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PREDICTION OF BATTING SUCCESS

by

Thomas William Ford

An Abstract

of a thesis 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

September 1981

Thesis Advisor: Dr. A. Craig Fisher

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ABSTRACT

In this study, the relationship of predictor variables (attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception) and batting outcomes (batting averages, strikeouts, and runs batted in) was investigated. High school and college baseball athletes ($\underline{N}$ = 51) were administered the attentional items of the Test of Attentional and Interpersonal Style (TAS), test of batting attentional style (TBAS), Group Embedded Figures Test (GEFT), Sport Competition Anxiety Test (SCAT), personal behavior scale (PBS), Index of Adjustment and Values (IAV), and a personal assessment questionnaire (PAQ). Coefficient alpha reliability for the TAS scales ranged from .62 to .74, while the TBAS ranged from .61 to .75. Multivariate analysis of variance revealed that the TBAS differentiated between high- and low batting averages groups while the TAS did not. Neither the TBAS nor the TAS differentiated between the high- and low strikeout groups and the high- and low runs batted in groups. Stepwise multiple regression showed that batting averages were predicted by the broad external, broad internal, underinclusive, and overloaded internal focuses of attention; locus of control; visual disembedding; and high perceived ability and success. Strikeouts were predicted by the broad internal and and overloaded internal focuses of attention; visual disembedding; and perceived ability and success. Runs batted in were predicted by the broad internal and underinclusive focuses of attention and perceived ability and success. Batting success was found to be

predicted by high perceived ability and success, internal locus of control, low ideal self, low broad external focus, low narrowed attentional focus, and externally overloaded focus of attention.

PREDICTION OF BATTING SUCCESS

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

---

by
Thomas William Ford

September 1981

Ithaca College
School of Health, Physical Education and Recreation
Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of

Thomas William Ford

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

The skill of hitting a baseball is one of the most difficult tasks in sports, if not the most difficult (Williams & Underwood, 1972) 1972). Add to that the need for consistency and the difficulty is magnified (Lau & Glossbrenner, 1980). A fastball thrown at 90 mph takes just .40 sec. to get to home plate after the pitcher releases the ball (Jerome, 1980). Within this time the batter has to decide what kind of pitch it is, if it will be a strike or ball, and whether to swing or not. To hit a fair ball, the ball must be contacted within 15 degrees to either side of a dead right angle to the direction of the pitch, which is 24 in. of the bat's total travel (Jerome, 1980). If hitting a baseball is so difficult, teaching someone to be a successful batter cannot be an easy task. It would, therefore, seem important to look at different variables which might be helpful in predicting batting performance.

It would appear that the batter must locate, select, and focus on the most relevant cues in order to be successful. To be superior in any sports setting individuals must have the attention for the environment they perform in (Cratty, 1973). If an athlete focuses on irrelevant cues, the performance will be less than optimal.

Nideffer (1976a) developed a self-report assessment device, the Test of Attentional and Interpersonal Style (TAIS), which determines the general attentional style of an individual from the situations

presented on the test. Nideffer (1976a) pointed out the importance of two dimensions of attention. The width dimension consists of attentional focus and varies from broad to narrow, while the directional dimension refers to internal (feelings and thoughts) and external (environmental) focus. In any particular situation, an individual's attentional focus may be described as broad external, broad internal, narrow internal, and narrow external. A certain attentional style may be effective in one situation but ineffective in another. Attentional styles need to be congruent with specific task demands.

The first half of the TAIS (74 items) consists of life situations relating to the three effective and three ineffective attentional scales. The effective scales include broad external focus, broad internal focus, and narrow focus, while the ineffective scales include overloaded external focus, overloaded internal focus, and underinclusive focus. Scores on each of the six attentional scales are used to form a composite picture of the relative strengths and weaknesses of a person's attentional functioning (Nideffer, 1976b).

Nideffer (1976a) recommended that assessment of attentional behavior should be as situation-specific as possible. On that basis it would seem important to construct an assessment tool capable of examining, for instance, the attentional style of batters in situations specific to batting. A test of batting attentional style (TBAS) containing 64 items was constructed.

Another variable of batting success, which may be considered,

is visual disembedding. Thurstone (1944) indicated that rapid identification of cues is needed for visual disembedding. This is, in effect, what the batter must do when batting. The batter must locate and select all the important cues needed from a field of relevant and irrelevant cues.

It seems possible that the attentional styles measured by the TAIS and TBAS might be affected by the anxiety level of the performer, as might well be the entire information processing system. Anxiety tends to narrow an individual's attentional focus and there is a tendency to become internally focused (Kahneman, 1973; Landers, 1980). In baseball, the batter must deal with anxiety in competitive situations; failure to do so could be detrimental to batting performance. As in the assessment of attention, it would seem important to assess anxiety with a situation-specific device. Martens (1977) developed such a device, the Sport Competition Anxiety Test (SCAT), to measure competitive trait anxiety, which is the tendency to perceive competitive situations as threatening.

Locus of control is another variable which may be important in the prediction of batting success. Individuals with an internal locus of control are more successful at problem-solving tasks than individuals with an external locus of control (Kleinke, 1978). It would seem important to include locus of control as a variable of batting success if one assumes that batting is a problem-solving task. Self-perception, locus of control, and anxiety seem to be somewhat related. Individuals with high self-esteem and perceived competence are found to have internal locus of control and low anxiety (Harter, 1978). Williams and Underwood (1972) and Lau and

Glossbrenner (1980) maintained that confidence in one's ability is an asset of a good hitter; this assertion makes self-perception an important part of batting success.

A test or tests for each of the following variables (attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception) was administered to assess the relationship between the variables and batting outcomes (averages, strikeouts, and runs batted in).

Scope of Problem

A total of seven tests were administered to 51 baseball athletes ranging from high school varsity to college junior varsity and varsity levels during the spring semester of 1981 in an attempt to predict batting success. A test of batting attentional style (TBAS) was constructed, based on part of Nideffer's Test of Attentional and Interpersonal Style (TAIS). The TAIS and TBAS were both administered to discover the athletes' attentional styles. Visual disembedding was measured by the Group Embedded Figures Test (GEFT). Competitive trait anxiety was measured by the Sport Competition Anxiety Test (SCAT). The personal behavior scale (PBS) was also administered to find out the degree to which the athletes attributed the causes of their behaviorial outcomes to internal versus external factors. Each athlete's self-concept and self-acceptance were assessed by the Index of Adjustment and Values (IAV). In an effort to determine self-report measures of ability and success, a personal assessment questionnaire was utilized.

Data were collected on all tests and statistical analyses were performed to investigate possible correlations between batting efficiency and attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception. The data were subjected to MANOVA procedures, multiple regression analysis, and canonical correlation in order to assess the various relationships that existed within the data.

Statement of Problem

The relationship between baseball athletes' batting outcomes (averages, strikeouts, runs batted in) and attentional style, visual disembedding, competitive trait anxiety, locus of control, self-perception, and perceived ability and success was investigated.

Hypotheses

1. There will be a significant difference between the scores on the TBAS attentional scales of batters with high batting averages and those with low batting averages.

2. There will be no significant difference between the scores on the TAIS attentional scales of batters with high batting averages and those with low batting averages.

3. There will be a significant difference between the scores on the TBAS attentional scales of batters with low strikeout per at bat percentages and those with high strikeout per at bat percentages.

4. There will be no significant difference between the scores on the TAIS attentional scales of batters with low strikeout at bat percentages and those with high strikeout per at bat percentages.

5. There will be a significant difference between the scores on the TBAS attentional scales of batters with high runs batted in per at bat percentages and those with low runs batted in per at bat percentages.

6. There will be no significant difference between the scores on the TAIS attentional scales of batters with high runs batted in per at bat percentages and those with low runs batted in per at bat percentages.

7. Batting average can be predicted from attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception.

8. Strikeout per at bat percentage can be predicted from attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception.

9. Runs batted in per at bat percentage can be predicted from attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception.

10. Batting outcomes can be predicted from attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception.

Assumptions of Study

1. The athletes were able to relate to the situations on each test.

2. The athletes were able to relate to the modes of response for each test.

3. Attention is measured effectively by the TAS and TBAS.

4. Visual disembedding is measured effectively by the GEFT.

5. Competitive trait anxiety is measured effectively by the SCAT.

6. Locus of control is measured effectively by the personal behavior scale.

7. Self-perception is measured effectively by the IAV and a personal assessment questionnaire.

Definition of Terms

1. Attention: the mental process of selectively or broadly focusing on internal (thoughts and feelings) or external (environmental) stimuli.

2. Attentional style: the attentional strengths and weaknesses of an individual along the attentional dimensions of width (broad or narrow) and direction (internal or external).

3. Effective attention: when the individual properly adjusts his/her focus according to the attentional demands in a particular situation.

4. Ineffective attention: when the individual's attentional focus is inappropriate for a particular situation.

5. Width dimension of attention: this refers to the amount of information and the breadth of perceptual field an individual controls.

6. Directional dimension of attention: this refers to the internal or external focus of attention.

7. Broad external focus of attention (BET): an effective attentional style in which the focus is on a range of environmental cues.

8. Overloaded external focus of attention (OET): an ineffective type of attention in which the focus is on a range of environmental cues.

9. Broad internal focus of attention (BIT): an effective attentional style in which the focus in on a range of cognitive and proprioceptive stimuli.

10. Overloaded internal focus of attention (OIT): an ineffective type of attentional style in which the focus is on a range of cognitive and proprioceptive stimuli.

11. Narrow focus of attention (NAR): an effective attentional style in which the focus is directed toward selective internal or external cues.

12. Underinclusive focus of attention (RED): an ineffective attentional style in which the focus is reduced and directed toward selective internal or external cues.

13. Visual disembedding: this refers to the ability to recognize detail even when it is confused by irrelevant material in the perceptual field.

14. Self-concept: how individuals perceive themselves.

15. Self-acceptance: how individuals feel about being the kind of person they believe themselves to be.

16. Ideal self: how individuals would like to be.

17. Self-discrepancy: the difference between the ideal and self-concept.

Delimitations of Study

1. Fifty-one volunteer high school varsity, college junior varsity, and college varsity baseball players served as subjects.

2. Attentional styles were determined by Nideffer's Test of Attentional Style and the investigator's test of batting attentional style (Appendix A).

3. Visual disembedding was measured by the Group Embedded Figures Test (Appendix C).

4. Competitive trait anxiety was measured by the Sport Competition Anxiety Test (Appendix D).

5. Locus of control was assessed by the personal behavior scale (Appendix E).

6. Self-concept and self-acceptance were assessed by the Index of Adjustment and Values (Appendix F).

7. Perception of ability and success were measured by the personal assessment questionnaire (Appendix G).

Limitations of Study

1. The results can only be generalized to baseball players who are considered similar to the athletes in this study.

2. Other tests of attentional style may yield different results.

3. Other tests of visual disembedding may yield different results.

4. Other tests of competitive trait anxiety may yield different results.

5. Other tests of locus of control may yield different results.

6. Other tests of self-concept and self-acceptance may yield different results.

7. Other tests of perceived ability and success may yield different results.

Chapter 2

REVIEW OF RELATED LITERATURE

This chapter consists of related literature concerning the task demands of baseball batting, as well as the relationship between batting success and attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception.

