Correlation of Aggression & Style of Play Among Tennis Players

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1977
CORRELATION OF AGGRESSION AND
STYLE OF PLAY AMONG TENNIS PLAYERS

A Thesis
Presented to
the Faculty of the Department of Physical Education and Recreation
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Master of Science

by
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August 1977
CORRELATION OF AGGRESSION AND STYLE OF PLAY AMONG TENNIS PLAYERS

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ACKNOWLEDGMENTS

The author wishes to express his gratitude to Dr. Thad Crews, Dr. Carol Hughes, Dr. Shirley Laney, and Dr. Richard Miller for their guidance, patience, and constructive criticism during the course of the investigation.

Particular thanks is extended to Coach Bill Thompson, Coach Duane Slaughter, Coach Alan Smith, and the twenty-six tennis players who cooperated in the study, as well as the individuals who served as tennis experts and subjects during the all-important pilot study. Also, special thanks to Dr. Tom Madron and Mrs. Carolyn Marks for their aid in the use of the computer.

In addition, for their continued inspiration and encouragement, the author wishes to express his sincere appreciation to his parents, who have supported him in everything he has ever attempted.
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Twenty-six male tennis team members competed against the same player under match-like conditions and were rated by a tennis expert according to their style of play. The instrument used to rate the subjects was the Expert's Rating Scale, a nine point scale indicating a tennis player's aggressive intentions. A Copy of Form AA of the Personality Research Form was completed by each subject prior to the expert's observation. Statistical analysis of the data consisted of determining a mean score for each subject's style of play and correlating that with the raw score for the aggression scale of the Personality Research Form. Results of the statistical analysis revealed no significant correlation between level of aggression and style of play of the tennis players.
CHAPTER I
STATEMENT OF THE PROBLEM

Introduction

It is quite evident that tennis is not the same as when Mary Outerbridge first introduced it to this country in 1874 (33). Once reserved exclusively for the royalty, tennis has spread to children, college students, middle-aged, and senior citizens alike -- all from a wide variety of backgrounds.

The United States Tennis Association (32) estimates that there are now over thirty-three million people playing tennis as opposed to only five million just sixteen years ago. Membership in the USTA (6) exceeded 112,000 in July, 1976, a figure 29 percent higher than the preceding year.

As tennis has increased in both popularity and participation in recent years, so has the need for research into the nature of the tennis player, with particular respect paid to aggressive tendencies. In
many "contact sports" aggression plays an important part; however, due to the nature of the game, the aggressive tendencies of the tennis player are not easy to determine.

Research into the personality characteristics of all athletes needs to be more conclusive. It is believed that some of the inconsistencies can be eliminated if further research is completed in this area.

Statement of Problem

This study was conducted in order to determine what correlation, if any, exists between aggression and the style of play of members of the men's varsity tennis teams at Belmont, David Lipscomb, and Trevecca Nazarene Colleges.

Significance of the Study

The results of this investigation could prove beneficial to the tennis player and coach, as well as contribute to the findings of similar investigations.

The developing tennis player could adapt a style of play that would be appropriate to his level of aggression and, thus, not be forced (by coach or otherwise)
into a playing style that would be considered unnatural or uncomfortable. The tennis coach could use the results of the study to match up compatible players for potentially successful doubles combinations.

In addition, results from this study could shed light into ascertaining the extent to which the two factors, aggression and style of play, are related.

**Hypothesis**

There will not be a significant correlation between level of aggression and style of play among members of the men's varsity tennis teams at Belmont, David Lipscomb, and Trevecca Nazarene Colleges.

**Assumptions**

It was assumed that responses to questions on the Personality Research Form were accurate and that there was no misrepresentation, intentional or otherwise, on the part of the subjects.

Furthermore, it was assumed that the conditions under which data were collected on each subject during the observation of style of play were as similar as possible due to the nature of the game of tennis. In other words, the
common opponent attempted to employ a standard game plan against each subject. It was impossible, however, to re-produce exact conditions for each subject and it was assumed that any slight deviation from the game plan was not a significant factor.

In addition, each subject was assumed to have given his maximum effort in exhibiting his actual style of play. Also, it was assumed the data collection procedure of testing the three different teams on different afternoons was not a significant factor.

**Delimitations of the Study**

This study was delimited to the twenty-six members of the men's varsity teams at Belmont, David Lipscomb, and Trevecca Nazarene Colleges in Nashville, Tennessee, and to only one factor of the total personality structure—aggression. The Personality Research Form and the Expert's Rating Scale were the instruments used to collect the data. The study was also delimited to the styles of play of the subjects.

**Limitations of the Study**

The investigator's lack of familiarity in all areas
of psychological testing was considered to be a limitation. This fact was minimized by the use of the Personality Research Form which does not require an extensive clinical background to administer, and the aid of members of the Psychology Department at Western Kentucky University. In addition, the investigator played against each team member with only short periods of rest in between and this was considered a possible limitation.

Definition of Terms

1. **Tennis player.** An individual member of an organized team who participates in intercollegiate matches and individual tournaments according to the rules established by the United States Tennis Association.

