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Behavioral Rigidity Across Sport Situations

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BEHAVIORAL RIGIDITY ACROSS SPORT SITUATIONS

by

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An Abstract

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ABSTRACT

The purpose of the investigation was to determine whether behavioral rigidity is consistent across sport situations. The sample was composed of 56 male junior and senior physical education majors at Ithaca College, in Ithaca, New York. The entire group of subjects were volunteer participants and each subject was administered a test and a retest of Schaie's Test of Behavioral Rigidity (TBR) and a sports situations scale devised by the researcher. The sports situations were comprised of 16 different situations that intuitively tested a coach's resistance to change. Each situation was based on the Likert Model, whereby the subject responds to a five-point scale ranging from strongly agree to strongly disagree.

After the data were collected for the test administration, the subjects were asked to take a retest of the same tests four weeks later. All 56 subjects completed both test administrations. After the data were scored, it was found that four of the subjects had obviously misunderstood the directions of several sub-tests in the TBR. At this point, these subjects were dropped from the investigation and the data from the remaining 52 subjects were subjected to statistical analysis.

Mean scores, standard deviations, and reliability coefficients were respectively obtained by analysis first,

for both the test and retest administrations. The sport situations scores were then factor analyzed from the test administration only and seven discrete situations emerged from the reduction of the data. These seven situations were henceforth treated to a multiple regression between the situations and behavioral rigidity scores, and a concluding analysis by canonical correlation between subtests of behavioral rigidity and sport situations.

It was found that the resulting F ratio and chi-square values were not significant. The hypothesis that there will be no significant consistent relationship between behavioral rigidity across sport situations was consequently accepted.

On the basis of the results of this investigation, it was concluded that both the person and the situation need to be considered in the study of human behavior. In light of the findings, the researcher feels justified in stating that the results are supportive of an interactionist position.

BEHAVIORAL RIGIDITY ACROSS SPORT SITUATIONS

A Thesis Presented to the Faculty of
the School of Health, Physical
Education, and Recreation
Ithaca College

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

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by
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Ithaca College
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CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of

Susan Kritzler Borowicz

submitted in partial fulfillment of the requirements for the degree of Master of Science in the School of Health, Physical Education, and Recreation at Ithaca College has been approved.

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Chapter 1

INTRODUCTION

In today's sport world, physical educators, coaches, and athletes are continually concerned with behavior that constitutes successful performance in sport. Considerable concern among teachers and coaches is to strengthen desirable behavior and to produce consistency in the performance of their athletes in the sport environment. As Rushall and Siedentop (11:158) stated, "behaviors which are 'desirable' should be consistently emitted, and those which are 'undesirable' should be eliminated." But is behavior consistently emitted in the sport environment?

Psychologists as well as educators have concerned themselves with this question for years, not just in sport as evidenced recently, but in behavior in general. The dilemma stems from the original belief in the area of psychology that one's behavior remains consistent across situations no matter what the situation is today, or whether the person would respond differently in the same situation tomorrow. Behavior, according to this model, then, is a function of intrapsychic structure that does not vary. Hence, the psychologists supporting this model suggest that behavior could be accurately predicted. Due to an early following in this field, psychologists became involved in

experimentation designed to uncover traits in an individual and began to type persons according to their responses on paper and pencil tests. This approach has traditionally been termed "trait psychology" where the investigators purely searched for consistencies in behavior. When specific traits are uncovered, such as extroversion, authoritarianism, or flexibility, for example, they are assigned to the person regardless of the situation with which the person interacts.

Attempts to type people have continued for years including the infiltration into the area of sport where sport psychologists hoped to answer questions such as those posed by Singer (14). Does the outstanding athlete possess a personality profile or particular personality traits dissimilar to those displayed by the average athlete? Does the personality of the athlete change due to participation in sport? Are there personality differences among groups of athletes classified by sport? Much has been studied concerning these questions, but as Singer (14) has stated, there is little evidence to support such notions and results, at best, have been inconclusive. In spite of these findings, trait studies, such as Hendry's (45) comparison of the personality dimensions of coaches and physical educators, continue.

It appears that if strides are going to be made in the area of personology, the psychologists and sports personologists are going to have to look elsewhere

to determine the factors that constitute a person's behavior. Several psychologists, who initially rejected the trait model, took an opposing view by tending to account for human behavior in terms of the situation in which it occurs (23). The situationist model, according to Bowers (23), states that persons vary in different situations, but variation within situations is minimized. This model, again, appears incomplete. Even though trait theorists do not entirely discount the environment, and situationists do not entirely discount individual differences, it is clear that the proponents of each theory hold firm to their respective positions.

Thus, in recent years, various researchers in psychology have undertaken a relatively new approach to the problem. This approach is commonly referred to as interactionism which considers both influences of the person and the situation on behavior simultaneously. A study by Endler, Hunt, and Rosenstein (37) and succeeding studies by Endler (31,32,33), and Endler and Hunt (35,36), have suggested a new format for investigating behavioral variance that makes possible the analysis of individual differences, situations, and their modes of response for each of the situations. Not only are each of these components contributing to the variance, but also their respective interactions. This model opens up a whole new realm of study for researchers desiring to find answers to the components that make up the sum of an individual's behavior.

In the area of sport, the acceptance of the interactionist model has been developing very slowly as generally sports personologists continue to consider traits solely as their criterion in the study of behavior (6). Pointing out this dilemma in his investigation, Horsfall (67) modeled a study after Endler, Hunt, and Rosenstein (37), except using sport-related situations. Horsfall (67) succeeded in finding similar results to Endler, Hunt, and Rosenstein (37) by partitioning behavioral variance. With results such as these, further study is warranted in the area.

Returning to the question posed at the outset, it is clear that there is conflict over the problem of behavioral consistency especially in the area of sport. In attempting to determine an answer to this question, one could consider studying a measure of behavior across a variety of sport situations to see if that behavior remains consistent. One such behavior, in the area of psychology that appears characteristic of persons in sport, is behavioral rigidity. The term is used to describe persons who resist change and cling to established sets, beliefs, habits, and patterns (27). Underlying behavioral rigidity are such areas as authoritarianism, dogmatism, perseveration, stereotypy, conservatism, and the analysis of personality traits. Research supports the view that rigidity increases with age (54,55). Intelligence is also considered a factor, as rigid behavior is more prevalent in

those persons of lower intelligence (54,55). Other research in the area of psychology revealed that flexible individuals exceed rigid ones in a positive direction in all areas studied such as occupation, and scored higher on social responsibility than the rigid subjects (53).

In the world of sport, physical educators, coaches, and athletes appear to be subject to a rapidly changing environment. The need to adjust to change in sport situations is not only apparent during a game or on the field, but has also developed in recent years concerning sport practices and disciplinary measures. No longer is the athlete willing to accept verbatim a coach's commands or decisions. He is demanding answers and reasons for certain practices that have placed coaches under much stress. Coaches, as well, are attempting to adjust to their changing athletes while still trying to maintain authority. Shecter's (57) article on "the coming revolt of the athletes" and Underwood's (61,62,63) series on "the desperate coach" clearly depict this sport dilemma. Coaches have been bewildered, angry, and disillusioned, no longer certain of their position or goals.

One wonders whether the athletic world will be able to adjust to these changes taking place. Perhaps coaches will try to halt these changes by maintaining rigid, conservative behavior by closing their minds to change in their own situations and change within themselves. Even so, if persons involved in sport do try to adjust, will they return

to the habits and patterns once considered "established"?

Since teaching and coaching environments are so subject to rapid change, one needs to be concerned with the consistency of behavior in a changing environment to produce effective performance. Study in the area of behavioral rigidity across sport situations will hopefully yield insights into understanding and coping with consistency in a changing sport environment.

Scope of Problem

The problem was limited to the study of behavioral rigidity across sport situations. Although behavioral rigidity may affect coaches, physical educators, and athletes in the area of sport, the population was confined to persons with an athletic background who either indicated an interest in coaching in the future or who had previously coached a team at any time in their past. The subjects consisted of junior and senior male undergraduate students who were majoring in physical education at Ithaca College in Ithaca, New York. Each subject was a volunteer participant.

From this population, the sample consisted of 56 male volunteers (N=56) who were administered a test and a retest of Schaie's Test of Behavioral Rigidity and a sport situations questionnaire devised by the researcher. The subjects (N=56) were further divided between 36 juniors and 20 seniors ranging in age from 20 to 26 years with a mean age of 21.36 years.

Statement of Problem

The purpose of the study was to determine whether there was a consistent relationship of behavioral rigidity across sport situations.

Hypothesis

There will be no significant consistent relationship between behavioral rigidity across sport situations.

Assumptions of Study

The investigation consisted of the following assumptions:

1. Behavioral rigidity is a multi-dimensional concept.

2. The available subjects were representative of male junior and senior undergraduate physical education majors at Ithaca College.

3. All subjects answered Schaie's Test of Behavioral Rigidity (TBR) honestly and to the best of their ability.

4. All subjects were able to associate with the sport situations either vicariously or from personal experience and responded to the situations to the best of their ability.