Task Demands of Batting

To get a complete understanding of the task demands of batting, one must be aware of the circumstances the batter encounters. The distance from home plate to the pitching rubber is 60.5 ft., but the pitcher striding forward to release the ball would reduce this distance to as close as 50.5 ft. (Cook, 1966). It takes a fastball between .43 sec. and .58 sec. to travel to the plate once it has been released (Slater-Hammel & Andres, 1952). This elapsed time is determined by the type of pitch thrown and the ability of the pitcher. For example, Slater-Hammel and Andres (1952) determined that the time for curveballs to get to the plate was between .54 sec. and .70 sec. A fastball that is travelling at 90 mph would get to the plate in .40 sec. (Jerome, 1980). These times were calculated while assuming constant ball speed throughout the flight of the ball. Cook (1966) measured that a ball thrown at a constant horizontal velocity of 87.3 mph (128 ft./sec.) would get to the plate in .43 sec., but would fall at least 2.96 ft. in that time. In addition to the baseball moving towards the batter and falling vertically, it also can move horizontally in the case of a slider or curveball, for example.

Suffice it to say, there are a variety of distance and spatial cues that must be processed if bat contact is to be made with the ball.

The batter has limited time to make decisions and react to the ball especially when one considers that the ball begins to pass through an arc too fast for the human eye to track when it is 20 ft. from home plate (Ariel, 1981). In a short time, the batter must decide what type of pitch it is, if it is a ball or strike, and whether to swing or not. The number and complexity of decisions may lead one to believe that some of the decisions (e.g., type of pitch) must be made prior to or at the time of the release of the pitch (Lawther, 1977; Newell, 1974). Lawther (1977) stated that it takes .10-.20 sec. or longer to initiate a movement reaction after cues have been perceived and about the same additional time to make the overt movement. For choice reactions and complex movements, the initiation time is much longer. In the task of batting, the movement may have to start coincidentally or even before the pitcher releases the ball.

Slater-Hammel and Stumpner (1950) investigated reaction time and batting. They measured starting reaction time (measure of speed with which the subject could start a bat moving upon sight of visual stimulus) and movement reaction time (the speed with which a subject could change the direction of a moving bat). The mean of the starting reaction time for all subjects was .21 sec. and the mean of the movement reaction time was .27 sec. These have to be minimal time limits in a batting situation because batting involves choice reactions, which take longer to initiate and make than simple reactions.

While the Slater-Hammel and Stumpner study consisted of only reaction time and batting, others have considered different problems. Hubbard and Seng (1954) and Hubbard (1955) contended that batting is primarily a perceptual-motor problem. They argued that, if the batter relies strictly on reaction time after all the cues have been observed, then it will be too late to make contact with the ball. Hubbard and Seng (1954) used cinematographic and observational analysis to reveal that batters track pitches with pursuit movement of their eyes. From the point of release until the ball is no longer visible, the batter must locate, track the pitch, predict its course and then decide whether to swing or not (Hubbard and Seng, 1950). These decisions are based on a number of variables.

According to Newell (1974), the most important decision a batter must make is to swing or not. This decision is causally determined by the perceived accuracy of the pitch, type of pitch, type of game or situation, past history of batter versus pitcher, and perceived ability of pitcher. Some time, either during the pitch or preferably beforehand, the batter would have to consider some of these variables.

Variables such as the type of game and situation, past history of batter, and perceived ability of self and pitcher would have to be considered before one steps into the batter's box. The recognition of the pitch would have to be saved for the batter's box. It would seem that successful hitters either recognize, select, and process a salient variable or variables that unsuccessful hitters do not, or that the successful hitters recognize them sooner.

Lawther (1977) contended that skilled performers "catch" earlier cues and link them to appropriate responses. Successful hitters know what to expect and ignore extraneous cues (both internal and external) in the stimulus pattern. The early cue reading is needed to estimate the distance, direction, and speed of the ball, as well as the reaction and movement time of the batter.

Both Lawther (1977) and Newell (1974) agreed that the time when the batter must make his choice to start his swing approximately coincides with the release of the ball. This magnifies the importance of closely scrutinizing the pitcher's wind-up for possible cues as to which pitch is coming. Newell (1974) further proposed that the batter might initiate the movement sequence on every pitch and at some time decide whether or not to continue the swing. If the batter can use late cues to control the swing, then he should be able to redirect the bat to the ball's perceived location. That is, as long as the batter collects the cues before the angular movement of the ball surpasses the limits of the eye movements, and before too much momentum is developed in the bat (Newell, (1974). Late cue utilization seems reasonable and is supported by the oft-heard claim that successful hitters seem to wait on the ball longer before committing themselves (Ariel, 1981).

Considering the literature reviewed, it seems as though a successful batter would need to possess certain characteristics. The ability to selectively ignore extraneous cues in the visual field, and the ability to recognize and respond to task-relevant cues seems

important. These abilities involve information processing and information processing is central to the concept of concentration and/or attentional style.

Attention

Nideffer (1978) defined attention as the ability to direct senses and thought processes to particular objects, thoughts, or feelings. Attention must correspond with the environmental demands to be effective, and specific sports demand certain attentional styles or the ability to alter styles to be appropriate for the task. Attentional processes can be defined along two dimensions--width (narrow and broad) and direction (internal and external) (Nideffer, 1976a).

Nideffer's (1976a) definition of attention is incorporated in the attentional aspect of the Test of Attentional and Interpersonal Style (TAIS), in order to measure the attentional and interpersonal process related to performance across different life situations. Within the TAIS are six scales that relate to the ability of individuals to control width and direction of attentional focus (Nideffer, 1976a). The broad external focus of attention (BET) addresses the ability to integrate many external stimuli at one time, while the overloaded external focus (OET) assesses the amount of confusion that results from external stimuli. The broad internal focus (BIT) addresses the capacity to attend to and integrate a variety of information from internal stimuli, while the overloaded internal focus (OIT) assesses the degree of confusion that results from thinking of

too many things at once. The narrow attentional focus (NAR) is the ability to narrow attention to concentrate effectively, while the underinclusive attentional focus (RED) encompasses the error-prone attentional style because attention is excessively narrow. The latter focus is very restricted and often referred to as tunnel vision. In selecting the optimal attentional style for performance, one must be cognizant of the situational and task demands. The ability to change styles in response to these demands is an important determinant of any successful performance.

The majority of competitive situations require a rapid shift from internal to external focus (Nideffer, 1976b). The athlete must focus on thoughts and feelings and then switch the focus to environmental stimuli. Lawther (1977) stated that competent athletes possess the ability to concentrate on cues relevant for their sport, filtering out irrelevant cues even to the extent that they are ignored completely. Lawther's statement is supported because individuals can selectively focus on some stimuli in preference to others (Kahneman, 1973).

In batting there would seem to be a need for shifts of attention and selective attention to cues. Nideffer (1976b) classified the optimal attentional style for batting as narrow and external without regarding attentional shifts. The narrow and external focus would be necessary from the point where the ball is being released up to the point where the batter loses sight of it, or makes a decision to swing or not. However, before this narrowing of attentional focus, it would

seem as though three different attentional focuses would occur beforehand. The first would be a broad internal focus as the batter is outside the batter's box preparing his stategy such as anticipation of the next pitch. In this preparation, the batter might recall the strategy the pitcher has used previously and internally construct the current situation including the number of outs, the count, and runners on base. The next attentional focus would be narrow and internal as the batter precedes to narrow his thoughts and feelings of previous and current situations. The third attentional focus would occur as the pitcher initiates the wind-up and the batter is focusing on different cues that may indicate the type of pitch. This latter focus would be broad and external. As the ball is released the narrow and external focus would take precedence as the batter focuses in on the ball.

Even though Nideffer developed the TAIS for a variety of situations, it has been argued that assessment devices should be as situation-specific as possible (Fisher, 1977; Martens, 1977). This assertion may cause one to wonder whether or not the TAIS would be equally effective in all situations, including baseball batting.

Visual Disembedding

There is another way of looking at information processing as it applies to baseball batting, and that is through the concept of field-dependence-independence (Witkin, Lewis, Hertzman, Machover, Meissner, & Wapner, 1954). Because a batter must be able to pick out (disembed) certain cues or stimuli from the environment (visual field),

it would appear that proficient batters might be more field-independent (e.g., they can separate the ball as a relevant cue from among the many irrelevant cues). Visual disembedding is the ability to break up an organized visual field to keep a part of it separate from its surroundings (Pargman, Bender, & Deshaies, 1975). This seems to be what a batter must do as he picks up the ball from the pitcher's release and tries to ignore all other stimuli. Gallahue (1968), in addressing the relationship between perceptual and motor abilities, concluded that an athlete must be able to select central objects from the background and make perceptual judgments based on the figure or surroundings.

Different tests measure visual disembedding but Mac Gillivary (1980) suggested the standard rod and frame test or embedded figures tests as the best choices. The Group Hidden Figures Test was used previously to assess the relationship between baseball batting and visual disembedding (Pargman, Schreiber, & Stein, 1974). However, no significant relationship was found. While it is improbable that visual disembedding holds the entire key to competence in batting, in combination with other variables it may well explain some of the batting success variance. In any adequate discussion of attention, visual disembedding, or other aspects of information processing, anxiety must be included because of its mediating influence.

Anxiety

Anxiety would seem to be an important variable of batting success because many researchers have discovered that high anxiety

seems to narrow attention (Easterbrook, 1959, Kahneman, 1973; Landers, 1980; Nideffer, 1976b; Wachtel, 1967). Batters cannot allow excessive narrowing of attention to happen if they are to be successful. Narrowed attention can result in missing important cues, for example, batters failing to see a flaw in the pitcher's wind-up that might tip off the pitch. Since anxiety narrows attention, there would undoubtedly seem to be a relationship between anxiety and performance on complex motor tasks such as hitting a baseball.

Highly anxious individuals do not perform as well as low anxious individuals on complex motor tasks (Carron, 1968; Lawther, 1977; Weinberg & Genuchi, 1980). The anxiety while performing a motor task such as batting is due in part to the competitive setting, and due in part to the athlete's personality make-up (e.g., high- or low trait anxious).

It seems necessary that anxiety due to competition be examined. Competitive trait anxiety is the tendency to perceive competitive settings as threatening (Martens, 1977) If batters possess high competitive trait anxiety, then they are probably going to be unsuccessful due to the fact that anxiety narrows attention and limits cue selection and processing. Because of its relationship to anxiety and performance in skilled situations, locus of control must be considered as a salient variable of batting success.

