A PHILOSOPHICAL ANALYSIS OF THE RELATIONSHIP BETWEEN THE WHOLE-MAN CONCEPT AND TENNIS

By

BILLYE KAY GIVENS

Bachelor of Art
Oklahoma State University
Stillwater, Oklahoma
1972

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1974

Submitted to the Faculty of the Graduate College
of the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF EDUCATION
July, 1980

A PHILOSOPHICAL ANALYSIS OF THE RELATIONSHIP BETWEEN THE WHOLE-MAN CONCEPT AND TENNIS

Thesis Approved:

Thesis Adviser

Dean of the Graduate College

ACKNOWLEDGMENTS

This study is dedicated to the first philosopher I knew, my grandmother, Lucille Brandt Thomas, who taught me the art of questioning the answers.

I would like to thank my Creator for sustaining me physically, mentally, and emotionally through the achievement of this long cherished goal.

In addition, I should like to thank Rev. Otto Elling who along with teaching me the game of tennis, taught me that winning is not the only thing.

I would like to thank my parents, Bill and Carolyn Givens, my family, and cherished friends for their time and patience in listening to me when I became frustrated and discouraged.

A special thanks goes to my committee and especially to Dr. Betty Abercrombie without whose encouragement and example none of this would have been possible.

TABLE OF CONTENTS

TABLE

FIGURE

CHAPTER I

INTRODUCTION

Being an instructor of English, humanities, physical education, elementary and intermediate tennis as well as being the men's and women's varsity tennis coach in a junior college, the author began to become very aware of the interrelatedness of learning to communicate through the media of words and movement. The author noted the puzzled look on students' faces when they became aware of the fact that their English teacher was also the tennis coach. The puzzled look was the result of many years of conditioning in the myths of the "dumb jock" and the "egg-head." The students had not yet discovered, as the author had, that one does not take one's mind to English and one's body to the gym or tennis courts. Delbert Oberteuffer wrote the following:

> Movement is a symbol of meaning and thus, represents the culmination of all thought; words have the same function. And both are used by the totality that is unified man to interpret himself to his universe and his universe to himself. Words and movement are man's primary means of communication and as such constitute the foundation of man's interaction.[1]

The "unified man" of which Oberteuffer speaks is not a new idea. In fact, the whole-man concept was purported by the Greeks, William Freeman wrote the following concerning the Greeks:

> The Greek civilization, particularly as represented by the Athenians, was a high point in the history of education. This period marked the first time in Western Civilization that the educational process had developed beyond predominantly military or trade designs and needs. For the first time education had a balanced goal: the development of a 'whole' man, a person who has well and equally developed

> in mind and body, a man who was acceptable to the military needs of his day, but who, unlike the Spartans, could also fulfill the civic or governmental needs of his time.[2]

Plato also supported the whole-man idea as seen in the following:

> They are not intended, one to train body, the other mind, except incidentally, but to insure a proper harmony between energy and initiative on the one hand and reason on the other, by tuning each to the right pitch. And so we may venture to assert that anyone who can produce the best blend of the physical and intellectual sides of education and apply them to the training of character, is producing harmony in a far more important sense than any musician.[3]

Another supporter of the whole-man concept was Descartes who wrote, "The union of mind and body has to be acknowledged as being for us primary and ultimate."[4] Along similar lines of thought was Montaigne's statement:

> I would have his outward manners, and his social behaviors and the carriage of his person formed at the same time with his mind. It is not a mind, it is not a body that we are training; it is a man, and he ought not be divided into two parts.[5]

Generations later, John Dewey supported the idea of educating the whole child. William Freeman wrote the following of Dewey's philosophical influence:

> Dewey, who had a strong belief in the unity of mind and body, suggested that a major reason why the system of Greek education had been so good was because the Greeks never tried to separate the mind from the body in the education process. His teachings included the concept of the 'whole child' and combined the mental and the physical as areas that could not be separated in education. This concept led to a gradual shift in the aim of physical education in the United States--from a health-centered concern with the student's body to a concern for all educational values--that is, to a unified view of the child and of education.[6]

In this generation, former President John F. Kennedy said, "Since the time of the ancient Greeks, we have felt that there was a close relationship between a strong vital mind and physical fitness."[7] Charles Bucher summed it up well when he wrote the following:

> The schools are trying to educate the 'whole' child. To listen to some of our critics you would think that children are composed of minds that are separate from their bodies . . . . Furthermore, the human being represents a unified whole, each part being necessary to the successful functioning of every other part. The individual reacts as a 'whole' organism and not just in parts. Therefore, education should be concerned with whether or not activities benefit the 'whole' individual and not just one part.[8]

After considering the above statements by learned men concerning the whole-man concept, the author began to analyze the possibility of a relationship between the whole-man concept and tennis as a branch of physical education and athletics in higher education. The author began to question what the students, themselves, wanted from their education. The following list of priorities reflected what the Carnegie Commission found undergraduate students to desire from their higher education experience:

> Their 'emotional growth'
> 'Learning to get along with people'
> ;Formation of values and goals'
> 'A detailed grasp of a special field'
> 'A well-rounded general education'
> 'Training and skills for an occupation'
> 'Outlets for creative activities'
> 'Earning power'[9]

From this list of priorities, one can see that students are concerned with and desire their total development.

At this point, the author began to question if more than merely physical things were being learned from an educational experience in tennis. The author became intrigued with analyzing whether or not concomitant learning that might be occurring in emotional, social, psychological, and ethical aspects through a tennis course was negative or positive as judged by universally accepted principles such as fair play and the golden rule which are basic to society. It was from the analysis

of the relationship between the whole-man concept and tennis that the author drew logical implications for evaluation.

Statement of the Problem

The purpose of this investigation was to analyze whether or not tennis contributed to the type of development described as the whole-man concept.

Significance of Study

With tennis now attracting approximately 40,000,000 players,[10] it seemed important to determine the present and potential value that tennis has for people. If tennis is seen as a part of physical education, then it is important to see if this part of the curriculum contributes to the goals of education which are concerned with education of the whole person.

Tennis has usually been viewed as an activity contributing primarily to physical development. It is possible that through tennis, learning can and does take place that contributes to one's development in the mental, emotional, and social aspects of one's life.

By investigating the learning process through a physical medium such as tennis, educators may determine if they have been teaching all that can be learned. If learning through tennis is taking place in the mental, emotional, and social areas as well as the physical, all learning should be evaluated. Negative emotional and social behavior could be accruing from tennis and if educators are aware of this, learning situations can be devised to enhance intellectual, emotional, and social development.

Basic Assumptions

Basic assumptions for study should be clearly established since much work builds upon them. In this study, the following three assumptions will serve as building blocks for the research project.

1. One should teach comprehensively through a movement medium such as tennis.
2. Tennis is a part of physical education and athletics, and it should contribute to the goals of education.
3. If more than just physical development occurs through a movement medium, all learning should be evaluated.

Research Question

Does tennis contribute to the type of development described as the whole-man concept?

Limitations of Study

This study involved only one sport, tennis.

Definition of Terms

Clearly defining the special context in which terms will be used in a study is very essential. The following terms are clearly defined as they will be used in this study.

1. The Whole-Man Concept (as related to physical education)

   Delbert Oberteuffer's following definition was used:

   > Education of an isolated 'physical' is not possible; and the term physical education signifies education by means of experiences which involve activity and movement and which also have emotional, behavioral, and intellectual components.[11]

2. Psychomotor Domain

The following definition by Robert Singer was used:

> Activities that are primarily movement oriented and that emphasize overt physical responses bear the label psychomotor. . . . They include the following kinds of behaviors, all of which could be interrelated or any of which could be independent: (1) contacting, manipulating, and/or moving an object, (2) controlling the body of objects, as in balancing, (3) moving and/or controlling the body of parts of the body in space with timing in a brief or long act or sequence under predictable and/or unpredictable situations.[12]

3. Cognitive Domain

The following definition by Muska Mosston was used:

> The ability to inquire, the ability to compare, the ability to draw concludions based on comparison, the ability to make decisions, the ability to use different strategies in approaching a problem, the ability to invent, the ability to discover, and the ability to reflect.[13]

4. Affective Domain

Benjamin Bloom pointed out the four following responses that accrue from this domain and these were used for this study: attitudes, feelings, thoughts, and actions.[14]

Design and Methodology

A philosophic analysis involves a verbal description searching for truth through consistent logical implications that can be drawn from fact. This involves studying written works, accepted principles, and standards of judgment for the purpose of analyzing, explaining, and showing relationships.

The word "philosophy" is a Greek derivative meaning "love of wisdom." Earle F. Zeigler defined philosophy more specifically as ". . .

a science which investigates the facts, principles, and problems of reality in an attempt to describe, analyze, and evaluate them."[16] William Freeman said, "One problem is evident in this definition--that is, . . . philosophy observes what we might consider the 'unobservable': ideas, concepts, and feelings."[17] Randolph Webster commented on philosophy in the following way:

> The word philosophy is derived from both the Latin and Greek languages and fundamentally means 'love of truth' and/or 'love of wisdom.' Love of wisdom means the desire to search for the real facts and values in life and in the universe, and to evaluate and to interpret these with an unbiased and unprejudiced mind. Philosophy is concerned with questions of right and wrong, justice, freedom, and discretion. Though there is a distinction between philosophy and science, philosophy can be said to be a science since it organizes knowledge about man and the universe for the purpose of evaluation and comprehension . . . . Philosophy criticizes, evaluates the worth of things, and synthesizes fact; while science describes, discovers and analyzes facts. For the welfare of humanity and for the advancement of knowledge and its proper use, every scientist should be a philosopher and every philosopher should be a scientist. Scientists discovered atomic energy; they know how it works and how to use it, but only philosophers deliberate about where and for what purpose it should be used. Both processes are essential.[18]

Richard B. Morland in the American Association for Health, Physical Education, and Recreation's Research Methods defined the philosophic method in the following statement:

> In formal research, other than purely descriptive and historical studies, the philosophic method is the rigorous application of the principles and processes of logic, within carefully defined limits, to the analysis of non-empirical problems.[19]

Morland also pointed out: "This method is appropriate when it is desired to analyze ideas, relationships, principles, implications, the worth of experiences, or the value of particular activities."[20]

William Freeman called attention to the fact that Elwood Davis and Donna Miller pointed out that

> . . . two contrasting processes are involved in philosophy: analysis, which is closely studying many things, and synthesis, which is trying to see how the things blend together, or indeed if they can be blended together.[21]

Davis and Miller defined analysis as

> . . . a method, the resolution of a compound into its elements, or a complex situation into its constituents. In contemporary empiricism, logical analysis indicates the application of logical principles in the determination of meanings.[22]

Davis and Miller defined synthesis as

> . . . the operation and result of piecing together comparatively simple elements into larger and more complicated wholes, the fusion of opposed ideas, thesis and antithesis, in a new, 'higher' idea or proposition in which their contradiction is overcome and their essential identity is revealed.[23]

Earle F. Zeigler also emphasized analysis and synthesis as reflected in the following statement:

> In the best modern tradition the method usually applied is reflective thought involving accurate analysis and synthesis of gathered data. Conclusions are arrived at only after all known facts are taken into consideration.[24]

Procedure

1. The author comprehensively elucidated the whole-man concept. This involved the research of statements concerning the whole-man concept by philosophers, educators, psychologists, learning theorists, sociologists of sport, and physical educators. First, the concept of the unity of man's nature was sought and then integrated education was explained. Integration involved in physical education was explored and finally integration in tennis was considered.
2. Tennis, as a branch of physical education and athletics was

explored for its potential of learning experiences involving the whole person through the psychomotor, cognitive, and affective domains. Areas specifically considered for learning experiences that might occur in a tennis class were the development of psychomotor skills, the development of fitness after the psychomotor skills have been developed, independent thinking, quick decision-making, concentration, levels of Bloom's taxonomy of cognitive development, emotional control, competitiveness, socially responsible behavior, self-image, and value judgments.

ENDNOTES

[1]Delbert Oberteuffer and Celeste Ulrich, Physical Education (New York, 1970), p. 30.

[2]William H. Freeman, Physical Education in a Changing Society (Boston, 1977), p. 34.

[3]Charles A. Bucher, Foundations of Physical Education (Saint Louis, 1972), p. 144.

[4]Ibid., p. 117.

[5]Ibid.

[6]Freeman, pp. 75-76.

[7]Bucher, p. 174.

[8]Ibid., p. 140.

[9]The Carnegie Commission on Higher Education, The Purposes and the Performance of Higher Education in the United States (New York, 1973), p. 14.

[10]U.S. News and World Report (January 15, 1979), p. 44.

[11]Oberteuffer and Ulrich, p. 3.

[12]Robert Singer, Motor Learning and Human Performance (New York, 1968), p. 23.

[13]Muska Mosston, Teaching Physical Education (Ohio, 1968), p. 143.

[14]David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, Taxonomy of Educational Objectives, Handbook II: Affective Domain (New York, 1964), p. 3.

[15]Randolph Webster, Philosophy of Physical Education (Dubuque, 1965), p. 3.

[16]Earle F. Zeigler, Philosophical Foundations for Physical, Health, and Recreation Education (Englewood Cliffs, New Jersey, 1964), p. 322.

[17]Freeman, p. 111.

[18]Webster, pp. 3-4.

[19]American Association for Health, Physical Education, and Recreation, Research Methods (Washington, D.C., 1973), p. 308.

[20]Ibid., 314.

[21]Freeman, p. 112.

[22]Elwood Davis and Donna Mae Miller, The Philosophic Process in Physical Education (Philadelphia, 1967), p. 435.

[23]Ibid., p. 445.

[24]Zeigler, p. 12.