Definition of Terms

The following terms were operationally defined for

this study:

1. Authoritarianism. An attitudinal system that consists of a number of interrelated antidemocratic sentiments including ethnic prejudice, political conservatism, and a moralistic rejection of the unconventional (2).

2. Behavioral Rigidity. A tendency to perseverate and resist conceptual change, to resist the acquisition of new patterns of behavior, and to refuse to relinquish old and established patterns (52).

3. Belief System Theory. A theory that represents all the beliefs, sets, expectancies, or hypotheses, conscious and unconscious, that a person at a given time accepts as reality (9).

4. Dogmatism. A closed system of beliefs that refers to the resistance to change of systems of beliefs--a total cognitive configuration of ideas and beliefs organized into a relatively closed system (9).

5. Flexibility. A term used to negate rigidity.

6. K. Warner Schaie's Test of Behavioral Rigidity. A test designed to measure the ability of the individual to adjust to the stress imposed upon him by constant environmental change. The test consists of three sub-tests, each of which yields two or more scores that combine to give three factor scores. The sub-tests are motor-cognitive rigidity, personality-perceptual rigidity, and psychomotor speed (12).

7. Motor-Cognitive Rigidity. A measure of effective

adjustment to shifts in familiar patterns and to continuously changing situational demands (12).

8. Perseveration. The continuation of an activity or pursuit usually to an exceptional degree or beyond a desired point.

9. Personality-perceptual Rigidity. A measure indicating an individual's ability to adjust readily to new surroundings and change in cognitive and environmental patterns (12).

10. Psychomotor Speed. A measure indicating the individual's rate of emission of familiar cognitive responses (12).

11. Stereotypy. The disposition to think in rigid categories and the tendency to resort to primitive, over-simplified, black-and-white explanations of human affairs (2).

Delimitations of Study

The study contained the following delimitations:

1. The sample was confined to volunteer participants who were male junior and senior physical education majors from the physical education department at Ithaca College in Ithaca, New York.

2. The rigidity test administered was Schaie's Test of Behavioral Rigidity which consists of only one instrument.

3. The sport situations scale consisted of 16 selected sport situations.

Limitations of Study

Due to the delimitations of the study, the following limitations became evident:

1. The subjects were volunteer participants and therefore generalizations could not be made beyond the subjects who were administered the test.

2. Each subject did not take the Test of Behavioral Rigidity and sport situations questionnaire at the same time and under the same test conditions.

3. Generalizations cannot be made beyond the composite rigidity measure across the 16 sport situations administered.

Chapter 2

REVIEW OF RELATED LITERATURE

The study of human behavior is certainly widespread throughout psychology literature as well as the study of behavioral assessment in the field of sport. With such a vast amount of literature, the researcher can quickly discern that there is conflict in the conceptual framework and theoretical background. Not only does one find conflict in behavioral theory in general, but also in the research concerning specific behavioral traits.

Behavioral rigidity-flexibility is included in this context. In spite of conflict in the area, its importance in the study of human behavior is indicative of individuals who tend to perseverate and resist conceptual change, who resist the acquisition of new patterns of behavior, and who refuse to relinquish old and established patterns (52). Although no research has been done concerning behavioral rigidity in relation to sport to the knowledge of the researcher, the terms rigidity and flexibility have been used throughout sport literature to characterize behavior of teachers, coaches, and athletes in sport situations.

For the purpose of this study, the review of related literature was divided into six sections. These include (1) trait psychology, (2) the multidimensionality of

personality, (3) meaning and theoretical origins of behavioral rigidity, (4) studies reporting behavioral rigidity, (5) criticism concerning studies in behavioral rigidity, and (6) summary.

Trait Psychology

The search for behavioral consistency has been a pervading question psychologists and sports personologists have concerned themselves with for years. As Straub (68) pointed out, men have been interested in assessing personality and questioning what others are like from about the fifth century B.C. through use of the horoscope and physiognomy. Traits today, however, are studied with greater complexity and consequently, have undergone name changes and theoretical changes over different cycles throughout recent years. Trait theory has also been termed factor theory and the individual difference theory. As entities themselves, traits have been termed factors, psychic structures, internal dispositions, and stable intra-organismic constructs to list the more prevalent terms. Even though these terms have been used simultaneously and interchangeably, there are differing views concerning them and different theoretical bases underlying trait psychology.

Classical trait theorists view traits as stable, highly consistent attributes that make a person's behavior consistent from one situation to another. Further, they serve as summaries for categories of observed behavior (47).

A classical trait theorist would assert that each individual has a characteristic level of rigidity, for example, that is constant from situation to situation. Gormly and Edelberg (42) suggested that even though data are lacking to support this view, their study of social aggressiveness provided strong evidence for the position that social aggressiveness can accurately be considered a personality trait. They, therefore, challenge persons who state that the trait viewpoint has no tangibility at all.

A criticism of classical trait psychology is that the assessment procedures do not take into account situational variables. This has led to the use of the dispositional approach to traits which is a more contemporary view and does not discount the environment. Argyle and Little (20) stated that the dispositional approach maintains stable individual differences, but allows for behavioral fluctuations across situations. The rank order of persons, however, remains constant in response to the environment.

Another area of the literature that is concerned with trait consistencies is the investigation of the role of actors and observers. As Mischel (47:264) pointed out, "the overattribution of consistency may be something people do unto others more than to themselves." A study by Sherrod and Farber (58) supported the view that personality traits are things other people have. In other words, the actors attributed their behavior to situational demands

whereas the observers attributed the same action to stable, personal dispositions. Results of two experiments by Hayden and Mischel (44) suggested similar findings due to the fact that an observer's initial impression of a person may bias the succeeding behaviors toward trait consistency.

The use of traits to search for behavioral consistencies has been an ongoing process with many questions still unanswered. Throughout the years data have often been conflicting and inconclusive. Researchers have attempted to infer broad dispositions and assign trait characteristics to persons without adequate empirical support. Examples of this in sport are researchers Ogilvie and Tutko (8), Tutko and Richards (15), and Hendry (45), to name a few. Other problems have been the assessment tools used. The testing instruments are relatively easy to administer and score, especially for large groups of subjects. Unfortunately, not only do the instruments not give accurate measures of a trait (18), but also they discount environmental variables. Alston (18) also mentioned that trait scores cannot be a basis for predicting behavior as an outcome in the environment.

A trait approach to assessing behavior has been found simply too limited in scope. Its value depends on how well traits can facilitate the prediction of one's behavior. If evidence was found to support the notion that people behave consistently across situations, then prediction of behavior could be accurately facilitated (6). Such

empirical evidence has yet to be fully manifested.

The Multidimensionality of Personality

Due to the lack of empirical evidence to support person consistencies across situations, researchers have recognized the importance that behavioral assessment of an individual is more than just personality traits, and that consideration of environmental factors needs to be included. Some researchers, in attempting to refute the trait model, appear to have gone too far in the opposite direction, though, and have considered solely the environment by ignoring or minimizing individual differences (5). The supporters of this particular model are known as situationists. The model suggests that each situation emits a different level of a trait and additionally, there is no variability within each situation (20,66). It seems that situationism, however, as cited by Bem (22:17), "has gone too far in the direction of rejecting the role of organismic or intrapsychic determinants of behavior." Bowers (23) criticized the fact that situationists depend too much on operant and experimental techniques to assess behavior, but also stated that the situationist model was necessary from a historical perspective as it was a viable counteractive to the trait approach.

As an alternative to the two extreme approaches to behavior, psychologists have suggested a third approach known as the interactionist or biocognitive view (23).

Interactionism suggests that both the person and the situation need to be considered together and that neither can function apart from the other. Interactionism, although studied by psychologists for quite some time, has yet to gain acceptance by sport psychologists (5). Ekehammar (30) stated that even though interactionism appears to be a relatively new concept, it is really older than the researchers' initial strategy of the early sixties. The earliest interactionist, as mentioned by Ekehammar (30), appeared to be Kantor who alluded to the concept in 1924. Following Kantor, others also alluded to interactionism such as Murphy, who developed a biosocial theory, and Lewin, who made reference to an individual's "life space" that included the psychological environment as well as the physical environment. The concept was discussed or referred to, however, without much empirical evidence (30). Today, such evidence does exist.

The approach to the person-situation interactionist model for empirical study did not come to the fore until the early sixties where multidimensional variance components were suggested as a strategy for research (4). Raush, Dittman, and Taylor (49) appear to be the first researchers to use such an approach. Others to follow were Endler, Hunt, and Rosenstein (37) who devised an S-R Inventory of Anxiousness and made possible the analysis of persons, situations, modes of response (reactions to each situation), and their interactions for their relative contributions to

behavioral variance.

Succeeding studies (32,33,34,35,36,48) using Endler's (31) variance components technique also partitioned behavioral variance. For the trait of anxiousness, Endler and Hunt (36) showed that about one-third of the variance came from the interactions of the main sources. When comparing the traits of anxiousness and hostility, Endler and Hunt (35) found that individual differences contributed more to the total variation for hostility than for anxiousness. For each separate trait, then, one can expect variation between each behavioral component as disclosed by the percentages that are combined to yield total behavioral variance. Such results indicated, according to the researchers, that other traits ought to be studied as well using this method if such traits are deemed important in the description of an individual.