Locus of Control

Locus of control refers to the expectancies individuals possess about whether or not they have the power to control what happens to them (Rotter, 1954). A person may have an internal locus of control

or an external locus of control. Internal locus of control individuals are those who feel they control their own destiny by their ability and effort, whereas externally controlled individuals feel that their destiny is controlled by external factors such as luck, chance, or actions of others (Geen, 1976; Kleinke, 1978).

Individuals with external locus of control generally feel helpless and feel they can do nothing to improve themselves or the situation, but internals feel optimistic, self-assured, and confident (Geen, 1975). Geen (1976) and Kleinke (1978) contended that individuals with an internal locus of control are more successful at problem-solving tasks especially when successful task completion is more indeterminate. Internals are also superior in selecting and processing information from the environment (Geen, 1976). For example, batters who are internal should be more successful because they are able to process and use information from the pitcher's wind-up to tell what kind of pitch is coming. Internals should also be more successful at batting because their attention is not narrowed by anxiety, based on their perception that they are somewhat in control of the situation. Externals have been found to be more anxious than internals, especially in skilled situations (Geen, 1976; Kleinke, 1978: Phares, 1957). Another variable necessary to complete the discussion of anxiety and its relationship to locus of control is self-perception.

Self-perception

One of the variables listed earlier in the decision of whether or not to swing at a pitch was the perceived ability of the batter (Newell, 1974). It seems probable that those individuals with high

perceived ability would also perceive themselves to be competent, and would be less likely to experience behaviorial disruptions due to anxiety (Harter, 1978; Kroll & Petersen, 1965).

Harter (1978) explained the relationship between perceived competence, perceived control, and performance. Positive evaluations of performance enhance the feelings of competence or self-esteem, which lead to a sense of internal control over many outcomes. On the other hand, negative evaluations reduce perceived competence or self-esteem and lead to an external perception of control over many outcomes, which predisposes one to exhibit anxiety in mastery situations (Harter, 1978). Batters who possess high self-esteem and perceived competence feel that they have control over their destiny and are able to maintain their attentional style because they are able to control their anxiety. In discussing the effects that self-perception has on attentional style, it seems necessary to explore different aspects of self-perception.

Bills (1975) described four aspects of self in his Index of Adjustment and Values (IAV). Self-concept is how individuals see themselves. Self-acceptance refers to how individuals feel about their self-concept. Ideal self refers to how a person would like to be. The self-ideal discrepancy details the difference betwen the self-concept and ideal self. Theoretically, successful batters should have a positive self-concept and self-acceptance since this relates to an internal locus of control and low anxiety. They should also have a low self-ideal discrepancy since that would show high self-esteem, which also relates to being internal and less anxious.

Summary

There are certain task demands that must be met if one is to achieve batting success. The successful hitter must respond earlier to cues and ignore irrelevant stimuli (Lawther, 1977). For instance, the batter must carefully observe the pitcher's wind-up to pick up salient cues (Lawther, 1977; Newell, 1974). The successful hitter may also respond to late appearing cues as long as he selects them before the ball is out of his sight (Newell, 1974). From the task demands reviewed in this chapter it seems fairly clear that baseball batting is a complex perceptual task.

Different variables have an effect on the batter's ability to maintain the proper concentration and frame of thought. Attention is an individual's style for directing his senses and thought processes to a particular stimuli (Nideffer, 1976a). Attention is defined on two dimensions--width (narrow and broad) and direction (internal or external) (Nideffer, 1976b). Associated with attention in selecting cues is visual disembedding. Visual disembedding is the ability to pick out external stimuli from a visual field (Pargman et al., 1975).

Anxiety has been found to narrow attention and disorganize attentional focus (Easterbrook, 1959; Kahneman, 1973; Landers, 1980; Nideffer, 1976b; Wachtel, 1967). It is necessary to look at anxiety as specific to the situation (Landers, 1980). Since batting occurs in a competitive setting, it seems necessary to describe anxiety along competitive lines. Competitive trait anxiety is the tendency to perceive competition as threatening (Martens, 1977).

Locus of control details whether or not people feel they have

control over their destiny (Rotter, 1954). Those who feel they have control are said to have an internal locus of control and have been found to be superior in problem-solving tasks (Geen, 1976; Kleinke, 1978). Individuals with an external locus of control feel that external factors control what happens to them, and have been found to be more anxious (Geen, 1976; Kleinke, 1978; Phares, 1957).

Another variable that seems necessary to batting success is self-perception. Individuals with high self-esteem and perceived ability have a sense of internal control and are less anxious (Harter, 1978; Kroll & Petersen, 1965). Bills (1975) operationalized self-perception along four interrelated dimensions: self-concept, self-acceptance, ideal self, and self-ideal discrepancy.

Chapter 3

METHODS AND PROCEDURES

The following chapter will deal with the methods and procedures used in this investigation. Selection of subjects, testing instruments, methods of data collection, scoring of data, and treatment of data will be described.

Selection of Subjects

The subjects were 51 varsity and junior varsity baseball players at five different high schools and colleges in the Central New York area during the spring of 1981. There were 13 athletes from the Ithaca College varsity, 12 from the Ithaca College junior varsity, 7 from Tompkins Cortland Community College, 12 from Lansing High School, and 7 from Trumansburg High School. Each athlete was asked to read and sign an informed consent form if he was willing to participate.

Testing Instruments

The following tests were administered to the subjects: the attentional items of the Test of Attentional and Interpersonal Style (TAS), a test of batting attentional style (TBAS), the Group Embedded Figures Test (GEFT), the Sport Competition Anxiety Test (SCAT), the personal behavior scale (PBS), the Index of Adjustment and Values (IAV), and a personal assessment questionnaire (PAQ).

Nideffer (1976a) developed the TAIS, which consists of 52 attentional situations randomly located in the first 74 items of the test. The statements related to attentional behavior and performance

across a range of life situations. There are six types of attentional styles represented by these situations. The effective styles are the broad external focus (BET), broad internal focus (BIT), and narrow focus (NAR), while the ineffective styles are the overloaded external focus (OET), overloaded internal focus (OIT), and underinclusive focus (RED). Six situations relate to the BET focus, 8 to the BIT, 12 to the NAR, 12 to the OET, 9 to the OIT, and 15 to the RED focus. Subjects rated each situation on a 5-point continuum ranging from "never" to "always" for the frequency of occurrence.

There has been some construct validation of the TAIS (Nideffer, 1976a). Predictive validity has also been reported for the TAIS attentional scales. Test-retest reliability coefficients for the 6 attentional and 11 interpersonal scales ranged from .60 to .93 (Nideffer, 1976a).

The TBAS consists of 64 attentional situations specific to batting. The baseball situations were chosen on the basis that they would be generally understandable for baseball athletes. These situations were also chosen in an attempt to cover a wide range of batting situations; 10 related to the BET, 11 to the OET, 11 to the BIT, 11 to the OIT, 10 to the NAR, and 11 to the RED focus (Appendix B). A random numbers table was used to order all the situations. The athletes responded to each statement on the TBAS in the same manner as on the TAIS with the 5-point continuum ranging from "never" to "always."

The Group Embedded Figures Test (GEFT) deals with the athlete's ability to visually disembed (Witkin, Oltman, Raskin, & Karp, 1971).

The GEFT has value in determining the field-dependence-independence of athletes. This test requires the athlete to disembed simple geometric shapes from more complex patterns and outline the correct shapes in pencil (Appendix C). The GEFT consists of a 2-minute practice session and two 5-minute test sections of nine problems each. Using the Spearman-Brown prophecy formula, the GEFT has a reported reliability estimate of .82 (Witkin, Oltman, Raskin, & Karp, 1971).

To determine each athlete's competitive trait anxiety, the SCAT (Martens, 1977) was administered. The athletes responded to each item according to how they generally feel in competitive sport situations. One of the three following responses are possible for each item: "hardly ever," "sometimes," or "often" (Appendix D). The SCAT has a reported test-retest reliability of $\underline{r}$ = .77 (Martens, 1977).

The PBS was constructed to determine whether success and failure were attributed to internal or external factors. The 30 statements were chosen from the following locus of control inventories: James Internal-External Locus of Control Scale, Nowicki-Strickland Locus of Control Scale, Reid-Ware Three-Factor Internal-External Scale, and Rotter Internal-External Locus of Control (Lefcourt, 1976). The statements were selected on the basis that they were applicable to the competitive sport setting and free from religious and political connotations. Two raters agreed independently on the acceptability of the items (Appendix E).

The IAV (Bills, 1975) measured four different aspects of the self: how a person sees himself/herself (self-concept), how a person feels about being the kind of person he/she believes to be (self-acceptance),

how a person would like to be (ideal self), and the difference between the ideal self and the self-concept (self-discrepancy). The athletes were required to place 49 items in a sentence or phrase concerning each of the four aspects of self, respectively. Each aspect was measured by different columns. The first column assessed self-concept as athletes responded to "How much of the time" each item is like them on a 5-point continuum ranging from "seldom" to "never." The second column measures self-acceptance as athletes responded to the statement of "how you feel about yourself" as described in the first column. Again, a 5-point continuum was used ranging from "I very much dislike being" to "I like very much being." Ideal self was assessed in the third column with athletes responding to the statement "How much of the time" you would like this item to be like you, on a 5-point continuum ranging from "seldom" to "most of the time" (Bills, 1975) (Appendix F). The estimated reliability of the four levels of the IAV using test-retest reliability over a 6-week period were reported as follows: self-concept, $\underline{r}$ = .90; self-acceptance, $\underline{r}$ = .83; ideal self, $\underline{r}$ = .92; and self-discrepancy, $\underline{r}$ = .87. Also reported was an estimation of split-half reliability, which revealed self-concept ranging from .52 to .93, self-acceptance from .82 to .93, ideal self from .77 to .93, and self-discrepancy from .87 to .93. The IAV has also been assessed for content, concurrent, and construct validity (Bills, 1975).

The personal assessment questionnaire (PAQ) was constructed to measure perceived success and ability in batting, using the semantic differential technique with a 5-point scale (Appendix G). The athletes

responded to a "As a batter I have been generally" statement on five bipolar adjective scales, and to the statement "My hitting or batting ability is" on nine bipolar adjective scales. Adjective pairs were listed in both positive and negative directions. The PAQ was adapted from Coulson and Cobb's (1979) generalized expectancy of sport success scale, and has been shown to be reliable (internal consistency, r = .96; test-retest reliability, r = .90).

Methods of Data Collection

The tests were administered either in a classroom, locker room, or in the dugout. Some athletes took the tests in groups of up to 13, while others took them individually depending on their availability.

