Alzheimer's disease and other forms of dementia. Certain findings emerged from a pilot study of a chess training intervention with elderly citizens as participants. There were 12 participants in the study. All participants were at least 65 years of age. There were seven male participants and five female participants. The chess training intervention lasted approximately three months. The intervention occurred either in a community senior center or in a community library. The intervention sessions were weekly with each session being 90 minutes in length with some lasting 2 hours. The training made extensive use of chess-related websites available on the Internet such as chess.com and lichess.org. The instruction involved the projection of a chess-related website projected onto a large classroom screen with the use of an instructor's computer connected to a projector that projected the computer-based image onto the screen. The chess training involved instruction in chess on topics such as tactics and basic checkmates. The chess activity that the students enjoyed the most was a group activity pitting the seniors as a group against an artificial opponent available on chess.com. The seniors tended to learn at a slower pace than undergraduates whom I have taught. Also, some of the seniors were quite timid, seemingly fearful of making a mistake. Overall, the seniors enjoyed the chess training and looked forward to the training activity.

**Keywords:** Elderly citizens, chess instruction, social activity, chess-related websites, thinking skills.

**Resumo:** O objetivo deste estudo foi explorar como pessoas idosas reagem à instrução de xadrez. Subjacente a esta investigação estava a crença de que o treinamento de xadrez poderia ser útil no cuidado de pessoas mais velhas, ajudando a manter a vitalidade cognitiva dos idosos e reduzindo a probabilidade de doença de Alzheimer e outras formas de demência. Certos resultados emergiram de um estudo piloto de uma intervenção de treinamento de xadrez com cidadãos idosos como participantes. Havia 12 participantes no estudo. Todos os participantes tinham pelo menos 65 anos de idade. Havia sete participantes do sexo masculino e cinco do sexo feminino. A intervenção de treinamento de xadrez durou aproximadamente três meses. A intervenção ocorreu em um centro comunitário para idosos ou em uma biblioteca comunitária. As sessões de intervenção foram semanais com cada sessão tendo 90 minutos de duração, com algumas durando 2 horas. O treinamento fez uso extensivo de sites relacionados ao xadrez disponíveis na Internet, como chess.com e lichess.org. A instrução envolveu a projeção de um site relacionado ao xadrez projetado em uma grande tela de sala de aula com o uso de um computador de instrutor conectado a um projetor que projetava a imagem baseada em computador na tela. O treinamento de xadrez envolvia instrução em xadrez sobre tópicos como táticas e xeque-mate básicos. A atividade de xadrez de que os alunos mais gostaram foi uma atividade em grupo que colocava os mais velhos como um grupo contra um oponente artificial disponível em chess.com. Os idosos tendem a aprender a um ritmo mais

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lento do que os alunos de graduação. Além disso, alguns dos idosos eram bastante tímidos, aparentemente com medo de cometer um erro. No geral, os veteranos gostaram do treinamento de xadrez e ficaram ansiosos pela atividade de treinamento.

**Palabras-chave:** Pessoas idosas, ensino de xadrez, atividade social, sites relacionados ao xadrez, habilidades de raciocínio.

# 1 INTRODUCTION

The purpose of this study was to explore how elderly citizens react to chess training as a means to improve cognitive vitality among elderly citizens and to reduce the likelihood among elderly citizens to contract Alzheimer's Disease and other forms of dementia. There are many forms of dementia with Alzheimer's Disease accounting for approximately 80% of all cases of dementia. Alzheimer's Disease is a progressive condition marked by memory loss and then death. Alzheimer's Disease and other forms of dementia are forms of cognitive decline that affect more than 35 million people worldwide.

Horstmann (2012) has written an excellent review of research on Alzheimer's Disease in her book *The Scientific American Healthy Aging Brain*. That book is the source for much of the following information on Alzheimer's Disease and other forms of dementia. In that book and throughout this manuscript, the expression "the elderly" and "seniors" are used interchangeably as both expressions refer to the same class of people, i.e., people who tend to be at least 65 years of age.

In the U.S.A., Alzheimer's Disease is the fifth leading cause of death for people over 65 years of age. Approximately 13% of Americans over 65 years of age have Alzheimer's Disease, or approximately 5.4 million people. Approximately 44% of Americans over 85 years of age have Alzheimer's Disease. Approximately 67% of those over 85 years of age afflicted with Alzheimer's Disease are women (approximately 3,4 million), with women tending to live longer than men (HORSTMAN, 2012, p. 91).

People diagnosed with Alzheimer's Disease can survive usually between 4 and 8 years after the diagnosis. Those afflicted with Alzheimer's Disease tend to live in nursing homes. Approximately 4% of the American general population are admitted into nursing homes by the age of 80. Approximately 75% of people afflicted with Alzheimer's Disease are in nursing homes by the age of 80 (HORSTMAN, 2012, p. 91).