CHAPTER II

THE EVIDENCE

The Whole-Man Concept

Understanding the nature of man is always important in education because the educational process will reflect the terms in which man is thought. Earl V. Pullias, professor of higher education and psychologist stated:

> The nature of man is the central problem of education. Perhaps, in truth, what man is like, in reality and in potential, is the most significant issue in all of human life. The conception we, as individuals and as societies, have of man and the implications that flow from that conception are a major influence in determining the direction of all thought and action--in short, of civilization.[1]

In this investigation, the holistic state of man's nature was explored. The investigation began with a clear understanding of the characteristics of holism or the whole-man concept. Delbert Oberteuffer, an expert on the whole-man concept, described the holistic state in the following terms:

> It should be clear the 'wholeness' or 'the whole man' does not mean the complete or the perfect man; it means soundness, not broken, not fragmented, a soundness in which the major elements of being are functionally related.
>
> This concept may be difficult to grasp mainly because we have learned to think in terms of parts rather than wholes. We assemble machines by parts. We usually think of illness in terms of specific parts--something is wrong with the stomach, or a tooth, or the joint. It is simplest to think of man atomistically--as an assemblage of component parts. One goes to church for the spirit, reads for the intellect, eats for the body, and bites the lip to control emotions! Only for purposes of analysis is it possible to segregate various

> aspects of man such as his organic nature, his emotional response, his neuromuscular development, his intelligence quotient. But it is never safe to assume that any one aspect exists by itself and is thus capable of development without reference to the other components.[2]

Oberteuffer used the analogy of a football squad to understand the integrating process. It is only as the players become welded together as a unit and the whole becomes more than the sum of its parts that the team becomes a functioning unit. What is done by one player alone may make no sense at all unless it is seen in terms of the whole pattern of the play.[3] Oberteuffer took the analogy a step further by writing:

> Likewise; man does not exist as a collection of parts. Man exists only when his parts--bones, muscles, eyes, spirit, heart, emotions, brain--are integrated--functioning in relation to one another. The human being starts from that point. Psychology, biology, sociology, and philosophy supply evidence that the living organism, even the living cell, starts out in an integrated state. It may become disintegrated later as a result of stressful influences, but integration is primary. Integration is the beginning state.[4]

From Oberteuffer's comments, one can see much evidence for the beginning integrated state of a human being. Oberteuffer developed further the concept of unity and pointed to much interdependency in the human being by the following:

> The mental, physical and spiritual aspects of life are inseparable; the human organism responds to its environment as a whole, lives as a whole, reacts as a whole, creates as one. It is not possible to regard the 'physical' side of life as something apart to be healed by physicians, fed by cooks, and exercised by physical educators. All of man's interaction with his environment is cyclic. The biological function of the organism may affect mental attitudes, attitudes may affect performance, performance helps to shape values, and values can cause change in behavior which in turn alters organic function. What affects one aspect of the totality that is a human being affects all aspects.[5]

After considering the holistic nature of the human organism, one might turn attention to the education of man in light of this concept. Earl Pullias wrote, "Man is engaged in a prolonged and urgent search for an

education that will realize his full potential--that is appropriate to the complex needs and abilities of his nature as man."[6] Marlin Mackenzie, physical education curriculum specialist, saw the integrated person as the desired outcome of liberal education as was evidenced in his statement:

> In short, study of kinesics (study of movement) through cognitive, affective, and psychomotor processes is one means of facilitating the development of an integrative person--a desired outcome of liberal education.[7]

Like Mackenzie, Barry Pelton, another curriculum theorist, also saw integration in the education process as was reflected in the following:

> We must remember, you and I, that education is a total process and that our product, the student, is a totally integrated being. The process is widely diversified; the product multidimensional. We deal in physical education, as do teachers in other disciplines, with individuals who have the capacity for growth psychologically, socially, and spiritually as well as biologically.[8]

Joining the ranks of Mackenzie and Pelton was Oberteuffer who also saw the physical education experience as being a potential medium for the development of the whole person as he wrote the following:

> Education of an isolated 'physical' is not possible; and the term physical education signifies education by means of experiences which involve activity and movement and which also have emotional, behavioral, and intellectual components. Modern physical education is a part of the total education process and is to be judged by its impact upon the whole man, not merely upon a few parts of him. Physical education seeks to assist in the total process of living.[9]

Philip Phenix, higher education curriculum theorist, explained the concept of man's unity in relation to the art of movement in the following statement:

> The fundamental concept of the arts of movement is the organic unity of the person. Health means wholeness, and the goal of education may be regarded as personal wholeness. From this standpoint the classic duality of mind and body is rejected. A person cannot think without a body, nor are his motor responses independent of thought. If learning is to be

> organic, provision needs to be made for activities in which the intellectual and motor components of experience are deliberately correlated. This union of thought, feeling, sense, and act is the particular aim of the arts of movement and of the fields of health, recreation, and physical education. Nowhere else is the coordination of all components of the living person so directly fostered, nor the resulting activity so deeply rooted in the unitary existence of the person.[10]

In agreement with Philip Phenix was Earl Pullias who emphasized the education of the whole man in the following comments:

> It is my thesis that progress toward a genuine education of the whole man depends, in a crucial way, on a more adequate understanding and appreciation of the abilities and talents common to all men. A central emphasis in education should be upon the unity or oneness of personality and upon the delicate interdependence of all aspects of the self. Or to put the principle more simply, education of the whole man requires a balanced attention to the three major aspects of the self: body, mind, and spirit.[11]

Pullias posed the following three questions to determine whether or not a particular educational program was designed to unfold man's full potential in the three aspects of self, body, mind, and spirit and to determine if an unbalanced emphasis upon one aspect hinders proper education of the whole.

1. Are experiences provided throughout all levels of education that will realize the full potential of the remarkable human body to the end that it might approach its best in vibrant health, in skill, in joy, and in creative use?

2. Are optimum experiences provided to develop the full potential of the human mind that it may be informed, reasonable, flexible, imaginative, and curious?

3. Are experiences provided that will unlock and cultivate the aesthetic and moral qualities inherent in man that enable him to give and receive love and loyalty and to order his life after the ways of truth, beauty, and goodness?

4. Does the educational experience keep these three aspects of man's self in proper balance in such a way as to avoid distortion and to achieve wholeness?[12]

Pullias saw physical education as a medium through which man's full potential could be developed and through which the four posed questions could be positively answered. Pullias wrote:

> The seriously unwell person loses all the best qualities of man: energy level is lowered, perception is narrowed, reasoning is more rigid, zest for living is reduced, imagination is dulled or confused, human relations are embittered, fear is increased, ethical judgment is warped. Aware of these facts, I have long been convinced that the part of education usually called Physical Education, including health and recreation, has a contribution of incomparable value to make to the education of the whole man. The current tendency to downgrade these phases of education in the face of the demands of modern life seems to me little short of madness.[13]

Although Pullias saw great potentiality for development of the whole person through physical mediums, Paul Dressel, another curriculum theorist, was quick to point to the broad generalizations of promises that physical education makes that he sees as good in theory but never seem to become realities. Dressel cited such phrases a "realization of maximum potentialities," "development and improvement of democratic behavior," "acceptable ethical code," "appreciation, understanding, and accepting of individual and cultural differences" associated with physical education and of these he said,

> These are impressive goals to which some small contribution may be made by physical education requirements. However, one doubts that the average physical education instructor can keep all these objectives in mind, and certainly few students will recognize these benefits as ensuing from the requirements.[14]

After considering the role of physical education in the development of the whole-man concept, tennis, as a specific part of physical education was considered. Barry Pelton wrote the following concerning the role of tennis in relation to the whole-man concept:

> The most important consideration for you, the individual student, are your self-image and the unfolding of your potential in an attempt to become the best individual that you may possibly become. Perhaps the second most important consideration

> is your personal concept of mankind in general and your relationship to and with your fellow man. Thus, a clear conception as to the nature of man and his potential is necessary if one is to become a totally educated individual. Needs and abilities are complex. Needs must be identified and abilities developed.
>
> Even though there is some disagreement as to the oneness of personality, it is my contentions that the central emphasis in education should be placed upon the unity of the total person and the interdependence of all aspects of self be recognized and accepted. An attempt to divide man into physical, psychological, social, and spiritual components is meaningless unless we realize their mutual interdependence. Hence, the attempt to actualize your individual potential and aid in making you as wholly educated a man as possible is a very worthy goal. Include in it experiences which contribute to your attaining your highest level of vibrant health, skill, joy, and creative use. Tennis can be such an experience.[15]

With the above explanations of the whole-man concept, in depth study was done on tennis as it relates to the type of development known as the whole-man concept through the psychomotor, cognitive, and affective domains of learning. Robert Singer, motor learning theorist, wrote:

> Thus high levels of tennis skill reflect effective integrated movements (psychomotor), the application of strategies, tactics, and knowledge of rules (cognitive), and appropriate attitudes, competitive feelings, and motivation (affective).[16]

Each domain was carefully studied in relation to the whole-man concept and tennis.

Psychomotor Development

The first area of exploration was the psychomotor domain of which Singer spoke. Singer specifically defined the psychomotor domain in the following terms:

> The psychomotor domain is concerned with bodily movement, control, or both. The behaviors in this domain can be characterized by the verb 'doing.' When performed in a general way, they represent a movement pattern or patterns; when highly specific and task-oriented, they indicate a skill or sequence of skills. This domain includes the following kinds of behaviors, all of which could be interrelated, and any of which could be independent:

1. Contacting, manipulating, and/or moving an object.
2. Controlling the body or objects, as in balancing.
3. Moving and/or controlling the body or parts of the body in space in a brief timed act or sequence under predictable and/or unpredictable conditions.
4. Making controlled, appropriate sequential movements (not time restricted); in a predictable and/or unpredictable and changing situation.[17]

Elizabeth Simpson has developed a classification schema for psychomotor domain objectives.[18] In the following, the author has applied the Simpson schema to the educational objectives involved in learning how to receive a tennis serve after considering Clein's and Stone's application to batting:

1.0 Perception-The process of becoming aware of objects, qualities, or relations by way of the sense organs. The category of perception has been divided into three subcategories indicating three different levels of the perception process.

1.1 Sensory stimulation-Impingement of a stimulus or stimuli upon one or more of the sense organs.

1.11 Auditory-Hearing or the sense of organs of hearing. The student listens to the instructor explain how to receive a serve.

1.12 Visual-Concerned with the mental pictures or images obtained through the eyes. The student observes a demonstration of receiving a serve either through live performance, motion picture, or still pictures.

1.13 Tactile-Pertaining to the sense of touch. The student is encouraged to hold the racket and feel the size, shape and weight, and grip.

1.14 Taste-Determine the relish or flavor of by taking a portion into the mouth.

1.15 Smell-To perceive by excitation of the olfactory nerves.

1.16 Kinesthetic-The muscle sense; pertaining to sensitivity from activation or receptors in muscles, tendons, and joints. The learner gets the "feel" of swinging the racket.

1.2 Cue Selection-Deciding to what cues one must respond

in order to satisfy the particular requirements of task performance. This involves identification of the cue or cues and associating them with the task to be performed. It may involve grouping of cues in terms of past experience and knowledge. Cues relevant to the situation are selected as a guide to action; irrelevant cues are ignored or discarded. The receiver must sort out the distracting cues issued by the server and other environmental factors and watch the ball.

1.3 Translation-Relating of perception to action in performing a motor act. This is the mental process of determining the meaning of the cues received for action. It involves symbolic translation, that is, having an image or being reminded of something, "having an idea," as a result of cues received. It may involve insight which is essential in solving a problem through perceiving the relationships essential to solution. Sensory translation is an aspect of this level. It involves "feedback," that is, knowledge of the effects of the process. Translation is a continuous part of the motor act being performed. The serve receiver is mentally relating his movement to results and is aided in this process by feedback, especially visual and kinestheic feedback.

2.0 Set-Set is a preparatory adjustment or readiness for a particular kind of action or experience. Three aspects of set have been identified: mental, physical, and emotional. This stage is illustrated by the receiver as he gets "set" for the serve.

2.1 Mental set-Readiness, in the mental sense, to perform a certain motor act. This involves, as prerequisite, the level of perception and its subcategories. Discrimination, that is, using judgment in making distinctions, is an aspect of mental set. This would be illustrated by the receiver concentrating on receiving the ball.

2.2 Physical set-Readiness in the sense of having made the anatomical adjustments necessary for a motor act to be performed. Readiness, in the physical sense, involves receptor set, that is, sensory attending, or focusing the attention of the needed sensory organs and postural set, or positioning of the body. The receiver would concentrate on the position of his feet, body, and racket prior to the serve.

2.3 Emotional set-Readiness in terms of attitudes favorable to the motor acts taking place. Willingness to respond is implied. The receiver would not be emotionally ready if he were allowing other factors to

attract his attention in place of the ball to be served.

3.0 Guided response-Guided response is the overt behavioral act of an individual under the guidance of the instructor or in response to self-evaluation where the student has a model or criteria against which he can judge his performance. Prerequisite to performance of the act are readiness to respond, in terms of set to produce the overt behavioral act and selection of the appropriate response. Selection of response may be defined as deciding what response must be made in order to satisfy the requirements of task performance. There appear to be two major subcategories, imitation and trial and error. The initial response in the development of skill is illustrated as the student swings the racket for the first time at a served ball.

3.1 Imitation-Imitation is the execution of an act as a direct response to the perception of another person performing the act. The receiver swings the racket as he perceives the way in which the instructor demonstrated.

3.2 Trial and Error-Trying various responses, usually with some rationale for each response, until an appropriate response is achieved. The appropriate response is one which meets the requirements of task performance, that is, "gets the job done" or does it more efficiently. The receiver eliminates extraneous movements and rejects inadequate responses until he can return the serve.

4.0 Mechanism-Learned response has become habitual. At this level, the learner has achieved a certain confidence and degree of proficiency in the performance of the act. The act is a part of his repertoire of possible responses to stimuli and the demands of situations where the response is an appropriate one. This stage assumes more complexity than the previous level and may include receiving in a game situation.

5.0 Complex overt response-At this level, the individual can perform a motor act that is considered complex because of the movement pattern required. At this level, skill has been attained. The act can be carried out smoothly and efficiently, that is, with minimum expenditure of time and energy. There are two subcategories: resolution of uncertainty and automatic performance. The skilled receiver in athletic competition illustrates this stage.

5.1 Resolution of uncertainty-The act is performed without hesitation of the individual to get a mental picture of task sequence. That is, he knows the

sequence required and so proceeds with confidence. The act is here defined as complex in nature. The receiver can return the serve without the necessity of having a mental image of the process.

5.2 Automatic performance-At this level, the individual can perform a finely coordinated motor skill with a great deal of ease and muscle control. The receiver can now return the ball with ease under far more complex conditions, such as, variations in the speed, direction, height, and spin of the oncoming ball.

6.0 Adaptation-Altering motor activities to meet the demands of new problematic situations requiring a physical response.

7.0 Origination-Creating new motor acts or ways of manipulating materials out of understandings, abilities, and skills developed in the psychomotor area.[19]

From the above breakdown of the psychomotor domain, one can see the complexity of steps involved in what appears to be simple, smooth movement. Robert M. Gagne, higher education instructional design specialist, added insight to the integrated functions of the psychomotor domain by the following statements:

> The relatively simple sequences of motor responses described as motor chains (Chapter 3) are often combined into more complex performances called motor skills. Sometimes these are referred to as 'perceptual-motor skills,' or 'psychomotor skills,' but these phrases appear to carry no useful added meaning. They imply, of course, that the learning and performance of motor skills involve the senses and the brain as well as the muscles; however, this fact is well known.
>
> Motor skills are learned capabilities that underlie performances whose outcomes are reflected in the rapidity, accuracy, force, or smoothness of bodily movement.
>
> . . . Usually, motor skills can be analyzed into part-skills that compose the total performance in the sense that they occur simultaneously or in a temporal order.
>
> . . . The integration of these parts must be learned, as well as the component part-skills themselves.[20]

Gagne's definition of psychomotor skills emphasized as did Simpson's schema for the psychomotor domain that even in the predominantly physical component of tennis, the senses and the brain are emphasized as well as the muscles in creating integrated movement. Robert Singer

made the point that although behaviors have been categorized, the distinctions are by no means pure, and there is considerable overlap exhibited among behaviors.[21] The fact that behaviors are classified only for convenience seemed to point to the fact that behavior is integrated as a whole.

