2004

Concentration Characteristics and Batting Performance In Collegiate Baseball and Softball

Daniel Samess

CONCENTRATION CHARACTERISTICS AND BATTING PERFORMANCE IN COLLEGIATE BASEBALL AND SOFTBALL

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Concentration Characteristics and Batting Performance In Collegiate Baseball and Softball

A Thesis

Presented to

the College of Graduate Studies of

Georgia Southern University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Kinesiology

with an Emphasis in Sport Psychology

In the Jiann-Ping Hsu School of

Public Health

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by

Daniel Samess

May 2004

April 12, 2004

To the Graduate School:

This thesis entitled, "Concentration Characteristics and Batting Performance in Collegiate Baseball and Softball," and written by Daniel S. Samess is presented to the College of Graduate Studies of Georgia Southern University. I recommend that it be accepted in partial fulfillment of the requirements for the Master of Science Degree in Kinesiology, with an emphasis in Sport Psychology, in the Jiann-Ping Hsu School of Public Health.

Kevin L. Burke, Thesis Director

We have reviewed this thesis
and recommend its acceptance:

Charles J. Hardy, Committee Member

A. Barry Joyner, Committee Member

D. Richard Carter, Department Chair

Accepted for the College of Graduate Studies

Charles J. Hardy
Acting Dean, College of Graduate Studies

DEDICATION

Because of their encouragement, unconditional support, and belief in me, I wish to dedicate this thesis to my family and fiancée, specifically, my parents Ronald and Claudette, my brother Kyle, and my soon to be wife Elizabeth. I also wish to dedicate this thesis to my late grandfathers, Phillip Samess and Phillip Dagen, for teaching me the meaning of hard work, family values, and for bravely serving our great country.

ACKNOWLEDGEMENTS

I wish to thank Dr. Kevin L. Burke, Associate Professor, Jiann-Ping Hsu School of Public Health, for his guidance, assistance, and invaluable advice throughout my two years at Georgia Southern University. Thanks to you I am a better writer, wiser person, and competent in the field of sport psychology.

I would also like to thank Dr. A. Barry Joyner and Dr. Charles J. Hardy for their valuable assistance throughout my thesis project, specifically in the areas of statistical analysis and the methodology. Both of you had a significant, positive effect on my graduate experience that I will never forget, thank you.

I would also like to thank Dr. Robert M. Nideffer, whose work on attention/concentration have allowed me and others to further the study of concentration and its effects on performance.

ABSTRACT

CONCENTRATION CHARACTERISTICS AND BATTING PERFORMANCE IN COLLEGIATE BASEBALL AND SOFTBALL

May 2004

DANIEL S. SAMESS

B.S. THE FLORIDA STATE UNIVERSITY

M.S. GEORGIA SOUTHERN UNIVERSITY

Directed by: Professor Kevin L. Burke

This study examined relationships between batting performance, trait anxiety, and concentration style. A predictive analysis was also formed to determine the combination of subscales that may best explain variance in batting performance. To accurately measure these variables, the Sport Competition Anxiety Test (SCAT; Martens, Vealey, & Burton, 1990) and the Batting-specific Test of Attentional and Interpersonal Style (B-TAIS; Albrecht & Feltz, 1987) were employed. Participants consisted of both male collegiate baseball and female collegiate softball players located in the southeastern section of the United States. Participants' 2003 batting statistics were utilized to assess batting performance, and participants must have compiled at least 40 or more at-bats during the 2003 season to participate in the study. To calculate overall batting performance the OPS (on-base percentage plus slugging percentage) batting statistic was utilized. Results displayed no significant relationships between OPS and B-TAIS

subscales among collegiate baseball participants. Also, no subscales explained variance in OPS. Significant relationships were found between collegiate softball, OPS, and B-TAISsubscales, and 17.3% (SE = .164) of the variance in OPS was explained by subscales INFP and RED. INFP was the best predictor of OPS (beta = .365). Sport competition anxiety was negatively associated with OPS for both baseball and softball participants. There were no significant correlational differences between OPS and B-TAIS subscales for gender.

