A Study of Rated and Unrated Chess Players with Respect to Locus of Control and Field   Independent – Dependent Cognitive Style

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Abstract

The study was conducted on a sample of 100 rated and unrated chess players of different age groups. Age group of all subjects was above 15 years. The sample was divided into two groups. High age group where the age group of the players is 27 years and above and lower age group whose age group was above 15 years but below 27 years. Although the game of chess has often featured in psychological research, we know very little about people who play chess, especially about rated and unrated chess players. Rated chess players are those players whose rating is 1900 Elo points and above. Chess players whose rating is below 1900 Elo points are called unrated chess players. Purpose of this study was to study rated and unrated chess players with respect to locus of control and field dependent / independent cognitive style. 2 x 2 factorial design was used and two way ANOVA was applied to study the independent effect and interaction effect of the variables. The results showed that rated chess players inclined towards external locus of control. But rated chess players do not show significant inclination towards field independence and unrated chess players do not show significant inclination toward field dependence.

Keywords- Chess, Rated Chess players, Unrated Chess players, Rating

'I give 98 percent of my mental energy to chess, others give only 2 percent.'

Bobby Fisherr

Introduction

Chess is the touchstone of the intellect as said by the German poet Johnn Wolfgang Von Goethe, and by this reputation cognitive scientists chose chess as their model and not billiards or bridge.

Chess is the best example of intellectual activity among games. According to Holding (1985), Newell, Shaw and Simon (1963), Chess is recognized as the king among (board) games. This special status of chess is because of its intellectual aura which surrounds it.

Intelligence is definitely an important factor for improvement in chess skill. Horgon and Morgon (1990) demonstrated a relationship between intelligence as Measured by Raven's progressive Matrices and improvement in chess skill. The 15 best players from the sample scored higher on the Raven's progressive matrices than the average chess player. Frydman M. Lynn R.(1992) also found that high level of general intelligence and of spatial ability are necessary to achieve standard of play in chess. Rahm B. noted that fluid intelligence as well as verbal and visuospatial working memory are important for chess player.

There are many studies to state the importance of general intelligence, proper use of general intelligence, proper use of frontal lobe of brain and the junction between occipital and partial lobe

(William Hartshtone 1994). Lots of studies suggest that expert chess players and amateur chess players use different parts of their brains during matches. Importance of intelligence in chess playing has been proved by no of studies.Study conducted on Belgian chess players found that on WISC (Weschaler Intelligence Scale for children) these players verbal IQ was 109, performance 10 was 129 and mean 10 was 121.

Due to the impact of this attitude most of the studies investigated only one factor i.e. Intelligence, neglecting other factors relevant for the acquisition of chess skill e.g. amount of practice, years of experience or other personality characteristics.

MeriumBilalic and Peter Mcleod (Oxford University), FernandGobet (Brunal University) study the chess skill of young chess players by using measures of intelligence (WISC III). Practice and experience. The results turned out that intelligence. was a significant factor in chess skill, moreover there was a negative correlation between intelligence and practice in the elite subsample. The study alarms in focusing on a single factor in complex real world situations where a number of closely interconnected factors operate.

Besides general intelligence, chess requires a high level of visuospatial ability (e.g. Chase and Simon, 1973a; 1973b, Frydman and Lynn, 1992). Calculating variations moves, that is imaging potential moves and representing future development are important factors in chess skill, though they are not the main factors. Given that no external help is allowed, chess players need to do these transformations in their mind's eye (Chase and Simon, 1973b). At first sight, these transformations seem to resemble the popular mental rotation task (Shepard and Metzlar, 1971) which taps visuospatial ability.

Playing chess also requires problem solving capacities in order to search through the chess problem space in an effective manner. Chess should thus requires planning abilities for calculating many moves ahead (Rahm B. 2006)

Good memory is also important for expertise in chess. De Groot (1946/1978) found large quantitative differences between strong masters and weaker players in memory task. They apply the photographic image of the board, recollect the salient aspect of past game. Holding (1985) Suggested that search and evaluation, are the key processes of expert performance. In this influential book written for the chess community, Kotov (1971) suggested that grandmasters are better than weaker playersbecause they know how to calculate variations and are more disciplined in their thinking.