Physical Development

After considering the psychomotor domain in depth, it was questioned what possible contribution to one's physical development could accrue after the psychomotor skills involved in the game of tennis had been developed. Barry Pelton wrote the following:

> After the basic skills have been learned and can be performed at the normal pace of play, tennis can contribute toward the optimum physiological functioning of the human body. A vigorous set of tennis may contribute to increased muscular development, and more efficient cardiovascular, respiratory, and organic functioning, increased arm, leg, and lower trunk strength, agility, coordination, and balance, stamina and endurance, and weight control.[22]

To accurately assess the potential fitness contribution of tennis, empirical research providing oxygen, energy, and caloric expenditures were considered in tennis with comparative values in other sports being considered as well. Dr. Cooper conducted experiments dealing with oxygen intake of athletes under stress, and his findings yielded a specific index of how hard the lungs were working. The higher the index number, the greater the oxygen utilization. Dr. Cooper estimated that from tennis singles with players of equal ability and with the duration of a set being 20 minutes, one and one-half points were earned in one set of tennis, three aerobics points were earned in two sets, and four and one-half points were earned for three sets to contribute to the 30 points per week which are essential for a minimal level of fitness.[23] One can

see that the points must be estimated giving strict attention to such specifics as singles, players of equal ability, and of long duration. The tennis aerobic points don't tell one much about fitness contribution until they are compared with aerobic points gained through other sports. Dr. Cooper provided very detailed points charts but for comparative purposes, 20 minutes of exercise was chosen as a common denominator. Running/Walking one and one-half miles in 21:44-18 minutes yields three aerobic points; swimming 600 yards in 20:00 minutes yields one and one-half aerobics points and the training effect; cycling four miles in 23:59-16:00 minutes yields two aerobic points; participating in handball, squash, or basketball for 20 minutes yields three aerobic points; rope skipping for 20 minutes continuously yields six aerobic points; wrestling for 20 minutes yields eight aerobic points; and stationary running for 20 minutes yields eight aerobic points.[24] One can see that the key factor in determining the fitness contribution of each sport depends on the way in which it is conducted. From Dr. Cooper's charts it would appear that running, swimming (because of training effect), rope skipping, and wrestling contribute most to one's fitness. Tennis can be relatively comparable with handball, squash, basketball, and cycling. Dr. Cooper wrote the following concerning finding a sport that will be enjoyable and will keep one fit:

> Finally, a good physical fitness program must be enjoyable--and must be something the students will continue for the rest of their lives. Not everybody is a jogger--or wants to be. Not everyone is a swimmer--or wants to be. . . . The tennis craze is accomplishing the same result. People have found it to be an enjoyable way to keep fit.[25]

From Dr. Cooper's comment, one sees that enjoyment of a fitness method is very important since a life-time of fitness is necessary. Obviously running, swimming, and rope skipping will contribute more aerobic points

in less time but if one does not like running, swimming, and rope skipping, tennis or any lesser fitness contributor is better than not being fit.

James Michener developed a chart of comparative sport values and he found striking similarity between his chart and a chart developed by Dr. James Nicholas who identified twenty-one components of an athletic act, grouping them into three categories: neuromuscular-physical (endurance, reaction time); mental-psychometric (intelligence, alertness); environmental (playing conditions, equipment). Nicholas then applied these criteria to sixty-one different sports.[26] The findings of Michener and Nicholas are shown in Table I.[27] Obviously most of the sports had higher scores than did tennis, but as a life-time sport, tennis does exceed golf. In one's post school days it may be difficult to get enough participants for football, basketball, whereas one partner may not be difficult to attain.

Arthur Steinhaus developed a chart in which he rated the popular sports in the United States as to their contribution to one's physical fitness. Steinhaus assessed tennis in the following manner: Endurance-Medium, Agility-High, Leg Strength-High, Abdominal Strength-Medium, Arm and Shoulder Strength-Medium.[28] One can see from Steinhaus' assessment that tennis falls between medium and high in physical fitness contribution.

After considering all the studies, it was possible to come to some evaluation of the value of tennis in contributing to one's physical fitness. James Michener made a good point of sport evaluation when he wrote:

> It is necessary, therefore, that the reader analyze all sports and games to which he is addicted, or accustomed, in order to

judge their relative values. Not all sports return equal rewards, and some kind of comparison between them is essential.[29]

TABLE I

TWELVE SPORTS GRADED BY NICHOLAS AND MICHENER

Sport	Total Score on All 21 Factors
Football	56
Ballet	55
Hockey	54
Judo	51
Prize Fighting	51
Basketball	50
Gymnastics	50
Fencing	49
Soccer	44
Baseball	44
Tennis	42
Golf	39

Equally important as contributions to fitness through tennis are physical detriments. Dr. Robert Nirschl pointed out that every sport has its specific kinds of injuries, and tennis is no exception. Dr. Nirschl listed the following as the ten most common tennis injuries of 1979: lateral tennis elbow, tendinitis shoulder, kneecap mechanism problems, medial tennis elbow, plantar fascitis, knee cartilage rupture, wrist sprain, tennis leg (medial calf rupture), neck and back strain,

and posterior tennis elbow.[30] Dr. Nirschl gave a complete description of each injury, who it was most likely to effect, prevention, and treatment information. Dick Gould, tennis coach, Stanford University, cited very similar tennis injuries and prevention ideas.[31]

From Dr. Nirschl's list one can see lateral, medial, and posterior tennis elbow constitute one-third of the list. From the research of Dr. James D. Priest, Vic Braden, and Susan Goodwin Gerberich, it was revealed that thirty-one percent of the 2,633 participants in Braden's Tennis College had experienced elbow pain at some time in their playing history.[32] The fact that age and frequency of play were most significant factors associated with those having tennis elbow indicates that the harmful effects of tennis may be cumulative, and many variables may interact before elbow pain accurs.[33]

The type of research that Priest, Braden and Gerberich have done is much needed. Vic Braden, founder and president of the National Foundation for Tennis Research, is a present pioneer in tennis research. Before establishing his nonprofit Research Center at Coto de Caza, Braden stated, "There's just so much about tennis that's never been scientifically researched."[34] As more scientific research produces facts, more accurate evaluation can be made of the sport, tennis.

James Michener summed up the situation well when he wrote, "All sports, even croquet, involve risk. . . . The prudent situation is that one risks a minimum of injury in order to gain a maximum advantage to one's health."[35]

Although the statistics are readily available on the fitness value of tennis as well as other sports, Michener pointed out that the vast majority of Americans are like the Romans who became a nation of

spectators of professionals instead of participants. Many Americans were shocked and could not account for the results of Dr. Kraus's tests which indicated that American school children were inferior to their European counterparts. Michener wrote the following:

> . . . The American people will always demand that our schools, colleges and universities provide such exhibitions; will approve spending public money on stadiums for exhibition rather than on tennis courts for participation; and will demand that television bring into their homes the best sports entertainment available. . . . we should also be providing education at all levels in lifetime sports that will improve the health of the nation. Emphasis should be paid to those which promise maximum personal rewards and which can be utilized throughout a lifetime.[36]

Delbert Oberteuffer told of a noted physiologist who accepted the position of director of a large and vital research laboratory in one of the country's largest chemical plants, stipulating that he never be called to any meeting between three and five in the afternoon. This was the time that he had reserved for tennis and handball which he felt were as important to his well-being as any "fringe benefit" the company might bestow upon him. To him, exercise was his life insurance and he inferred that such insurance was as important to the company as it was to him personally.[37] Oberteuffer wrote:

> Activity helps maintain the organic integrity of all people--youth and aged alike. . . . Activity need not always involve competition. . . . To be able to hit the tennis ball back and forth across the net just to feel the tingle of the racket within the hand has as much meaning to many as playing in the City Tennis Tournament. . . . Physical educators must help their students see and understand the consequences of ageing and must help people to find worth, rather than fear, in the ageing process.[38]

Oberteuffer was one of the few who seemed to be aware of the need for educating people for the aging process. In a youth oriented society, there is much fear and ignorance associated with the aging process. Physical fitness has been found to postpone the aging process in

addition to improving the quality of life.[39] Obviously, Oberteuffer saw tennis as a medium in which to maintain organic integrity.

Two threats to maintaining organic integrity in Americans are obesity and tension. Twenty-five percent of the American population is overweight.[40] Tension is a fact of life. Fitness can help make these threats benign instead of malignant. Barry Pelton wrote the following which is extremely germane:

> We [physical educators] have important things to say about tension and relaxation, yet we are losing out to the tranquilizer. We can tell people what they need to know about the conservation of energy and the control of body weight. We know a great deal about strength, its development and maintenance still people are more prone to listen to advisors in weight lifting clubs than they are to some of us. We have long stressed the importance of recreation and have taught for the purpose of carry-over for many years. Still the masses sit and watch, while the trails, the casting ponds, and the tennis courts are virtually unpopulated.
>
> Haven't you ever asked yourself why we are being outsold and at a much higher price? Perhaps it is because we have insisted on relating ourselves to the wrong motives. Perhaps we need to show our students how our program is related to life, to health, to vitality, to personal appearance and to status. Perhaps we need to do a better job of tying what we know to what we do and thus show people what we really have to offer.[41]

In overview of the physical fitness contribution of tennis, it appeared that although running, swimming, and rope skipping are far more efficient fitness contributors, tennis can be an adequate fitness contributor depending upon the way in which the activity is conducted. In a singles match of long duration between evenly matched, highly skilled participants in 100° weather, there would be far more fitness contribution than there would be between two very unevenly matched players, playing a social game of tennis in the cool of the evening. Vic Braden indicated a need for scientific research in tennis and Braden said, "Tennis is good exercise but only when the action sustains

the heart beat at a high level. . . . The way most people play tennis, you can't consider it good exercise."[42]

Although it would take longer to attain the same number of aerobic points in tennis than it would take in running, swimming, or rope skipping, for those who do not enjoy those activities but who desire fitness, tennis would be a viable option. One does run a risk of the ten injuries previously mentioned with special dangers associated with tennis elbow. Nevertheless, one runs the risk of injury in any activity. Runners can develop shin splints; swimmers can develop bursitis. The lower quality of life that can accure from no activity such as obesity, hypokentic disease, tension, aging, and inefficient body functioning is a risk in itself. Inaction can be just as much a risk as can action.

Cognitive Development

Closely related to the psychomotor domain is the cognitive domain. The close relationship between teh psychomotor domain and the cognitive domain is seen in the following statements of Delbert Oberteuffer:

> It is becoming more and more apparent that movement is not only a basic means of learning, but provides the foundation for all learning experiences. The work of Piaget in Switzerland; Vygotsky in Russia; Hebb in Canada; and Bloom, Kephart, Montessori, and Delacato in the United States has stressed the fact that the child's early learning is through his kinesthetic sense, his sense of movement, and that if that fundamental phase is neglected, subsequent difficulties with the learning process may be anticipated.[43]

The cognitive domain encompasses the student's intellectual skills and abilities as well as his knowledge and his ability to demonstrate this knowledge depending on the particular instructional objective. Knowledges of various kinds represent cognitive behaviors, as do skills requiring comprehension, application, evaluation, and the like. The

domain includes:

1. Recalling (remembering facts, idea, or procedures)
2. Comprehending (interpreting, translating, extrapolating)
3. Analyzing (organizing patterns, relationships)
4. Solving (applying ideas, evaluating)
5. Decision making (selecting, classifying)[44]

The major categories of Benjamin Bloom's classification were presented in hierarchial fashion in the following:

1. Knowledge: specifics, principles, theories, methods, etc.
2. Comprehension: translation, interpretation, and extrapolation
3. Application: various circumstances
4. Analysis: elements, relationships, principles
5. Synthesis: arranging an entire structure
6. Evaluation: judgments[45]

Robert Singer wrote the following concerning the cognitive domain:

> Cognitive domain behaviors can be part of skilled motor performance or evaluated apart from it. Most athletic endeavors require a degree of cognition in the form of perceiving relationships, analyzing and solving problems, or deciding on appropriate responses. Although the actual psychomotor act is measured in terms of response effectiveness according to predefined rules and techniques of execution, its cognitive aspects should not be taken for granted.[46]

Muska Mosston, teaching methods specialist, suggested that "intellectual activity" should be defined in more specific terms. According to Mosston, the following were some of the abilities of the intellect:

1. Ability to inquire.
2. Ability to compare.
3. Ability to draw conclusions based on the comparison.
4. Ability to make decisions.
5. Ability to use different strategies in approaching a problem.
6. Ability to invent.
7. Ability to discover.
8. Ability to reflect.[47]

After looking at the above descriptions of the cognitive domain, the author considered what cognitive behaviors could be called into play in tennis. In this area, Billie Jean King and Greg Hoffman wrote:

> Tennis players have more than a few things to think about. They must think about the balls, about distances and angles, about the net, about their opponent, about their swing, about the wind, if they're playing outdoors and the artificial lighting if they're playing indoors, about their position on the court, about the score and a thousand other things.[48]

In considering the many things about which King and Hoffman suggest that a tennis player must think, it is easy to see why so many tennis theorists emphasize the importance of concentration and mental practice as the most important cognitive skill. W. Timothy Gallwey, tennis instructor and author of The Inner Game of Tennis, wrote of concentration:

> Concentration is the act of focusing one's attention. As the mind is allowed to focus on a single object, it stills. As the mind is kept in the present, it becomes calm. Concentration means keeping the mind now and here. Concentration is the supreme art because no art can be achieved without it, while with it, anything can be achieved. One cannot reach the limit of his ability in tennis without learning it; what is even more compelling is that tennis can be a marvelous medium through which skill in concentration can be developed. By learning to concentrate while playing tennis, one develops a skill that can heighten his performance in every other aspect of his life.[49]

Carlene Petersen, women's tennis coach at the University of Denver, defined concentration as ". . . the entire mental aspect of the game of tennis."[50] Petersen made the point that when concentration slips, or to use Evonne Goolagong-Cawley's term "walkabout" occurs, the match is usually lost.[51] Petersen wrote of the complexity of tactics:

> Tactics are part of the mental game and demand concentration. Players must know what the correct percentage shot is in each situation. Then they must choose their shots accordingly. . . . Strategy cannot be implemented without choosing the target and type of shot before the ball is hit. Mentally thinking about how and where you want to hit the ball actually helps you physically execute that shot.[52]

Petersen also emphasized analysis of patterns used by one's opponent and methods of anticipation as being mental essentials.[53]

Billie Jean King also wrote of what Petersen referred to as "anticipation." King defined this as "court sense." King wrote the following of this mental aspect:

> It is a form of human radar that occurs when an innate understanding of angles and an ability to quickly compete and translate that understanding into a physical reaction are combined. . . . In simple terms, a player who is somehow able to anticipate consistently an opponent's shots has court sense, while a player who is seldom able to maneuver into a position to effectively return an opponent's shots doesn't.[54]

King emphasized the difficulty in teaching this mental aspect but relayed the message that it could be carefully cultivated and refined. King suggested that the principles of deductive reasoning and logic along with explanations of geometric angles were helpful teaching tools for this mental aspect of the game.[55]

Allen Fox, a four-time member of the U.S. top ten and who has a doctorate in psychology wrote, ". . . you cannot separate the mental and physical aspects."[56] From the statements by Petersen and King, one can easily see how much mental and physical interaction is required in developing "court sense."