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Concentration Characteristics and Batting Performance in Collegiate Baseball and Softball

Previous literature suggests that concentration plays a factor in athletic performance, and elite athletes had superior scores on concentrational inventories as compared to novice athletes (Mallett & Hanrahan, 1997; Meyers & Bourgeois, 1999). Studies involving concentration have found that elite athletes are more likely to use concentration techniques prior to and during competitions. Meyers and Bourgeois (1999) investigated mood and psychological skills of elite and sub-elite equestrian athletes. This study sought to discover any differences between these athletes by using the Profile of Mood States (POMS; McNair, Lorr & Droppleman, 1971), and Psychological Skills Inventory for Sports (PSIS; Mahoney, Gabriel, & Perkins 1987). Variables compared were rank, gender, and different types of equestrian events during competitions. The results indicated that elite equestrian athletes exhibited significantly higher levels of anxiety management (76.4 +/- 3.2 vs. 62.8 +/- 1.8, $p<.0005$) and concentration (81.0 +/- 3.2 vs. 69.1 +/- 1.9, $p<.002$) than sub-elite athletes. There were no significant differences between the other variables tested (rank, event, and gender).

Mallett and Hanrahan (1997) designed a study specifically to utilize a narrow, internal focus of concentration (Nideffer & Sharpe, 1978) to improve speed and consistency in the 100m race. The study investigated the effects of a specific cognitive plan to improve participants' times in the 100m race. The participants were elite male athletes competing at the national level. The plan or strategy used was a narrow-internal focus of concentration. By gathering information from the participants, a plan was devised that separated the race

into three segments. The first segment was 0-30m, and this phase was referred to as the acceleration phase. The second segment was from 30-60m, and was referred to as the maximum velocity phase, and the third segment of the race, the 60-100m segment, was called the speed endurance phase. A light was placed at each segment in the race to indicate a change in thought for each athlete. Each phase was given a one-word phrase that each athlete would think or say aloud when he got to a new segment in the race. During the first segment the athlete would think "push," and when reaching the second segment would then say "heel," then at the final phase utilize the word "claw." Each word represented a segment in the race that the participants could identify with. Therefore, the athletes concentrated on a single thought during each of the three segments in the race (narrow-internal focus of concentration). All but one of the participants improved in the 100 meter time trials, and in a subjective evaluation questionnaire, all 12 participants directly attributed success to the interventions.

Meyers and Sterling (1994) attempted to examine differences in psychological skills and mood states of world ranked female tennis players, and to then relate athletes' skill levels (top, middle, and lower ranked athletes) to psychological abilities using the PSIS. Top-ranked athletes ranked from 1-65 in the world, middle-level athletes ranked from 75-180, and lowest ranked athletes from 200 and higher. Results from the PSIS displayed that top-ranked athletes exhibited greater concentration and motivation than lower ranked athletes.

Meyers and Leunes (1996) examined psychological skills in collegiate rodeo athletes using the PSIS. The PSIS identified six constructs applicable to the sport environment (anxiety management, concentration, self-confidence, motivation, mental preparation, and

team orientation). Results indicated that highly skilled collegiate rodeo athletes had greater concentration skills than low skilled collegiate rodeo athletes. Highly skilled athletes also scored higher in motivation, anxiety management, and confidence than low skilled athletes. Men scored significantly higher than women in anxiety management, concentration, and confidence. No significant differences were found across all rodeo events, and there were not any significant differences between contact and non-contact events. Throughout these three studies the only statistically significant data came from differences between high and low skilled athletes, neither gender, nor event type yielded any significant differences. Therefore, research supports the association between concentrational techniques and advanced/superior performance (Meyers & Sterling, 1994; Meyers & Leunes, 1997; Meyers & Bourgeois, 1999).