Practice is also important for expertise in chess. Chase and Simon (1973) found that practice is important to become good chess player. They asked their participants to fill in a grid stating how many hour per week they spent either studding or practicing chess in each year of their chess career. With this information they calculated the cumulative time spent studding and playing chess. The result showed a strong skill effect. For studding the cumulative hours spent by GM, IM, CM and CB were: 6890, 7904, 1872 and 416 hours, respectively; for playing: 7722, 7072, 2704 and 1326 hours, respectively.

Chess masters are highly selective and direct their attention rapidly to good moves (De Groot, 1978, Klein and Peio 1989)

The competitive side of chess has not escaped the attention of researchers. Mazur, Booth and Dabbs (1992) found that testosterone level, usually linked to aggressiveness tends to be higher in winners than losers in chess.

Rated chess Players are those players whose game is good. According to AICF (All India Chess Federation) rating started from1900 points. Rated players are those players whose rating is above 1900 points. Players obtaining below 1900 points are suppose to be non rated. From research evidences several factors are identified to which rated chess players perform best in chess tournaments. Although, considerable research has been conducted outside India in chess there is no

research found in chess in India. The present study intend to find out the difference between rated and non rated chess players and also compare male rated and female rated chess players with respect to intelligence.

It has been observed in many tournaments that few players performed best and acquired more ratings while others could not. In spite of having all the essential factors as knowledge of the game, practice, motivation to win, they could not achieve their goal. Why ? It is important to know whether intelligence is main factor. So this study will compare rated and non rated chess players with respect to intelligence.

REVIEW OF LITERATURE

After reviewing related studies, the following results are observed.

- Frydman M, Lynn R (1992) conducted study on thirth-three tournament, level young Belgian chess players aged 8 to 13 with the French WISC (Wechsler Intelligence Scale for children). The mean full scale IQ = 121; Verbal IQ = 109 and performance IQ = 129. The results suggest that a high level of general intelligence and of spatial ability are necessary to achive a high standard of play in chess.

- Ericsson KA, Krampe RT, Teschromer C studied. "The role of practice in the acquisition of expert performance". Result explains experts performance as end result of individuals prolonged efforts to improve performance.

- Cooke NJ, Atlas RS, Lane DM, Berger RC studied, "Role of high level knowledge in memory for chess position". Result suggest that experts can recall meaningful chess position so well because their encoding and retrival relies on prior learning of thousands of specific "Chunks" of information. Experienced players could reconstruct multiple positions at a level beyond chance or guessing.

- Holding (1992) studied "Theories of chess skill" He found that chess skill relies on thinking ahead rather than on pattern recognition.

Methodology:

Aims & objectives

The present study aims to

- Compare rated and non rated chess players with respect to their belief system.ie locus of control belief.
- Compare rated and non rated chess players with respect to their cognitive style as field dependent/ independent.

Accordingly, the following specific questions are addressed by the present study.

i)   Whether rated chess players are more internals?
ii)   Whether non rated players are more externals?
iii) Whether high age group players are more internal?
iv)   Whether low age group players are more external?
v)   Whether rated players are more field independent?
vi)   Whether nonrated players are more field dependent?
vii) Whether high age group players are more fields independent?
viii) Whether low age group players are more field- dependent!?

In order to answer the aforesaid questions empirically, it was the major concern of the study is whether rated chess players differ from the nonrated chess players in their belief system and in their cognitive style.

HYPOTHESIS :

The main hypothesis formulated in present investigation is as follows

Hypothesis I   :   Rated chess players will inclined to internal locus of control.

Hypothesis II   :   Non rated chess players will inclined to external locus of control.

Hypothesis III   :   High age group players will inclined to internal locus of control.

Hypothesis IV :   Low age group players will inclined to external locus of control.

Hypothesis V   :   Rated chess players will inclined to field independent cognitive style.

Hypothesis VI :   Non rated chess players will inclined to field dependent cognitive style.

Hypothesis VII :   High age group players will inclined to field independent cognitive style.

Hypothesis VIII: Low age group players will inclined to field dependent cognitive style.