The total testing time was divided into two testing sessions to break up the monotony. At each session the subjects were given a packet containing the tests that were to be taken, along with #2 pencil and eraser. The first session consisted of completing the informed consent form, the Test of Attentional and Interpersonal Style (TAS), the Index of Adjustment and Values (IAV), the personal assessment questionnaire (PAQ), and the Sport Competition Anxiety Test (SCAT). The test of batting attentional style (TBAS), the Group Embedded Figures Test (GEFT), and the personal behavior scale (PBS) were completed in the second session.

At the first testing session, the investigator distributed the packets and asked the athletes to read and sign the informed consent form if they were willing to participate. The investigator then reviewed the instructions for each test and gave the athletes an opportunity to ask any questions. The athletes completed the tests

at their own rate. The second session consisted of three tests. The Group Embedded Figures Test was administered first as it was a timed test. After this, the test of batting attentional style and the personal behavior scale were completed at each athlete's own rate.

Scoring of Data

The data from the TAIS and the TBAS were submitted to the computer on markread cards. The "A" to "E" scores on the markread cards were substituted with Likert-type values ranging from 1 to 5. On the PAQ, a number value ranging from 1 to 5 was made for each adjective pair, with 1 representing the negative judgment and 5 representing the most positive judgment. The total score from the success section and the ability section was hand calculated.

The GEFT was scored by comparing the forms the athletes had outlined with correct forms on the answer key. The score was the number of correctly traced simple forms in the second and third sections combined. The first section was not included in the scoring as it was for practice purposes only.

There were four scores on the Index of Adjustment and Values (IAV): self-concept, self-acceptance, ideal self, and the discrepancy between ideal self and real self. The sum of column I represented self-concept while the sum of column II represented self-acceptance. The third column's sum represented ideal self. Before adding columns I and III, the ratings on the negative traits were reversed, meaning a 1 was changed to a 5, 2 to a 4, and 5 to a 1 while the number 3 remained constant. Items 5, 13, 18, 25, 28, 34, 36, 41, and 49 were listed as negative traits (Appendix F). After the columns were summed,

the discrepancy score was computed by subtracting column I from column III.

For each response on the SCAT, a number value was assigned. Items 1, 4, 7, 10, and 13 were not scored as they are irrelevant items. Items 6 and 11 are scored as follows: 1 was assigned to "often," 2 was to "sometimes," and 3 was assigned to "hardly ever," The remainder of the relevant items were scored as following: 1 was assigned to "hardly ever," 2 was assigned to "sometimes," and 3 was assigned to "often" (Appendix E). The sum of the responses indicated each athlete's score.

The score of the PBS was computed by the addition of the total responses. Athletes were requested to read each statement and circle the response desired from the following: "strongly agree," "agree," "disagree," or "strongly disagree." A number ranging from 1 to 4 was assigned to each response.

Treatment of Data

Internal consistency of the TAS and TBAS was calculated by Cronbach's (1951) coefficient alpha. Multivariate analysis of variance was computed for both the TAS and TBAS, using batting averages, strikeouts, and runs batted in, respectively, as the independent variable. MANOVA's were followed by univariate analysis of variance and discriminant function analysis, in order to explain the various between group differences. Batting averages, strikeouts, and runs batted in were each predicted from multiple regression analysis of the measures of attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception. Additionally, the multivariate relationship between batting averages, strikeouts, and

runs batted in (outcome measures) and attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception (predictor measures) was calculated. All hypotheses were tested at the .05 level of probability.

Chapter 4

ANALYSIS OF DATA

The results of the investigation are presented in this chapter. The chapter is divided into the following sections: (a) internal consistency for the attentional scales of the test of batting attentional style (TBAS) and the Test of Attentional Style (TAS), (b) multivariate analysis of variance for batting averages with the attentional scales of the TBAS and TAS, (c) multivariate analysis of variance for strikeouts with the attentional scales of the TBAS and TAS, (d) multivariate analysis of variance for runs batted in with the attentional scales of the TBAS and TAS, (e) multiple regression analysis of the predictor variables (attention, visual disembedding, anxiety, locus of control, and self-perception) with batting averages, (f) multiple regression analysis of the predictor variables with strikeouts, (g) multiple regression analysis of the predictor variables with runs batted in, (h) canonical correlation of batting outcome measures (batting averages, strikeouts, runs batted in) with the predictor variables, and (i) summary.

Internal Consistency of the TAS and TBAS

The internal consistency of subunits of a test are measured by coefficient alpha (Cronbach, 1951). Alpha reliabilities for each of the attentional scales of the TAS and TBAS are reported in Table 1. Two coefficients are listed for some scales.

Table 1

Internal Consistency of Test of Attentional Style (TAS) and Test of Batting Attentional Style (TBAS)

Variables	TAS	TBAS
BET	.72	.65
OET	.55 (.67)[a]	.66 (.74)[f]
BIT	.62 (.66)[b]	.66 (.75)[g]
OIT	.57 (.62)[c]	.57 (.61)[h]
NAR	.29 (.74)[d]	.43 (.67)[i]
RED	.35 (.62)[e]	.71

[a]Items 7 and 30 deleted.

[b]Item 27 deleted.

[c]Items 59 and 69 deleted.

[d]Items 4, 25, 28, 29, 32, and deleted.

[e]Items 5, 6, 17, 27, 49, and deleted.

[f]Item 15 deleted.

[g]Items 3 and 20 deleted.

[h]Item 52 deleted.

[i]Items 7, 17, and 45 deleted.

Coefficients appearing in parentheses are values adjusted to improve internal consistency by deleting items correlating negatively or below .10 with the scale as a whole. Adjusted reliability coefficients for the TAS varied from a low of .62 (OIT and RED) to a high of .74 (NAR). Coefficients for the TBAS varied from .61 (OIT) to .75 (BIT). The TAS values are higher than those obtained by Taylor (1979).

Multivariate Analysis of Variance for Attentional Scales of TBAS and TAS

Batting Averages

MANOVA revealed a significant difference between the TBAS attentional scales of athletes exhibiting high batting averages and those exhibiting low batting averages, F (6,44) = 4.82, $p < .001$. This result led to the acceptance of the first hypothesis.

ANOVA follow-up revealed significant ($p < .05$) between group differences on BET, BIT, OIT, and RED (Table 2). Athletes exhibiting high batting averages revealed higher BET and BIT scores. Higher NAR scores were associated with athletes exhibiting high batting averages but the difference was not significant. Athletes exhibiting low batting averages revealed higher OIT and RED scores.

Discriminant function analysis revealed that RED contributed 37.00% to the between group variance, followed by NAR with 20.35%, OET with 20.32%, and OIT with 17.35%. These four scales accounted for approximately 95% of the variance, and it is worth noting that these important diferentiating scales were generally ineffective in their nature (Nideffer, 1976b).

Table 2

Means, Standard Deviations, and ANOVA of TBAS for High- and Low Batting Averages

	High Batting Average		Low Batting Average		
	M	SD	M	SD	F
BET	32.76	3.55	30.08	4.28	5.91*
OET	22.76	4.94	22.81	3.83	.00
BIT	33.64	4.40	30.96	3.59	5.70*
OIT	21.04	4.27	23.81	3.19	6.92*
NAR	28.36	4.08	26.73	2.91	2.71
RED	21.60	4.43	25.50	4.04	10.81*

*p < .05.

**p < .01.

MANOVA revealed no significant difference between the TAS attentional scales of athletes exhibiting high batting averages and those exhibiting low batting averages, F (6, 44) = .32, p >.05. This result led to the acceptance of the second hypothesis.

Strikeouts

MANOVA revealed no significant difference between the TBAS attentional scales of athletes exhibiting low strikeouts and those exhibiting high strikeouts, F (6, 44) = .38, p >.05. This result led to the rejection of the third hypothesis.

MANOVA revealed no significant difference between the attentional scales of athletes exhibiting low strikeouts and those exhibiting high strikeouts, F (6, 44) = .47, p >.05. This result led to the acceptance of the fourth hypothesis.

Runs Batted In

MANOVA revealed no significant difference between the TBAS attentional scales of athletes exhibiting high runs batted in and those exhibiting low runs batted in, F (6, 44) = .82, p >.05. This result led to the rejection of the fifth hypothesis.

MANOVA revealed no significant difference between the TAS attentional styles of athletes exhibiting high runs batted in and those with low runs batted in, F (6, 44) = 1.78, p >.05. This result led to the acceptance of the sixth hypothesis.

Multiple Regression Analysis

In order to assess the overall degree of relationship between a set of predictor variables (attention, visual disembedding, anxiety, locus of control, and self-perception) and a single criterion measure

(batting averages, strikeouts, and runs batted in, in turn), the stepwise procedure of multiple regression was utilized. The decision to terminate the regression equation was made after examination of R^2 and the partial F value related to the most recently entered variable (Draper & Smith, 1966).

Batting Averages

Multiple regression of the predictor variables on batting averages revealed the following 10 significant ($p < .05$) variables: perceived ability and success, locus of control, ideal self, NAR (TAS), visual disembedding, competitive trait anxiety, BIT (TAS), BET (TBAS), RED (TBAS), and self-concept. These 10 variables predicted approximately 61% of the variance in batting averages. This result led to the acceptance of the seventh hypothesis.

Strikeouts

Multiple regression of the predictor variables on strikeouts revealed the following seven significant ($p < .05$) variables: visual disembedding, BIT (TBAS), self-concept, competitive trait anxiety, perceived ability and success, NAR (TAS), and OIT (TAS). These seven variables predicted approximately 33% of the variance in strikeouts. This result led to the acceptance of the eighth hypothesis.

Runs Batted In

Multiple regression of the predictor variables on runs batted in revealed the following five significant ($p < .05$) variables: perceived ability and success, competitive trait anxiety, BIT (TAS), BET (TBAS), and RED (TBAS). These five variables accounted for approximately 42% of the variance in runs batted in. This result led to the acceptance

of the ninth hypothesis.

Canonical Correlation Analysis

The overall measure of the multivariate relationship between the outcome measures (batting averages, strikeouts, and runs batted in) and the predictor variables (attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception) reached statistical significance, $R_c = .84$, $\chi^2 (60) = 90.50$, $p < .01$. The significant canonical correlation explained approximately 91% of the variance, using the 1 - lambda approximation. This result led to the acceptance of the tenth hypothesis. Examination of the canonical variates revealed the following relationship between the outcome measures and predictor variables:

High batting averages and low strikeouts ⟷ High perceived ability and success, low ideal self, internal locus of control, low narrowed attention (TAS), low broad external focus (TBAS), and high overloaded external focus (TBAS).

Summary

Adjusted reliability coefficients for the TAS varied from a low of .62 (OIT and RED) to a high of .74 (NAR). The adjusted reliability coefficients of the TBAS varied from .61 (OIT) to .75 (BIT).