It was helpful to consider what levels of learning in Bloom's hierarchy of cognitive development were used in playing tennis. Being able to demonstrate a knowledge of score keeping and the rules is the simplest essential part of successful participation in a game of tennis. This demonstration of knowledge would engulf the first three levels of Bloom's taxonomy, knowledge, comprehension, and application. Another essential for successful participation in a game of tennis is being able to demonstrate knowledge of and application of strategy. This demonstration of knowledge would certainly find its basis in the first three levels of learning, but it could also include analysis, synthesis,

and judgment. Effective tennis strategy has been seen to require anticipation, quickness in thought, movement, and decisions concerning the different options and their consequences. Real problem solving situations can exist in tennis, and situations can either be ignored or can be aided by some guided discovery techniques that can transfer to other learning situations. Ability to make decisions and ability to use different strategies in approaching a problem that Mosston speaks of as "intellectual activities" are essential to successful tennis.

The ability to make decisions quickly on the court involves much independent behavior. In tennis, a coach cannot call the plays and make the decisions as in football or basketball. Bucher wrote, "The more thinking that takes place on the part of the student, the more educational the activity becomes."[57] Marlin MacKenzie, curriculum theorist, wrote the following:

> Growth in self-direction and independent learning through athletic participation is directly related to the actions of the coach . . . . The coach who is seriously concerned about the education of students will become less and less a central figure during practice and will not engage in decision making during a contest . . . . Since the coach would have no direct involvement in the contest, he would be forced to prepare his players in advance for their independent decision-making responsibilities . . . . He can observe, record, and analyze player performance, which can be useful in planning and conducting subsequent practice sessions with his athletes. While he observes a contest, he can also point out good and bad player performance and communicate his subtle observations of strategy to nonparticipating athletes who are watching the contest with him . . . . The real task of the coach is to help them understand the principles involved in choosing a feasible course of action, and then to allow them freedom to act.[58]

Tennis would appear to be an excellent medium through which independent learning could take place since the coach automatically already plays a secondary role during the match. MacKenzie also pointed out that although independent learning was more time consuming and although

initially a lower grade of performance results, in the long run students will become more independent and will retain the concepts longer. MacKenzie further pointed out that when the coach is in a secondary role, he is subject to less ridicule, to less criticism, to less pressure, and to less praise.[59]

Echoing MacKenzie's idea for increasing the learning potential in athletic situations was Delbert Oberteuffer when he wrote the following:

> If coaches did not do this [call the shots], the game would surely be less than perfect. But we want nearly perfect play because we want victory; and for this we pay a heavy price--the player is denied the opportunity to learn many of the finer points of his game and, more important, he is denied the right to make his own decisions, test his judgment, and thus learn. The more the adult control, the greater the depreciation of educational value. A wise plan to put coaches together in the stands during the game, and thus give the game back to the players, has been ignored. Yet, player control of the game has great merit and is surely worth a try.[60]

Charles Bucher was another physical educator who pointed to the potential learning situations in athletic situations when he wrote,

> Through his experience in various games and sports he will develop a sense of values, an alertness, the ability to diagnose a tense situation, the ability to make a decision quickly under highly emotionalized conditions, and the ability to interpret human actions.[61]

If students are given guidance and made aware of the cognitive processes involved in decision making, much more can be learned. Delbert Oberteuffer wrote,

> To solve problems; to reflect on past experiences; to reckon with consequences; to understand relationships; to act independently; to plan a course of action; to undertake a project; to synthesize, summarize, and conclude--these things characterize learning and reflective thinking.[62]

A method of teaching tennis that fully uses the learning potential for creating independent learners is a movement education progression. Through this method, the student explores different grips, manners of

stroking the ball, and serves and decides which work the best for her or him. Student focused, independent learning is emphasized in this method.[63]

MacKenzie wrote the following about the potent educational setting:

> The athlete can also learn more about human movement from firsthand experience in a potent educational setting. The exciting nature of athletics serves to increase learning because the cognitive, affective, and motor processes of the athlete are fully engaged. That is, the athlete is totally involved in learning through concurrent use of his emotions, intellect, and motor abilities. He also gains a unified sense of himself--how he thinks, feels, and moves. Furthermore, ideal conditions for learning are always present in sport, particularly immediate feedback and reinforcement.[64]

In addition to the fact that there are many potential cognitive learning situations in tennis, the fitness that can accrue from tennis participation can affect one's scholastic success. Bucher wrote, "Dave Brace, F. R. Rogers, Clayton Shay, Marcia Hart, and others have done extensive research showing relationships between scholastic and academic success and physical fitness."[65] Psychiatrist Ray Killinger reported:

> . . . aerobic fitness resulted in improvement in the following seven categories of the thinking process: originality of thought; duration of concentration; mental response time; ability to change topics and subjects quickly; depth of thinking; duality of thought--the ability to entertain a number of ideas at once; and finally, mental tenacity.[66]

In concluding the cognitive aspects of tennis, one can see a reciprocal relationship between movement fitness and cognitive development. Movement and fitness development enhances one's mental alertness and one's mental alertness allows one to become more physically efficient in movement. It was seen that many cognitive skills are called into play in a game of tennis when one considers concentration, strategy, tactics, opponent analysis, methods of anticipation, court sense, and quick decision-making involving alternative shot choices, their execution and

their placement along with the consequences of the alternative options. Billie Jean King summed up well the mental aspects of tennis when she wrote:

> At the highest levels of tennis competition, the physical skills of the players are extremely close. As a result, the player who eventually triumphs is generally the one who is better prepared mentally. But at any level of play, tennis requires players to use their heads, and to be mentally alert.[67]

Cognitive development in tennis has a great potential for carefully constructed learning experiences that cut across interdisciplinary lines from logic to geometry.

Affective and Social Development

The third domain of learning which is closely integrated with the psychomotor and cognitive domains is the affective domain. Benjamin Bloom indicated the four following responses that accrue from this domain: attitudes, feelings, thought, and actions.[68] Vanderzwaag defined the affective domain further by writing the following:

> If one is seeking to relate sport to something other than the acquisition of physical skill or knowledge, he is faced with only one other large choice. That choice is what we have designated as the attitudinal realm. A particular writer or speaker may choose to refer to character; another may discuss social development; a third is oriented toward the concept of citizenship; still a fourth may get carried away with remarks about sportsmanship. But, in the final analysis, it seems evident that each one is referring to the attitudinal reactions which take place as the individual interacts with a group.[69]

Robert Singer distinquished the affective domain further from the other two domains by discussing the level or origin, evaluation, and rate of change in the following:

> Behaviors in the affective domain originate at a lower level of consciousness or awareness than other types of behaviors. At the heart of affective behaviors is emotion, or feeling.

Interests, attitudes and values, character development, and motivation are other 'internalized' processes. Although most teachers are concerned with general affective objectives, they fail to evaluate students directly, either because of the difficulty involved or because they feel such objectives cannot be graded. Furthermore, it is usually thought that affective behaviors are slow to change, whereas psychomotor skills and informational items can be learned in a reasonable period of time.[70]

The affective domain included the following behaviors:

1. Valuing (selection, commitment, acceptance, preference);
2. Appreciating (evaluating, selecting);
3. Motivating (interest, persistence at).[71]

The categories as formulated by David Krathwohl were the following:

1.0 Receiving-Willing to receive or attend to certain cues or situations. Applied to tennis, this might indicate that a player is sensitized to emotional control on the court.

1.1 Awareness-One takes into account a situation, phenomenon, object, or stage of affairs. One might be aware of exhibiting emotional control.

1.2 Willingness to Receive-This involves being willing to tolerate a given stimulus and not trying to avoid it. A player might tolerate stimuli that could cause him or her to lose emotional control.

1.3 Controlled or Selected Attention-There is an element of the learner's controlling the attention here, so that the favored stimulus is selected and attended to despite competing and distracting stimuli. A player may favor emotional control despite competing distractions that would cause one to lose control.

2.0 Responding-The student is sufficiently motivated that he is actively attending. The player may make an active attempt to exhibit emotional control.

2.1 Acquiescence in Responding-Compliance as in reaction to a suggestion. The player may obey rules of court behavior.

2.2 Willingness to Respond-This is a voluntary response. The player may voluntarily exhibit emotional control while on the court.

2.3 Satisfaction in Response-A feeling of satisfaction accompanies the response. A player finds satisfaction in exhibiting emotional control.

3.0 Valuing-Internalization of the worth of something.

3.1 Acceptance of a Value-This is a tentative belief which is sufficiently consistent that others can identify the value. A player could believe in exhibiting emotional control on the court consistently enough that others could recognize it.

3.2 Preference for a Value-The individual desires and pursues a value. The player might actively strive for emotional control.

3.3 Commitment-Conviction and certainty beyond a shadow of a doubt is exhibited here. The player has a conviction that emotional control is of worth.

4.0 Organization-As the learner successively internalizes values, he encounters situations for which more than one value is relevant.

4.1 Conceptualization of a Value-This permits the individual to see how the value relates to those that he already holds or to new ones that he is coming to hold. The player may see how his value of emotional control on the court relates to his value of emotional control off the court.

4.2 Organization of a Value System-A complex of values is brought into a dynamic equilibrium. Consistency in behavior is beginning to develop in on and off court situations.

5.0 Characterization by a Value or Value Complex-An internalized hierarchy of values is organized into an internally consistent system that has controlled the behavior of the individual for sufficient time that he has adapted to behaving this way. A player might have adapted his behavior to the point of consistently exhibiting emotional control.

5.1 Generalized Set-The generalized set is that which gives an internal consistency to the system of attitudes and values at any particular moment.

5.2 Characterization-This is the peak of the internalization process in which objectives are developed which concern one's view of the universe and one's philosophy of life.[72]

Although Robert Singer set up a special social domain to do justice to the goals of physical education, Bloom, Vanderzwaag and others included the following social domain behaviors within the affective

domain, and they were discussed in the affective domain for the purpose of this study. Special attention was paid to the following four areas that Robert Singer succinctly stated:

1. Conduct (sportsmanship, honesty, respect for authority)
2. Emotional stability (control, maturity)
3. Interpersonal relations (cooperation, competition)
4. Self-fulfillment (confidence, self-actualization, self-image)[73]

Many times, broad generalizations and claims of character development, scholarship, citizenship, sportsmanship, and cooperation are associated with sport and often that is all they are--claims. Terry Orlick well stated the positive and negative potential outcomes of sport in the following statements:

> For every positive psychological or social outcome in sports, there are possible negative outcomes. For example, sports can offer a child group membership or group exclusion, acceptance or rejection, positive feedback or negative feedback, a sense of accomplishment or a sense of failure, evidence of self-worth or a lack of evidence of self-worth. Likewise, sports can develop cooperation and a concern for others, but they can also develop intense rivalry and a complete lack of concern for others.[74]

From Orlick's statement, one can see that there is a great potential for learning positive or negative affective and social behavior through sports such as tennis. It is not difficult at all to find reading materials on how to improve your forehand, backhand, serve, lob, or overhead smash, but it is much more difficult to locate printed materials on how to develop emotional control, a positive self-image, self-actualization, sportsmanship, or honesty. These behaviors are either just expected to accompany skill development or they are considered unimportant in the development of a player. Robert Singer wrote the following concerning haphazard development of such behaviors:

> Desirable social behaviors, like most learned behaviors, do not occur in a haphazard fashion but must be developed through

> meaningful educational experiences . . . . Nonacceptable cooperative behaviors can be learned as easily as acceptable ones. Nondesirable competitive actions can be learned as easily as desirable ones. The same is true for sportsmanship, emotional control and stability, self-fulfillment, and the like. Behaviors related to personal and social adjustment are important for successful sports participation as well as in a variety of everyday situations.[75]

Reiterating Robert Singer's ideas of constructing meaningful educational experiences for desirable social behavior was Delbert Oberteuffer who wrote,

> It is necessary to teach values in the same way that one teaches skill. To hope that a sport program will help with character formation and will automatically emphasize concomitant values of fair play and sportsmanship is not enough.[76]

A tennis professional in agreement with Singer and Oberteuffer is Billie Jean King. King wrote the following:

> Learning how to hold a tennis racquet, how to hit a tennis ball, and even how to think about where the ball should be directed is only part of the process by which a child becomes a tennis player. There is another element of the game, and it cannot be ignored because it is the one that is most likely to make or break a young player. This crucial segment of tennis may be neatly tied up into a package and labeled 'The Emotional Game.' The package may be further marked with the warning: 'Fragile' and 'Handle with care.' Children who play tennis open this package every single time they step onto a tennis court. Their performances, no matter how basic or advanced, will be accompanied by a barrage of emotions. At one time or another, they will experience joy, anger, frustration, and practically every other emotion listed in the catalogue of human feelings. And how children react to these feelings will depend a great deal on their individual development. But every child can use some guidance in this area.[77]

It would appear from the statements from the above mentioned theorists that a potential for contributing to one's affective and social development and thus to one's whole person does exist through a sport such as tennis. Nevertheless, such development does not inherently exist in a tennis learning situation and positive behavior does not just automatically accrue.