VARIABLES

- Rated chess players

- Non rated chess players

- Locus of control

- Field independent-dependent cognitive style

SAMPLE

The number of subjects participating in this study was 100. These are chess players participated in various tournaments conducted in India. The sample consists of 50 rated chess players and 50 non rated chess players. It is worth mentioning that a combination of stratified random and purposive sampling technique was used while selecting 100 chess players. It is an Ex-Post Facto approach.

The age of all the subjects is above 15 years. The sample is divided into two groups High age group where the age of the players is 27 years and above, and the lower age group whose age is above 15 years but below 27 years. Again these two groups divided into two groups. High age rated chess players and High age non rated chess players. Likewise Low age rated chess players and Low age non rated chess players.

Tools

1) Internal VS External control of Reinforcement Inventory (IECR)

This measure developed by Rotter (1966) and adopted by Pande (1973) is used in this study to assess the belief concerning the internality vs externality of control of reinforcement on the part of subjects.

2)HiddenFigureTest(HFT)

This test identified as HFT (cf-1) is one of the several forms of embedded figure Test developed by Jackson, Messick and Myers (1964). It has been used for measuring the extend of field – independence in the subjects of this study.

Statistical technique- 2x2 factorial design used and two way ANOVA applied to study the independent effect and interaction effect of the variables.

Importance of study

The study will help chess players to improve their game. The findings are expected to serve as a guide to chess players to enhance their game. It will help chess player to choose carrier.

RESULTS

Hypothesis I predicts that rated chess players whose rating is above 1900 points will be more inclined towards internality of locus of control than the non rated chess players. For Verification of the hypothesis 2 x 2 factorial design has been created in which the subjects were segregated on the basis of ratedness. Thus the sample was selected to include rated as well as non rated chess players i.e. those chess players whose rating is above 1900 points and also the players whose rating is below 1900 points.

Thus the sample consisted two groups, rated chess players (N = 50) and non rated chess players (N=50). Means of the total scores were calculated exclusively for the rated and non rated chess players by disregarding the age of the players. Table 1 (Part A) contains means of the scores indicating the extent to which rated and nonrated chess players, differing in age, differ on locus of control belief and Table 1 (Part B) contains summary of ANOVA.

The summary of the ANOVA contained in the B part of Table 1 shows that the F ratio 1292.33 is highly significant at 0.01 level (F= 1292.33, p<0.01). This suggest that the means 4.31 and 17.56 differ significantly. The results support the Hypothesis 1 that the rated chess players are more inclined toward internality of locus of control belief (M= 4.31). At the same time **Hypothesis 2** is also supported that the non rated chess players believe in externality of locus of control belief (M=17.56). Higher the score more the inclination towards externality of locus of control belief and lower the score more the inclination towards internality of locus of control belief.

Hypothesis 3 predicts that the high age group players will more inclined towards internality of locus of control belief than the lower age group players. In order to verify the hypothesis the sample is divided in two groups on the basis of age. Two age groups were formed high age group (N= 50) and the low age group (N=50). The players who were above 27 years of age are called high age group and the other group of players who were below 27 years is known as low age group. In way the whole sample is divided into 4 groups. Rated high age group (N=25) and Rated low age group (N=25) and nonrated high age group (N=25) and non rated low age group (N=25)

It is clear from the summary of ANOVA (B part of Table 1) that the main effect i.e., age difference is significant at 0.01 level. (F=8.17, p<0.01).

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In table 1 part A the mean of scores indicating the extent to which the players belong to these two groups i.e. high age group and low age group, believe in the internality of locus of control scale. Disregarding the ratedness of the players if overall means of high age group players and low age group players are compared significant is obtained.

The significant "F ratio pertaining to age main effect appearing in table 1 (B) provides support to hypothesis 3. A glance at means appearing in table 1 part A show that chess players, higher in age believe in internality of locus of control belief (M = 10:41) than the low age group players (M=11.45).