MANOVA for the TBAS and batting averages revealed a significant difference between the TBAS attentional scales and batting averages. ANOVA follow-up revealed significant between group differences on BET, BIT, OIT, and RED. Discriminant function analysis revealed that four scales (RED, NAR, OET, and OIT) accounted for 95% of the variance. MANOVA revealed no other significant difference between the TBAS

attentional scales and strikeouts or runs batted in. MANOVA also revealed no significant difference between the TAS attentional scales and batting averages, strikeouts, or runs batted in.

Multiple regression of the predictor variables and batting averages revealed 10 significant variables that accounted for approximately 61% of the variance. Five prime variables were found in predicting batting averages: locus of control, visual disembedding, BIT (TAS), BET (TBAS), and RED (TBAS).

Multiple regression of the predictor variables and strikeouts revealed seven variables that accounted for approximately 33% of the variance. Of these seven variables, four prime variables were found in predicting strikeouts: visual disembedding, BIT (TBAS), perceived ability and success, and OIT (TAS).

Multiple regression of the predictor variables and runs batted in revealed five variables that accounted for approximately 42% of the variance. Three prime variables were found to predict runs batted in: perceived ability and success, BIT (TAS), and RED (TBAS).

A canonical correlation between batting outcome measures and the predictor variables reached statistical significance and explained approximately 91% of the variance. The canonical correlation revealed the following psychological profile of batting efficiency: high perceived ability and success, low ideal self, internal locus of control, low NAR (TAS), low BET (TBAS), and high OET (TBAS).

Chapter 5

DISCUSSION OF RESULTS

This chapter discusses the results reported in chapter 4. Topics include the following: attentional scales of the TAS and TBAS associated with batting outcomes (batting averages, strikeouts, and runs batted in); prediction of batting outcomes; psychological profiles of successful batters; and summary.

Attentional Scales of the TBAS and TAS Associated with Batting Outcomes

Multivariate analysis of variance (MANOVA) revealed that the TBAS differentiated athletes exhibiting high- and low batting averages, whereas the TAS did not. The ability of the TBAS to differentiate athletes with high- and low batting averages along with the inability of the TAS to do so, supports the claim for situation-specific assessment devices. Fisher (1977) and Martens (1977) have both argued elsewhere that sport assessment devices should be as situation-specific as possible. Attention during batting situations may not be accurately assessed unless attention is measured in situations specific to batting. The TBAS does differentiate athletes with high- and low batting averages because it is specific to batting.

Individuals perceive different situations as threatening or non-threatening. For example, athletes may perceive a batting situation as non-threatening and perform well because they have the proper attentional focus. In another batting situation that necessitates the

same attentional focus, athletes may fail because they perceive the situation as threatening. The perception of threat produces anxiety, which tends to narrow athletes' attention excessively (Kahneman, 1973; Landers, 1980), an attentional style not appropriate for batting success. ANOVA revealed that the TBAS predicted high batting averages with two appropriate attentional focuses (broad internal and broad external), while the TBAS also predicted low batting averages with two inappropriate attentional focuses (underinclusive and internally overloaded).

The broad and internal focus refers to an effective attentional style (Nideffer, 1976b) in which the focus is on external stimuli (e.g., cognitive and affective). By being broad and internal, the batter is able to anticipate the next pitch. Anticipation is actually the internal cognitive and affective processing of the situation (e.g., ball and strikes, number of outs, baserunners, and the inning) as well as the past history of the batter versus pitcher (Newell, 1974). For instance, the batter may recall that in past games the pitcher threw a fastball when there was a full count. If the batter has a full count on him, he may anticipate a fastball on the next pitch based on past history. This anticipation is necessary for successful batters (Williams & Underwood, 1972). After batters prepare strategy with their broad and internal focus, they must be broad and external during the pitcher's wind-up.

Being broad and external involves perceiving, selecting, and processing relevant environmental cues. It was suggested earlier that the batter adopt a broad and external attention as the pitcher is in the wind-up in order to discover any cues that may indicate the type of

pitch. A pitcher may slow his motion when a change of speed pitch is thrown or may change the grip on the ball in the glove when throwing a curveball. It would appear that successful batters can recognize relevant cues earlier than less successful batters and are able to respond to them appropriately (Lawther, 1977). By being broad and external, batters enhance their probability that they will recognize early cues and consequently have a longer time in which to make their performance decisions. While BET and BIT were found to predict high batting averages, two other attentional scales, RED and OIT, were found to predict low batting averages.

The underinclusive (RED) focus is an ineffective attentional style in which the focus is reduced and directed toward internal or external cues (Nideffer, 1976b). Batters with the reduced focus, or tunnel vision, have attention that is too narrow to recognize the proper cues. Because of the narrowed attention, the batters may be focusing on the "slump" they are in, or on some other restricted cue, instead of focusing on cues necessary for success. To successfully meet the task demands of a skill, an athlete must focus on the necessary cues for that situation (Nideffer, 1978).

Another attentional focus linked to low batting averages is overloaded and internal (TBAS), which is an ineffective type of attention (Nideffer, 1976b) in which the focus is directed toward a range of cognitive stimuli. As with the reduced attentional focus, athletes operating the internally overloaded focus have an inappropriate attentional focus but for different reasons. Internally overloaded batters think of too many things at once and are confused by the multiple

thought patterns. Batters may be worrying about driving in the winning run, not getting a hit in previous at bats, and facing a good pitcher, all simultaneously. Batters who are internally overloaded pay attention to irrelevant cues, and this predisposes batting failures.

Discriminant function analysis revealed that four attentional scales of the TBAS (RED, NAR, OET, & OIT) contributed to most of the between group variance. The underinclusive and internally overloaded focuses were previously discussed concerning their inappropriate focuses for high batting averages.

Another inappropriate focus for high batting averages was the externally overloaded focus. The externally overloaded focus refers to confusion due to the recognition of too many environmental cues (Nideffer, 1976b). Batters who are externally overloaded may be trying to pay attention to all the pitcher's movements when there is only one relevant cue.

Instead of being externally overloaded, batters have to be narrow at certain times. Narrow focus of attention refers to attention directed to selective internal or external cues (Nideffer, 1976b). Batters may be narrowing their attentional focus on an external cue such as the ball or an internal cue such as correcting their mechanics of batting. Focusing on the mechanics would occur before the batters are ready to swing and the focus on the ball would occur as the ball is released from the pitcher's hand.

Although the TBAS was able to differentiate between batters with high- and low batting averages, it did not differentiate between batters with high- and low strikeouts, or high- and low runs batted in. Perhaps

the differentiation of batters with high- and low strikeouts is such a difficult problem that impact of other variables must be considered in conjuction with the attentional scales.

An explanation for the TBAS not differentiating between batters with high- and low runs batted in would be that runs batted in are not solely based on the batter's ability but the abilities of the preceding batters as well. There must be someone on base to get a run batted in, the exception being the batter hitting a home run. Runs batted in may be more dependent on one's position in the batting order rather than being based on one's attentional focus.

As stated earlier, the TAS did not differentiate between athletes with high- and low runs batted in. The ineffectiveness of the TAS can be explained by its lack of specific situations relative to batting. This appears to be consistent with the literature which states assessment devices should be as situation-specific as possible (Fisher, 1977; Martens, 1977).

Prediction of Batting Outcomes

Batting Averages

Six prime variables were found to predict batting averages by multiple regression: perceived ability and success, locus of control, visual disembedding, BIT (TAS and TBAS), BET (TBAS), and RED (TBAS).

Athletes with high perceived ability and success had high batting averages because their perceived competence is likely to lead to low anxiety. Since the anxiety level is low, there is little interference with the proper attentional focus (Harter, 1978; Kroll & Petersen, 1965). Batters with high perceived ability and success and internal locus of

control feel that they are in control of skilled situations such as batting. Internals have also been found to be more successful at problem-solving tasks (Geen, 1976; Kleinke, 1978). Batters with internal locus of control are able to select information or cues from the pitcher and use the cues to succeed in the task. Information selection is a significant variable in the prediction of batting success, evidenced by the fact that visual disembedding increased the prediction equation.

Visual disembedding, which is the ability to break up an organized visual field to keep part of it separate from its surroundings (Pargman, Bender, & Deshaies, 1975), was associated with high batting averages. Successful batters must be able to separate the ball as a relevant cue from among the many irrelevant cues (e.g., baserunners, fielders, and possibly some distractions in the pitcher's wind-up). By ignoring the irrelevant cues, batters have a greater chance for success as they focus on the ball as early as possible.

Also predicting batting averages were three attentional scales: BIT, BET, and RED. These three scales have been discussed earlier in the section concerning attentional scales of the TBAS and TAS associated with batting outcomes. It should be noted that the underinclusive focus (TBAS) predicted low batting averages. The broad external focus (TBAS), broad internal focus (TAS and TBAS), high perception of competence, high visual disembedding, and an internal locus of control predicted high batting averages.

Strikeouts

Multiple regression analysis revealed three prime variables of

strikeouts: visual disembedding, BIT of the TBAS, and OIT of the TAS. Selecting relevant cues is extremely important in batting success which is why visual disembedding predicted low strikeouts. Batters must separate the ball from all irrelevant stimuli if they are to make contact with the ball consistently. For instance, batters would not be caught off stride if a pitcher adds an extra movement in his wind-up because the movement is not a relevant cue.

Another predictor of low strikeouts was the broad and internal focus of the TBAS. The reason for the batters with a broad internal focus experiencing fewer strikeouts is the same as why they had higher batting averages. Batters with a broad internal focus learn to anticipate the pitch and this attentional style enables them to ready themselves for relevant cues and, therefore, they should be less likely to strike out. Batters with an internally overloaded focus will strike out more than batters with a broad internal focus. Batters' thoughts must be processed and, if there are too many thoughts to contend with, they will not be capable of taking in any relevant cues. In summary, batters with low strikeouts have ability to visually disembed and a broad internal focus while batters with high strikeouts have an internally overloaded focus.

Runs Batted In

Multiple regression analysis revealed three prime variables of runs batted in: perceived ability and success, BIT of the TAS, and RED of the TBAS. All three variables have been discussed earlier as predictors of batting averages and/or strikeouts. High perceived ability and success athletes had a high number of runs batted in for

the same reason as they had high batting averages. To be specific, for runs batted in, batters who perceive themselves as high in ability and success do not allow baserunners to create a threatening situation for them. The batter's perceived competence leads to a feeling of control in skill situations (Harter, 1978; Kroll & Petersen, 1965).

The broad and internal focus of the TAS also was a significant predictor of high batting averages. Batters with a broad and internal focus contemplate the situation and then decide what is the best way to maximize success. Broad and internal batters will more likely anticipate each pitch so they will have a better chance at driving in runs when the opportunity presents itself.