First it might be beneficial to consider the empirical research that has been done in the area of character development in relation to sport. Bruce Ogilvie and Thomas Tutko for eight years have studied 60,000 athletes, including 15,000 who have taken a test that measures 11 traits common to athletes, concerning the effects of competition on personality, and they found no empirical support for the tradition that sport builds character. The authors wrote,

> Indeed, there is evidence that athletic competition limits growth in some areas. It seems that the personality of the ideal athlete is not the result of any molding process, but comes out of the ruthless selection process that occurs at all levels of sport. Athletic competition has no more beneficial effects than intense endeavor in any other field.[78]

Empirical research dealing with attitudinal development through sport appeared to be somewhat sparse. Vanderzwaag wrote the following:

> Generally speaking, attitudinal development has also been associated with the concept of education through the physical . . . . Unfortunately, the scientific data which either refutes or supports these claims has been sparse. It has been much more convenient and/or attractive to explore the possible physical values which may accrue from participation in sport. However, the relatively few studies which have been done serve at least two purposes. First of all, they tend to cast doubt on many of the speculative claims which have been made. Secondly, they point out those areas which need to be further researched. Because the subject is attitudes there will always be some room for speculation, but, hopefully, the speculation will be handled with caution and future efforts will be directed toward the attempt to obtain more facts.[79]

Vanderzwaag went on to express that attitudes are not easily assessed or measured. Attitudes are a special challenge because they cannot be directly taught. Vanderzwaag wrote:

> As a tennis instructor, one is first and foremost engaged in teaching the various skills of tennis. In so doing, he also teaches certain aspects of knowledge about the game of tennis. While this teaching is taking place, the students acquire not only skill and knowledge but also attitudes. These may be attitudes about the game itself, sport generally, the instructor, other students, or any combination of these. Unfortunately, the attitudes acquired are not always those which the

> instructor might hope would be acquired. Attitudes tend to be a very individual or personal matter, much more so than either knowledge or skill.[80]

Vanderzwaag called attention to the scientific studies of sport and attitudes by Deane Richardson, James Keating, W. Kroll, K. H. Petersen, Joy Kistler, Robert McAfee, Robert Singer, Harry Webb, Kinji Ikegami, Jack Schendel, Erwin Hahn, Roscoe Brown, John Kane and others. From these studies Vanderzwaag drew the following generalizations:

1. Attitudes toward sport and attitudes derived from sport, as well as any other attitudes, are inextricably linked to the process of socialization.
2. Studies of personality must ultimately be reduced to study of attitudes.
3. Any reference to sport in relationship to character is relatively meaningless unless character is more carefully defined in the context in which it is being discussed.
4. Specific attitudes attained from participation in sport vary considerably from one age group to another.
5. It would seem that the attitudinal values of sport are also somewhat specific to the particular sport.
6. If I were forced to single out one specific attitude that characterizes all those who engage in sport, I guess that the attitude would be that which revolves around and emanates from the concept of interaction. There is one problem here; interaction is not an attitude; it is a process. However, the process of interaction in sport and through sport results in a collective feeling (attitude) that may be most significant, intangible as it is.
7. Perhaps the one factor which makes the area of attitudes most difficult to research is that it is virtually impossible to isolate attitudes with regard to any particular activity.
8. As to future possibilities for attempting to know more about the influence of sport on attitudes, everything we do know about attitudes points in the direction of the need to employ peer evaluations.[81]

Oberteuffer called attention to the research of Bryant Cratty in showing how significant sport can be in personality development. Oberteuffer wrote,

> Improvement in the capacity for self-analysis and self-direction, and better social and emotional adjustment are realistic products of the physical education experience. Also inherent in the physical education experience are such

> behavioral experiences as withdrawal, the discovery of social incapacity, anxiety, frustration, and self-deception.[82]

It would seem that personality development is going to be influenced by sport, but the question is whether or not the influence will be positive or negative which largely depends on whether or not the teacher or coach carefully constructs educational experiences that will promote positive personality development or leaves development to chance.

Barry Pelton expressed the lack of research of the psychological value of participation in physical activities such as tennis. Nevertheless, Pelton discussed some potential development that can result from tennis.

> Recently educators and physicians have given attention to the research of the psychological values of participation in physical activities such as tennis. Even though research evidence is lacking to support this theory, it seems safe to assert by observation and conversations with participants that a good vigorous game of tennis may help to release tensions built up by crowded schedules of classes and library hours, assists the student in clarification of his self-image, provides an outlet for anger, frustration, and aggression, lessens the overall feeling of mental confusion which is the result of a busy schedule, and aids the student in returning to reality.[83]

Expressing concern for a lack of research of the value of such an expensive enterprise as sport in higher education was Arthur Chickering as he wrote the following:

> Many college students invest substantial time in athletic and artistic activities to develop a variety of physical and manual skills. For a few, such skills and their augmentation may become a vocation; for more, they may become an avocation around which much of life is organized; for many, they become a source of occasional satisfaction or status. Yet even though this is so, and even though athletic programs are a major expense in many college budgets, I find no study of the development of physical or manual skills nor any study of the developmental consequences of participation in such activities in the literature of higher education. . . . But consequently, the contribution of these elements to student development remains unclear . . . . Some research, however, suggests the potentials are great.[84]

Chickering, like the other field authorities, seemed to agree that the potential for positive whole development from sport was great even though research describing the present development contribution was sparse. Considering the research of P. A. Bower and F. J. Ryan, Chickering concerning poor competitors and good competetitors, wrote the following:

> These findings suggest that experiences encountered in athletics provoke reactions sharply relevant to the development of competence and sense of competence, and to the development of increased awareness of emotions and increased ability to manage them productively.
>
> Athletics offers a context in which concrete, unequivocal, and public performance provides clear evidence of achievement and of developmental progress. Thus it is an arena where competence or the lack of it must be faced squarely, and therefore one's attitudes toward his own abilities and potentials are starkly revealed. It is therefore also an arena in which sense of competence may be significantly fostered.[85]

In considering Chickering's above statement in light of tennis, it would appear that the stakes of a lack of competence would be very high since there is virtually no place to hide in the tennis arena. Development of increased awareness of the emotions and increased ability to manage them productively are fertile areas of learning in tennis when one observes the behavior of such players as Nastase, Connors, and others. Chickering considered the role of sport in one's development further in the following:

> In athletics, the open and direct expression of feelings that elsewhere must be properly muted or denied is legitimate. Rage and delight are expected reactions; their expression in voice, gesture, and action part of the game. Angers and frustrations from other encounters can also be unloaded. I know a tennis-playing dean. Often when he bashes his cannonball serve, he shouts the name of a student. Those serves usually don't go in, but they have plenty of zip.
>
> . . . Ryan's findings indicate how difficult and anxiety-provoking expression of aggression can be for some persons, and learning to manage aggression is a developmental task required for movement from adolescence to adulthood. The full experience and expression of emotions that athletics provokes

> and legitimizes may relax restraint enough to permit productive carry-over to other arenas. Hair let down in one situation may be loosened more readily in another.[86]

Learning to manage aggression and developing emotional control seemed to be of common concern to all of the theorists when considering the affective domain. Delbert Oberteuffer wrote the following concerning the obligation of physical education to make a contribution to one's emotional control:

> The physical education experience can and should make a constructive contribution to the development of emotional control. General education as reported by the President's Commission on Higher Education, . . . does not stop with the development of intellectual powers. For a satisfying and successful life a person must also be emotionally stable and mature, able to endure the conflicts and tensions, the compromises and defeats, that life is almost certain to bring . . . . American schools and colleges have hitherto paid little attention to the educational implications of this fact . . . . General education should correct this deficiency. It should make growth in emotional and social adjustment one of its major aims.[87]

It would seem that much of the problem of developing emotional control is tied up with the American culture's obsession with winning. Allen Fox, former U.S. Davis Cup Player who holds a Ph.D. in psychology wrote the following concerning the American culture's preoccupation with winning:

> Fortunately or unfortunately, winning is of tremendous importance in our society. From earliest childhood, the concept is pounded into our subconscious in a multitude of subtle ways. . . . Our culture is goal oriented and competitive. This atmosphere has been created because there are simply more people around than there are 'good things' in life . . . . Most people are doomed to lose often because there are always more competitors than winners. How, then, does the average person cope with the constant pain of loss? He creates defense mechanisms. He refuses to compete. In his conscious mind, he changes goals and convinces himself that winning is not his object.[88]

Further emphasizing the American culture's emphasis on winning are the following statements: Vince Lombardi's, "Winning isn't everything, it's

the only thing."; George Allen's, "Every time you win, you're reborn; when you lose, you die a little."; Bill Musselman's, "Defeat is worse than death because you have to live with defeat."; and Leo Durocher's, "Nice guys finish last."[89] All of the above statements reveal the American preoccupation with winning and the high cost of losing. Vince Lombardi later said to Jerry Izenbert,

> I wish to hell I'd never said the damned thing (Winning isn't everything, it's the only thing.) I meant the effort . . . I meant having a goal . . . . I sure as hell didn't mean for people to crush human values and morality.[90]

Unfortunately Lombardi is remembered for his first statement, which was largely adopted as a slogan by many. With such emphasis on competition and winning, pressure mounts on even a beginning tennis player and when instant success does not come, emotional control is the first to go as a list of derogatory adjectives are often applied to oneself or defense mechanisms abound. James Michener saw tennis from a broader perspective when he wrote the following:

> I cannot support Lombardi and Nicklaus and the coaches. Losing a game is not equivalent to death. Failing to be numero uno does not make me a lesser human being. Over the past twenty years I have repeatedly played one fine tennis player who used to have a national ranking, and I have never once defeated him. This does not mean that he is a better man than I. (You should see what I did to him in bottle pool!) It merely means that he is the better tennis player. I would be delighted to play him again tomorrow, for losing 6-3, 6-2 to a fine player is more rewarding than beating some beginner 6-0, 6-0.[91]

Many people feel that competition is out of bounds and William Sadler, Jr. was one of them. Sadler described competition and those characteristics that accrue from it in the following:

> In competition one cares mostly about one's own existence; one's goal is to increase the worth of his existence, at the expense of someone else. In competition one's existence is put to the test; one's worth will be approved, if one wins, through the awarding of a prize. One's perspective is fixed

> on attaining a definite result. If this competitive posture were sustained, one's personality system would tend to become rigid. The care structure of competition thus hardly is compatible with the care underlying self-actualization, at least if an extrinsic goal such as a reward is decisive. Competitive concern tends to interfere with the realization of other values . . . . As the Greeks well knew, the beauty of the human form in sports can match the beauties produced by an artist or by nature; but care about winning also can lead to the loss of form and expressions of the ugliest traits in human nature. Play can grace life with joy as well as fun; but hardpressed care for winning can produce anxiety and disgust. Competition ultimately is inadequate as a life stance, interfering with communion between man and his world, and ill preparing persons for important existential moments such as marriage and friendship, sickness and death, ecstacy and grief.
>
> While competition may be an element of sports, it must have well defined limits if it is not to undermine those values which make human life worthwhile.[92]

Sadler suggested that to rescue sports from the madness of unbounded competition one begins by recognizing the range, intensiveness, and consequences of competition in sports and in society.[93] Sadler theorized that one should examine which forms of activity are most expressive and conducive to such social order values as personal growth, freedom, creativity, love, reason, happiness, beauty and justice, and which forms are most obstructive.[94] Sadler cited criticism of competition by Skinner when he wrote,

> In his behavioristic Utopia, Skinner (1962) expresses criticism of competition through Frazier, the founder of the community: 'We are opposed to personal competition. We don't encourage competitive games, for example, with the exception of tennis and chess where the exercise of skill is as important as the outcome of the game; . . . A triumph over another man is never a laudable act.'"[95]

From the above statement one can see that tennis is being suggested as a medium of potential development of positive traits through competition. Obviously, the positive contribution won't automatically be concomitant with skill. Barry Pelton stated,

> In our classes, especially where competition is involved, students tend to learn about themselves. Perhaps these

> experiences could be even more profitable if relevant information about needs and drives, motivation, the self-image, personality, and behavior could be included as part of the course content.[96]

James Michener saw tennis as a medium in which natural anger generated in competition could be instantly discharged without harm to another. Michener wrote the following:

> . . . The problem is quite different from that posed by tennis, for in the latter game (tennis) one has a live opponent against whom one is contesting, and frustration can be easily discharged, even if specific shots go astray. Also, at the height of tension one can smash the ball, run vigorously to the net, lunge sideways to retrieve a return, and in many other ways get rid of one's frustrations while working up a healthy sweat. The natural anger that the fierce competitor generates can be instantly discharged, which is not always the case in golf, where one often competes against oneself, against an impersonal par.
>
> I know many men who would be better off not playing golf, because consistently they end the day in worse emotional shape than when they started, whereas had they been playing tennis or some similar sport with an attacking opponent, they might have ended the day exhausted emotionally as well as physically, which is a marvelous condition to be in occasionally.[97]

One can see from Michener's statement that he does not consider competition or relieving frustrations and anger as negative. When one has a constructive, healthy outlet for such behaviors, one develops positively and not necessarily at the expense of another person. Oberteuffer emphasized the importance of positively directing emotional charge when he wrote the following:

> It should be clear to any who understand the factors involved in games, sport, dance, aquatics--indeed in movement--that there is considerable emotional charge throughout. Basic desires are involved; the whole organism is involved. Success or failure can be clearly seen and felt. There is a clash of person on person--wholly, bodily, intellectually, in every respect. The interplay of personality with personality is very real, sometimes stark, and always in need of direction if the physical education experience is to be brought in line with other aspects of education in the development of emotional control. . . . In the laboratory of the playfield, human emotion can be seen, felt, studied, and directed.[98]

Just as emotional control is tied to competition, both influence one's self-image. Much loss of emotional control results from self-inflicted pressure to win because winning for some is equated with their self-worth. W. Timothy Gallwey, author of Inner Tennis, wrote the following of self-image:

> I know of no single factor that more greatly affects our ability to learn and perform than the image we have of ourselves. Who we think we are influences everything we do, every thought we have, every feeling we allow. The most dramatic and most lasting changes that take place in people's tennis--or in their life--occur when they abandon a concept of self which has previously limited their performance.[99]

Gallway, a former captain of the Harvard tennis team, said of his own tennis experience:

> For most of my life I was imprisoned by the proposition that my worth as a human being could be measured by my performance. In order to be worthy of respect and love I felt that I had to perform up to certain expectations. When I succeeded, Self I would feel good; if I didn't, it would make me feel miserable. The truth is that I am what I am; my essential nature is changeless. Of course, there is also a part of me which does change, and it operates best when I remember who I really am and don't identify with the ups and down of my performance.[100]

Gallwey's statement seemed to reflect an intricate relationship that may develop between a tennis player's performance and self-image. Although learning to hit forehands and backhands has occurred, it appears that concomitant learning of how to deal with one's feelings of self worth when less than good performance occurs has been largely neglected. Since the image one has of one's self influences the performance of future forehands and backhands, it would seem that a vicious circle could develop.

Gallwey gave a case study example of the effects of self-image on a tennis student, Joe.[101] In warm up Joe mis-hit his first three backhands and thought, "What terrible shots!" Joe began to wonder if his

backhand would be on or off today. After he tried to correct his stroke, he missed a couple more shots and he thought, "My backhand is really lousy today." Already, this negative judgment had moved from the ball, the "terrible shot," to his "lousy backhand." Gallwey made the point, "The judgment moved closer to himself and defined one of his possessions, his backhand."[102] After a few more backhand errors, Joe said, "I can't hit a backhand to save my life!"[103] The judgment had moved from being one of Joe's possessions to the core of his potential as reflected in the word, "can't" which implied that Joe didn't have the potential to hit a backhand. Joe even removed the word "today" from his last exclamation and had extended his judgment indefinitely. When the match started, Joe missed a few easy forehands and began to think of himself as a terrible tennis player. When Joe said, "I am a terrible tennis player,"[104] he had reached the heart of his self-image because "am" limited him potential. Gallwey said of Joe:

> Joe's game deteriorates still further, living up to the reputation of his self-created image, and soon he is telling himself, I'm an uncoordinated bastard. Now his negative self-identification includes all physical activities that he's ever played, as well as those he hasn't. Though he doesn't realize it at the moment, he's increasing his chances of breaking a glass while washing dishes that evening.
>
> Joe loses his match to a player he thought he really should have beaten, and goes home thinking that he's no good at anything. Now there are no limits at all to his negative judgment--which, you will recall, had no basis for existence in the first place. Depressed, he will proceed to act out his self-image at home, and his family will suffer because of a few missed tennis shots.[105]

Obviously, every tennis player who has a bad day on the court will not be affected to the degree that Joe was, but Joe does represent many tennis students with whom Gallwey has come in contact and who allow their self-worth to become dependent upon their tennis game. Gallwey told of another student who came to him for lessons and said, "Oh, I'm so glad

to meet you; maybe you can help my game. You see, my backhand . . . well, it simply doesn't exist!"[106] Gallwey made the following point:

> When that thought generalizes, it becomes the final self-condemnation: I don't exist, I'm a nothing.
>
> With remarkably little practice Self I can go through the entire process from 'What a lousy shot that was' to 'I'm a nothing' within a few seconds, and has the power to make you behave as if these thoughts were really true. Such judgments are usually formed on the basis of limited experience of one's performance and then quickly broadened to identify one's whole self. Thus, self-image becomes a role we act out, often preventing us from really experiencing our true selves or expressing our potential.[107]

After examining the two examples of tennis students, it would appear that one's self-image affects one's tennis game and that one's tennis game affects one's self-image. If a tennis instructor teaches only the physical skills, it would seem that students may be plagued with frustrations that could be avoided if the instructor taught the whole student how to deal with the emotions involved which can permeate one's life even beyond the court.