2. **Personality Research Form (Form AA).** Devised by Douglas N. Jackson, the Personality Research Form contains 440 items purporting to measure the following twenty-two scales: abasement, achievement, affiliation, aggression, autonomy, change, cognitive structure, defencence, dominance, endurance, exhibition, harmavoidance, impulsivity, nuturance, order, play, sentience, social recognition, succordance, understanding, desirability, infrequency.

3. **Aggression.** According to the Personality Research Form Manual, a high scorer can be described as one who "enjoys combat, and argument; (is) easily annoyed; sometimes willing to hurt people to get his way; (and) may seek to get even with people whom he perceives as having harmed him." The defining trait adjectives listed are aggressive, quarrelsome, irritable, argumentative, threatening, attacking, antagonistic, pushy, hot-tempered, easily-angered, hostile, revengeful, belligerent, blunt, and retaliative.
4. **Style of Play.** The desired game plan a tennis player consistently employs throughout the course of a tennis match.

5. **Experts.** Individuals familiar with tennis and experienced in it either by playing, coaching, or both.

6. **Experts' Rating Scale.** A nine point scale devised specifically for this study by the investigator for purposes of evaluating each subject's style of play.

**Summary**

In this chapter a statement of the problem was presented. The problem was identified, the significance of the study was demonstrated, the hypothesis and assumptions were introduced, the delimitations and limitations were listed, and the definitions were formulated in order to aid the reader in interpretation of the study.

A review of literature relevant to the problem is presented in Chapter II.
CHAPTER II
REVIEW OF RELATED LITERATURE

Introduction

Having presented an introduction to this investigation, the purpose of this chapter is to furnish a review of literature relevant to this study. This chapter concerns itself with the following: personality of the tennis player; theories of aggression; aggression and sport; assessment of aggression; and the Personality Research Form.

Personality of the Tennis Player

Before attempting to analyze the relationship between a specific personality trait and an aspect of a competitive game, it is important to assess the more general relationship of the personality structure to the competitive game. Several studies involving the general and specific personality traits of tennis players have been conducted.

Hazelton and Piper (12) investigated the social values
of individual and team sport participants. Having administered a questionnaire to female college freshmen participating in speedball, archery, and tennis, the investigators found the speedball players scored higher than both tennis and archery groups with respect to enjoyment derived from playing with other girls in group situations.

Sperling (30) investigated the personality traits of college varsity, intramural, and non-participants in athletics using the Human Behavior Inventory and four other scales. Sperling reported that when comparing scores within the varsity groups, the tennis players rated higher on liberalism.

Lakie (16) investigated the personality traits of athletes participating in football, basketball, tennis, golf, track and wrestling. Having administered five scales of the Omnibus Personality Inventory, the investigator found when comparing the combined tennis-golf group to other athletic groups, the tennis-golf athletes were more independent, less conventional and compulsive, and enjoyed greater intellectual curiosity and interest in aesthetic matters.

Hughes (13) compared personality traits of male freshmen participating in athletics by use of the Edwards
Personal Preference Schedule. Hughes found that the freshman tennis team scored significantly higher than non-letter winners and some of the other athletic groups on heterosexuality, exhibitionism and aggression and, consequently lower for dominance, autonomy, and intraception.

Singer (28) used the Edwards Personal Preference Schedule in a study of baseball and tennis players. The tennis group scored significantly higher than the norm group on the aggression variable and lower on the abasement variable than the intercollegiate baseball players.

McHugh (22) investigated the personality traits of varsity lettermen. She found that those placed in the category of "implement contact" (baseball, golf, and tennis) appeared to be outgoing, emotionally stable, socially uninhibited, sensitive, imaginative, resourceful, and tense. In addition, the tennis players were found to be the group most similar in personality traits. They varied four stens or less on thirteen of the sixteen factors on the Cattell 16 PF Questionnaire. On four factors (A, E, H, and Q4) they varied only two stens in range.

Gold (11), using the Guilford-Martin Personality inventory, investigated the personality traits of college and professional tennis and golf players. Fifteen athletes
(eight tennis players and seven golfers) were compared with an equal number of professional athletes in the same sports. The investigator found the college and professional tennis players to be more extroverted than the college golf players while at the same time the college tennis players were more calm, relaxed, and unruffled than their professional counterparts.

Ostrow (25) reported no difference in the level of aggression of intercollegiate male tennis team members compared to non-active players and non-athletes. In addition, he found that a season of competition had no effect on the pre-season through post-season frequency and total aggression levels of the subjects. Ostrow used the Edwards Personal Preference Schedule and six selected Thematic Apperception Test pictures.

Olson (24) interviewed outstanding tennis players in order to evaluate their personality characteristics. By using a group of tennis experts to rank players, Olson compared personality traits of champions with those judged to be near-champions. The investigator interviewed twelve famous tennis players approximately one-half hour each. Results indicated the champions to be more purposely intense and serious, more mechanized, and more concerned
with only winning. Olson also concluded that the champions were less aware of crowd reaction, less disturbed, and less pressured about winning than the near champions.