In a different kind of a study, but using similar techniques of analysis, Moos (48) observed 16 psychiatric patients who were asked to describe their reactions to six psychiatric ward subsettings. Moos stated that persons, settings, and person x setting interactions accounted, in general, for statistically significant and important proportions of the total variance. This included subjects' responses to questionnaires as well as actual behavior. Moos indicated that in contrast to responses to questionnaires, actual behavior contributed a greater source of variation in proportion to the total variance.

In spite of hesitation by some concerning the methodological approach to partitioning behavioral variance (68), evidence to support the position of interactionism is in focus. Sport psychologists generally have yet to incorporate interactionism in the area of sport, but strides are being made to provide a sounder theoretical framework from the field of psychology and the study of personality. In sport, however, a study has been done which was modeled after Endler, Hunt, and Rosenstein (37). Horsfall (67) designed an inventory of anxiousness specifically using basketball situations to locate sources of behavioral variation. Results were surprisingly similar to those of Endler, Hunt, and Rosenstein (37). The combination of the simple interactions was approximately one-third of the total variance. Horsfall (67) concluded that neither the person nor the situation alone substantially contributed to the total behavioral variation in sport-related situations for the trait of anxiousness.

From a researcher's standpoint, it appears that at this time the model of interactionism projects the most viable approach to behavioral assessment. As noted by a survey of studies involving personality and situational variables, Sarason, Smith, and Diener (51) reported that studies involving main effects and interactions have increased. The issue that still permeates an acceptance of interactionism, is the assessment methods employed that further provide meaningful measures of individual differences (51).

Goldfried and Kent (41:419) pointed out this problem as well in stating that "one of the basic characteristics of behavioral assessment is the attempt to maximize the similarity between test response and criterion measure." Assessment techniques, then, need to be developed to increase inferences from test response to the actual situation. In spite of this limitation, researchers appear more sensitive to the interactionist approach and are continuing their investigation with broader horizons and greater challenges.

Meaning and Theoretical Origins of Behavioral Rigidity

Behavioral rigidity is not a simple concept and is a term that has proved difficult to define. Rigidity has been used to describe behaviors characterized by the inability to change habits, sets, attitudes, and discriminations (27). Schaie (52) defines it as a tendency to perseverate and resist conceptual change, to resist the acquisition of new patterns of behavior, and to refuse to relinquish old and established patterns. The term has been reported by some researchers as a unitary trait, but more recent literature points to the use of the term as a multidimensional concept (21,24,25,27,38,40,46,51,53,64,65). In relation to those persons who are authoritarian in nature, Adorno (1) suggested rigid thinking occurs in people who support the status quo, resist social change, and support conservative values. Besides authoritarianism, rigidity research has also been associated with dogmatism, perseveration, stereo-

typy, conservatism, problem solving, and the analysis of personality traits.

Rigidity is a term that has actually grown from the term perseveration which was first introduced by Neisser in 1894 and was then described by Spearman in 1927. The word rigidity was first actually used in 1935 by Cattell, and according to Chown (27), one of the best definitions seemed to be that given by Cattell and Tiner (26) in 1949 in describing disposition rigidity. This type of rigidity refers to the difficulty with which old established habits may be changed in the presence of new demands. Chown (27) stated that rigidity has also been studied in relation to brain injury. Rokeach (9) distinguished dogmatic thinking from rigid thinking in that dogmatic thinking is resistance to changing a system of beliefs and rigid thinking is resistance to changing single beliefs. If a person is characteristically rigid, said Rokeach (9), then his difficulties center in thinking analytically. Werner (64) made the distinction that rigidity has been defined structurally by some researchers and functionally by others, thereby creating differences between investigators over interpretations of the term rigidity. One theory which most of the earlier experimenters avoided is the Lewinian theory that links rigidity to the presence of strong boundaries between mental functions. Chown (27) suggested that Lewin neglected the dynamic relation of a certain task to the mental make-up of an individual.

Rigidity, then, due to the ambiguity and different uses of the term, has its basis in several theories. The type of rigidity described for the purpose of this research study, has its basis in Adorno's (1,3) authoritarianism and Rokeach's (3,9) theory of belief systems that stems from Adorno's authoritarianism. Originally Adorno's theory, from a psychoanalytic point of view, has its origins in understanding the roots of prejudice. An authoritarian personality may be produced by parental use of harsh and rigid forms of discipline on the child (3). Unquestioning obedience is expected from the child with parents emphasizing duties and obligations. The parent may be contemptuous or exploitive toward persons of lower status and, under these conditions, a child could develop hostility and fear, being overly dependent without the ability to defy or question parental authority. By repressing rigidly all hostility toward the parents, the child begins to identify with authority and displaces hostility to out-groups who are usually of lower status. The need to repress frustrations felt in earlier childhood leads to a rigid personality organization, stereotyped thinking, and punitive attitudes with idealization of strength and toughness. Both Adorno (1) and Rokeach (9) speak of this behavior as expressed by fascists.

Rokeach (9) developed a theory concerning a system of beliefs and disbeliefs. A system is open to the extent a person can receive, evaluate, and act on relevant informa-

tion from the outside, and an enduring state of threat is asserted to create the closed mind. An authoritarian family may predispose the child to develop defensively rigid and closed belief systems (3). Rigidity, in this case, points to difficulties in overcoming single sets or beliefs encountered in attacking, solving, or learning specific tasks or problems. Therefore, stated Rokeach (9), high rigidity should lead to difficulties in the analytic phase of thinking, and high dogmatism leads to difficulties in the synthesizing phase of thinking.

Research in Behavioral Rigidity

Experimental and research studies on behavioral rigidity cover a broad spectrum in the field of psychology. Studies are reported associating rigidity with another term, rigidity as a "trait," problem-solving studies, age and intelligence studies, and research on the behavioral consistency of rigidity, to list the more prominent ones. Goins (40) mentioned several questions asked by researchers in the area. For instance, why do people persist in behavior when it is no longer useful? Why do they hold on to their accustomed patterms of behavior when other more efficient ones are available? Why do they manifest behavior which is sometimes destructive and self-defeating? These questions appear to be some of the more salient ones, however, researchers have such a diversity of theoretical bases and definitions, that often the term "rigidity" will be used while

researchers are studying differing areas. With regard to terminology, the expression "flexibility" is used to negate the term rigidity in order to place the behavioral concept on a continuum from the extreme of flexibility to the extreme of rigidity.

Studies by Schaie (52,53,54,55) reported a number of interesting findings in the area. Noting differences between "rigid" and "flexible" individuals, Schaie (53) reported that flexible individuals exceeded rigid ones in a positive direction in all areas studied. Extremely flexible subjects had more education, a higher mean income, were successful and happier, had a higher occupational level, and scored higher on social responsibility than rigid subjects. Another variable in the study of rigidity is age. It was found that people become more rigid with increasing age on all dimensions of rigidity measures (52), and by the time a person reaches the age of 40, a loss of flexibility is definitely noticeable (54,55). Schaie did not report the reason for loss of flexibility, but suggested it could be by maturational change or environmental effect. In sum, changing patterns of interpersonal relationships, continuous readjustment of motor activities, changing activities, and activities requiring alternation, all pose difficulties for a rigid person (54).

Other types of studies associate rigidity with some other term. For example, rigidity has been studied in relation to authoritarianism. Brown (24) cited such a relation-

ship and concluded that the rigidity that is associated with authoritarianism is a kind of defensive behavior that is perceived as warding off personal failure. This conclusion was reached as Brown (24) was successful in creating conditions that aroused the behavior. More recently, Rogers and Wright (50) investigated whether there was a relationship between behavioral rigidity, authoritarianism, and obsessive-compulsiveness. The subjects were administered Schaie's TBR, the California F Test, and Scale 7 of the MMPI where researchers found no significant differences between correlations for males and females. There were tendencies evidenced, however, relating to the person-perceptual and psychomotor speed aspects for the sample tested which warranted further study toward a better definition of behavioral rigidity including authoritarianism and/or compulsiveness.

Behavioral rigidity is often alluded to concerning motor ability, task achievement, or performance. Chown (28) reported that when testing subjects in job performance, generally the older subjects performed less well than the younger ones, but age did not necessarily imply a lack of flexibility. Using Schaie's TBR, Shockley (59) investigated whether behavioral rigidity had an influence on the success of college students in a physical science course. When compared by analysis of variance, the extremely flexibile subjects performed significantly better than the rigid ones on factors such as knowledge of elementary math, over-all scholastic aptitude, quantitative aptitude, reading profi-

ciency, skill in critical thinking, and skill in applying principles of physical science to new situations. Individual differences in concept learning ability to perform a variety of tasks has been studied where the tasks necessitated that a subject perform with a flexible approach (29). Concept learning ability was not found to be significantly related to rigidity with these subjects, however.