Allen Fox also pointed to self-image problems resulting from tennis. Fox wrote:

> The reason any true competitor is in a high state of tension before walking on court centers on the fact that a tennis match is a test, a mental test, which in tennis is where you are most vulnerable--in the mind. . . . But if you flunk the mental test, if you are not tough enough on the big points, if your resolve collapses when match point looms, then it is your self-image which takes the punishment . . . .
>
> In our society, mental ability is more important than physical ability. There is no stigma attached to physical illness. Mental illness is a different matter.[108]

Fox related fear of winning and losing in tennis to the works of psychiatrist Alfred Adler who felt that the dominant drive was for power and superiority in an effort to escape deep-seated feelings of inferiority. Fox pointed out that winning and losing becomes a test of inferiority. Fox went on to show that the scoring system makes the contest even

tougher. Each game is an independent contest.[109] Fox wrote:

> In basketball, football or soccer, any team that establishes a substantial lead has the option of closing the game up, playing safe and letting the clock do the rest. As long as they do not make any stupid mistakes, the simple passage of time will eventually finish off their opponents. They don't actually have to do the winning themselves. But in tennis, time is irrelevant. The match will go on and if you do not take the points, your opponent will. And therein lies the beauty and the inherent terror of the tennis scoring system. No matter how big your lead, you are never safe.[110]

Fox concluded that if having reached match point and a player cannot clinch the victory, then he has failed the mental test and an inferior self-image results.[111]

Stanley H. Cath, a practicing psychiatrist and associate clinical professor of psychiatry at Tufts University Medical School, Alvin Kahn, a practicing psychiatrist and clinical instructor in psychiatry at Harvard Medical School, and Nathan Cobb, a feature writer and columnist for the Boston Globe Sunday Magazine, "New England", have written an article, "How Your Self-Image Controls Your Tennis Game" which provided insights into tennis players and their self-images based on the knowledge Cath and Kahn have gained from therapy sessions with their tennis-playing patients. The authors wrote:

> More than 30 million Americans now play tennis, but few of them play as well as they could, or as well as they think they should. For many, the problem is one of psychology rather than skill, as two of us have learned from therapy sessions with tennis-playing patients. Tennis players bring their own emotions, tensions, personalities, and egos onto the court along with their rackets, and the result is often a conflict between their idealized self-image and the reality of their actual abilities.[112]

Cath and Kahn pointed out that while most players claim they take up tennis for fun, few seem to enjoy it. They also pointed out that many of those who took up tennis as an escape or as a form of relaxation found that it made them even more tense than before and that attempts at

mastery frequently ended in frustration and demoralization. The authors pointed out that much can be learned by listening to the inner dialogues of tennis players on the court. They recorded such dialogues as: "Oh no! How could you?" . . . "You fool! What the hell are you doing today?" . . . "Hit the ball, damn you!" . . . "That's right, you ass. Right into the net."[113] The authors wrote the following:

> These inner dialogues and unfulfilled expectations reflect the difference between the ideal self and the actual self. Everyone has a vision of what he or she looks like when playing tennis, but unfortunately the image is usually a misleading illusion of mastery and control. When players discover the gulf between fantasy and reality, their self-esteem is endangered. Humiliation is a constant threat on the tennis court, and there's no place for the ego to hide. Cheating at tennis, which we believe is much more common than most players admit, is usually the result of trying too hard to live up to the ideal self-image. Cheaters want to win so badly that they subconsciously see their opponent's shots fall outside the line.[114]

It would seem that a pandora box might be, in some cases, opened when one begins to explore the opportunities for learning about oneself through the physical medium of tennis. It seems that if some knowledge of how to deal with humiliation, the ego, illusions, and cheating is not gained, the possibility of developing frustrated, amoral tennis players is a real possibility. Kahn and Cath wrote:

> If healthy pride and self-worth are intact off the court, the frustrations of unpredictable or unsuccessful performance at tennis can usually be endured. If other sources of self-esteem exist--a loving mate, a supportive partner, a successful career--one should be able to keep a sense of proportion, and easily absorb the letdown of a badly played game. Unhappily, many people look upon tennis as a measure of their own worth as human beings: My backhand stinks; therefore I stink. An erratic volley becomes a reflection of an unstable personality. An off day is no longer just an off day; it indicates some sort of character failure.[115]

It appears that these two clinical psychologists have discovered some of the same things about tennis players and their self-images that tennis

instructor, Timothy Gallwey has discovered. Kahn and Cath saw tennis as a metaphor of an emotional barometer also. Kahn and Cath wrote:

> Just as off-court security can help one's game, insecurity can hurt it. As a result, tennis serves as a kind of emotional barometer. If your job or your marriage is in trouble, your tennis will most likely be erratic. Thus, 'married doubles' can easily turn into an emotional encounter session. This ma or may not help the marriage, but it rarely helps the tennis.[116]

It seems that the physical medium of tennis could provide a fertile field of learning much about the emotions. If learning experiences could be devised to help one deal with one's emotions on the court, it is possible that one might be able to transfer that knowledge to situations off the court as opposed to the present situation that seems to exist in which many tennis players increase the frustration of their off-court life as a result of their tennis game.

Kahn and Cath related the story of another client whose self-esteem tumbled because he felt that he had failed others on the tennis court. Kurt was involved in a doubles match in which partners changed at the end of each set. As it happened, the side Kurt was on lost each time. As Kurt approached the final partner, he said, "You don't want to play with me on your side. I'm the kiss of death."[117] Kahn and Cath wrote:

> Believing that you are turning the game into a nightmare for others is a devastating blow to the self-esteem. And calling oneself the 'kiss of death' is a perfect example of how overly self-critical someone can become on the tennis court. Such self-flagellation often leads to increased self-consciousness, further loss of self-control, and poorer play.[118]

From the above example, one can see the lengths to which tennis players can take self-flagellation over a simple game of tennis. Allen Fox added insight to the situation when wrote:

> On or off the tennis court, our self-images are largely determined by feedback and information given to us by other people. Others constantly react to us and, thereby, tell us

> what they think of us. These evaluations are, by and large, transmitted to us without words and relate to our every ability and trait, both mental and physical. They are noted and weigh heavily in our own evaluations of ourselves.[119]

In considering Fox's comment and applying it to Kurt's situation, it is possible that Kurt's partners each contributed to the destruction of Kurt's self-esteem and helped form his poor self-image. Regardless of the intricacies through which Kurt gained his poor self-image, guided learning experiences in that area could have helped Kurt learn how to cope with such frustration. When one moves from playing tennis as an individual sport to taking on a partner and developing into a team sport, the social interactions such as those Kurt experienced increase one's needs for education of the whole person. When a player considers himself as the "kiss of death" over a simple tennis game, he reflects the American culture's value on winning. As Kahn and Cath previously pointed out, the real danger occurs when the player allows a losing or poor self-image to permeate his life beyond the court. William Sadler considered this competition out of bounds and called attention to Arthur Miller's tragic hero, Willie Loman. Sadler wrote,

> Arthur Miller's (1958) Willie Loman is a moving example of the tragic outcome of perpetual losers in our society; so important was it for Willie to win, that he madly sought to succeed through suicide where he had failed in life.[120]

Barry Pelton sized up the situation in the following:

> Out of our extensive sport programs there ought to develop a sensitivity to culture, to honest competition, to the fact that the loser is not necessarily the defeated, but that the defeated are those who never seriously try. We must somehow help our students recognize that philosophical concepts pervade the same communications network as an idea about badminton strategy, that life is holistic, and that all the experiences of life can and should enhance the quality of living.[121]

Kahn and Cath found that the next step many players took after

degenerating their self-images was to start rationalizing and finding alibis for their less than desirable performances. Many would become distracted by activity on other courts and then claim not to have really been into the match which accounted for the loss[122] Oberteuffer saw sport as an excellent avenue for learning to deal with reality. Oberteuffer wrote:

> It is necessary to learn to accept reality in order to understand the true meaning of status. Reality is never wholly pleasant; there are usually good and bad things well mixed together.
>
> The alibi is an attempt to avoid certain unpleasant aspects of reality. The batter who blames his bat for the third strike, the tennis player who claims that the sun was in his eyes and that is why he missed the stroke, the swimmer who loses and as an afterthought remembers that he had a cramp in the arch of his left foot--these people need assistance in facing realities. Physical education offers many opportunities for facing and learning to accept reality.[123]

Closely related to accepting the reality of the discrepancies between one's self and one's idealized self is one's ethical development. Kahn and Cath previously cited the phenomenon of cheating resulting from players trying too hard to live up to the ideal self-image. Oberteuffer wrote, ". . . the most compelling obligation of a program of physical education is to support and perpetuate those moral and ethical principles which are basic to society."[124] In tennis, constructing learning experiences for ethical development should be of utmost importance because tennis is a sport in which the players call their own lines most of the time. Almost every sport other than tennis never has a contest in which there are not referees, umpires, or officials of some kind. In most tennis classes, varsity matches, and amateur tournaments, the players call their own lines just as tennis players are dependent upon self for choosing strategy on each point. Ethical development as well as independent decision making is a much needed area of development in the

whole tennis player. Jay B. Nash was an eloquent spokesman for the idea of character education within the field of physical education and he wrote the following:

> Character education may be defined as the behavior of an individual upon which the society in which he moves places a stamp of 'good.' It must always remain a relative term as the qualities which the community pronounces 'good' will vary with the community and will develop with the ages. The particular point to be noted in this connection is that character is one of the desirable outcomes of education and hence is one of the desirable outcomes of physical education . . . .[125]

The American culture puts a stamp of "good" on honesty, fairness, justice, responsible behavior, sportsmanship, and the Golden Rule. These qualities do not automatically go along with the forehand and backhand unless character education and ethical educational experiences are included.

Some experimentation in constructing learning experiences through the medium of tennis are presently going on. Dillion Adolescent Psychiatric Services, a private psychiatric hospital in Tulsa, Oklahoma, are helping clients through "tennis therapy."

> The idea behind 'tennis therapy' is to keep the interest of disturbed youth a group notorious for its short attention span long enough to let them taste success. To this end, the game is simplified to ensure prompt improvement. . . . Although tennis therapy has yet to be tested empirically, Jerry Dillion, M.D., founder of the hospital, has observed some encouraging results from the method, which he calls, 'a happy marriage between recreation and a treatment modality.'[126]

Mr. Dillion said of his tennis therapy,

> We see kids gaining confidnece; they're much more physically and emotionally open, a little more courageous--like they're turtles coming out of their shells. We see them taking chances, discussing difficult areas of broken family relationship.[127]

Dillion noted some of the tangible lessons learned on the tennis court such as:

> . . . following the rules, competing positively, rebounding from mistakes and not being overcome by anger. 'When they learn from their mistakes and hang in there after losing, we say 'Hey, you can do the same thing with your family.'' Tennis also teaches many incidental social lessons, including arranging a tennis date, meeting the partner punctually, reserving courts and checking to see if balls are available.
>
> Physical exertion seems peculiarly well suited to the psychiatric setting. 'If a kid happens to be so uptight that a verbal therapy session would only aggravate him, a counselor can suggest tennis,' says Dillion. 'Ideally, every good therapy session should be preceded by 30 minutes of tennis.'[128]

Considering the success of the Tulsa experiment, it is thought that the average nine-month stay can be cut from 60 to 30 days. Similar programs are to be developed nationwide after the year's trial in Tulsa.

Showing some concern for the human values of tennis students is what is believed to be a first offering of an interdisciplinary course in the history of inter-collegiate athletics. Robert Greene, director of athletics at the City College of the City University of New York, out of concern for the social and psychological development of the student-athlete in higher education developed a course, "Tennis Values and Human Values." Aiding Robert Greene in this research project was Lawrence Nyman, clinical psychologist and tennis player as well. Participants in the course were volunteers from the varsity men's and women's tennis teams at the City College of New York. Parallels were drawn between the game of tennis and the game of life, with prescribed readings from books of sport psychology. Dr. Nyman guided the group with the following three questions:

1. What are you trying to achieve from this course?
2. On what level of tennis do you plan to be by the end of the semester?
3. What personal characteristics would you like to acquire by the end of the semester?[129]

Robert Greene described the course further in the following paragraph:

> The widespread interest in tennis offered a lively exchange of viewpoints at meeting. The association between anger on and off the tennis court was one topic which resulted in a reduction of over-hitting on the tennis court by one of the class members. Another participant's interpretation of being 'psyched' by his opponent created enlightening dialogue. The group talked about winning and losing, tension, and patience; on and off the court 'game plans' were formulated, and efforts were made to develop greater powers of concentration in players.[130]

Greene pointed out that some talks emanated from carefully planned questions based upon actual experience and personalities such as the following:

1. Guillermo Vilas, after winning the Toronto Open Tennis tournament, said that the players he competed against were his friends, and winning prize money was not particularly important. What do you think of his attitude?
2. An eastern player had the physical ability and strokes to play international professional tennis. With six months of intensive practice, he could have been making a large salary, receiving considerable recognition, et. He did not have any family responsibilities to tie him down. Why do you think he chose to take a job of limited income rather than shoot for the big time? Would you have done what he did?
3. Of the greatest male and female tennis players in the world, whose life appeals to you most, and why does it? Consider his/her on and off the court activities.
4. A CCNY player was receiving poor calls from his opponent in the first set of a match last year against another college. What should he have done?
5. How would you describe the personality and attitude of a doubles partner you would like to play with? Do you possess these same qualities?
6. A few years ago, the seventh ranked substitute on the CCNY tennis team hoped the number six man would lose a match or two so he could move up and get a chance to play. Were his feelings normal?[131]

In assessing the value of such an interdisciplinary course, one should look at the outcomes. Robert Greene wrote the following:

> What were the outcomes of the course? It began to exploit the human development potential that lies in intercollegiate athletics. The student-athlete and coach can establish a unique rapport that fosters behavior growth. Greater acceptance of other members of the team resulted from this course. Increased awareness and self-understanding occurred. The seminar offered the opportunity for individuals to be heard

> and recognized which is important in a large urban institution such as City College. The players also seemed to become happier and more relaxed during the course.[132]

It would seem that seminars such as this would be extremely beneficial in the development of the "whole" tennis player. Certainly the learning potential associated with tennis was explored and found to be a rich area of learning.

