

CHESS AND EDUCATION

#4

Psychometrics

John Artise

The game of chess makes one of the most important contributions to the field of education. Inherent in it are the basic principles of psychological learning theory: Memory, Pattern Recognition, Decision-making, and Reinforcement. All of these variables interact during a game of chess and produce the results of the human thought process: a win or a lose. Chess is a closed system. The number of possible moves and variations is finite, although this number is extremely large. Because of its being a closed system, the game can be analyzed and organized for study, just like music, or calculus, or a foreign language. Once the player has incorporated the rule schema (system of rules) for chess, everything he learns about the opening, middle-game, and end-game is based upon this rule system. If a player's understanding of the rule schema is of a high level, then it is very likely that his learning progress will be very rapid. With the afore mentioned as an introduction, I would like to discuss the contribution which chess does indeed make to education and learning.

During my two years of psychological research in chess, I have discovered certain facts about the game which relate to human cognitive processes:

1. Memory Improvement—Chess has done wonders for people in this area. Players of all levels have admitted that their general memory has significantly improved as a result of over-the-board play and home analysis. The nature of the game is such that the visual aspects of the game (positional configurations, anticipated piece movements, diagonals, ranks, files, etc.) make deep impressions on that area of the mind which is responsible for memory. Visual stimuli tend to improve memory more than any other stimuli; thus, chess serves well in this area. It should also be noted that recall is also improved. Many of my subjects have claimed that they can now recall in detail events which would have been obscure to them before they had taken up the game seriously. It would seem, then, chess is definitely an excellent memory exerciser the effects of which are transferable to other subjects where memory is necessary.

2. Logic — I do not believe that anyone is born with a superior faculty for logic. I believe that logic is created and developed as a result of other psychological contingencies related to human learning. The kind of logic employed in chess is based largely upon the rule schema, but not entirely. The element of "player psychology" enters the picture and sometimes creates its own logic. Player "A" may choose a move not because it is most logical, but because he believes that player "B" will not see the reason behind it. Yet many of the players I have interviewed have asserted that chess either sharpened or created a unique sense of logic which they have applied to other aspects of life successfully. They feel that they make less mistakes where decision-making is concerned either in chess or out of it.
3. Observation and Analysis — By observation I mean awareness. Chess has the unique ability of teaching the player to become aware of details and the nuances of every position. The player learns to observe the whole board and recognize both the important and unimportant aspects of the position. In short, the player is conditioned to observe and become aware. The effects of this conditioning are transferable. The college student, for example, who plays chess, may now find that when he studies for a test, he can separate the important from the unimportant facts; he also tends to notice and consider the small details of the material he is reading. He has learned to observe, and this is crucial. In the area of analysis the chess-player is required to make mental calculations based upon the observed position and his knowledge of the rules. He learns to "see" deeply into position the possible tactical moves which may result in an advantage for him. He then calculates, always being guided by the rule schema. Many of my subjects who are either college or high school students have said that they can analyze and set up problems much better than before they studied chess. They admit (at least some of them, anyway) that they are better able to solve math problems by transferring the same kind of methodology used in chess.
4. Operant Conditioning — This is by far the most important aspect of chess which directly relates to human learning. In human psychology operant conditioning involves the learner actually doing, observing and responding to the stimuli presented to him. In chess the same holds true. The player makes moves based on his knowledge of the rules, his analysis and observations and above all, his judgement. After his opponent's reply, he sees the results of his thought process. From this experience he learns. He learns from operating on what he has analyzed. In a way chess is more complete than most college studies. In many subjects the learner never gets a chance to operate on what he observes and analyzes. Thus, learning is incomplete and the learner gets turned off to further learning. In psychology parlance, he becomes negatively reinforced. In chess, however, the learner receives positive reinforcement. He obtains immediate knowledge of the results (the KR contingency).

Chess is a marvelous game, whether it be science or art, which should be instituted in schools and colleges throughout this country as it is in other countries. Its benefits to education are evident. In my two interviews, one with Dutch grandmaster Jan Timman, and the other with Bent Larsen, both told me about the success of chess in the elementary and secondary schools of their respective countries. Timman said, "The future for chess in the schools is getting better and better. There are now special teachers for chess who give instruction to children." And Larsen commented, "In ordinary school in the ninth and tenth grades, students can select chess as a school activity. . . what you hear about school chess in Denmark comes from an organization outside the Danish Chess Federation. It organizes a lot of chess in schools after school hours. This is increasing in popularity." I sincerely hope that chess instruction, lectures, praxis, etc. can find its way into the college curriculum on a steady basis. In the Soviet Union, for instance, at the Institute for Physical Culture and Sport, a student, usually in the master category, can major in chess! In fact, I think it was Anatoly Karpov who wrote his Bachelor's thesis on the games of Bobby Fischer. To conclude, I would like to quote that talented Soviet GM and chess teacher, Alexander Kotov. "It is not difficult to combine a very strong attraction to chess with work and study. My own experience was that not only did chess not hinder my studies at school and in college, but even proved to be helpful as it played a part in development habits of logical thought."

John Artise: I am 27 years old and have a B.S. Degree in the German & Russian languages. I also hold a M.A. degree in Linguistics. I am presently teaching English to foreign students. I speak 3 other languages besides Russian and German: Spanish, Italian, and Portuguese. I became interested in chess 4 years ago when I closely followed Bobby Fischer's rise to the top. In 1972 I undertook the task of designing a series of psychometric tests to administer to chess players in order to characterize certain aspects of their ability. This all stemmed from my keen interest in learning theory and teaching methods. The psychology of human cognitive processes became a pleasant preoccupation which I brought from my experience in language teaching to chess. I also conducted interviews for publication with famous chess personalities. Jan Timman, Bent Larsen, and Ruth Cardoso have among them. I am planning to develop a chess teaching-machine based on operant conditioning contingencies. I am currently doing research in ability of women in chess.

Frank Brady

International Arbitor of the World Chess Federation, formerly editor of Chess Life & Chess World. Author of Profile of a Prodigy: The Life & Games of Bobby Fischer. Player, writer, teacher, referee.

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