Wulf, Lauterbach, and Toole (1999) had 22 participants hit golf balls using a nine iron club into a target hole. Two groups were randomly formed, one was instructed to use the narrow-internal focus of attention; the second group utilized the narrow-external focus of attention. The purpose was to determine which form of attention would be more effective for performance. Due to past research (Wulf, Hol, & Prinz 1998; Wulf & Weigelt, 1997) where evidence was found regarding the negative effects instruction had on athletic performance, the experiment focused on providing instructions that directed the learners' attention to the effects that specific movements had on the environment. Therefore, the participants in the narrow-internal group were instructed to focus on arm movements while swinging the nine iron golf club. The participants in the narrow-external group were instructed to focus attention on the movement of the golf club and how such movements determine a successful or unsuccessful strike. The study involved two phases; a practice

phase where participants were given instructions and cued to focus on either arm movements or club movements (consisted of 80 trials/participant). The second phase was the retention phase, where each participant engaged in 30 trials, however, there were no instructions given. Performance was measured using four concentric circles (with radii of: 1.45, 2.45, 3.45, and 4.45 meters) around the target hole, the closer the better, and the scorer recorded where the ball landed. Participants received five points for hitting the target, balls landing in the first zone received four points, balls in the second closest zone were awarded three points, balls landing in the third zone got two points, and one point was given to balls lading in the fourth zone. Results indicated that participants whose instructions were to focus on club movements performed at a higher level in both the practice and retention phase than those in the narrow-internal focus group. Narrow-external group participants performed almost twice as well than the narrow-internal group during the practice phase, and during the retention phase the narrow-external group out-performed the narrow-internal group, but results were less *dramastic* (K. L. Burke, personal communication, March 27, 2003) than the previous phase. Results revealed the beneficial effects of directly instructing participants in attentional focus instructions. Therefore, it may be suggested that instruction was particularly powerful when the researchers were present and directly affecting the performer's focus of attention. Overall the participants did retain the instructions learned. Providing evidence that instructing athletes using the narrow-external form of concentration (given the task and sport) may be beneficial, and may have an increased effect on athletic performance when compared to giving instruction using the narrow-internal focus of concentration.

Another study involving collegiate athletes and their abilities to concentrate was conducted by Wilson, Ainsworth, and Bird (1985). The goal was to distinguish between athletes on a collegiate volleyball team who the coach labeled as "good" or "poor" concentrators using self-reported questionnaires and physiological instrumentation. Although the coach's labeling system was purely based on personal opinion, the study sought to determine if the TAIS (Nideffer, 1976) and physiological instruments could make similar distinctions between the participants. The methodology consisted of four phases; the first phase was a baseline phase that recorded each participant's resting dominant brain waves using an electroencephalogram (EEG). An EEG score ranging from 8-13 Hertz represented a relaxed wakefulness without a great deal of visual processing, anything higher than 13 Hertz suggested a diminished alerting and activating response. Phase two utilized a modified version of Jenson's (1966) Stroop Test. The Stroop Test was used as a static attention task which causes cognitive incongruency. Participants were instructed to verbally read a card that was not the actual color of the card (i.e., a blue colored card that read green). This instrument was used because it required attentional processing and selective attention. The third phase consisted of a video game called "space eggs" which was played using an Apple II computer. This game required multitasking, where participants tried to shoot enemy spaceships while simultaneously avoiding enemy bombs. The final phase involved a recovery period of 10 minutes and the administration of the TAIS which participants had one week to complete. Results revealed that good concentrators had significantly lower scores for the subscales BET (broad-external) and BIT (broad-internal) than poor concentrators. However, good concentrators had significantly higher scores on the narrow-internal and narrow-external subscales of the

TAIS. No other subscales of the TAIS significantly differentiated between the two groups. The EEG results displayed significantly lower frequency readings for good concentrators during baseline and recovery phases. There were no significant differences between the groups regarding the Stroop Test and video game.