Hypothesis 4 predict that low age group of chess players will inclined to more externality of locus of control belief (M=11.45). In order to verify this prediction, means of both the groups high age group (i.e. above 27 years of age) and the low age group (i.e. 15 yrs to 27 yrs of age were calculated and compared. It has been found that there is a significant difference between the high age group players (i.e. the chess players are above the age of 27 yrs) and the low age group players, (i.e. the chess players who are between 15 yrs to 27 yrs of age). The mean difference is highly significant at 0.01 level.

These results indicate that the high age groups of players in comparison with the low age group of players are more inclined towards internality of locus of control belief The interaction effect involving the combined impact of ratedness and age has turned out to be significant at 0.01 level. The F ratio obtained is 5.99.

Now the cognitive style of the sample is observed on the basis of H.F.T. (cf-1) (Hidden figure test) scores which measures the dependent - independent cognitive style. The scores on this test within each group of players were arranged in descending order. Those subjects whose scores belonged to upper half of the distribution were identified as field dependent while those players whose scores belonged to the lower half were identified as field independents or simply higher the scores more the inclination towards field independent cognitive style or lower the score more the inclination towards field dependent cognitive style.

Hypothesis 5 predict that rated chess players will inclined to field independent cognitive style and **Hypothesis 6** predict that Nonrated chess players will inclined to field dependent cognitive style.

To verity the hypothesis 5 and 6 the entire group of 100 subjects were first divided into two groups. Rated chess players (N=50) and Nonrated chess players (N = 50). The mean scores on HFT scale are calculated disregarding their age. The mean scores on HFT scale of the first group i.e. rated chess players, (those players whose rating is above 1900 points) is calculated. Again the mean score on HFT scale of non rated chess players, those players whose rating is below 1900 points is calculated.

The summary of ANOVA contained in the B part of Table No 6 shows that the F ratio of 0.21 pertaining to ratedness main effect has turned out to be non significant (F=0.21 n.s). This suggests that the means of 21.49 and 21.75 appearing in Table 6 A at its bottom have not differed significantly. Thus the prediction contained in **Hypothesis 5** that "Rated chess players will inclined to field independent cognitive style," fails to get supported by the finding of this study.

At the same time **Hypothesis 6** which predict that Nonrated chess players will inclined towards field dependent cognitive style is also not supported by the results. It shows that there is no evidence to say that rated and nonrated chess players differ in their cognitive style i.e. field dependence independence. **Hypothesis 7** predicts that, High age group chess players will inclined to field independent cognitive style.

To verify the hypothesis the sample was divided into two groups on the basis of high age group and low age group. The players belonged to the high age group were above 27 yrs of age where as the low age group players were below 27 yrs or say in the range of 15 yrs to 27 yrs of age. These

two were formed by disregarding their ratedness. The means of the two groups are calculated and compared. The means 22.37 and 20.87 differ significantly at 0.01 level (p<0,01).

It can be seen in the part B of Table 6 that the 'Age' main effect has turned out to be (F= 7.56, p< 0.01). This suggest that there is a significant difference between the two means 22.37 and 20.87 appearing in table 6 (Part A) of its bottom. The indication is that the players high in age are more field independent than the players who were low in age.

Hypothesis 8 predicts that the, 'Low age group chess players will inclined toward field dependent cognitive style. As the two groups have been already formed on the basis of age by disregarding their ratedness, it can be said that the significant difference (F= 7.56, p< 0.01) in two means is due to age. The players of younger age i.e. between 15 yrs to 25 yrs are more inclined toward field dependent cognitive style.

The interaction effect involving the combined impact of the age of the players and their ratedness has turned out to be significant (F= 3.94, p< 0.05). The global interaction effect to which this significant F ratio pertains, indicates that Rated players who were above 27 yrs of age are more field independent, than the other group.

CONCLUSION
Following are the conclusions obtained in the present study.

1. Rated chess players inclined toward internal locus of control.

2. Non rated chess players inclined toward external locus of control.

3. High age group players inclined toward internal locus of control.

4. Low age group players inclined toward external locus of control.

5. Rated players do not show significant inclination toward field independence.

6. Non rated players do not show significant inclination toward field dependences.

7. High age group players inclined toward field independent – cognitive style.

8. Low age group players inclined toward field dependent- cognitive style.

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