Physiologically, Alzheimer's Disease is marked by the abnormal accumulation of beta-amyloid plaque covering neurons and the formation of tau

tangles within neurons. As a result of these two abnormal neurological changes, neurons die in the brain and cognitive and physical deterioration results. Once Alzheimer's Disease is established in a person, the person will inevitably die (HORSTMAN, 2012, p. 91).

Alzheimer's Disease is not an inevitable part of the aging process. Many older people do not have Alzheimer's Disease or any other form of dementia. In fact, many elderly citizens die from conditions other than Alzheimer's Disease or any other forms of dementia.

The medical costs of Alzheimer's Disease and other forms of dementia are enormous, in the 100's of billions of dollars worldwide annually. As a result, there has been a frantic search for medical cures for various forms of dementia such as Alzheimer's Disease and Lewy bodies dementia. Governmental agencies and private companies such as pharmaceutical firms have spent billions of dollars on research to find medical cures for different forms of dementia. Despite the enormous expenditure of governmental and private funds, there remains no biomedical cure for Alzheimer's Disease or any other form of dementia. In other words, the return on investment on those billions of dollars has, thus far, been zero and the quest for a successful biomedical cure for Alzheimer's Disease or any other form of dementia has, thus far, been a failure (BREDESEN, 2017, p. 3-6).

Although the biomedical quest for a cure for Alzheimer's Disease has been a huge failure thus far, the massive public health problem with dementia remains. Instead of continuing an emphasis on the futile search for a biomedical cure, there is a growing interest in the role of lifestyle factors that influence the human disposition toward dementia. Among the lifestyle factors that are related to the occurrence of dementia are diet, sleep, exercise, and cognitive stimulation. Improper diet, lack of sleep, lack of exercise, and the lack of cognitive challenge appear to be related to the emergence of dementia. Among the forms of cognitive activities that appear to be helpful in maintaining cognitive vitality among the elderly, chess has been cited as a potential cognitive activity that could be useful in the care of seniors; however, there has been no extensive thorough investigation of the efficacy of chess training as a means to maintain brain health among elderly citizens and to protect the elderly against

the ravages of Alzheimer's Disease and other forms of dementia. This study is a pilot study on the efficacy of chess training to contribute to the cognitive well-being of elderly citizens (HORSTMAN, 2012, p. 142).

Chess instruction is usually oriented toward school-aged children (e.g., CAPABLANCA, 1994; COAKLEY, 2000; SADLER, 1999; SCHLOSS, 2014; SEIRAWAN, 2003; STEAN, 2002; WEERAMANTRY & EUSEBI, 1993; WILSON, 1994). No books could be located that are specifically for teaching chess to elderly people. Also, no books could be identified specifically for elderly people to learn chess.

The motivation for this study is the belief that chess training has the potential to be very useful in the care of older people by preventing the onset of Alzheimer's Disease and other forms of dementia and by helping to maintain cognitive vitality among senior citizens. Chess requires higher order thinking skills such as skills at critical thinking, problem solving, decision making, planning, and creative thinking. Having Alzheimer's Disease or any other form of dementia is incompatible with playing chess at even a moderate level of chess competency. To explore how elderly citizens react to chess training, a pilot study was implemented and examined to determine how elderly citizens respond to chess training.

## **2 DEVELOPMENT**

### **2.1 Method**

#### **2.1.1 Participants**

There were 12 participants in the study, 7 men and 5 women. All participants were over 65 years of age. All participants had little or no experience with chess.

#### **2.1.2 Instrument**

The investigator tested all of the participants with the Saint Louis University Mental Status (SLUMS) Examination. The SLUMS test was used to

detect mild cognitive, impairment and dementia. The SLUMS test has 11 test items and is administered to each participant individually.

Test scores for the SLUMS test can range from 0 to 30. Scores between 27 and 30 are viewed as normal for a person with a high school education. Scores between 21 and 26 indicate a mild cognitive impairment. Scores between 0 and 20 indicate dementia.

Two of the male participants had SLUMS scores in the 21 to 26 range and thus were viewed as having a mild cognitive disorder. The other 10 participants had SLUMS scores in the normal range between 27 and 30. The SLUMS testing occurred prior to the chess training.

No participants were tested with the SLUMS instrument at the end of the three months of chess training. The lack of any post-intervention testing of participants is compatible with the purpose of the pilot study that was to explore how seniors would react to chess training. In future studies on the cognitive effects of chess training on the elderly, senior participants in both an experimental group (group of seniors receiving chess instruction) and a control group (group of seniors not receiving chess instruction) would likely be administered the SLUMS measure prior to the chess intervention and immediately after the chess intervention.