Batters who are not as successful at driving in runs are those with the underinclusive focus, which was previously discussed as a predictor of low batting averages. Athletes with tunnel vision reduce their attention by selectively attending to isolated cues and not altering their attentional focus to capture the entire environment. Batters who do not allow previous poor performances, for instance, to impact unnecessarily on subsequent performances, might be expected to successfully meet the batting task demands and have a higher number of runs batted in. To produce a high number of runs batted in, batters must have a high perception of ability of success, broad and internal focus, and must not have an underinclusive focus.

Psychological Profiles of Successful Batters

As might be expected, successful batters have high batting averages and low strikeouts. Canonical correlation analysis revealed that athletes who exhibited high batting averages and low strikeouts possessed the

following psychological profile: high perceived competence (ability and success), internally controlled, low ideal self, low narrowed attentional focus of the TAS, low broad and external attentional focus of the TBAS, and high externally overloaded attentional focus of the TBAS. The first three profile variables were much stronger in the pattern than the latter three variables. Overall the profile pattern accounted for 91% of the common variance between the batting and psychological variables.

The most important profile variable of batting success was perceived competence. Those batters with a high perceived ability and success feel competent, in control of the situation, and, therefore, less anxious; these characteristics greatly contribute to their batting success.

Another variable important in predicting batting success was low ideal self. Ideal self is an aspect of self-perception that refers to how a person would like to be (Bills, 1975). Successful batters in this study did not assess themselves as high ideal self, but in fact were lower on the ideal self measure than were less successful batters. On the surface, at least, that seems incongruous. However, it just might be that their ideal self-perceptions suffer from what might be termed false modesty. Perhaps these successful batters are willing to let their batting outcomes speak for themselves (i.e., actions speak louder than words). Low ideal self along with perceived competence and internal control accounted for most of the variance of batting success while three attentional scales (low NAR, low BET, and high OET) accounted for a less amount of variance.

The low broad and external focus in successful batters may be

explained by the fact that batters have so many external cues to attend to that it may be more appropriate if they do not attempt to respond to them simultaneously. With this reduced broad and external focus, batters would almost be narrow and external. That is, batters would only focus on the external cues to which they could properly attend. There is so little time to be broad and external once the pitcher begins his motion that it might be more realistic to pre-select some cues that are likely to appear.

Two other attentional scales associated with batting success were low narrowing (TAS) and high internal overloading (TBAS). The relationship of the former focus with batting success may be explained by the fact there is no differentiation between internal and external focus of narrow attention. Batters may be narrowing their attentional focus on the ball (external) or a strategy (internal). Unless narrowed attention is specified as internal or external, the attentions cannot be accurately determined.

The high internally overloaded focus also predicted batting success. Possibly, successful batters do become confused by their own thoughts but this does not necessarily happen while they are batting. The internally overloaded focus could take place in the dugout, for instance, while the batters are thinking of all the possible ways to get a hit. Then, as the batters get closer to their turn at bat, they shift to the proper attentional focus for that time span.

If one were to select out successful batters from psychological profiles, they would have perceived competence, internal locus of control, and low ideal self. That is, these three profile variables

would be expected to account for most of the variance in batting success.

Summary

MANOVA revealed that the TBAS differentiated high- and low batting average groups, while the TAS did not. Sport assessment devices should be as situation-specific as possible (Fisher, 1977; Martens, 1977). There were 10 attentional focuses of the TBAS found to predict batting outcomes, whereas the TAS revealed four.

Important in predicting high batting averages were high perception of control and internal control. These two variables are related because batters with high perceived ability and success have a sense of control of the situation which reduces anxiety (Kahneman, 1973; Landers, 1980). The low anxiety results in an appropriate attentional focus.

The appropriate attentional focuses of high batting averages were the broad external focus (TBAS) and broad internal focus (TAS and TBAS). The batters select cues from the pitcher's wind-up with their broad external focus after anticipating the pitch with their broad internal focus. An inappropriate focus of attention for high batting averages is the underinclusive which involves batters with tunnel vision.

Low strikeouts were predicted by visual disembedding which shows that batters can select the ball as a relevant cue out of a visual field. The broad and internal focus (TBAS) also related to low strikeouts while batters who were internally overloaded (TAS) had high strikeouts because of their inability to select proper cues.

High runs batted in were predicted by high perceived competence

and the broad internal focus of the TAS. Low runs batted in were predicted by the underinclusive focus of the TBAS.

A psychological profile of a successful batter would include high perceived competence, internal control, low ideal self, low narrowed attention (TAS), low broad and external focus (TBAS), and high overloaded external focus (TBAS).

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study investigated the relationship of five predictor variables (attention, visual disembedding, competitive trait anxiety, locus of control, and self-perception) and batting outcomes (batting averages, strikeouts, and runs batted in). Seven tests were administered to 51 baseball athletes ranging from high school varsity to college junior varsity and varsity levels. The seven tests administered were a test of batting attentional style (TBAS), the Test of Attentional Style (TAS), Group Embedded Figures Test (GEFT), Sport Competition Anxiety Test (SCAT), personal behavior scale (PBS), Index of Adjustment and Values (IAV), and a personal assessment questionnaire (PAQ).

Internal consistency of the TBAS and TAS, was reported by Cronbach's (1951) coefficient alpha. A multivariate analysis of variance revealed that the TBAS differentiated between athletes with high batting averages and those with low batting averages while the TAS did not. The TBAS and TAS did not differentiate between the high- and low strikeout groups or the high- and low runs batted in groups.

The stepwise procedure of multiple regression was used to assess the relationship between the predictor variables and a single criterion measure (batting averages, strikeouts, and runs batted in, in turn). High batting averages were revealed to be predicted by five prime variables: high perceived ability and success, internal locus of control,

high visual disembedding, broad external focus of the TBAS, and broad internal focus of the TAS and TBAS. Low batting averages were predicted by two prime variables: the underinclusive focus and the internally overloaded focus of the TBAS. Low strikeouts were predicted by visual disembedding, broad internal focus of the TBAS, and high perceived ability and success, while high strikeouts were predicted by the internally overloaded focus of the TAS. High runs batted in were predicted by high perceived ability and success and the broad internal focus of the TAS, while low runs batted in were predicted by the RED (TBAS) scale.

A canonical correlation was used to determine psychological profiles of successful batters (high batting averages and low strikeouts). The successful batters were found to have high perceived ability and success, internal locus of control, low ideal self, low broad external focus of the TBAS, low narrowed attentional focus of the TAS, and high externally overloaded focus of the TBAS.

Conclusions

1. The TBAS is able to differentiate between athletes exhibiting high- and low batting averages.

2. The BET and BIT focuses of the TBAS, the BIT focus of the TAS, internal locus of control, and visual disembedding are able to predict high batting averages.

3. The RED and OIT focuses of the TBAS are able to predict low batting averages.

4. Visual disembedding, the BIT focus of the TBAS, and high perceived ability and success are able to predict high strikeouts.

5. The OIT focus of the TAS is able to predict low strikeouts.

6. High perceived ability and success and the BIT focus of the TAS are able to predict high runs batted in.

7. The RED focus of the TBAS is able to predict low runs batted in.

8. High perceived ability and success, internal locus of control, and low ideal self are able to predict batting success.

Recommendations

1. Tests of attentional styles should be developed for other sport areas using appropriate situations to represent the six attentional scales used in this study.

2. A study should be conducted with the TBAS, but the NAR scale may be divided into a narrow external and a narrow internal focus of attention to examine the effects of each.

3. A study should be conducted to predict batting success with the addition of some variables: hand-eye coordination and eyesight.

Appendix A

TEST OF BATTING ATTENTIONAL STYLE

INSTRUCTIONS

USE NO. 2 PENCIL. DO NOT WRITE ON THE TEST BOOKLET.

Read each item carefully and then answer according to the frequency with which it describes you or your sport behavior. For example, "When I am tired I tend to lose concentration on the pitches."

A = NEVER

B = RARELY

C = SOMETIMES

D = FREQUENTLY

E = ALWAYS

If your answer to the first item is SOMETIMES, you would darken C on the answer card for item number 1. The same key is used for every item, thus each time you mark an A you are indicating NEVER, etc.

1. Please be sure to mark your name in the space provided at the top of the answer card.

2. Fill in your school's name in the space following "Course:" at the top of the answer card.

1. I would describe myself as a constructive hitter recognizing the pitcher's tipoffs of pitches and taking advantage of them.

2. The pitch is delivered and by the time I decide to swing the ball is by me and then I find it was my pitch to hit.

3. I talk to myself when the pitcher winds up. For example, "If the pitch is a curve, I'll take it but if it's a fastball, I will swing."

4. The coach has instructed me to take a strike but I would rather swing away. My performance suffers, while I think about the instructions and my own feelings.

5. When I am batting, I am almost totally unaware of the spectators.

6. I have struck out in my first two at-bats. I continue to think about the strikeouts and my performance worsens.

7. The pitch is on the outside part of the plate. I decide whether to pull the ball or hit it to the opposite field and concentrate closely on my plan.

8. The pitcher has just knocked me down with a pitch. I want to charge the mound to seek revenge.

9. I am always aware of the situation when I am at-bat, such as the count, numbers of outs, and runners.

10. I tend to swing at pitches out of the strike zone more with runners in scoring position than without runners on base.

11. I am aware of how the pitcher is pitching to me by his/her different movements.

12. In my first at-bat the pitcher throws two quick strikes. I have trouble concentrating on the next pitch.

13. I have been sitting on the bench for most of the game and have developed strong feelings against the coach. I am called upon to pinch-hit and am unable to concentrate.

14. I remember a pitcher's selection of pitches from my previous at-bats but I still make appropriate adjustments in my next at-bat.

15. I often find myself taking only a half-swing because I cannot decide whether it is a pitch to hit or not.

16. I am constantly aware of where the opposition is playing me.

17. I concentrate so well while I am batting that I am not aware of the coach shouting instructions.

18. I have just been warned by the umpire to stop questioning his calls. My performance declines as the thoughts of being ejected from the game distract me.

19. With the bases loaded, I tend to take more good pitches than I should because I really want to succeed.

20. I can take a pitch and think ahead to what may be thrown next.

21. When a coach shouts to me while I am batting my performance declines because I try to listen to the instructions.

22. I take advantage of a pitcher who "tips off" pitches.

23. My friends are watching and I try to impress them with an extra-base hit.

24. I have just swung at a bad pitch, but quickly removed distractive negative feelings.

25. The pitcher throws me a pitch high and outside. I remember that this pitcher usually follows this with an inside fastball and I am ready for the next pitch.