In the area of psychology, there has been a continual search for consistency in behavior. If traits, so to speak, were found consistent across situations, then behavior could accurately be predicted. Since empirical evidence does not support this notion, there has been conflict among psychologists concerning the generality of traits. Behavioral rigidity is no exception. The conflict prevails in this area as well with studies supporting or rejecting the generality of behavioral rigidity. Schmidt and others (56) supported the idea that rigidity is a consistent personality trait, but other studies (21,25,38) point to the multidimensionality of rigidity. Fink (38) hypothesized that if problem-solving behavior is affected by a unitary trait of rigidity, the subjects would tend to maintain their rank-order positions. Evidence was to the contrary. Fink concluded that rigidity was too complex to expect consistency. Researchers' concern that the behavior is more than just a function of the person was depicted by the conclusions of Bry and Nawas (25). The successive events as well as the interaction of one's reinforcement history needs to be con-

sidered. Belmont and Birch (21:3) summarized their position by the following statement:

> . . . it should be recognized that the resulting behaviors are determined by neither factor alone, but by the interaction of situational and personality variables. This view of the problem suggests that a full analysis of rigidity must include analysis of both situation and person, as well as of the interactions between them. Rigidity would then not exist within an individual to be projected into concrete situations, nor could the structure of the situation alone elicit rigid behavior.

A series of tasks was administered by the researchers to subjects with the conclusion that situational demands and personality trends simultaneously determine behavioral rigidity. Belmont and Birch (21) suggested that an individual should not be classified as rigid or nonrigid, based upon his performance of any single task.

Criticism Concerning Studies in Behavioral Rigidity

It should be noted that a variety of reviews in the literature of behavioral rigidity (27,39,40,46,64,65) have determined that contradictions have occurred because basically there is little agreement to the identity or definition of the term. The term appears to have been used in different ways for different studies without a strong basis of support or theory. Werner (64) reported that some authors have defined rigidity structurally while others defined it functionally. A functional use implies organismic impairment such as a person with brain injury or it may refer to a person organically unimpaired, but frustrated. The concept

of rigidity has also been used in a structural sense in reference to the structural organization of personality. In addition, confusion arose because researchers have interchanged the concept of rigidity with stability. A final criticism by Werner (64) was that generalizations have occasionally been derived from the assumption that rigidity is a uniform rather than a multiform concept.

Further analysis in the area of rigidity revealed criticism in assessment tests used by researchers to measure rigidity (27,40). Chown (27) stated that relationships between tests of rigidity are not always known and that overlap between experiments has been exceedingly small. Chown (27:209) also mentioned the following:

> . . . where two people have used the same two tests, their results hardly ever agree and it is hard to say whether this is due to faults in the tests, or discrepancies in the conditions, administration, and scoring of the tests.

From a review by Goins (40) in 1962, it was stated that the validity of the most prevalent measure of rigidity, the water-jar Einstellung test, was in doubt. Chown (27) urged the alteration and review of some of the rigidity measures.

Wolpert (65), in his review, suggested that researchers look at a new view of rigidity. He felt that individuals have studied primarily the negative aspects, and that the positive aspects of rigidity have been overlooked. Caution must be taken, in other words, with regard to an individual's range of behavior. Wolpert, furthermore, stated that an

individual should not be judged by a simple pencil and paper test alone. Researchers have been unwise to draw conclusions that there is a generalized rigidity factor. With regard to the generality of the "trait," Wolpert (65:589) stated the following:

> The individual rigid in some areas and flexible in others would be the exception rather than the rule, for the existence of a general rigidity syndrome implies that there should be a consistency in the degree of rigid behavior an individual exhibits in different areas of mental functioning.

The experimenter based his statements of caution on his own investigation. His 38 subjects failed to exhibit consistent rigidity scores on different tasks. Wolpert (65) concluded that the search for a generalized syndrome should be replaced by a search in the conditions in which it would be manifested.

Summary

Psychologists and sports personologists have continued to study human behavior with the pervading hope that at a future time, the prediction of behavior will be within grasp. This study has often led researchers into diverging areas with experimentation dealing with the analysis of personality traits or behavior as a function of the situation. Since these areas represent limitations to behavioral analysis, a third approach has come into focus that deals with both the components of the person and the situation. This model has been termed interactionism and states that an individual's

behavior is a function of intrapsychic structures interacting with environmental situations simultaneously. Recent research (4,31,32,35,36,37,48,67) using a variance components technique appears, at this time, to be a viable approach toward answering the conflicting question of behavioral consistency. Experimenters using this technique supported the interactionist position.

Behavioral rigidity, as was evidenced in the literature, is an ambiguous term that needs to be operationally defined for research. Rigidity has been defined numerous ways, but is commonly regarded as one's resistance to changing sets, habits, beliefs, attitudes, and discriminations (27). Underlying behavioral rigidity are such areas as dogmatism, authoritarianism, conservatism, stereotyping, and perseveration. Much of the recent literature in the area supported the existence of multidimensionality in behavioral rigidity, rather than the previously conceived idea that rigidity was a uniform trait. Research in behavioral rigidity does lend support to the general criticism of consistency in behavior as some researchers in the area appear to have recognized the importance of studying both the person and the situation as well as their respective interactions (21,38,65).

Continued research has been urged by many of the investigators toward seeking answers to the questions underlying the analysis of behavior. Interactionism has certainly opened "Pandora's box" so to speak, with the hope that researchers can continue to make strides with conclusive empirical evidences.

Chapter 3

METHODS AND PROCEDURES

The methods and procedures used by the experimenter for the study are outlined in this chapter. The selection of subjects, the use of the testing instruments, and the methods of data collection are described in the first sections. Scoring and treatment of data follow with summarization in the concluding section.

Selection of Subjects

From a population consisting of junior and senior male, undergraduate, physical education majors at Ithaca College in Ithaca, New York, a sample of 56 subjects (N=56) volunteered to participate in the study. These subjects included 36 juniors and 20 seniors ranging in age from 20 to 26 years with a mean age of 21.36 years.

Testing Instruments

There were two testing instruments used in the study. Schaie's Test of Behavioral Rigidity (TBR) was used to measure the construct of behavioral rigidity and a sports situations scale was devised by the researcher to test for subjects' responses to situations that could elicit change.

Test of Behavioral Rigidity

The TBR is a three-dimensional system designed to test three factors of rigidity. These are motor-cognitive rigidity, personality-perceptual rigidity, and psychomotor speed. A composite rigidity quotient is also measured. The TBR consisted of timed and untimed sections that took a total of 30 minutes to administer.

The Capitals Test and the Opposites Test are timed tests where the subject must think and respond quickly. In the Capitals Test, a subject was asked to copy a paragraph exactly as he saw it. He was then asked, in a succeeding time period, to reverse every letter of the original paragraph. The Opposites Test was series of three subtests using antonyms and synonyms where a response pattern could be formed. The subject, in the third subtest in this series, was then asked to combine the two initial tests by responding to either capital letters or small letters according to whether the response was an antonym or a synonym.

The Questionnaire is an untimed test where the subject was asked to complete all questions. This section was designed to indicate a subject's flexible responses to social responsibility and only certain responses were used for two scales. Other responses were used as filler items and were intended to mask the items used for the flexibility scales.

Sports Situations Scale

The second testing instrument was a sports situations scale that was administered to procure responses to a variety of athletic situations that tested the individual's resistance to change. It was devised by the researcher with the assistance of several male coaches and a graduate sports psychology class to create situations that were representative of real life experiences. A sample of 16 situations was administered that included making decisions and testing the beliefs of the subject. The experimenter purposely included situations that ranged from a relatively easy response, such as voting for a team captain, to situations that were relatively difficult to form a quick response to, such as the suspension of a star player. All of the situations were formulated from the position that each player was "coach." The subjects were asked to respond to a five-step scale spanning from strongly agree to strongly disagree (See Appendix C).

Methods of Data Collection

The data were collected by the administration of a test and a retest approximately four weeks later of Schaie's Test of Behavioral Rigidity and the sports situations scale. The subjects were contacted originally for the first administration from intact classes and were requested to fill out a participation form that indicated whether they were willing to take part in the experiment (See Appendix B).

This was repeated in four weeks so subjects could indicate time availability.

At both testing administrations, the subjects were given the sports situations scale first so as not to bias their responses from the TBR. After writing in their name and grade level, subjects were asked to read the directions silently (See Appendix C) and to begin immediately if there were no questions. This test was not timed so that when completed, subjects were told to indicate by an upraised hand that they were through. When all had finished the situations scale, each subject was given a copy of the TBR and was told to fill in all the personal information on the front of the test booklet. This included name, age, date of birth, last grade completed in school, and occupation. The experimenter, then, indicated that the TBR was only connected with their ability to adjust to change. The subjects were asked to read silently the instructions of the test while the experimenter read the directions out loud. These instructions can be seen in Appendix A. Subjects were allowed to ask questions before each test as well. Since the final section of the test was the untimed Questionnaire, each subject was allowed to leave immediately upon completion of the section after turning in the test booklet to the experimenter.