In overview, it would appear that the affective domain is one of the most important but least planned for areas of learning in tennis. Every tennis experience has positive and negative potential outcomes. No empirical evidence supports the tradition that sport builds character concomitantly with skill. Americans' preoccupation with competition and winning has created an environment full of emotional explosions and defense mechanisms. Charged emotion is a characteristic associated with humans and will always be, so self-exploration and learning to cope with the emotions in non-destructive ways are areas of needed cultivation. A healthy self-image along with socially acceptable behavior are areas for which learning experiences need to be planned. Value judgments must be made daily whether on the tennis court of off. Carefully planned learning experiences must be constructed if amoral individuals are not the desired outcomes.

ENDNOTES

[1]Earl V. Pullias, "The Education of the Whole Man," Quest, VII (December, 1966), p. 37.

[2]Delbert Oberteuffer and Celeste Ulrich, Physical Education (New York, 1970), pp. 3-4.

[3]Ibid., p. 4.

[4]Ibid.

[5]Ibid., p. 9.

[6]Pullias, p. 38.

[7]Marlin M. MacKenzie, Toward a New Curriculum in Physical Education (New York, 1969), p. 59.

[8]Barry C. Pelton, New Curriculum Perspective (Dubuque, Iowa, 1970), pp. 7-8.

[9]Oberteuffer and Ulrich, p. 3.

[10]Phillip Phenix, Realms of Meaning (New York, 1964), p. 166.

[11]Pullias, p. 40.

[12]Ibid., pp. 40-41.

[13]Ibid., pp. 41-42.

[14]Paul L. Dressel, College and University Curriculum (Berkeley, California, 1968), pp. 105-106.

[15]Barry C. Pelton, Tennis (Pacific Palisades, California, 1969), pp. 74-75.

[16]Robert N. Singer, Motor Learning and Human Performance (New York, 1975), p. 7.

[17]Robert N. Singer and Walter Dick, Teaching Physical Education: A Systems Approach (Boston, 1974), p. 97.

[18]Ibid., pp. 341-345.

[19]Ibid., pp. 97-99.

[20]Robert Gagne and Leslie J. Briggs, Principles of Instructional Design (New York, 1974), pp. 66-67.

[21]Singer, pp. 22-23.

[22]Pelton, p. 73.

[23]Kenneth H. Cooper, New Aerobics (New York, 1970), p. 185.

[24]Kenneth H. Cooper, Aerobics (New York, 1968), pp. 165-173.

[25]Kenneth H. Cooper, The Aerobics Way (New York, 1977), p. 213.

[26]James A. Michener, Sports in America (New York, 1976), pp. 78-79.

[27]Ibid., p. 79.

[28]Charles A. Bucher, Foundations of Physical Education (Saint Louis, 1972), p. 462.

[29]Ibid., p. 69.

[30]Robert Nirschl, "Keeping Fit: A Top Ten List to Avoid," World Tennis, XVII (January, 1980), pp. 42-44.

[31]Dick Gould, Tennis Anyone? (Palo Alto, California, 1978), pp. 95-96.

[32]James D. Priest, Vic Braden, and Susan Goodwin Gerberich, "An Analysis of Players With and Without Pain," The Physician and Sport Medicine, VIII (April, 1980), p. 91.

[33]James D. Priest, Vic Braden, and Susan Goodwin Gerberich, "A Study of Players With Pain," The Physician and Sport Medicine, VIII (May, 1980), p. 85.

[34]Bill Bruns, "How to Beat Yourself at Tennis," Human Behavior (September, 1973), p. 34.

[35]Michener, p. 87.

[36]Ibid., p. 69.

[37]Oberteuffer and Ulrich, p. 62.

[38]Ibid., p. 130.

[39]Herbert A. de Vries, Physiology of Exercise, 2nd ed. (Dubuque, Iowa, 1974), p. 355.

[40]Ruth Lindsey, Ada Van Whitley, and Billie J. Jones, Body Mechanics (Dubuque, Iowa, 1974), p. 41.

[41]Pelton, New Curriculum Perspectives, p. 11.

[42]Vic Braden and Bill Bruns, "Vic Braden: 10 Cures for Choking on Court," Tennis (May, 1980), p. 34.

[43]Oberteuffer and Ulrich, p. 26.

[44]Singer and Dick, pp. 101-102.

[45]Ibid.

[46]Ibid., p. 102.

[47]Muska Mosston, Teaching Physical Education (Columbia, Ohio, 1966), p. 143.

[48]Billie Jean King and Greg Hoffman, "Put Your Mind to Work on Court," Tennis (December, 1978), p. 42.

[49]Timothy W. Gallwey, The Inner Game of Tennis (New York, 1974), p. 90.

[50]Carlene Petersen, "Concentration: Key to Tennis," Coaching: Women's Athletics (May/June, 1978), p. 56.

[51]Ibid.

[52]Ibid.

[53]Ibid., p. 58.

[54]King and Hoffman, p. 42.

[55]Ibid., p. 45.

[56]Allen Fox, "How to Help Your Opponent Fold," Tennis (September, 1978), p. 44.

[57]Charles A. Bucher, Foundations of Physical Education (Saint Louis, 1972), p. 160.

[58]MacKenzie, pp. 115-117.

[59]Ibid., pp. 118-119.

[60]Oberteuffer and Ulrich, p. 106.

[61]Bucher, p. 501.

[62]Oberteuffer and Ulrich, p. 106.

[63]Elaine Mason, "New Tennis Progressions," Journal of Physical Education and Recreation (April, 1968), pp. 24-28.

[64]MacKenzie, p. 115.

[65]Bucher, p. 501.

[66]Kenneth H. Cooper, The Aerobic Way, p. 183.

[67]King and Hoffman, p. 42.

[68]David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, Taxonomy of Educational Objectives, Handbook II: Affective Domain (New York, 1964), p. 3.

[69]Harold J. Vanderzwaag, Toward a Philosophy of Sport (Reading, Massachussetts, 1972), p. 197.

[70]Singer and Dick, p. 103.

[71]Ibid.

[72]Ibid., pp. 351-358.

[73]Ibid., p. 105.

[74]T. D. Orlick, "The Sports Environment: A Capacity to Enhance--A Capacity to Destroy," Sports in Contemporary Society, D. Stanley Eitzen (Editor) (New York, 1979), p. 218.

[75]Singer and Dick, p. 106.

[76]Oberteuffer and Ulrich, p. 173.

[77]Billie Jean King and Greg Hoffman, "Coping With the Emotions on Court," Tennis (January, 1979), p. 39.

[78]Bruce C. Ogilvie and Thomas A. Tutko, "Sport: If You Want to Build Character, Try Something Else," Psychology Today, V (October, 1971), p. 61.

[79]Vanderzwagg, p. 186.

[80]Ibid., p. 187.

[81]Ibid., pp. 198-208.

[82]Oberteuffer and Ulrich, p. 85.

[83]Pelton, Tennis, p. 73.

[84]Arthur W. Chickering, Education and Identity (San Francisco, 1976), p. 27.

[85]Ibid., p. 29.

[86]Ibid., pp. 29-30.

[87]Oberteuffer and Ulrich, p. 95.

[88]Allen Fox, "Are You Afraid to Win?," Tennis (February, 1978), p. 102.

[89]Michener, p. 421.

[90]Ibid., p. 432.

[91]Ibid., p. 423.

[92]William Sadler, Jr., "Competition Out of Bounds: Sport in American Life," Marie Hart (Editor) Sport in the Sociocultural Process (Dubuque, Iowa, 1976), pp. 172-173.

[93]Ibid., p. 174.

[94]Ibid., p. 173.

[95]Ibid., p. 164.

[96]Pelton, Tennis, p. 9.

[97]Michener, p. 81.

[98]Oberteuffer and Ulrich, pp. 95-96.

[99]Timothy W. Gallwey, Inner Tennis (New York, 1976), p. 111.

[100]Ibid., p. 130.

[101]Ibid., pp. 112-114.

[102]Ibid., p. 112.

[103]Ibid., p. 113.

[104]Ibid.

[105]Ibid., pp. 113-114.

[106]Ibid., p. 114.

[107]Ibid.

[108]Allen Fox, "Do You Dig Yourself Into a Hole on Court?," Tennis (September, 1979), p. 108.

[109]Ibid, p. 109.

[110]Ibid., p. 112.

[111]Ibid., p. 110.

[112]Nathan Cobb, Alvin Kahn, and Stanley Cath, "How Your Self-Image Controls Your Tennis Game," Psychology Today, XI (june, 1977), p. 46.

[113]Ibid.

[114]Ibid.

[115]Ibid., pp. 46-49.

[116]Ibid., p. 49.

[117]Ibid., p. 51.

[118]Ibid.

[119]Fox, "How to Help Your Opponent Fold," p. 43.

[120]Sadler, p. 172.

[121]Pelton, Tennis, p. 10.

[122]Cobb, p. 49.

[123]Oberteuffer and Ulrich, p. 185.

[124]Ibid., pp. 165-166.

[125]Vanderzwaag, p. 188.

[126]"Tennis Anyone? A Smashing New Therapy for Troubled Teens," Human Behavior, VIII (May, 1979), p. 37.

[127]Ibid.

[128]Ibid.

[129]Robert Ford Greene, "Tennis Values and Human Values," Journal of Physical Education and Recreation, XLVIII (June, 1977), p. 33.

[130]Ibid.

[131]Ibid.

[132]Ibid.

CHAPTER III

SUMMARY AND CONCLUSIONS

The writer has investigated the relationship between the whole-man concept and tennis. The procedure was to comprehensively elucidate the meaning of the whole-man concept and then to explore tennis as a learning medium through the psychomotor, cognitive, and affective domains for potential learning in the development of the whole person.

The contribution of tennis to one's physical fitness development after the psychomotor skills involved in the game of tennis have been developed was carefully researched. It was found through several research studies that such aerobic activities as running, swimming, and rope skipping are the best fitness contributors. It was found that tennis could be an adequate fitness contributor, depending upon the way in which it was played. Tennis singles played between two players of equal ability for a duration of three sets, each one lasting at least 20 minutes, would yield four and one-half aerobic points and an adequate fitness session.[1] For those who do not enjoy running, swimming, or rope skipping, tennis is a viable option if conducted properly. Since tennis only requires two people, it may be a more convenient fitness avenue than team sports for post school days.

Research showed that one does run a risk of ten most common injuries with tennis elbow being the most common. Nevertheless, one runs a risk in any activity and the lower quality of life that can accrue from

an inactive life may be more of a risk than any activity.

In the cognitive area of development, it was found that much learning potential can be readily exploited in tennis. A reciprocal relationship exists between movement fitness and cognitive development. It was found that all levels of Bloom's taxonomy can be utilized in the various mental aspects of tennis such as concentration, strategy, tactics, opponent analysis, methods of anticipation, court sense, and quick decision making involving alternative shot choices, their execution, their disguises, and their placement along with the consequences of alternative options. The imperativeness of concentration on so many cognitive processes concurrently, distinguishes tennis somewhat from other individual sports such as swimming, running, and golf which do not involve the multiple stroke execution and strategy decisions that must be made instantaneously in tennis. The complexity of the manipulation of a variety of top spin, slice, and American twist serves often executed with such concentration distractors as wind, sun, and another ball rolling on the court, makes the tennis serve a more complex maneuver than the serve in sister racket sports such as racketball and squash.

Although there is much potential cognitive development in tennis, learning experiences must be constructed instead of leaving cognitive development to chance if this learning is to be fully exploited.

The domain that appeared to be the most important but the least planned for area of learning in tennis was the affective domain. Research showed that affective learning is concomitant with physical skills. No empirical support was found for the theory that sport builds character. In fact, negative traits have been found to result in many cases where attitudinal development was left to chance. Carefully

constructed learning experiences in emotional control, competitiveness, socially responsible behavior, self-image, and value judgments are needed if frustrated, amoral tennis players are not the desired outcome.

This study revealed that there is a great need for scientific research in the area of tennis. Hopefully, Vic Braden, licensed psychologist and founder and president of the National Foundation for Tennis Research, will have valuable research forthcoming from his Tennis College in Coto de Caza, California. Braden has already collaborated with Dr. James D. Priest and Susan Goodwin Gerberich on two pieces of research dealing with tennis elbow. Through testing and observation, Braden hopes ". . . to determine the psychological commonalities of tennis champions, as well as losers, and disseminate the findings to players and coaches."[2] Braden is also researching the medical and fitness aspects of tennis as well as tennis equipment and the question of at what age a child should start playing tennis. Braden is anxious to test his hypothesis that reading skills can be improved through tennis.[3] Much more accurate evaluations of the worth of the tennis experience will be possible when scientific evidence becomes available.

In summation, it would appear that tennis can contribute positively to the type of development known as the whole-man concept, but only if carefully constructed learning experiences are established and the cognitive and affective concomitant learning is not left to chance.

The author would recommend that the person who is serious about constructing learning experiences that exploit the maximum potential of learning in tennis look carefully at the following model by Robert Singer.

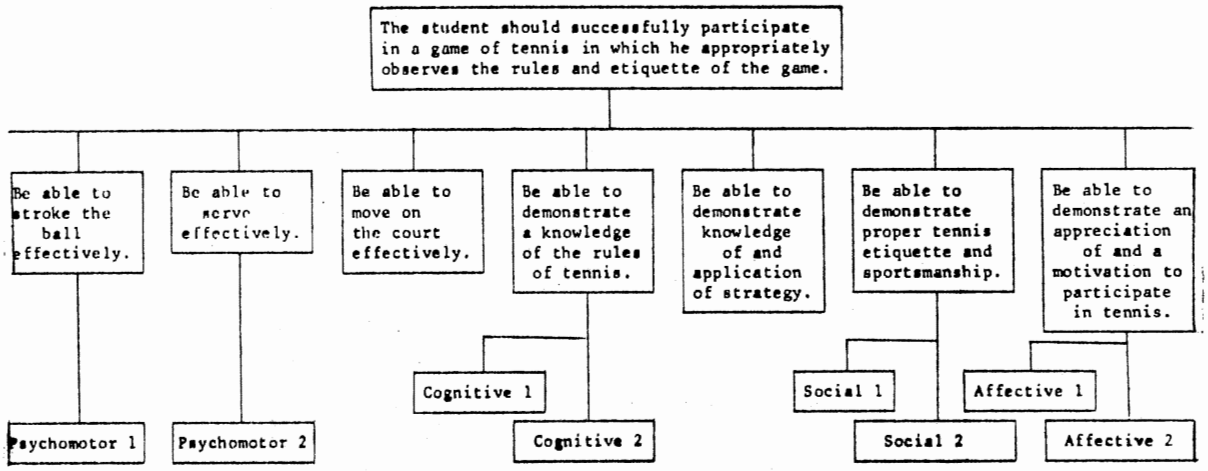

Figure 1. Singer's Model [4]

Based on this model, Singer provided some sample performance objectives that reflect the education of the whole student.