26. In important games excessive pressure to do well causes me to make mistakes, particularly at the beginning.

27. I would rather bat with no runners on base so I would not have to be aware of signs from the coach.

28. I can tell what pitch is coming by seeing how the pitcher releases the ball.

29. A good pitch crosses the plate without me swinging at it because I decide too late whether or not to swing.

30. I see a pitch and recall how the coach suggested to hit it and I use the technique.

31. When I am slightly injured and continue to play I tend to lose my concentration.

32. The umpire has made two bad calls on me. I don't let it distract me and concentrate on the next pitch.

33. When I swing at a bad pitch I have trouble forgetting it and have trouble concentrating on the rest of the pitches.

34. I ignore any comments from the opposition's bench while I am batting.

35. I am worried about batting against a superior pitcher.

36. I end the inning with the bases loaded but I am not affected by the failure through the rest of the game.

37. I am awaiting the pitch when a teammate attempts to steal second base unexpectedly. I am distracted by this.

38. I can often determine the pitch by the way the pitcher has his/her hand positioned in the glove as he/she winds up.

39. With a count of two strikes, I often swing at a bad pitch in fear I will take a called third strike.

40. My performance deterioriates considerably when weather conditions are not favorable.

41. I can anticipate certain pitches and get base hits because of this anticipation.

42. I get very frustrated when a runner is picked off while I am batting.

43. I see the shortstop leaving his/her position to cover second base on a steal and respond by hitting the ball to the vacated spot.

44. I have just done well in my first two at-bats. I sit back on my performance with the feeling that I've earned my place in the line-up for the rest of the game.

45. It is equally easy for me to concentrate against less skilled and more skilled pitchers.

46. The third baseman is playing deep so I decide to bunt down the third base line.

47. I am at the plate waiting for the pitch when an opponent shouts or waves his/her arms. I am distracted by this.

48. If I have struck out my first time at-bat, I am able to forget about it and concentrate for the rest of the game.

49. It's the last inning and my team is behind. I begin to do desperate things, such as trying to pull an outside pitch over the fence.

50. I concentrate the same whether it be my first at bat or my last.

51. The pitcher tips off a fastball in the windup but instead comes with a slow speed pitch which I take for a called strike because I was waiting for the fastball.

52. I am constantly analyzing and evaluating my hitting while I am at the plate.

53. When I am batting I "coach" myself mentally with encouraging instructions.

54. I often find myself taking pitches that are good to hit.

55. The catcher is setting up on the inside corner so I am ready for an inside pitch.

56. A teammate has just complained to me after I failed to score him/her from third base. In my next at-bat, the same teammate is on first base and I make an extra effort to score him/her.

57. It is equally easy for me to concentrate on batting either at home or away.

58. The first baseman is holding the runner on and the second baseman is playing me up the middle so I try to hit the ball to the right side of the infield.

59. When playing away from home I may be distracted by the new surroundings particularly in my first at-bat.

60. I can usually stay confident even through one of my poorer performances.

61. In important games excessive pressure to do well leads me to swing at pitches I normally take.

62. The umpire makes a bad call on me. I immediately complain to him forgetting about the game.

63. It is equally easy for me to concentrate on hitting whether there are runners on base or not.

64. The batter in front of me just got hit by a pitch. I am a little hesitant to go to the plate.

Appendix B

ITEM NUMBERS FOR TBAS SCALES

Attentional Scale	Item Number
BET	1, 11, 16, 22, 28, 38, 43, 46, 55, 58
OET	2, 10, 15, 21, 27, 29, 37, 42, 47, 54, 59
BIT	3, 9, 14, 20, 25, 30, 36, 41, 48, 53, 60
OIT	4, 8, 13, 19, 26, 31, 35, 40, 49, 52, 61
NAR	5, 7, 17, 24, 32, 34, 45, 50, 57, 63
RED	6, 12, 18, 23, 33, 39, 44, 51, 56, 62, 64

Appendix C

GEFT SCORING KEY

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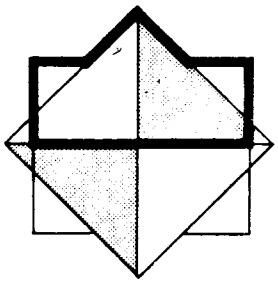

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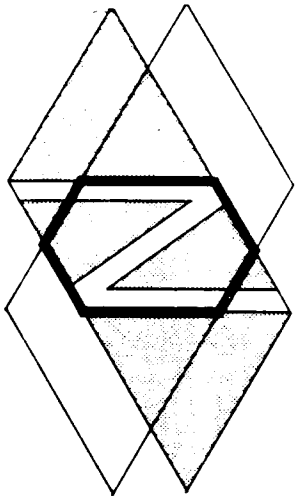

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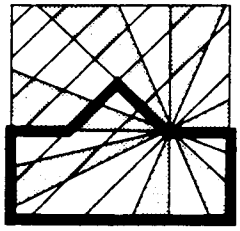

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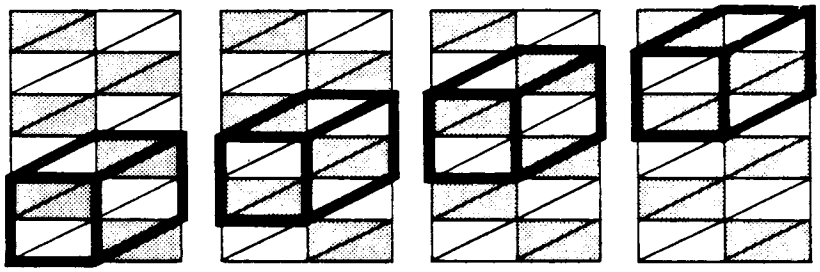

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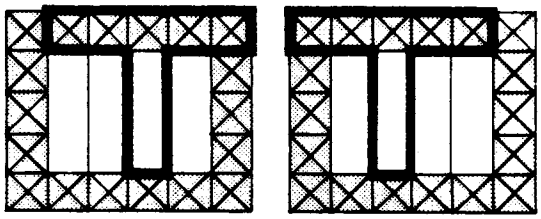

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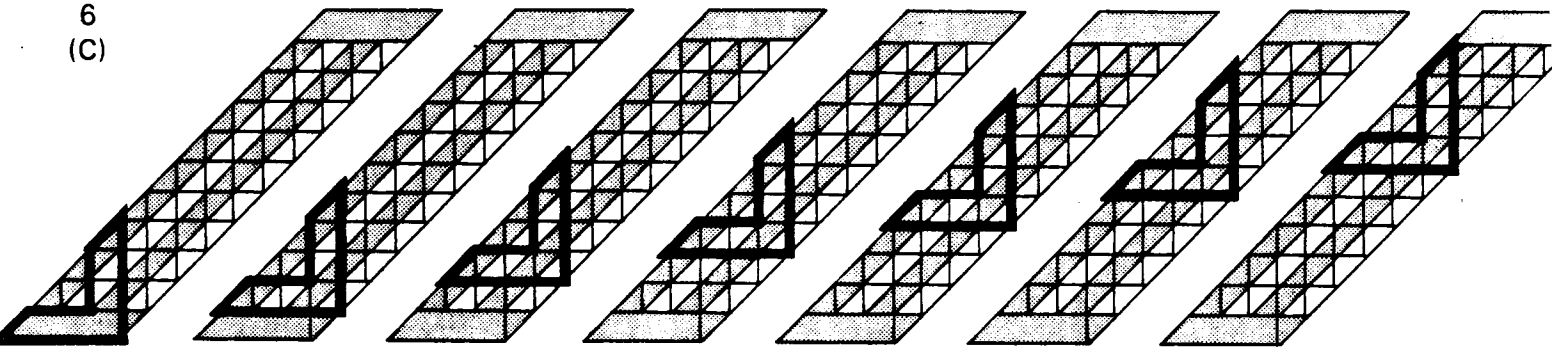

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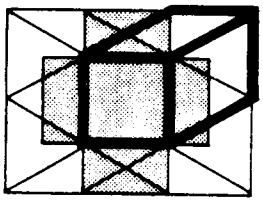

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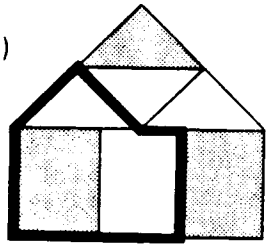

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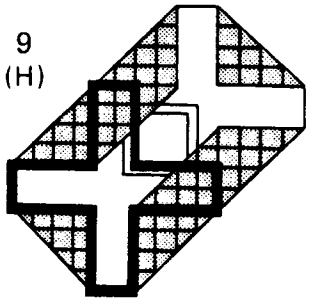

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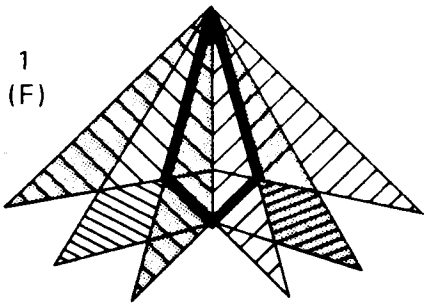

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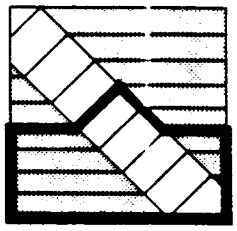

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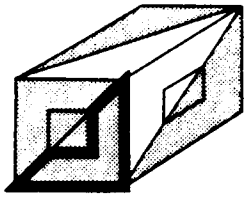

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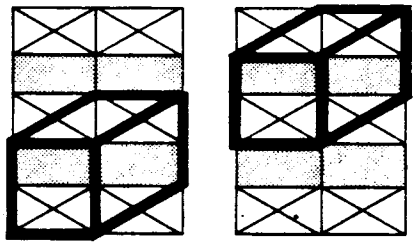

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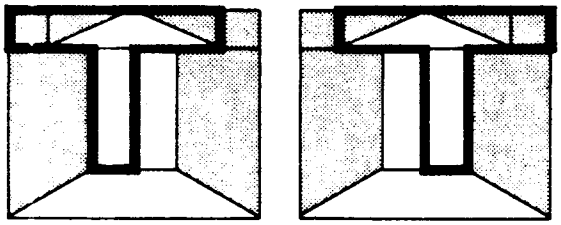

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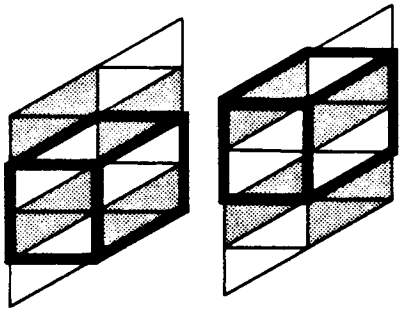

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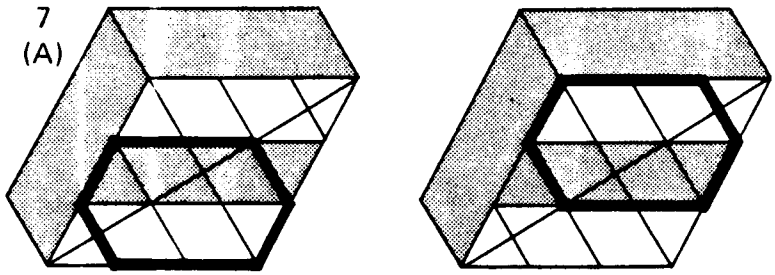

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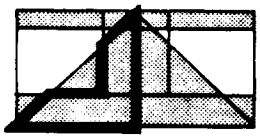

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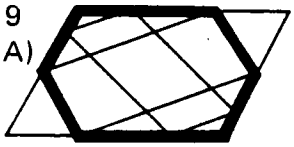

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Appendix D

SPORT COMPETITION ANXIETY TEST

Name: _____ Age: _____ Sex: _____

DIRECTIONS: Below are some statements about how persons feel when they compete in sports and games. Read each statement and decide if you HARDLY-EVER, or SOMETIMES, or OFTEN feel this way when you compete in sports and games. If your choice is HARDLY-EVER, blacken the square labeled A, if your choice is SOMETIMES, blacken the square labeled B, and if your choice is OFTEN, blacken the square labeled C. There are no right or wrong answers. Do not spend too much time on any one statement. Remember to choose the word that describes how you usually feel when competing in sports and games.