Scoring of Data

Both the Test of Behavioral Rigidity and the sports

situations scale were scored by hand. Each sport situation, depending on the decision to be made, could be termed either a "rigid" situation or a "flexible" situation. The scale devised was based on the Likert method where numbers were assigned from one through five with a one indicating a very rigid response and a five indicating a very flexible response. According to the direction assigned to each situation, whether positive or negative, a number from one to five could be paired with each of the subject's responses. This data were filled in on a chart beside each subject's name so that it could be subjected to computer analysis at a later time.

Each test booklet of the TBR was also scored by hand and subjects were not penalized for spelling errors in any section. Raw scores were tabulated for each section with decimals carried out to two places. In the Opposites Test, words that were started incorrectly, then corrected, or any word that was erased could not be counted. After all raw scores were tabulated, they were converted to weighted scores (13). The weighted scores for each factor were totalled and could be interpreted as standard scores with a mean of 50 and a standard deviation of 10. The weighted scores were then subjected to separate factor tables to yield "Rigidity Quotients" with a mean of 100 and a standard deviation of 15. The separate factor scores are arranged on tables in seven-year intervals from 22 to 84 years (13). The Rigidity Quotients were interpreted by the following

classification (13:9):

	Score		Interpretation
if	69 or below	as	very rigid
	70 to 79	as	rigid
	80 to 89	as	moderately rigid
	90 to 109	as	average
	110 to 119	as	moderately flexible
	120 to 129	as	flexible
	130 or above	as	very flexible

Since the subjects in this experiment ranged in age from 20 to 26 years, their scores were interpreted from Schaie's age interval of 22 to 28 years (13).

Treatment of Data

The data were subjected to SPSS programs (7) from the statistical library available at Ithaca College, in Ithaca, New York. Mean scores and standard deviations with all items separate were derived from the Tallys program, however. The data were treated to this program in order to discriminate between the resulting scores from both the test and the retest.

To locate reliability data between the test and the retest, the data were treated by the SPSS program Pearson Corr to find Pearson product-moment correlation coefficients. The data were then factor analyzed whereby a principal component solution and the varimax rotation of the factor matrix are performed. This determined the minimum number of independent dimensions needed to account for most of the variance in the original set of variables (7). A stepwise multiple regression from the situations followed, indicating

where factors loaded the highest. Finally, the data were treated to canonical variate analysis to maximize the relationship between the two sets of variables.

Summary

This chapter was concerned with the methods and procedures used in the study. The basic design was to test for a measure of a behavioral trait and to locate responses from a variety of hypothetical sport situations using a five-step Likert scale. The subjects used were 56 male physical education majors at the college level who were administered a test and a retest of Schaie's Test of Behavioral Rigidity and a sports situations scale. Data were scored and then treated by the SPSS programs at the computer center to obtain statistical analysis to test the hypothesis.

Chapter 4

ANALYSIS OF DATA

The data that were analyzed for the purpose of this investigation are outlined in this chapter. The first two sections consist of (1) analysis of demographic data and (2) the reliability of the data. Following this, the chapter was divided into five more sections which include (3) mean scores and standard deviations, (4) test/retest reliability coefficients, (5) a varimax rotated factor matrix, (6) analysis of variance and multiple correlation coefficient, and (7) canonical correlation. The chapter is concluded by a (8) summary.

Analysis of Demographic Data

From a total population of junior and senior male, physical education majors at Ithaca College, 56 persons (N=56) volunteered to participate. It was found that there were 36 juniors and 20 seniors in the group. After all the participants had taken part in both the test and the retest, it was found during the scoring that four of the subjects had obviously misunderstood all of the directions due to a large discrepancy between scores for their test and retest. At this point, the four subjects were dropped from the experiment. The remaining subjects (N=52) consisted of 34

juniors and 18 seniors with a mean age of 21.38 years.

Reliability of Data

Direct reliability data were obtained in this experiment by the administration of a test and a retest of Schaie's Test of Behavioral Rigidity and a sports situations scale devised by the researcher. However, since the subjects were volunteer participants, the reliability data are limited to the 52 subjects that were administered the tests only under the conditions at the time the tests were administered. The data are also only reliable within the limitations of the developer of the TBR and his scoring procedures as well as the limitations of the sports situations scale devised.

The reliabilities for each of the subtests of behavioral rigidity that Schaie administered are reported by test/retest correlations in the TBR manual (13). Schaie's correlations were adjusted by the Spearman-Brown Formula and were reported for various ages arranged in seven-year intervals.

Mean Scores and Standard Deviations

The mean scores and standard deviations for the test and retest rigidity factors and sport situations are presented in Table 1. For the rigidity factors, personality-perceptual rigidity had the highest mean score of 94.94 for the test, while the psychomotor speed factor had the highest mean score of 97.87 in the retest. The standard deviations are also outlined in the table with the composite rigidity score showing

Table 1

Mean Scores and Standard Deviations For Test and Retest Rigidity Factors and Sport Situations

Test Item	Test (N=52)		Retest (N=52)	
	Mean	S.D.	Mean	S.D.
1. M-C Rigidity	93.75	7.84	93.81	8.00
2. P-P Rigidity	94.94	11.78	91.56	14.22
3. Psych. Speed	92.92	11.70	97.87	12.12
4. Comp. Rigidity	93.96	5.34	94.04	7.62
5. Situation 1	4.54	0.61	4.58	0.64
6. Situation 2	3.42	1.29	3.33	1.32
7. Situation 3	4.19	0.82	3.77	1.13
8. Situation 4	1.98	0.98	2.27	0.99
9. Situation 5	1.81	0.89	1.94	0.87
10. Situation 6	1.79	0.94	1.60	0.63
11. Situation 7	2.29	1.26	2.31	1.09
12. Situation 8	4.15	0.67	4.19	0.84
13. Situation 9	2.65	1.10	2.77	1.20
14. Situation 10	3.63	1.33	3.90	1.07
15. Situation 11	3.23	1.13	3.02	1.15
16. Situation 12	2.62	1.40	2.58	1.23
17. Situation 13	1.77	0.88	1.83	0.86
18. Situation 14	3.77	0.85	3.90	0.80
19. Situation 15	3.12	1.28	3.23	1.18
20. Situation 16	3.46	1.21	3.33	1.18

the lowest overall standard deviations for both the test and the retest.

The sport situations, listed under test items five through 20, show mean scores and standard deviations as well. The mean scores ranged from a high of 4.54 in situation one, indicating a very flexible overall response, to a low of 1.77 in situation 13, indicating a very rigid overall response for the test. Retest mean scores show a range of 4.58 for situation one to a low of 1.60 in situation six. The standard deviations for the sport situations ranged from 1.40 to 0.61 for the test and from 1.23 to 0.63 respectively for the retest. Both of the highest standard deviations are represented by situation 12, but for the lowest standard deviations, situation one is representative for the test, while situation six had the lowest for the retest.

Test/Retest Reliability Coefficients

The reliability coefficients for both the rigidity factors and sport situations from the test to the retest are presented in Table 2. For the rigidity factors and composite score, it can be seen that the reliability coefficients ranged from a high of .82 for both personality-perceptual rigidity and psychomotor speed, to a low of .40 for motor-cognitive rigidity.

The reliability coefficients for the 16 sport situations are represented by a high in situation one of .75 to a low of .08 for both situations six and 14. The reliabilities

Table 2

Test/Retest Reliability Coefficients For Rigidity Factors and Sport Situations*

Test Item	r (N=52)
1. M-C Rigidity	.40
2. P-P Rigidity	.82
3. Psych. Speed	.82
4. Comp. Rigidity	.77
5. Situation 1	.75
6. Situation 2	.53
7. Situation 3	.45
8. Situation 4	.65
9. Situation 5	.70
10. Situation 6	.08
11. Situation 7	.55
12. Situation 8	.55
13. Situation 9	.61
14. Situation 10	.62
15. Situation 11	.51
16. Situation 12	.55
17. Situation 13	.49
18. Situation 14	.08
19. Situation 15	.71
20. Situation 16	.56

* Rounded to two places.

for the sport situations have a wider range overall than the rigidity scores. However, the rigidity scores are generally represented by higher reliability coefficients with the exception of motor-cognitive rigidity.

Varimx Rotated Factor Matrix

A factor analysis of the 16 sport situations that included an orthogonal rotation of the factors with a varimax solution is presented in Table 3. This analysis was done for the scores from the test administration only. By factor analyzing, the scores were reduced to commonalities so that the distance between the situations was maximized in order to prevent redundancy.

As outlined in the table, there were a total of seven factors emitted from the data. For each of the separate factors from I to VII, the variable that loaded the highest was extracted. It can be noted that variables 4, 9, 13, 1, 10, 2, and 7 were extracted for each of the respective factors in that order.