Although not having conducted actual scientific investigations, several renowned students of the game have formulated their own personal opinions after observing a number of tennis players.

Budge (5) felt that "... every champion has his own peculiar style that is the expression of his individuality or personality, but each one has borrowed something from the champion before him."

Beisser (3) reported several occasions of world-class tennis players who talk to themselves constantly as the match progresses. This type of self-criticism perhaps is a way to avoid guilt by denying that one is winning, since a majority of tournament tennis players possess unconscious destructive fantasies toward their opponents which hinder the players' ability to realize the goal of winning.

Luszki (21) theorized that the successful tournament tennis player demonstrated an above average level of extrapunitive aggression, whereas the less competitive player tended to be less sadistic and exhibited intrapunitive aggression.
Due to the lack of conclusive research into the personality of the tennis player, one is prevented from drawing any definitive statements. Nevertheless, the tennis player appears to be relatively independent, liberal, and somewhat aggressive in both thought and action. To attribute these traits (or any others for that matter) to participation in tennis as opposed to the complexity of the individual, however, is not justifiable.

Theories of Aggression

This investigation was limited to only one variable—aggression. Although only one aspect of the total personality structure, its importance is not diminished due to its prevalence within the very roots of our society.

Various interpretations concerning the nature and scope of aggression have been purported. Layman (17) distinguished between reactive and instrumental aggression, contingent upon the act responsible for its instigation. Reactive aggression was goal-response oriented whereas instrumental aggression was concerned with attaining a reward.

Worschel (35) found a significant relationship
existing between the readiness to exhibit direct aggression and an individual's interpretation of a self-ideal concept. Ogilvie (23) found that aggression allowed for an identification with the object that was aggressed upon. Lesser (18) classified aggression as either physical, outburst, unprovoked, verbal, or direct with respect to its intensity within a social context.

These interpretations depend on each one's philosophy of an underlying theory of aggression. Theorists can generally be classified as subscribing to either the innate or learned theories of aggression.

Freud originated the innate theory postulating that the nature of aggression is instinctive in man. In summarizing his feelings on the subject, Freud (10) maintained:

In all that follows I adopt the standpoint, therefore, that the inclination to aggression is an original, self-sustaining instinctual disposition in man, and I return to my view that it constitutes the greatest impediment to civilization. At one point in the course of this (enquiry) I was led to the idea that civilization was a special process which mankind undergoes, and I am still under the influence of that idea. I may now add that civilization is a process in the service of Eros, whose purpose is to combine single human individuals, and after that families, then races, peoples and nations, into one great unity, the unity of mankind. . . . But man's natural aggressive instinct,
the hostility of each against all and of all against each, opposes this programme of civilization. This aggressive instinct is the derivative and the main representative of the death instinct which we have found alongside of Eros and which shares world-dominion with it. And now, I think, the meaning of the evolution of civilization is no longer obscure to us. It must present the struggle of Eros and Death, between the instinct of life and the instinct of destruction, as it works itself out in the human species.

Lorenz (20), another proponent of the innate theory, wrote the following in support of his belief that the principal importance of aggression lay in its preservation of the species:

What is certain is that, with the elimination of aggression . . . the tackling of a task or problem, the self-respect without which everything that a man does from morning shave to the sublimest artistic or scientific creations, would lose all impetus; everything associated with ambition, ranking order, and countless other equally indispensable behavioral patterns would probably also disappear from human life.

Storr (31) admonished that "we know in our hearts that each one of us harbours within himself those same savage impulses which lead to murder, to torture, and to war."

According to Ostrow (25), whereas many psychologists have subscribed to the innate theory as the basis for
aggression, they have, in turn, attempted to modify its stated direction. The innate theory was alarming to some psychologists. The prospect of aggression being embodied within the roots of man and controllable only by re-direction seemingly put the psychologists in a helpless situation. It did not account for the possibility that aggression could be inhibited by environmental manipulations.

The earliest supporters of the learned theory of aggression included Dollard et al. (9), who felt that aggression was "an act whose goal-response is injury to an organism." They felt that aggression is the result of frustration, that the existence of frustration occurs before aggression is exhibited, and that the existence of frustration always results in some type of aggressive behavior.

According to Alderman (1):

The Dollard viewpoint . . . would say that a feeling of frustration commonly associates with aggression, partly because it feels like anger, partly because one way to remove frustration is to attack it directly, and partly because frustration of the aggression itself causes even more aggressive behavior. This paradigm would seem to easily explain certain behaviour in sports.
Many investigators have supported this frustration-aggression relationship. However, just as there were modifications of the direction of the instinctive theory by its supporters, so are there modifications of the frustration-aggression hypothesis proposed by supporters of the learned theory. Levy (19) held that repression and displacement, along with aggression, were possible reactions to frustration. Yates (36) devoted an entire book to the relationship of frustration to regression and fixation, as well as aggression. Berkowitz (4) held that external stimuli, rather than inner drive, contributed more to eliciting an instigation to aggression.