	Hardly-Ever	Sometimes	Often
1. Competing against others is socially enjoyable.	☐A	☐B	☐C
2. Before I compete I feel uneasy.	☐A	☐B	☐C
3. Before I compete I worry about not performing well.	☐A	☐B	☐C
4. I am a good sportsman when I compete.	☐A	☐B	☐C
5. When I compete I worry about making mistakes.	☐A	☐B	☐C
6. Before I compete I am calm.	☐A	☐B	☐C
7. Setting a goal is important when competing.	☐A	☐B	☐C
8. Before I compete I get a queasy feeling in my stomach.	☐A	☐B	☐C
9. Just before competing I notice my heart beats faster than usual.	☐A	☐B	☐C
10. I like to compete in games that demand considerable physical energy.	☐A	☐B	☐C
11. Before I compete I feel relaxed.	☐A	☐B	☐C
12. Before I compete I am nervous.	☐A	☐B	☐C
13. Team sports are more exciting than individual sports.	☐A	☐B	☐C
14. I get nervous wanting to start the game.	☐A	☐B	☐C
15. Before I compete I usually get up tight.	☐A	☐B	☐C

APPENDIX E

PERSONAL BEHAVIOR SCALE

INSTRUCTIONS

Below are 30 statements about various topics. They have been collected from different groups of people and represent a variety of opinions. There are no right or wrong answers. For every statement there are large numbers of people who agree and disagree. Please indicate whether you agree or disagree with each statement as follows:

Circle SA if you strongly agree.

Circle A if you agree.

Circle D if you disagree.

Circle SD if you strongly disagree.

Please read each statement carefully and be sure that you indicate the response that most closely corresponds to the way you personally feel. Record your response on the answer sheet.

1. Sometimes I impulsively do things that at other times I definitely would not let myself do.

2. Sometimes I feel that I don't have enough control over the direction my life is taking.

3. It is relatively easy for me to behave in a manner very different from the way I would want to behave.

4. I often realize that despite my best efforts some outcomes seem to happen as if fate planned it that way.

5. In my case getting what I want has little or nothing to do with luck.

6. Little in this world controls me, I can do what I decide to do.

7. In the long run people receive the respect and good outcomes they work for.

8. Success in dealing with other people seems to be more a matter of the other person's moods and feelings at the time rather than one's own actions.

9. When things are going well for me I consider it due to a run of good luck.

10. It isn't wise to plan too far ahead because most things turn out to be a matter of good or bad misfortune anyhow.

11. If they want to, people can control their immediate wishes and not let these motives determine their total behavior.

12. Life is too full of uncertainties.

13. Sometimes I do not understand how I can have such poor luck.

14. Some people seem born to succeed while others seem born to fail no matter what they do.

15. Success is mostly a matter of good breaks.

16. I feel that many people could be described as victims of circumstances beyond their control.

17. There is no such thing as luck, what happens to me is a result of my own behavior.

18. Most people don't realize the extent to which their lives are controlled by accidental happenings.

19. A great deal that happens to me is probably just a matter of chance.

20. Many times I feel that we might just as well make many of our decisions by flipping a coin.

21. It is possible for me to behave in a manner very differently from the way I would want to behave.

22. I feel that I have a great deal of influence over the way other people behave.

23. Much of time the future seems certain and predictable to me.

24. People's misfortunes result from the misktakes they make themselves.

25. Many times the reactions of people seem haphazard to me.

26. There's not much use in worrying about things--what will be, will be.

27. I believe that a person can really be a master of one's own fate.

28. I usually feel in control of what I'm doing.

29. It is usually true of successful people that their good breaks will outweigh their bad breaks.

30. I have usually found that what is going to happen will happen as a consequence of my own actions.

Appendix F

INDEX OF ADJUSTMENT AND VALUES

Instructions: There is a need for each of us to know more about ourselves, but seldom do we have an opportunity to look at ourselves as we are or as we would like to be. On the following page is a list of terms that to a certain degree describe people. Take each term separately and apply it to yourself by completing the following sentence:

I AM A (AN) _ _ _ _ _ _ _ _ _ _ PERSON.

The first word in the list is academic, so you would substitute this term in the above sentence. It would read--I am an academic person.

Then decide HOW MUCH OF THE TIME this statement is like you, i.e., is typical or characteristic of you as an individual, and rate yourself on a scale from one to five according to the following key:

1. Seldom, is this like me.
2. Occasionally, this is like me.
3. About half of the time, this is like me.
4. A good deal of the time, this is like me.
5. Most of the time, this is like me.

Select the number beside the phrase that tells how much of the time the statement is like you and insert it in Column I on the next page.

EXAMPLE: Beside the term ACADEMIC, number two is inserted to indicate that--occasionally I am an academic person.

Now go to Column II. Use one of the statements given below to tell HOW YOU FEEL about yourself as described in Column I.

1. I very much dislike being as I am in this respect.
2. I dislike being as I am in this respect.
3. I neither dislike being as I am nor like being as I am in this respect.
4. I like being as I am in this respect.
5. I like very much being as I am in this respect.

You will select the number beside the statement that tells how you feel about the way you are and insert the number in Column II.

EXAMPLE: In Column II beside the term ACADEMIC, number one is inserted to indicate that I dislike very much being as I am in respect to the term, academic. Note that being as I am always refers to the way you described yourself in Column I.

Finally, go to Column III; using the same term, complete the following sentence:

I WOULD LIKE TO BE A (AN) _ _ _ _ _ _ _ _ _ PERSON.

Then decide HOW MUCH OF THE TIME you would like this trait to be characteristic of you and rate yourself on the following five point scale:

1. Seldom, would I like this to be me.
2. Occasionally, I would like this to be me.
3. About half of the time, I would like this to be me.
4. A good deal of the time, I would like this to be me.
5. Most of the time, I would like this to be me.

You will select the number beside the phrase that tells you how much of the time you would like to be this kind of person and insert the number in Column III.

EXAMPLE: In Column III beside the term ACADEMIC, number five is inserted to indicate that most of the time, I would like to be this kind of person.

Start with the word acceptable and fill in Column, I, II, and III before going on to the next word. There is no time limit. Be honest with yourself so that your description will be a true measure of how you look at yourself.

		I	II	III			I	II	III
a.	academic	2	1	5	25.	meddlesome			
1.	acceptable				26.	merry			
2.	accurate				27.	mature			
3.	alert				28.	nervous			
4.	ambitious				29.	normal			
5.	annoying				30.	optimistic			
6.	busy				31.	poised			
7.	calm				32.	purposeful			
8.	charming				33.	reasonable			
9.	clever				34.	reckless			
10.	competent				35.	responsible			
11.	confident				36.	sarcastic			
12.	considerate				37.	sincere			
13.	cruel				38.	stable			
14.	democratic				39.	studious			
15.	dependable				40.	successful			
16.	economical				41.	stubborn			
17.	efficient				42.	tactful			
18.	fearful				43.	teachable			
19.	friendly				44.	useful			
20.	fashionable				45.	worthy			
21.	helpful				46.	broad-minded			
22.	intellectual				47.	businesslike			
23.	kind				48.	competitive			
24.	logical				49.	fault-finding			

Appendix G

PERSONAL ASSESSMENT QUESTIONNAIRE (Form B)

Name: _____

Institution: _____

Please mark X in the space that best represents your personal assessment of the statements. Example: If you have always been a successful hitter, mark X in the left hand space; if you have been unsuccessful as often as successful, mark X in the middle space; if you have been an unsuccessful hitter, mark X in the right hand space.

As a batter I have been generally

successful	_ _ _ _ _	unsuccessful
unnoticed	_ _ _ _ _	recognized
frustrated	_ _ _ _ _	rewarded
happy	_ _ _ _ _	sad
uncertain	_ _ _ _ _	confident

My hitting or batting ability is

above average	_ _ _ _ _	below average
bad	_ _ _ _ _	good
ridiculed by coach	_ _ _ _ _	praised by coach
superior	_ _ _ _ _	inferior
limited	_ _ _ _ _	broad
praised by others	_ _ _ _ _	ridiculed by others
encouraging	_ _ _ _ _	frustrating
strong	_ _ _ _ _	weak
worse than most	_ _ _ _ _	better than most

Appendix H

INFORMED CONSENT FORM

We are conducting research to examine the relationship between batting averages and a number of psychological variables, namely attention, concentration, perception, anxiety, and self-esteem.

As a subject you will be asked to take the following paper-and-pencil tests:

1) Test of Attentional Style: this test determines which attentional styles describe the subject (15 min.).

2) Test of Batting Attentional Style: this test is similar to the Test of Attentional Style but is more specific to batting (15 min.).

3) Group Embedded Figures Test: this test measures visual perception (20 min.).

4) Sport Competition Anxiety Test: this test measures the degree of anxiety in competitive situations (5 min.).

5) The Personal Behavior Scale: this test assesses the degree to which one allocates the causes of behaviorial outcomes to internal versus external factors (15 min.).

6) Perceived Ability and Success: this test determines how successful one perceives himself and the level of his ability according to the subject (5 min.).

7) Index of Adjustment and Values: this test will assess how one perceives himself as a person (20 min.).

At the end of the season, your batting average will be used as data also. All of your data will remain completely confidential.

The total time involved in the testing procedure should take 1 1/2 to 2 hours. This time will be divided into two sessions so you will not be tested for 2 straight hours. The tests may be taken in a group or individual setting. Participation in this study is voluntary and your initial agreement to participate does not stop you from discontinuing participation at any time.

Please consider the purposes and time commitment of this study before you decide whether or not to participate. Indicate your decision below. Thank you.

Thomas Ford, Graduate Student

A. Craig Fisher, Thesis Advisor

_____ Yes, I voluntarily choose to participate in this study.

_____ No, I do not wish to participate in this study.

_____

(signature)

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