Ryska (1998) investigated the relationship between psychological skills and perceived anxiety levels of sub-elite tennis players. Athletes' perceived anxieties prior to competition may be different than actual anxiety levels, cognitively and somatically. The cognitive based strategies tested in the study were mental imagery, relaxation, attention control, self-talk, and goal setting. The Competitive State Anxiety Inventory-2 (CSAI-2; Martens, et al., 1990) scale was used to measure levels of cognitive state anxiety, somatic state anxiety, and self-confidence. Results from the CSAI-2 showed that attention control or concentration proved most advantageous for predicting cognitive and somatic state anxiety. Attention control also was an indicator of self-confidence when used with positive self-talk, and the use of self-talk and attention control was associated with higher levels of self-confidence prior to competition. Furthermore, players who made greater use of attention control combined with goal-setting strategies exhibited lower levels of worry and concern regarding competition and performance in upcoming competitions. Athletes who utilized the attention control and imagery/relaxation strategies reported having lower levels of somatic-based anxiety prior to competitions.

Connolly and Janelle (2003) conducted a two-part study to investigate the effectiveness of association and dissociation attentional strategies on the performance of male and female collegiate varsity rowers. The first of two experiments involved placing participants in either an associative or dissociative condition/group. Those in the

associative group were asked to focus on their breathing, how their body felt, and rowing technique, while others in the dissociative group were instructed to focus on three experimenters and answer various questions about their colleagues and perform other various tasks. The hypothesis stated those in the associative condition would row significantly further than those in the dissociative condition. Results confirmed the hypothesis in that participants in the associative group rowed significantly longer distances than those in the dissociative group.

In the second experiment participants engaged in five different rowing sessions, the first was a baseline session; the second session involved the participants to focus on *internal association* thoughts. The third session had rowers engage in *internal dissociation* thoughts, and the fourth session had the rowers use *external association* strategies. During the fifth session participants were instructed to use *external dissociation* strategies while rowing. Time to finish rowing sessions, heart rate, and perceived exertion were measured during each of the five conditions. Results displayed significant differences between sessions and the respective times. Post hoc analyses found that rowers in the internal and external association conditions performed significantly faster when compared to times in the baseline condition. Also, both associative conditions elicited faster times than the internal dissociation condition. No significant time differences were found between both dissociative conditions and the baseline condition. Both heart rate and perceived exertion were higher in the associative conditions than the dissociative conditions. Although the hypothesis was not fully supported, the resulting data suggested that associative conditions were conducive to superior performance in rowing. Focusing on the body, technique, and monitoring the competition during the sessions proved to be more effective strategies than

concentrating on distracting stimuli. Therefore, association strategies, whether internal or external, may be more effective for endurance performance in such a task as rowing.

Concentration and anxiety management ability have been shown to be predictive of athletes' levels of performance (elite/high vs. sub-elite/low ranking). Elite athletes consistently displayed higher levels of concentration and anxiety management than lower-level athletes. Evidence also showed that concentration may be helpful in controlling somatic and cognitive anxiety levels; therefore, allowing athletes to control anxiety prior to and during competitions.

The purpose of this study was to investigate a possible relationship between baseball and softball players' concentrational styles and batting performance (OPS; On-base percentage plus slugging percentage). Participants who had higher OPS were expected to score higher on the BET, BIT, NAR, and INFP subscales of the B-TAIS, and score lower on the OET, OIT, and RED subscales (represents a positive relationship between effective attentional styles and batting performance, and a negative relationship between batting performance and ineffective attentional styles). The effects of sport competition anxiety on concentration style (B-TAIS) was examined, and the development of a regression analysis was utilized to explain variance in OPS.

Methods

Participants

Participants consisted of male (n = 25) and female (n = 33) collegiate baseball and fast-pitch softball players. All must have played on the collegiate team for at least one full year, and must have accumulated a minimum of 40 at-bats during the season in which data were utilized. The participants' ages ranged from 18-25 (mean age = 21) years old.