Support for both theories has been given. However, the sole support for either would not be a suggested approach. History has shown in various areas of psychology, that when an innate theory is proposed and is followed by a learned theory, the end result is generally joint acceptance of both.

When applied to the assessment of aggression, this trend tends to justify Scott's (27) belief that aggression is characterized by a multiple theory of causation due to a combination of genetic, psychological, social, and environmental factors.
Aggression and Sport

In addition to their frustration-aggression hypothesis, Dollard et al. (9) held that "... the occurrence of any act of aggression is assumed to reduce the instigation to aggression." Husman (14) maintained that a catharsis or lowering of the instigation toward aggression would result if aggression were displaced into socially-approved channels like observing or participating in sports.

Lorenz (20) supported this value of sport and stated:

The value of sport, however, is much greater than that of a simple outlet of aggression in its coarser and more individualistic behavior patterns, such as pummeling a punch-ball. It educates man to a conscious and responsible control of his own fighting behavior. Few lapses of self-control are punished as immediately and severly as loss of temper during a boxing bout. More valuable still is the educational value of the restrictions imposed by the demands for fairness and chivalry which must be respected even in the face of the strongest aggression-eliciting stimuli.

Relating sport to controlling the aggressive drive, Lorenz (20) further stated:

The most important function of sport lies in furnishing a healthy safety valve for the most indispensable and, at the same time, most dangerous form of aggression that I have described
as collective militant enthusiasm. . . . The Olympic Games are virtually the only occasion when the anthem of one nation can be played without arousing any hostility against another.

Ostrow (25), in summation, writes the following:

Hereto lies the role of sport. Its relationship to aggression becomes one of control rather than reduction, redirection rather than release. To the physical educator lies the implementation--the challenge remains.

Assessment of Aggression

Due to the fact that aggression is classified as a factor or trait within the personality structure, its assessment is allowed to follow general personality measurement procedure. However, ingrained in this generality reside specific assessment problems.

Accurate assessment of personality is dependent upon a concise understanding of its definition and scope. Psychologists, meanwhile, have not been in agreement on this matter.

Many definitions have been put forth in an attempt to describe and delimit aggression. While they tend to differ in some respects, they generally imply that aggression is an offensive action against another
organism with intent to harm or injure.

This problem is compounded, as Ostrow (25) writes:

Our inability to clearly define personality created additional assessment difficulties. For example, attempts to objectify and qualify personality evaluative tools have been hampered by a lack of precise personality definition. This causal relationship is further found when validity and reliability become criteria of good testing. It is hoped that empirical research will continue to contribute to an accurate formulation of personality definition and scope. It is suggested, however, that empiricism may eventually succumb to the formalism of theory, with inductive reasoning contributing to a more rapid solution of personality assessment problems.

Investigators have attempted to classify different methods of personality assessment. The work of Rosenzweig appears to be generally the most indicative, if not the most representative, of the categorization techniques. Rosenzweig (26) classified methods of personality measurement as either subjective, objective, or projective in nature.

The subjective method, according to Rosenzweig (26), is "... based upon what the subject himself has to say about his traits, attitudes, personal experiences, aims, needs, and interests." These techniques encompass
inventories, case histories, autobiographies, and interviews.

The objective method strives to measure personality by directly observing the subject's overt behavior instead of evaluating the subject's personal statements. Such methods include hypnosis and suggestibility, physiological (covert) measurements, and rating scales.

Rosenzweig (26) maintains that projective methods "... are intended to reveal the underlying traits, moods, attitudes, and fantasies that determine the behavior of the individual in (such) actual situations." Each of the variety of projective techniques allows the subject to provide his own idiosyncratic responses as he sees fit.

The important question now appears to be which technique will be employed to measure aggression. Rosenzweig (26) maintained:

Whether in clinical practice or in fundamental research, the appraisal and investigation of personality at the present time demands a composite plan of attack in which opinion, overt, and implicit behavior are all elicited and evaluated in a complementary fashion.

Cratty (7) echoes this statement and further adds,

"... the coach's observation of an athlete's need and willingness to aggress in a game are perhaps the most valid indices of evaluating aggression."
It is for this reason that the investigator advocates a multiple methodological assessment employing the Expert's Rating Scale along with the Personality Research Form in evaluating style of play and aggression.

**The Personality Research Form**

The Personality Research Form (PRF), devised by Douglas N. Jackson, is a self-report inventory which, according to Jackson (15), "is designed to yield conveniently a set of scores for personality traits broadly relevant to the functioning of individuals in a wide variety of situations."

According to Crites (8), the PRF represents a rather unique innovation in personality assessment. First, it is focused primarily upon the areas of normal functioning rather than psychopathology. Second, it was developed from a well known theory of personality (originally proposed by Henry Murray in 1938). Third, the basic procedure for item selection and validation is founded upon item analysis.

The PRF is available for use in five different forms. Form AA, the one used in this study, consists of 440 items comprising twenty 20-item content scales and two 20-item validity scales. This form requires between 40-70 minutes
to administer. Hand scoring templates provide for efficient analysis of results.