Psychomotor Domain

1. The right-handed student will stand on the right side of a regulation tennis court. The teacher, who is on the left side of the opponent's court, will throw 20 balls overhand to the student. (Reverse for left-handed student.) Using the forehand stroke, the student should be able to hit 15 of the 20 balls back to the same side and within the doubles court.
2. The student will stand in the proper position for serving on a regulation tennis court and serve ten balls from the right side. He should be able to complete, with reasonably correct form, 8 out of 10 attempted serves into the correct service court.

Cognitive Domain

1. The student should be able to observe a singles game in class and keep score correctly with no more than one error.
2. The student should be able to answer correctly 90 percent of the items on a written examination on the rules of tennis. The examination will consist of 20 multiple-choice, 10 completion, and 20 true-false questions.

Affective Domain

1. The student should be motivated to play more tennis during

his free time than he did before taking the tennis class.
2. The student should show an interest in tennis by observing one match of the school's varsity tennis team.

Social Domain

1. The student should be able to participate in a tennis singles game with another member of the class and call all balls correctly, as judged by the teacher.
2. In tournament play in class the student should be able to demonstrate emotional stability by controlling his feelings and temper, as judged by the teacher.

From Singer's model, one can see that tennis has the potentiality to positively contribute to a student's "whole" development but carefully constructed learning experiences must be planned.

ENDNOTES

[1]Kenneth H. Cooper, New Aerobics (New York, 1970), p. 185.

[2]Bill Bruns, "How to Beat Yourself at Tennis," Human Behavior (September, 1973), p. 34.

[3]Ibid., p. 34.

[4]Robert N. Singer and Walter Dick, Teaching Physical Education: A Systems Approach (Boston, 1974), p. 328.

[5]Ibid., p. 328-329.

SELECTED BIBLIOGRAPHY

Abelson, Raziel, Marie-Louise Friquegnon, and Michael Lockwood. The Philosophical Imagination An Introduction to Philosophy. New York: St. Martin's Press, 1977.

American Association for Health, Physical Education, and Recreation. Research Methods. 3rd Ed. Washington, D.C.: American Association for Health, Physical Education, and Recreation, 1973.

Anthony, Julie. "Everyone says 'Concentrate.' But How Do You Do It?" Tennis (November, 1977), pp. 39-40.

Ball, Donald W. and John W. Loy. Sport and Social Order: Contributions to the Sociology of Sport. Reading, Massachusetts: Addison-Wesley Publishing Company, 1975.

Barry, Vincent. Philosophy: A Text With Readings. Belmont, California: Wadsworth Publishing Company, 1980.

Beisser, Arnold R. "Tennis." (Eds.) Slovenko and Knight. Motivations in Play, Games and Sports. Springfield, Illinois: Charles C. Thomas Publishers, 1968, pp. 451-457.

Braden, Vic, and Bill Bruns. "Vic Braden: 10 Cures for Choking on Court." Tennis (May, 1980), pp. 32-34.

Bruns, Bill. "How to Beat Yourself at Tennis." Human Behavior (September, 1973), pp. 30-34.

Bucher, Charles A. Foundations of Physical Education. 6th Ed. Saint Louis: The C. V. Mosby Company, 1972.

Chickering, Arthur W. Education and Identity. San Francisco: Jossey-Bass Publishers, 1976.

Cobb, Nathan, Alvin Kahn, and Stanley Cath. "How Your Self-Image Controls Your Tennis Game." Psychology Today, XI (June, 1977), pp. 46-51.

Collingwood, Thomas R. "The Effects of Physical Training Upon Behavior and Self Attitudes." Journal of Clinical Psychology, XXVII, (1971), pp. 583-585.

Collingwood, Thomas R. and Leonard Willett. "The Effects of Physical Training Upon Self-Concept and Body Attitude." Journal of Clinical Psychology, XXVII, 1971, pp. 411-412.

Cooper, Kenneth H. Aerobics. New York: Bantam Books, Inc., 1968.

Cooper, Kenneth H. New Aerobics. New York: Bantam Books, Inc., 1970.

Cooper, Kenneth H. The Aerobics Way. New York: Bantam Books, Inc., 1977.

Davis, Elwood and Donna Mae Miller. The Philosophic Process in Physical Education. Philadelphia: Lea and Febiger, 1967.

de Vries, Herbert A. Physiology of Exercise. 2nd Ed. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1974.

Dowell, L. T., J. L. Badgett, and C. W. Landiss. "A Study of the Relationship Between Selected Physical Attributes and Self-Concept." Contemporary Psychology of Sport. Chicago: Athletic Institute, 1970, p. 152.

Dressel, Paul L. College and University Curriculum. Berkeley, California: McCutchan Publishing Corporation, 1968.

Folkins, Carlyle H. "Effects of Physical Training on Mood." Journal of Clinical Psychology, XXXII (April, 1976), pp. 385-388.

Fox, Allen. "Are You Afraid to Win?" Tennis (February, 1978), pp. 102-103.

Fox, Allen. "How to Help Your Opponent Fold." Tennis (September, 1978), pp. 42-45.

Fox, Allen and Richard Evans. "Do You Dig Yourself Into a Hole on Court?" Tennis (September, 1979), pp. 108-114.

Fox, Allen and Richard Evans. "Psyched Out on Court? An Insider's Cure." Tennis (October, 1979), pp. 64-68.

Freeman, William H. Physical Education in a Changing Society. Boston: Houghton Mifflin Company, 1977.

Gagné, Robert and Leslie J. Briggs. Principles of Instructional Design. New York: Holt, Rinehart and Winston, Inc., 1974.

Gallwey, Timothy W. Inner Tennis. New York: Random House, 1976.

Gallwey, Timothy W. The Inner Game of Tennis. New York: Random House, 1974.

Gould, Dick. Tennis Anyone? 3rd Ed. Palo Alto, California: Mayfield Publishing Company, 1978.

Greene, Robert Ford. "Tennis Values and Human Values." Journal of Physical Education and Recreation, XLVIII (June, 1977), p. 33.

Haimowitz, Morris L. and Natalie Reader Haimowitz. Human Development Selected Readings. 2nd Ed. New York: Thomas Y. Crowell Company, 1966.

Honer, Stanley M. and Thomas C. Hunt. Invitation to Philosophy Issues and Options. 3rd Ed. Belmont, California: Wadsworth Publishing Company, Inc., 1978.

Journal of the Philosophy of Sport, I (September, 1974).

King, Billie Jean and Greg Hoffman. "Coping With the Emotions on Court." Tennis (January, 1979), pp. 39-42.

King, Billie Jean and Greg Hoffman. "Put Your Mind to Work on Court." Tennis (December, 1978), pp. 42-48.

Kraft, Robert E. and Julia Julien. "Working With the Whole Child." Journal of Physical Education and Recreation, XLVIII (June, 1977), p. 25.

Krathwohl, David R., Benjamin S. Bloom, and Bertram B. Masia. Taxonomy of Educational Objectives, Handbook II: Affective Domain. New York: McKay, 1964.

Kupperman, Joel J. Philosophy The Fundamental Problems. New York: St. Martin's Press, 1978.

Lindsey, Ruth, Billie J. Jones and Ada Van Whitley. Body Mechanics. 3rd Ed. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1974.

MacKenzie, Marlin M. Toward A New Curriculum in Physical Education. New York: McGraw-Hill Book Company, 1969.

Mason, Elaine. "New Tennis Progressions." Journal of Physical Education, Health, and Recreation (April, 1968), pp. 24-28.

McGaugh, James L., Norman M. Weinberger, and Richard E. Whalen. Psychobiology The Biological Bases of Behavior. San Francisco: W. H. Freeman and Company, 1967.

Michener, James A. Sports in America. New York: Random House, 1976.

Mosston, Muska. Teaching Physical Education. Columbia, Ohio: Charles E. Merrill Publishing Company, 1969.

Murphy, Chet. "Flexible Tennis Instruction." Journal of Physical Education and Recreation, XLVIII (June, 1977), pp. 26-32.

Muuss, Rolfe E. Theories of Adolescence. 2nd Ed. New York: Random House, 1968.

Nelson, Wayne G. "Open Your Mind to Tennis." Journal of Physical Education and Recreation (September, 1969), pp. 76-77.

Nirschl, Robert. "Keeping Fit: A Top Ten List to Avoid." World Tennis, XVII (January, 1980), pp. 42-44.

Oberteuffer, Delbert and Celeste Ulrich. Physical Education. New York: Harper and Row Publishers, 1970.

Ogilvie, Bruce C. and Thomas A. Tutko. "Sport: If You Want to Build Character, Try Something Else." Psychology Today, V (October, 1971), pp. 61-63.

Orlick, Terry D. "The Sports Environment: A Capacity to Enhance--A Capacity to Destroy." Sports in Contemporary Society. Ed. D. Stanley Eitzen. New York: St. Martin's Press, 1969, p. 218.

Osterhoudt, Robert G. An Introduction to the Philosophy of Physical Education and Sport. Champaign, Illinois: Stipes Publishing Company, 1978.

Pease, Dean A., Lawrence F. Locke, and Martin Burlingame. "Athletic Exclusion: A Complex Phenomenon." Quest, XV (June, 1971), pp. 42-47.

Pelton, Barry C. New Curriculum Perspectives. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1970.

Pelton, Barry C. Tennis. Pacific Palisades, California: Good Year Publishing Company, 1969.

Petersen, Carlene. "Concentration: Key to Tennis." Coaching: Women's Athletics (May/June, 1978), pp. 56-58, pp. 56-58, 91.

Phenix, Phillip. Realms of Meaning. New York: McGraw-Hill Book Company, 1964.

Priest, James D., Vic Braden, and Susan Goodwin Gerberich. "An Analysis of Players With and Without Pain." The Physician and Sport Medicine, VIII (April, 1980), pp. 81-91.

Priest, James D., Vic Braden, and Susan Goodwin Gerberich. "A Study of Players With Pain." The Physician and Sport Medicine, VIII (May, 1980), pp. 77-85.

Pullias, Earl V. "Problems of Aging: Psychological Principles." Journal of Physical Education and Recreation (October, 1977), pp. 9-11.

Pullias, Earl V. "The Education of the Whole Man." Quest, VII (December, 1966), pp. 37-43.

Ruch, Floyd L. and Philip G. Zimbardo. Psychology and Life. 8th Ed. Glenview, Illinois: Scott, Foresman and Company, 1971.

Sadler, William A., Jr. "Competition Out of Bounds: Sport in American Life." Ed. Marie Hart. Sport in the Sociocultural Process. 2nd Ed. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1972, pp. 163-175.

"Self Exploration Tennis." Tennis Trade (December/January, 1978/1979), p. 24.

Singer, Robert N. Motor Learning and Human Performance. 2nd Ed. New York: Macmillan Publishing Company, Inc., 1975.

Singer, Robert N. and Walter Dick. Teaching Physical Education A Systems Approach. Boston: Houghton Mifflin Company, 1974.

Snyder, William S. and Eugene A. Troxell. Making Sense of Things An Invitation to Philosophy. New York: St. Martin's Press, 1976.

Struhl, Paula R. and Karsten J. Struhl. Philosophy Now. 3rd Ed. New York: Random House, 1980.

Stumpf, Samuel E. Elements of Philosophy An Introduction. New York: McGraw-Hill Book Company, 1979.

Swift, Porter W. General Psychology. New York: McGraw-Hill Book Company, 1969.

"Tennis Anyone? A Smashing New Therapy for Troubled Teens." Human Behavior, VIII (May, 1979), p. 37.

The Carnegie Commission on Higher Education. The Purposes and the Performances of Higher Education in the United States. New York: McGraw-Hill, 1973.

U.S. News and World Report (January 15, 1979), p. 44.

Vanderzwaag, Harold J. Toward a Philosophy of Sport. Reading, Massachusetts: Addison-Wesley Publishing Company, 1972.

Wadsworth, Barry J. Piagett's Theory of Cognitive Development. New York: David McKay Company, Inc., 1971.

Webster, Randolph. Philosophy of Physical Education. Dubuque, Iowa: Wm. C. Brown Company Publishers, 1965.

Woodhouse, Mark B. A Preface to Philosophy. Belmont, California: Wadsworth Publishing Company, 1980.

Woods, Sherwyn M. "The Violent World of the Athlete." Quest XV (June, 1971), pp. 55-60.

Zeigler, Earle F. Philosophical Foundations for Physical, Health, and Recreation Education. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964.

Zeigler, Earle F. Physical Education and Sport Philosophy. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1977.

VITA

Billye Kay Givens

Candidate for the Degree of

Doctor of Education

Thesis: A PHILOSOPHICAL ANALYSIS OF THE RELATIONSHIP BETWEEN THE WHOLE-MAN CONCEPT AND TENNIS

Major Field: Higher Education

Minor Field: Health, Physical Education and Recreation

Biographical:

Personal Data: Born in McAlester, Oklahoma, March 21, 1951, the daughter of Carolyn Thomas Givens and William Burl Givens.

Education: Graduated from Wilburton High School, Wilburton, Oklahoma, in May, 1969; received the Bachelor of Arts degree from Oklahoma State University in 1972, with a major in English; received the Master of Science degree from Oklahoma State University in July, 1974, with a concentration in English; completed requirements for the Doctor of Education degree at Oklahoma State University in July, 1980, with a major in Higher Education and a specialization in Health and Physical Education.

Professional Experience: Teacher at Eastern Oklahoma State College in Wilburton, Oklahoma, from 1973 to present. Teaching assignments have been in physical education, English, and humanities. Coaching assignments include coaching men's and women's varsity tennis. Working with the intramural program and conducting a tennis clinic have also been experienced as well as teaching elementary tennis in summer school at Oklahoma State University.

Professional Organizations and Activities: member of Oklahoma Association for Health, Physical Education, and Recreation; Section Chairperson for College Division of Girl's and Women's Sports; member of Southwest Regional Conference on English in the Two-Year College; Higher Education Alumni Council member; Eastern Oklahoma State College faculty council representative; President of Board of United Ministries at Eastern.

Awards, Publications, Honors: Phi Kappa Phi; Outstanding Young Women of America; ranked No. 1 in Women's 25 Singles in the state of Oklahoma 1976 to present; article in Oklahoma Association for Health, Physical Education for Health, Physical Education, and Recreation Journal; article in National Library Journal; presented a paper on sport's literature at the Southwest Regional Conference on English in the Two-Year College.