Instrumentation

The Batting Test of Attention and Interpersonal Style (B-TAIS; Albrecht & Feltz, 1987) was used to assess attentional style (trait) in baseball batting. This inventory consists of 59 questions which are presented in a Likert-style where each question is scored between zero and four points. The B-TAIS consists of seven attentional subscales measuring the ability to concentrate (BIT, BET, OIT, OET, NAR, RED, and INFP). Subscales intend to measure the broad-internal and external attention of focus (BIT, BET), the narrow-internal and external attention of focus (NAR), the susceptibility to become distracted or overloaded by external and internal information (OET, OIT, and RED), and information processing (INFP). Reliability in the form of test-retest reliability for the B-TAIS ranged from .72 to .95. Convergent validity was supported in that participants' scores on the B-TAIS correlated .50 with their scores on the TAIS, and construct validity was supported in those participants' scores on designated subscales of the B-TAIS correlated with their competitive trait anxiety scores. Also, participants' scores on the B-TAIS were predictive of seasonal batting performance scores (Albrecht & Feltz, 1987).

The Sport Competition Anxiety Test (SCAT; Martens et al., 1990) was utilized to measure participants' (trait) sport competition anxiety. The SCAT consists of 15 questions in which three answers for each question are provided. Answers are scored from zero to two points. Reliability in the form of internal consistency ranged from .95 to .97; convergent validity and content validity of the SCAT were supported.

Procedure

Experimentation began after receiving informed consent from the participants and their respective collegiate baseball/softball coaches. The B-TAIS and SCAT were briefly

explained through a coaches instructional sheet provided by the researcher (see Appendix E). Once inventories, consent forms, and instructional sheets were mailed to respective schools, the team's coach or assistant coach was responsible for explaining and administering the inventories at locations convenient to participants. A total of 15 collegiate teams received the questionnaires; however, only nine teams returned completed questionnaires. Six of the teams completed the inventories prior to the 2004 season, and the remaining three teams completed the inventories during the 2004 season.

Performance data were attained from each participant's 2003 season. The statistical performance data utilized was on-base percentage plus slugging percentage (OPS). A data collection sheet was utilized to organize and conceal participants' statistical information.

Results

SPSS was utilized as the primary statistical tool to evaluate any differences and/or discrepancies between variables. Data analysis consisted of comparing and contrasting the participants' B-TAIS scores to past statistical performances. Initially, OPS was correlated to the BET, NAR, OET, BIT, OIT, RED, and INFP subscales of both male and female collegiate baseball and softball players. Utilizing the correlations found between collegiate baseball and softball participants, a Fischer's Z-test was utilized to find any significant differences between the correlations (alpha = .05). A regression analysis using the backward selection technique was also performed using SPSS to explain variance in OPS from the subscales on the B-TAIS, and to establish variable importance in accurately predicting batting performance using the subscales on the B-TAIS. An independent t-test was utilized to determine possible differences between baseball and softball groups. Results displayed no significant differences for gender ($p > .05$).

Collegiate Baseball

Relationship between the B-TAIS subscales, SCAT and OPS

Results displayed nonsignificant relationships between the OPS and BIT subscale ($r = -.10$), the OPS and BET subscale ($r = -.07$), the OPS and OIT subscale ($r = -.08$), the OPS and INFP subscale ($r = -.09$), and the OPS and NAR subscale ($r = -.07$). No relationships were also found between OPS and OET ($r = .05$), and OPS and RED ($r = .13$).

The relationship between sport competition anxiety and OPS resulted in a nonsignificant, correlation ($r = -.10$). Nonsignificant relationships were found between sport competition anxiety and the BIT ($r = -.32$), BET ($r = -.06$), OET ($r = .32$), NAR ($r = .06$), and RED ($r = .38$) B-TAIS subscales. Sport competition anxiety was significantly associated to the OIT subscale ($r = .43$, $p < .05$).