### **2.1.3 Procedure**

The chess training lasted approximately three months. It was limited to three months due to funding limits and time constraints on the principal investigator. Ideally, to examine the cognitive effects of chess training on seniors with little or no prior experience with chess, the intervention of chess training should continue for at least one year and preferably two years, because chess is a complex game that requires much training and practice in order to attain at least an intermediate level of chess skill.

The chess training made extensive use of chess-related websites available on the Internet such as chess.com and lichess.org. The instruction involved the projection of a chess-related website projected onto a large classroom screen with the use of an instructor's computer connected to a projector that projected the computer-based image onto the screen.

The course always occurred in a classroom in which there were either an instructor's computer connected to a projector and a large screen or at least the opportunity to connect the instructor's personal computer to a large monitor to display a large chessboard and position on the monitor. In other words, the room for each session had an instructor's computer (personal or provided by a senior center) with access to the Internet and with a connection to a projector and a large screen. The chess sessions were typically 90 minutes in length with later sessions lasting up to 2 hours. In later sessions, the seniors became so engrossed in the games that they wanted to continue past the regularly scheduled 90 minutes per lesson to complete the games being played.

The chess training involved instruction in chess on topics such as basic rules, algebraic notation, tactics, and basic checkmates. After the elderly participants received a set of introductory lessons, the elderly participants would play chess games against artificial opponents available on chess.com. The resulting chess positions would be displayed on the large screen or monitor and a physical chessboard with physical chess pieces.

## **2.2 Results**

The senior participants tended to differ from undergraduates whom I have taught in two ways. One, the seniors were neither as competitive nor as quick to learn. I had to proceed at a slower rate with seniors. Two, the seniors tended to be timid and afraid to make mistakes.

The seniors enjoyed playing as a group against an artificial opponent such as level 1 or level 2 on chess.com which were the lowest opponent levels on chess.com. The seniors would take turns making a move with other seniors offering advice to the senior making the move. The instructor would enter the move into a computer and display the move on either a physical chessboard or a computer-connected display screen or both the physical chessboard and the display screen. If the seniors defeated an artificial opponent playing both White and then Black, the seniors would then play an artificial opponent at the next level on chess.com.

The instructor served as the impartial referee and commented periodically on the game positions. The instructor lauded and celebrated good moves informing the seniors why the moves were viewed as good moves. Care was taken to have the artificial opponent be at a chess skill level that was similar to that of the seniors. The seniors enjoyed playing chess as a group and they enjoyed making good moves and winning at chess. The seniors became competent enough to compete well as a group against a level 3 opponent at chess.com but not well enough to defeat a level 4 opponent at chess.com. An estimate of the group's chess rating would be an Elo rating in the 1100-1300 range.

### **2.3 Conclusions and Recommendations**

Several conclusions can be made from this pilot study. One, the two participants with mild cognitive impairment did not seem to make much progress at playing chess. They often needed help from other participants in making moves. The cognitive benefits of chess training for seniors with mild cognitive impairment may be very limited. Two, the other participants in the normal cognitive range seemed to make definite progress at playing chess. It is uncertain how much progress that they could have made if the chess training continued.

Several recommendations emanate from this pilot study. One, chess training for seniors should involve group-based chess lessons. Seniors seemed to be very social, enjoying the camaraderie of playing as a group. Two, the benefits of social activities in chess training warrant careful study. Seniors and others enjoy learning from each other. Three, there should be efforts to provide chess training for seniors. Chess training is likely an inexpensive means to contribute to the brain health and cognitive vitality of elderly citizens. Four, chess instruction for seniors should make extensive usage of computer technology and computer-based websites. Seniors seemed to be very savvy with cell phones and enjoyed the usage of computers and chess-related websites freely available on the Internet. Five, there should be research on the

extent to which chess training protects seniors from the onset of Alzheimer's Disease and other forms of dementia.

### **3 FINAL CONSIDERATIONS**

This study provides evidence that chess training is a viable intervention to promote the quality of life among seniors. The senior participants in this study enjoyed the chess lessons and looked forward to the challenge and the camaraderie in the group games against artificial opponents provided on chess.com

Chess instruction is likely a practical, useful, and efficient form of instruction that should be implemented in retirement villages and community senior centers.

Also, chess instruction for seniors in community senior centers and retirement villages provides a potentially highly generative and interesting setting for research on the scientific study of chess and its utility in addressing the enormous public health problem of Alzheimer's Disease and other forms of dementia. Chess training should be seriously considered as an intervention to be used in research in the quest to promote brain health among seniors and to protect the elderly from the ravages of Alzheimer's Disease and other forms of dementia.

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