Jackson reports that the median reliability for the twenty PRF content scales is above .92 with a range of .80 to .94. The reliability co-efficient for the aggression scale is .94.

While reliability is vitally important in making inferences from test scores, validity is the traditional criterion for determining the acceptability of the empirical definition of the trait employed, or the degree of confidence one can place in a scale score as actually being representative of a construct.

In recent years, it has become increasingly important to demonstrate that a test correlates with what it is supposed to correlate with (the convergent aspect of validity) and in addition to indicate low correlations with theoretically distinct variables (the discriminant aspect). The principal PRF validation studies rely heavily upon the implementation of trait and behavior ratings by persons with natural opportunities to observe the ratees.

In order to determine convergent validity, Jackson studied California college students and found a median correlation for the entire twenty PRF scales of .52 with behavior ratings and .56 for the Trait Rating Form. The
validity co-efficients for the aggression scale are .66 and .73 for the behavior ratings and the Trait Rating Form, respectively. Discriminant validity was determined by a procedure devised by Jackson in 1966 termed multi-method factor analysis. Using this analysis the 20 PRF content scales load the appropriate factor with almost exceptionless regularity. The results from this factor analysis supply substantial proof of the convergent and discriminate validity of the PRF scales.

Crites (8) had the following to say about the Personality Research Form:

The PRF is a well conceived and well developed personality inventory, whose psychometric characteristics are more than adequate. It is relatively free from response bias; it measures largely independent variables; it is reliable, both structurally and temporally; and it correlates with variables it should correlate with and not with those it should not correlate with.

Wiggins (34) feels that "the PRF is among the most methodologically sophisticated personality inventories presently available . . . it is likely that the PRF will become a major focus of investigation during the next decade."

Anastasi (2) echoes the previous statements by stating:
Because of the rapid proliferation of personality inventories, any new inventory needs to be carefully scrutinized to decide whether such an addition is justified. In the case of the PRF, sufficient progress in test construction procedures is indicated to provide this justification. In accordance with proper test construction practice, reliability and validity were built into the test in the initial stages of item construction and selection. Technically the PRF appears to be exemplary... as a research instrument, it has high promise.

The Personality Research Form appears to be one of the most scientifically developed tests available. It is aimed at normal individuals rather than clinical personalities; its reliability and validity are sound enough to be certain of its use; the administration of the test can be done with relative ease; and one need not have had an extensive clinical background to interpret the results obtained from the test. In light of the above comments, the investigator felt justified in his selection of the Personality Research Form as the instrument to assess aggression.

Summary

In this chapter a review of literature relevant to the problem was presented. The personality of the tennis
player was generalized, the theories of aggression were stated, the relationship of aggression and sport was discussed, the methods of assessing aggression were examined, and an overview of the Personality Research Form was furnished.

The methodology employed in this study is presented in Chapter III.
CHAPTER III

METHODOLOGY

Introduction

In Chapters I and II, a statement of the problem and a review of related literature were presented. This chapter is concerned with the construction and reliability of the rating scale, the selection of subjects, and the collection of data.

Construction and Reliability of Rating Scale

For purposes of evaluating the styles of play of the subject, the Expert's Rating Scale was developed (Appendix A). The investigator solicited the aid of the men's tennis coach at Western Kentucky University in order to develop the rating scale to its present form. It was maintained that by first using the Expert's Rating Scale in a pilot study and evaluating the data collected from it, the reliability of the Expert's Rating Scale could be determined.

It was maintained that in order to accurately judge each subject's style of play, a group of tennis experts
should be selected for that purpose. The experts would need to be experienced with tennis to the point of having played it, or coached it, or both. Seven qualified men were contacted and the purpose of the study and the role of the expert in assessing each subject's style of play was explained to each of them. All agreed to participate. Each expert was given a copy of the rating scale in order to familiarize himself with the guidelines for rating each subject.

It was believed that in order for the experts to observe each subject under as similar conditions as are possible, each subject must be observed under match-like conditions competing against the same player. The investigator served as the common opponent, offering competition for each subject while, at the same time, allowing the subject to exhibit his selected style of play.

Observation in this situation was felt to be more suitable than observation during a challenge match, for example, because each subject would be allowed to control the tempo of the match (thus exhibiting his style of play). During challenge matches between team members, one player or the other might tend to dominate the action thus overshadowing the other.

Six members of the men's varsity tennis team at
Western Kentucky University served as subjects in a pilot study conducted on the Western campus on April 7, 1977. They were observed by the experts and ratings were recorded on rating sheets provided by the investigator (Appendix B).

The subjects were instructed to play each point as they would during a regular match. It was emphasized that they were to disregard keeping score and concentrate on winning each individual point. It was felt that these comments would help elicit play representative of each subject's style of play.

The common opponent played each subject a total of twenty-three points. The common opponent served the first seven points, the subject served the next seven points, and then the complete procedure involving the sudden-death nine point tiebreaker was followed. Double faults were eliminated. Line calls were minimized so as to emphasize the intent behind each shot and de-emphasize whether it was in or out.