Analysis of Variance and Multiple Correlation Coefficient

By using the most discrete situations extracted from the factor analysis, the data were subjected to an analysis of variance of the regression of the sport situations on scores of behavioral rigidity. This can be seen in Table 4. The degrees of freedom, sums of squares, and mean squares

Table 3

Varimax Rotated Factor Matrix of Sport Situations*

Variable	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI	Factor VII
1.	0.08	-0.10	-0.02	0.79	0.01	0.04	-0.01
2.	-0.19	0.08	0.18	-0.31	-0.03	0.77	-0.07
3.	-0.67	-0.08	0.07	-0.04	0.08	0.41	0.16
4.	0.76	0.16	-0.23	0.07	0.16	0.20	0.29
5.	0.13	-0.02	0.54	0.10	0.64	0.23	-0.21
6.	0.09	-0.03	-0.11	0.22	-0.07	0.75	0.08
7.	0.04	-0.02	-0.02	-0.02	0.02	-0.00	-0.86
8.	0.15	-0.48	-0.16	0.49	-0.30	0.18	-0.05
9.	-0.13	-0.81	0.26	-0.05	-0.06	0.00	-0.06
10.	0.01	0.04	0.12	0.02	-0.84	0.14	-0.02
11.	-0.18	0.23	0.50	-0.03	-0.08	0.18	-0.57
12.	-0.09	0.36	0.22	0.72	0.06	-0.19	0.19
13.	-0.16	-0.07	0.81	0.01	-0.03	-0.17	0.08
14.	0.33	0.04	0.34	0.08	-0.22	0.31	0.59
15.	0.14	0.70	0.26	-0.00	-0.34	0.12	-0.17
16.	0.45	-0.00	0.16	-0.46	-0.09	-0.01	-0.52

*Rounded to two places.

Table 4

Analysis of Variance of the Regression of Sport Situations on Scores of Behavioral Rigidity and Multiple Correlation Coefficient*

Analysis of Variance	df	SS	MS	F	R
Regression	7	210.21	30.03	1.06	0.38
Residual	44	1243.71	28.27		

*Rounded to two places.

are each reported on the table. The resulting F ratio and multiple correlation coefficient are reported as well. Due to the reported F ratio of 1.06, the hypothesis was therefore accepted.

Canonical Correlation

Because there is more than one factor that yields a composite rigidity score, the subtests of behavioral rigidity were further treated simultaneously by canonical correlation, which is reported in Table 5. As can be seen, a resulting eigenvalue, corresponding canonical correlation, degrees of freedom, and chi-square were all reported. A chi-square figure of 20.22736 was not significant. This information additionally reinforced the acceptance of the null hypothesis.

Summary

The analysis of the data through a statistical assessment was presented in this chapter. Mean scores and standard deviations as well as reliability coefficients for both a test and a retest of behavioral rigidity and sport situations were reported first. A continued investigation included factor analysis where seven discrete situations were extracted. The data were then subjected to a multiple regression analysis between the seven situations and behavioral rigidity scores, and a final analysis by canonical correlation between subtests of behavioral rigidity and the sport situations. The resulting F ratio and chi-square

Table 5

Canonical Correlation Between Sub-Tests of Behavioral Rigidity and Sport Situations

Eigenvalue	Corresponding Canonical Correlation	Degrees of Freedom	Chi-Square
0.19006	0.43596	21	20.22736

values were found to be not significant. Therefore, the hypothesis was accepted.

Chapter 5

DISCUSSION OF RESULTS

For the purpose of discussing the results of this investigation, the chapter is subdivided into two major sections. The first section is the discussion of the results of the present study and the second section is a comparison of the results of the present study to other studies with similar findings, either in psychology in general or in sport psychology. The chapter is concluded with a summary.

Results of Present Study

It is understood for this study that behavioral rigidity is composed of several factors that were each tested separately and then averaged for a composite behavioral rigidity score. The factors were known as motor-cognitive rigidity, personality-perceptual rigidity, and psychomotor speed. It can be seen in Table 1 that the mean scores and standard deviations for both the test and retest were reported under test items one through four. Interestingly enough, the means for both the test and retest ranged from 91.56 for personality-perceptual rigidity in the retest to 97.87 for psychomotor speed, also reported under the retest. The range of these scores all can be categorized by Schaie's classification as "average." Since the classification of

average ranges from 90 to 109, these means can be considered average with tendencies toward the moderately rigid category. This would not be a particularly surprising finding since a great deal of conceptual literature in the area of sport refers to coaches as authoritarian, rigid, inflexible, or resistant to change (5,8,13,14,15,16,45,57,61,62,63). The fact that the means were average with rigid tendencies for this particular population is probable since the subjects are yet young in the sense of coaching experience on a personal basis. Schaie (54,55) reported that the older a person becomes, the more rigid the person tends to be as habits and lifestyles become set and familiarity with one's environment is more firmly rooted. Perhaps experienced coaches with many years in the field would indicate greater responses in the rigid category.

Greater standard deviations under personality-perceptual rigidity and psychomotor speed factors seem to indicate a wider range of responses than the other factors. This result causes one to suspect that these two factors would elicit greater individual or personal responses for this particular set of subjects for adjustment to new surroundings and the rate of emission of familiar cognitive responses. There are many reasons why an individual responds the way he does in any circumstance. Perhaps it is his background, educational experience, parental upbringing, or circumstances at the moment. Whatever the reason, it was not unusual to find subjects very rigid or very

flexible for individual scores under these two factors. Thus, a greater standard deviation appears indicative of greater subject variation.

The 16 situations were also presented in Table 1 under test items four through 20. The means for both the test and retest measures ranged from a high of 4.58 for situation one under retest to a low of 1.60 for situation six, also under retest means. Since the scoring was based on the Likert methods, responses could range anywhere from 1.00 to 5.00. A 1.00 indicated a very rigid response and a 5.00 indicated a very flexible response to the situations. Situation one overall received the most flexible responses with very little deviation. The situation concerned whether the subjects would change from "coach" picking the team captain to allowing the players to vote for team captain. A very flexible response seemed to indicate that these subjects probably experienced voting for team captain and were successful using this method. A small standard deviation indicates that possibly the subjects were not responding to changing from selecting to voting, but rather responded more to their feelings that they would prefer a voting situation. Similar responses toward flexibility are apparent in situations 3, 8, 10, and 14. It is also interesting to note that for situations 3, 8, and 14, there are relatively smaller standard deviations as well.

A very rigid response would be indicated by responses at 1.00 on the Likert model. Situations 5, 6, and 13

appear to have the most rigid responses for both the test and retest with situation six having the lowest overall mean scores. This situation was considered a highly evoking one as the coach had to decide whether he would cut a disinterested and overweight player from his football team under pressure from the player's father who was a member of the school board and president of the booster club. The subjects generally answered with rigid responses.

The remaining situations were answered on a more moderate level with tendencies either toward rigidity or flexibility. Larger standard deviations are also more generally apparent indicating that the subjects had a wider range of responses for these particular situations. The largest standard deviations overall from test to retest appears to be situation 12. The situation suggests changing an entire offensive strategy during a basketball playoff game where a win was a must. Apparently, this situation permitted a greater range of response by the subjects with slight tendencies toward the rigid category. Since this situation did not have moral implications, as it basically was a technique decision, the subjects offered a wider variation in response in spite of the fact that this situation can also be considered intuitively highly evoking.

The test and retest reliability coefficients were reported for both the rigidity factors and sport situations in Table 2. Schaie's Test of Behavioral Rigidity overall emitted the highest reliability coefficients. The coefficients

for personality-perceptual rigidity and psychomotor speed yielded the highest scores. These scores appear to be in rather an acceptable range as Schaie (13) reported very similar correlations, also in the same region. The composite rigidity score in Table 2 shows a correlation of .77, which is also very similar to Schaie's .79 that was reported for the two seven-year intervals from 1956 to 1970. Schaie's scores were adjusted by the Spearman-Brown Formula, however. The exception appears to be motor-cognitive rigidity. The investigator reported a correlation of .40 whereas Schaie reported an adjusted correlation of .68. It can be recognized that motor-cognitive scores were low overall for both the investigator and Schaie. In spite of the difference, it should be realized that the test/retest was limited to a four-week separation whereas Schaie's test/retest coefficients were treated to seven-year intervals. It is possible that the type of subtests given for motor-cognitive rigidity were somewhat retained by the subjects over the four-week span as the opposites test sets up a response pattern. The subjects may also have discussed the test even though they were told not to discuss their experiences until after the retest. The responses for the subtests under motor-cognitive rigidity would have been the only feasible tests that the subjects could have remembered from Schaie's TBR.

Test/retest reliability coefficients were obtained for the 16 situations as well. The coefficients ranged from a high of .75 for situation one to a low of .08 for both

situations six and 14. These coefficients overall can at best be considered mediocre. With the exception of the two situations with the lowest correlation, the next lowest correlation was situation three with .45. It appears that situations six and 14 were either morally or emotionally based. Perhaps the subjects misunderstood the intentions of the investigator for their response to these two items. The subjects were to respond whether they agreed or disagreed with the decision made by the coach in each situation. It is also possible that the subjects "read into" these situations rather than responding to each situation with an immediate response as instructed.