When the common opponent was serving, he attempted to employ a consistent game plan against each subject. On the first two serves he stayed back along the baseline and on the next two points he followed the serves to the net. On the fifth point he made an approach shot and followed it to the net and on the sixth point he hit a short shot.
allowing the subject to take the net whereupon the common opponent responded with a lob. On the last point, the common opponent played freely or if one of the other points had not gone as planned it was substituted here.

It should be noted that the common opponent used only spin serves of medium speed so as to allow the subject an opportunity to play the point out. In addition, during rallies every attempt was made to keep the ball within the middle area of the court (about two or three feet from each side line) so as to allow the subject every available opportunity to control the tempo of the point.

Each subject was rated 1-9 on the basis of each individual point. In the event they were unable to rate a certain point, the experts were instructed to leave it blank. After the pilot study, the subjects and experts were once again thanked for their cooperation in the investigation.

The mean scores were calculated for each subject after first eliminating the highest and lowest ratings (Appendix C). The data were analyzed in the Academic Computing and Research Services Department at Western Kentucky University. An alpha model of the SPSS reliability system was computed in order to determine intra-rater
and inter-rater reliability of the rating scale.

According to Specht (29), two reliability co-efficients are computed by the program— Cronbach's alpha and a co-efficient labeled standardized item alpha. The standardized item alpha co-efficients for intra-rater reliability and inter-rater reliability were found to be .976 and .949 respectively.

It was maintained that due to the high inter-rater reliability co-efficient, only one of the experts would be necessary for observation during the actual data collection procedure provided the same one observed during all three periods. One of the experts was contacted and he agreed to participate.

**Selection of Subjects**

The subjects used in this study were the twenty-six members of the men's varsity tennis teams at Belmont, David Lipscomb, and Trevecca Nazarene Colleges in Nashville, Tennessee. The team from David Lipscomb consisted of eight members while both Belmont and Trevecca Nazarene had nine players each.

The tennis coaches at each of the colleges were contacted by phone during the last week of March, 1977. The investigator explained to each the purpose of the
study and inquired as to the availability of his respective team for participation. Each agreed to participate and subsequently sent copies of tennis schedules so as to ascertain potential dates for collection of data.

Ages of the subjects ranged from 18 to 22 years excluding one subject who was 26 years old. Of the twenty-six subjects, 24 were American while the other two were Australian.

**Collection of Data**

Data were collected at Trevecca College on April 15, 1977; at David Lipscomb College on April 18, 1977; and at Belmont College on April 20, 1977. The collection procedure was standard at each college. It was assumed that collecting the data on separate afternoons was not a significant factor in this study since the weather conditions were similar each time.

Each subject had been previously informed by his respective tennis coach about the nature of the study and that the administration of a personality test was involved. None of the subjects was aware, however, of the part of the study dealing with observation of style of play.

Each subject received a copy of Form AA of the
Personality Research Form and an answer sheet. The subjects were told to follow the instructions printed on each copy of the test booklet. Total administration time was sixty minutes or less.

After checking each test to make sure all statements were answered and everything was in order, the second part of the data collection procedure began.

The investigator, serving as the common opponent, played each subject a total of twenty-three points, using the same format and game plan that was previously used and described during the aforementioned pilot study.

The subjects were observed by one of the experts used during the pilot study and rated accordingly. The subjects were observed in an order corresponding to their position on their respective teams. In other words, the number one player was taken first, the number two player second, and so on. This was done to help insure each subject's playing under as similar conditions as possible and also to allow for fatigation on the part of the common opponent.

The common opponent took short periods of rest after each group of two subjects (first and second, third and fourth, etc.). After each subject was finished, the investigator thanked him and explained the study and purpose
of participation. Total data collection time was four hours or less at each college.

Summary

In this chapter the methodology of the study was presented. The measures taken to construct the rating scale and determine its reliability were examined, the method of selecting subjects was described, and the data collection procedure was discussed.

An analysis of the results is presented in Chapter IV.
CHAPTER IV
PRESENTATION AND ANALYSIS OF DATA

Introduction

Having presented in previous chapters an analysis of the problem, a review of related literature, and the methodology employed in this study, this present chapter is concerned with the presentation and analysis of the data under two basic headings: statement of the statistical hypothesis and statistical treatment of data.

Statement of the Statistical Hypothesis

There is no statistically significant correlation between the level of aggression and style of play of members of the men's varsity tennis teams at Belmont, David Lipscomb, and Trevecca Nazarene Colleges.

Statistical Treatment of Data

As in the pilot study, the high and low ratings (of the total twenty-three) were eliminated and the remaining
twenty-one ratings were averaged to determine the overall style of play of each subject. In addition, the raw scores from the aggression scale of the Personality Research Form were determined by hand scoring each test.

A summary of the mean scores of the style of play observation and the raw scores from the Personality Research Form is presented in Table I for Belmont College, Table II for David Lipscomb College, and Table III for Trevecca Nazarene College.

A Pearson Product Moment Correlation of the SPSS System was computed at the Academic Computing and Research Services Department of Western Kentucky University. The Pearson r correlated the means of the style of play with the raw scores from the Personality Research Form of the twenty-six subjects. The results are presented in Table IV.

A correlation of .392 was necessary for statistical significance and a coefficient of .255 resulted; therefore, the null hypothesis was not rejected.

Summary

This chapter's purpose was to present and analyze
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### TABLE II

**DAVID LIPSCOMB COLLEGE**

**SUMMARY TABLE OF STYLE OF PLAY (S.O.P.) MEANS AND PERSONALITY RESEARCH FORM (P.R.F.) SCORES**

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<td>8</td>
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TABLE III
TREVECCA NAZARENE COLLEGE

SUMMARY TABLE OF STYLE OF PLAY (S.O.P.) MEANS AND PERSONALITY RESEARCH FORM (P.R.F.) SCORES

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TABLE IV

SUMMARY TABLE OF MEANS
STANDARD DEVIATIONS, AND CORRELATION

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<td>Mean</td>
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<td>Standard deviation</td>
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<td>r</td>
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<td>0.255a</td>
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^aNonsignificant at the .05 level of confidence
the data collected in this study. The statistical procedures used in the analysis were identified and the data from the statistical analysis were presented in numerical tables.

A summary of the study, a discussion and interpretation of the results, conclusions based on the statistical analysis, as well as recommendations for further study are presented in Chapter V.
CHAPTER V

SUMMARY, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

Introduction

Up to the present, an analysis of the problem, a review of related literature, the methodology employed in the study, and a presentation and analysis of data have been presented. This chapter lends itself to a summary of the study, a discussion and interpretation of the results, conclusions based on the statistical analyses, as well as recommendations for further study.

Summary

The purpose of this investigation was to study the relationship between level of aggression and style of play of male tennis team members.

Twenty-six members of the men's varsity tennis teams at Belmont, David Lipscomb, and Trevecca Nazarene Colleges competed against the same player under match-like conditions.
They were observed by a tennis expert who rated them according to their style of play. The instrument used to rate the subjects was the Expert's Rating Scale, a nine point scale indicating a tennis player's aggressive intentions. A copy of Form AA of the Personality Research Form was completed by each subject prior to the expert's observation.

Statistical analyses of the data consisted of determining a mean score for each subject's style of play and correlating (Pearson r) that with the raw score for the aggression scale of the Personality Research Form.

The results of the statistical analyses revealed no significant correlation between the level of aggression and style of play of the subjects.

**Discussion**

Examination of the results revealed that there was no significant correlation at the .05 level of confidence and, therefore, there was no significant positive relationship between level of aggression and style of play.

In all likelihood, this finding is representative of many tennis players. It is highly unlikely that there should
be a high correlation between on-court aggression and personal aggression (as measured by the Personality Research Form).

When a player is aggressive on the court, he is so for a variety of reasons. Aggressiveness, for the most part, comes with having played a great deal of tennis and feeling comfortable and secure in an aggressive playing style. The aggressive tennis player appears to be self-confident and may not necessarily be high on personal aggression.

This is not to say that a non-aggressive player is always insecure and lacking in confidence (although this may be the case in beginning tennis players). It does seem probable, however, that personal conflict could account for a low amount of self-confidence which may be exhibited by a non-aggressive playing style.

Low personal aggression scores potentially imply little personal conflict. It appears, due to the non-significant correlation between aggression and style of play, that one is not able to accurately predict on-court aggression by first examining personal aggression. One does not have to look far to find an offensive, aggressive player who turns into a gentle, mild-mannered individual when he or she steps off the court.

It appears likely that an aggressive style of play is more indicative of personal skill than anything else.
It is not enough just to look at on-court aggression and personal aggression without taking into consideration the skill level of the individual.

To suggest that more positive relationships between aggression and style of play may appear as the skill level increases is mere speculation. It appears appropriate to maintain that one is unable to consistently predict how an individual will express himself on the court.

Conclusion

Within the limitations of the population and design of this investigation, examination of the results has suggested that it can be justifiably concluded that there is no significant correlation between a male tennis player's level of aggression and his style of play.

Recommendations for Further Study

The results, discussion, and limitations of this study have posed a number of questions relative to possible further research.

1. Would comparable results be obtained from an identical study in which a larger sample size were employed to increase the power of the statistical test utilized?
2. Would comparable results be obtained from a study in which more than one tennis expert were utilized to observe the subjects?

3. What might be added to the descriptions of the Expert's Rating Scale that would objectify it even further?

4. Would a more accurate indicator of each subject's style of play be assessed by allowing the common opponent to rate the subjects along with the tennis experts?

5. Would comparable results be obtained from a study in which the tennis experts served as the common opponents for the subjects?

6. Would a significant correlation result if style of play were to be correlated with another aspect of the total personality structure?

7. Would comparable results be obtained from a study in which the subjects were more highly skilled athletes -- i.e. members of an All-America Team or professional tennis players?
EXPERT'S RATING SCALE

1. **NON-AGGRESSIVE** = passive, defense-oriented; relaxed and comfortable on baseline; when drawn to net, returns back

2.