Situations 1, 5, and 15 received the highest reliability coefficients with .75, .70, and .71 respectively. These situations were considered "light" as opposed to the more highly evoking ones as decisions here were easier to make, hence, perhaps the higher correlations. Situation one concerned voting for a team captain, situation five, benching a player, and situation 15 concerned a football player intending to keep a beard. Even though the light situations revealed the highest reliability coefficients, the intention of the investigator was to attempt to evoke a range of responses by including a variety of situations with some difficult decisions to be made. Since the subjects were inexperienced with coaching, perhaps older coaches who have experienced some of these situations, would respond with greater reliability.

The procedure utilized for the rest of the investigation is shown in Tables 3, 4, and 5. Basically, the data were reduced from a larger to a smaller size. The 16 situations were subjected to a factor analysis with orthogonal rotation and a varimax solution. From the seven factors, a variable was extracted from each factor that loaded the highest. Variables 1, 2, 4, 7, 9, 10, and 13 were found to be most discrete. These situations were then subjected to an analysis of variance of the regression of the sport situations on the behavioral rigidity scores. A resulting F ratio of 1.06 was not significant which was expected, since it was hypothesized that behavioral rigidity would not be consistent across sport situations. The final analysis was a canonical correlation that subjected the three subtests of behavioral rigidity and sport situations to statistical analysis. This program checks whether a particular type of patterning exists in the data. The resulting chi-square figure was also not significant. Again, this finding was not surprising as it shows that the subtests of motor-cognitive rigidity, personality-perceptual rigidity, and psychomotor speed are not consistent across sport situations when subjected to a simultaneous statistical data analysis.

Comparison of Results of Present Study to Other Studies

The ability to predict behavior across situations is a much sought after and challenging field of study. As yet, concrete evidence that persons can predict behavior in situations has not been found. The problem stems basically from the use of theories in behavior that have not been substantiated by research. Although theoretical clarification in research studies has been dealt with more adequately in the field of psychology, sports personologists are yet relatively limited to the investigation of personality traits or environmental influences. There are some sport personologists who are aware of the dilemma, however, and increasing concern has led several researchers to study the position of interactionism.

The present study was prompted by this concern for further study from an interactionist's viewpoint. The results point to the fact that behavioral rigidity is not consistent across sport situations for the population investigated. These findings were not surprising since recent literature dealing with the consistency question has been supportive of interactionism. In the area of sport, Horsfall's (67) study locating sources of behavioral variance in sport-related situations is an evidential approach to interactionism. By partitioning the variance between persons, situations, modes of response, and their respective

interactions, Horsfall (67) concluded that the trait of anxiousness, in effect, could not be consistent across situations as neither the person nor the situation alone significantly contributed to the total variance in basketball situations.

Horsfall's (67) study using the field of sport was modeled after a study by Endler, Hunt, and Rosenstein (37). Endler, Hunt, and Rosenstein's study (37) and succeeding studies (32,35,36,48) in the field of general psychology, all support interactionism and stress the need to other researchers to use a more viable approach in researching consistencies in behavior.

Research in behavioral rigidity has not been without its conflicts as well. These conflicts are based primarily upon the same question. If behavioral rigidity was a general trait, then it would be consistent and predictable across situations. The majority of evidence has been to the contrary, however. Schaie's research (52,53,54,55) has supported the multidimentionality of rigidity, and Fink's (38) study reporting negative evidence concerning the generality of rigidity, seem to indicate that few researchers consider rigidity as a generalized trait.

The clearest studies indicating the need to examine persons as well as environmental conditions in behavioral rigidity are Wolpert's (65) investigation and Belmont and Birch's (21) study of personality and situational factors in the production of rigidity. Wolpert (65) suggested

replacing the search for a general trait of rigidity by searching in the conditions in which it would be manifested. Although Wolpert (65) did not mention "interactionism," it seems implied that if progress is to be made in rigidity research, investigators are going to have to include environmental influences. Belmont and Birch (21) were more specific. These researchers concluded that there are two influences on behavior which, precisely stated, are one's personality and the demands of specific situations. Furthermore, they stated (21:3) that "it should be recognized that the resulting behaviors are determined by neither factor alone, but by the interaction of situational and personality variables." The study of interactionism at present, appears to be the most viable approach as the results of the present study, and research by other investigators indicate that future investigators should carefully consider all aspects of behavioral influences.

Summary

The results of the present study and a comparison of those results to other studies were presented in this chapter. Specifically, the mean scores and standard deviations, reliability coefficients, and the procedures for the statistical reduction of the data and concluding analyses were all discussed for the present study. The findings that behavioral rigidity and subtests of rigidity were not consistent across sport situations was not considered a surprising result.

Other studies from general psychology in behavioral rigidity, studies partitioning behavioral variance such as Endler, Hunt, and Rosenstein's (37) work, and Horsfall's (67) study partitioning behavioral variance using sport-related situations, seem to indicate that interactionism represents the most viable approach to the study of behavior at the present time. Most important, the approach is supported theoretically by empirical evidence. The results of the present study further reinforces the pursuance and need for additional research.

Chapter 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of the study was to determine whether behavioral rigidity is consistent across sport situations. The subjects were composed of 56 male junior and senior physical education majors at Ithaca College in Ithaca, New York. All of the subjects were volunteer participants and each subject was administered a test and a retest of Schaie's Test of Behavioral Rigidity (TBR) and a sports situations scale devised by the researcher.

Schaie's TBR is composed of a variety of subtests designed to determine rigidity scores for measures of three separate factors and a composite rigidity measure. The three factors are motor-cognitive rigidity, personality-perceptual rigidity and psychomotor speed. These factors are combined and then averaged for the composite rigidity score.

The sports situations scale is a combination of 16 separate situations that were collected from several male coaches at Ithaca College who encountered the situations or a form of the situations that tested a coach's resistance to change. The researcher then took these situational ideas

to form hypothetical ones that, it was felt, the subjects could intuitively relate to themselves. Each situation was based on the Likert method whereby the subject responds to a five-point scale ranging from strongly agree to strongly disagree.

After the data were collected for the test administration, the subjects were asked to take a retest of the same tests four weeks later. All 56 subjects completed both test administrations. After the data were scored, it was found that four of the subjects had obviously misunderstood the directions in several subtests in the TBR. At this point, these subjects were dropped from the investigation, and the data from the remaining 52 subjects were subjected to statistical analysis.

The data were treated initially to analysis for mean scores and standard deviations for both the test and retest administrations as well as reliability coefficients. A factor analysis of the 16 sport situations followed in order to maximize the distance between situations and to locate situations considered most discrete. Seven discrete situations emerged from this analysis. Upon reduction of the data by factor analysis, it was then treated to a multiple regression analysis between the seven situations and behavioral rigidity scores, and a concluding analysis by canonical correlation between subtests of behavioral rigidity and sport situations.

It was found that the resulting F ratio and chi-square

values were not significant. The hypothesis that there will be no significant consistent relationship between behavioral rigidity across sport situations was consequently accepted.

It was concluded on the basis of the results of this investigation, that both the person and the situation need to be considered in the study of human behavior. In light of the findings of this investigation, the researcher feels justified in stating that the results are supportive of an interactionist position.

Conclusions

After completion of the investigation, the researcher made the following conclusions:

1. As a trait, behavioral rigidity is not consistent across sport situations.

2. The subtests of behavioral rigidity, which are motor-cognitive rigidity, personality-perceptual rigidity, and psychomotor speed are not simultaneously consistent across sport situations.

3. The results of this investigation lend support to research including both the person and the situation with their respective interactions in the study of human behavior.

Recommendations

The investigator suggests the following recommend-

ations for further study:

1. Random sampling should be used in selection of subjects.

2. Experienced coaches, either male or female, may be studied including a greater age range.

3. A similar investigation could be conducted using coaches in a specific sport, such as basketball, and using specific basketball situations.

4. If a similar study were conducted, test/retest administrations should be extended in time to no less than eight weeks minimum, in order to prevent retention of test items.

5. A social desirability scale should be administered to run a multiple correlation between the social desirability and the situations and to use the regression values to correlate with measures of rigidity. This would control or partial out the effects of social desirability on the situations.

APPENDICES

Appendix A. Standardized Instructions for the Test of Behavioral Rigidity

Introduction

"The purpose of the tests you are about to take is to measure certain mental processes which we think are closely connected with the ability to adjust to change."

"There are three parts to the test, each measuring a different thing, and each of which is equally important. Some of the things which we will ask you to do will seem easy and others will be more difficult. In some tests there will be only one correct answer which you will be asked to find. In others there will not be any answer that could be called "right" and you will be asked to give your own opinion."

"Please try to answer all questions and attempt all the tasks the examiner will ask you to do. The three tests will take about thirty minutes."

"The first thing we shall ask you to do is to fill in the personal information on the front of your test booklet. Fill in your name, your age in years to your nearest birthday, your education, showing the highest grade you attended, and your occupation. If you are not working now, give your last occupation and also the occupation in which you worked most of your life, if it is different."

1. The Capitals Test

"Turn to page 3 of your test booklet and look on the left hand side of the page at the instructions for the first test. This is a test of your ability to concentrate."

"You are to copy the passage of writing appearing on page 2 of the test booklet. Copy this paragraph, in writing, not printing, exactly as it appears. Please write as fast as you can. Ready? Start!"

(The examiner will call stop after exactly 2:30 minutes.)

"Stop! Stop right where you are. You must stop now whether you have finished copying the paragraph or not."

"Now look at the instructions on the right side of the page under Series B. You are to copy the same passage again, but this time write a capital letter wherever a small letter appears in the original, and write a small letter wherever a capital letter appears in the original." Like this:

"If the original sentence should read:"

The Duke DREW his sword.

"Then you would copy the sentence like this:"

tHE dUKE drew HIS SWORD.

"Please remember, you should write, not print. Ready? Start! (The examiner will stop the test after exactly 2:30 minutes.) Stop! You must stop now whether you have finished copying the paragraph or not!"

2. The Opposites Test

"Now turn to page 4 of your test booklet and fold the booklet over. I shall read the instructions for the next test with you."

"In this test you are to write after each word given another word which means the opposite. For example, if the word "fast" were given, you could write "slow"; if the word "summer" were given, you could write "winter." Are there any questions?"

"You have two minutes for this test. Please work as fast as you can. Do not start before I give the signal. Ready? Start!"

(The examiner will call "stop" after exactly 2:00 minutes.) "Stop! You must stop now even if you have not finished the whole list!"

"Now turn the booklet over to page 5, the next page. In the second part of this test you are to write after each word given another one which means the same or is similar. For example, if the first word were "fast" you could write "quick", or if the first word were "autumn" you could write "fall." Is that clear? You have again two minutes for this test. When the starting signal is given begin working as fast as possible. Ready? Start!"

(The examiner will call "stop" after exactly 2:00 minutes.) "Stop! Stop wherever you are even if you have not finished the list!"

"Turn to the next page, page 6, and fold the booklet

under. In the next list you are again to write words after other words which are given to you. This time, however, you are to write the word which means the same as the first word only when the first word is printed in CAPITAL LETTERS. For example, if you see the word "FAST" printed in capital letters, your answer could then be "quick."

"But whenever the first word is printed in small letters, then your answer should be the opposite of the first word. If, for example, the first word were "fast" printed in small letters, then you would write "slow." Are there any questions? You have two minutes for this list. Please work as fast as possible. You must do one right after the other and not skip any! Ready? Start!"

(The examiner will call "stop" after exactly 2:00 minutes.) "Stop! Stop wherever you are! You must stop now even if you have not finished."

3. The Questionnaire

"Now turn the booklet over to page 7. This is the last test you will be asked to do. Look at the instructions at the top of the page. I will read them with you."

"Read each of the following statements carefully, decide how you feel about it, and then mark your answer in the space provided. If you agree with the statement or feel that it applies to you, make a heavy mark in the space for T. If you disagree with the statement or feel that it does not apply to you, make a heavy mark in the space for F.

There is no right or wrong answer to any question. All these statements are about things concerning which people have different opinions. The best answer is your own opinion. Be sure to answer every statement even if you have to guess at some."

"Since your first response will usually be the best indication of your opinion, try to work as fast as possible and do not change your answer unless you feel that you misread the question. When you finish page 7, go right on to page 8. There is no time limit for this test. When you have finished, return the booklets and the answer sheets to me. Go ahead!"

Appendix B. Participation Request Form
To Obtain Subjects

Name _____

Class of _____

Address _____

Telephone _____

Would you be willing to participate in this study in which you would indicate your coaching beliefs in a variety of sport situations, and would take a short test of behavioral responses that would take no more than one hour of your time?

____ YES ____ NO

If YES, please indicate a time you would be available by checking a time slot below. If none of the times given are open for you, please list a time you are available.

Tuesday	____ 6:00-7:00 PM
	____ 7:00-8:00 PM
Wednesday	____ 6:00-7:00 PM
	____ 7:00-8:00 PM
Thursday	____ 6:00-7:00 PM
	____ 7:00-8:00 PM
Other Time	Day _____
	Time _____

Thank you for your cooperation.

Appendix C. Directions and Sport Situations

NAME_____

CLASS_____

DIRECTIONS

In the near future, many of you may find yourselves in a teaching or coaching position at either the secondary or college level. The following situations are circumstances you may encounter in sport. Each situation described has actually happened to various coaches at one time or another. It is your job to decide how you would handle these situational decisions if you are coach. You are to either agree or disagree with each decision made by the coach whether to make changes or to stay the same on a continuum from strongly agree to strongly disagree.

SA = Strongly Agree
A = Agree
U = Undecided
D = Disagree
SD = Strongly Disagree

Circle the answer that most appropriately is in agreement with your coaching or player philosophy regarding the situational decisions on the following pages.

For Example:

1. SA A U D SD As head college football coach, you decide that your players should have hair no longer than their earlobes.

In the coaching role in this situation, if you strongly agree, you would circle SA. If you strongly disagree, because you feel hair length is not important, you would circle SD. If you only partially agree or disagree, you would circle either A or D. Only in circumstances that you have absolutely no decision or opinion because you are undecided, then use U. Please be sure to mark an answer for each situation. All answers will be kept in the strictest confidence. Are there any questions?

1. SA A U D SD In past years, you have always picked the captains of your team. Upon players request this year, you decide to change and allow the players to vote for team captain.

2. SA A U D SD As head football coach, you absolutely insist that all players are to wear the helmet, pads, and shoes of your choosing, and you are not willing to allow any exceptions.

3. SA A U D SD It is your job to scout high schools for potential football players at the college level. You decide to scout only those schools that fit the field playing patterns of the college you work for.

4. SA A U D SD You are "on the road" with your junior varsity and varsity basketball squads. Your junior varsity team is scheduled to play in an hour and a half. Normally, when you stop for the pre-game meal, you require your J.V. players to eat a light carbohydrate diet since their game is scheduled first. Tonight many are protesting because the varsity, who plays in four and a half hours, "always gets steak." You decide to give in to the players demand.

5. SA A U D SD Your star basketball player adamantly dislikes practices. He constantly gets "injured" during practice and goes for water as many times as he can get away with. You decide he is too valuable to bench so you start him anyway.

6. SA A U D SD Mr. Jones is a member of the school board and president of the booster club. All summer, he has been telling you what a fine athlete his son Rick is and how he knows Rick would make an excellent addition to your high school football team this year. Rick shows up for practices, but obviously shows a lack of interest by being sluggish during practice and by refusing to lose weight. In spite of the pressure you might be under from Mr. Jones, you cut him.

7. SA A U D SD You are coaching at the high school level. Some of your outstanding seniors, who are sure they are set for a spot on your squad, decide to take "Advantage" of their seniority by continually coming to practices late, and by grabbing a few minutes to smoke a cigarette. You inform them that they are no longer eligible to make your squad.

8. SA A U D SD You are head football coach at the college level. Recently you've read several articles on new strength training techniques which you have never used before. You decide to implement those techniques as they appear a useful addition to your present work-outs.

9. SA A U D SD This afternoon is the final game of baseball play-offs. A win would permit your team to go to the state tournament. You are coach and both your number 1 and 2 pitchers are rested and ready to go. Your number 1 pitcher has a tendency to be a hot-tempered know-it-all who sometimes gets emotional during a game, but he throws strikes and is strong throughout most innings. Today, however, he appears unusually loud, which is an indicator to you that he may have a bad game. Number 2 is not as strong as number 1, but is less emotional on the mound. As coach in making a final decision, you change your original strategy and go with number 2.

10. SA A U D SD It is the first day of men's varsity soccer practice. Two females show up ready to participate. As coach, you allow them to work out as part of the team with the intention of giving them a full shot to make the club.

11. SA A U D SD In the eighth inning of a baseball game, you indicate to your pitcher to walk the next man intentionally. Your pitcher, feeling he can get the man out anyhow, decides to pitch to him instead. Since your pitcher violated your coaching decision, you temporarily suspend him.

12. SA A U D SD Your basketball team has won 16 games so far this season with only 5 losses. Tonight's game is the only chance to clinch a berth in the play-offs. A win is a must! Your team begins the game strong, but by the end of the first quarter, your offense falls apart and is no longer effective against the strong defense of the opposing team. Since you have been winning with a set pattern, you never found it necessary to adjust before in this situation. You decide to totally change your offensive strategy.

13. SA A U D SD All season long, your team has a fixed batting order, but in the play-offs, you decide to move the clean-up hitter, who has been successful in that position all season, to the first spot on the line-up without explanation.

14. SA A U D SD Spiegel and Wade are quarterbacks for Amity College. Both are consistent players, but as coach, you start Spiegel as he has a stronger running game. Halfway through the season, Spiegel decides to give up his position to Wade as he feels his performance has dropped and the team is not winning. Even though you prefer Spiegel, you decide to try Wade.

15. SA A U D SD A player indicates to you, (you are head coach), that he intends to play the upcoming college football season with a full beard. You decide a full beard is absolutely unacceptable.

16. SA A U D SD One of your players decided to cut a class in order to attend a practice today. As coach, you had set the rule at the beginning of the season that no player was ever to cut class for practice. You decide to suspend your player for several games.

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