3. **Seldom Aggressive** = occasionally hits forcing shots; in tense situations more relaxed on baseline, tends to lob rather than hit passing shots

4.

5. **Moderately Aggressive** = combines offensive and defensive styles into effective game plan; alternates adequately between the two

6.

7. **Frequently Aggressive** = in tense situations more relaxed up at net; tends to hit passing shots rather than lobs; frequently hits forcing shots

8.

9. **Highly Aggressive** = dominant, offense-oriented; rushes net at every available opportunity; hits attacking and forcing shots
<table>
<thead>
<tr>
<th></th>
<th>HIGHLY AGGRESSIVE</th>
<th>MODERATELY AGGRESSIVE</th>
<th>NON-AGGRESSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SERVE</strong></td>
<td>hard, nearly flat, hit to corners and opp. weakness, doesn't let up on 2nd serve, hit deep into service court, follows serve to net (both 1st and 2nd)</td>
<td>hard, first, spin on 2nd, will probably attack net if 1st serve is forcing, rarely attacks on 2nd serve unless it is hit out</td>
<td>spin on both serves, little placement, used to just get ball in play, never follows it to net, serves are not necessarily deep and never overpowering</td>
</tr>
<tr>
<td><strong>SERVICE RETURN</strong></td>
<td>returns generally are hard and forcing, may even chip 2nd serve and attack net, if opp. attacks net may attempt passing shot or hit directly at feet</td>
<td>mixes up forcing returns when able, and lob returns when forced, tends to hit at feet of attacker rather than pass, hits deep (relatively near center) if server stays back</td>
<td>returns just get ball back in play, little placement on shots, would tend to lob returns if server attacks, stays back</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FOREHAND</strong></td>
<td>topspin, low, hard, forcing attacking shots, alternates often from corner to corner or may specifically attack opp. weakness, nearly always used in passing opportunities</td>
<td>may use topspin, backspin, or flat shots when opportunity arises, most always used in passing opportunities, often hit to opp. weakness</td>
<td>generally high, softer than an aggressive FH, ball is kept in play, more defense-oriented, may use underspin or high arching shots to control tempo, rarely used to pass</td>
</tr>
<tr>
<td>HIGHLY AGGRESSIVE</td>
<td>MODERATELY AGGRESSIVE</td>
<td>NON-AGGRESSIVE</td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
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<td>---------------------------------------------------------------------------------</td>
<td></td>
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<tr>
<td>BACKHAND</td>
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<td></td>
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<tr>
<td>topspin, with an occasional backspin shot, low, hard and forcing, rarely in middle of court, often used in passing opportunities</td>
<td>generally underpin with an occasional topspin, seldom used in passing situations, hit to opp. weakness</td>
<td>backspin for control rather than power, ball may tend to float, rarely if ever used to pass an attacking opp.</td>
<td></td>
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<tr>
<td>LOBS</td>
<td></td>
<td></td>
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<tr>
<td>generally topspin, used offensively when opp. has closed net, usually hit when put in forced position (otherwise would hit passing shot)</td>
<td>mostly backspin with an occasional topspin, used in both offensive and defensive situations, hit relatively deep, may be used to change pace or set tempo of match</td>
<td>backspin as a rule, used defensively to allow time to get back into point, used in place of passing shots and attempted deep</td>
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<tr>
<td>VOLLEY AND HALF VOLLEY</td>
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<tr>
<td>used as an offensive weapon, comes to net at every available opportunity, attempts to win point on 1st volley, shots are hard and attempted forceful, closes net after each volley, HV used when attacking net, racket comes over ball (top-spin)</td>
<td>used after good first serve and approach shot, rarely follows 2nd serve, doesn't necessarily try to win point on 1st volley, HV is generally used to get ball back in play</td>
<td>uses volley only when drawn to net, uncomfortable with shot and just tries to get ball back, hits shots safely within court, HV is seldom used (generally near baseline used with backspin, might favor HV over volley)</td>
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<tr>
<td>Highly Aggressive</td>
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<td>Non-Aggressive</td>
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<tr>
<td>whether shot is in or out is immaterial, attacking or offensive intent is the important criterion, weight should be forward, &quot;grunt,&quot; may draw opp. up to allow for potential pass.</td>
<td>the degree of aggressive intent is the important criterion, weight should be generally evenly distributed after a shot, may hit angle shots after pulling opp. in then hit a passing shot.</td>
<td>passive or defense-oriented intent is the important criterion, weight should be slightly back, degree of defensiveness is to be considered.</td>
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APPENDIX B

EXPERT'S RATING SHEET
EXPERT'S RATING SHEET

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<th>Player</th>
<th>Rater</th>
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1 2 3 4 5 6 7 8 9

"Game" 1

"Game" 2

Tiebreaker

1. Rate 1-9 on the basis of each individual point.

2. You may leave a blank space if you are unsure how to score it.
APPENDIX C

MEAN SCORES AND RHO VALUES
FROM PILOT STUDY
MEAN SCORES AND RHO VALUES
FROM PILOT STUDY

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