Significant, positive relationships within B-TAIS subscales were found between the BET and BIT subscales ($r = .71$, $p < .01$), INFP and BIT ($r = .87$, $p < .01$), INFP and BET ($r = .69$, $p < .01$), NAR and BET ($r = .45$, $p < .05$), NAR and INFP ($r = .41$, $p < .05$), RED and OIT ($r = .40$, $p < .05$), and RED and NAR ($r = .55$, $p < .01$) subscales. All other relationships were not statistically significant, therefore, no other relationships were found between B-TAIS subscales. Refer to Table 1 for all correlations between B-TAIS subscales, the SCAT, and the batting statistic OPS.

Utilizing the backward selection technique it was concluded that the B-TAIS subscales and sport competition anxiety accounted for zero percent of the variance in OPS. No combination(s) of the B-TAIS subscales and SCAT accurately contributed to explaining variance in OPS.

Collegiate Softball

Relationship between the B-TAIS subscales, SCAT and OPS

OPS displayed significant, positive relationships with the BIT ($r = .35$, $p < .05$) and INFP ($r = .38$, $p < .05$) subscales. Nonsignificant relationships were found between OPS and the NAR ($r = .22$), BET ($r = .29$), OIT ($r = -.16$) and RED ($r = -.30$) subscales. The relationship between the SCAT and OPS resulted in a nonsignificant relationship of $r = -.30$.

The SCAT displayed significant negative relationships to the BIT ($r = -.37$, $p < .05$), BET ($r = -.37$, $p < .05$), and NAR ($r = -.47$, $p < .001$)) subscales. Nonsignificant relationships existed between the OIT ($r = .33$) and OET ($r = .24$), and INFP ($r = -.12$) subscales.

The correlation of the B-TAIS subscales as compared to each other revealed only one unexpected (nonsignificant) association between the NAR and RED subscales ($r = .10$). The BIT, BET, and NAR subscales were all significantly associated with each other, and INFP subscale was significantly associated to the BET, BIT, and OIT subscales (see Table 2). The OET subscale was significantly associated to the OIT, BET, BIT, and NAR subscales. The OIT subscale was significantly associated to the OET, INFP, NAR, BIT, and BET subscale. Refer to Table 2 for correlations of the B-TAIS subscales, the SCAT, and OPS.

Once again the backward selection technique was utilized in predicting OPS from the subscales of the B-TAIS and the sport competition anxiety. Results concluded that the INFP subscale was the most important variable in predicting OPS with a beta value of .365. The combination of B-TAIS subscales that most accurately explained variance in

OPS consisted of the RED and INFP subscales where the adjusted R square was .173 with an SE of .164. Therefore 17.3% (plus or minus .164) of the variance in OPS can be explained by the RED and INFP subscales of the B-TAIS. The second best predictor of OPS included subscales RED, NAR, and INFP, which explained 16.8% (plus or minus .165) of the variance in OPS. A greater amount of variance using a larger combination of variables that consisted of the RED, OET, NAR, and INFP subscales yielded an adjusted R square of .215 (SE = .160), which accounted for 21.5% of the variance in OPS. Baseball and softball data were also combined to determine variance and variable importance in OPS. The gender variable was the only variable that explained variance (10.2%, SE = .172) in OPS. Multicollinearity tests displayed variable influence factors (VIF) that were within acceptable range.

Because data came from two different groups (baseball and softball participants), it was necessary to determine if correlations from B-TAIS subscales and OPS were significantly different from each other. Results from this analysis showed no significant correlational differences between groups, though three of the Z_r scores were close to significant compliance (OPS/INFP Z_r =1.77; OPS/BIT Z_r =1.66; OPS/RED Z_r =1.60). (See Table 3)

Discussion

Research Question 1

Collegiate Baseball

According to past research (Albrecht & Feltz, 1987) the subscales on the B-TAIS that refer to effective deployment of attention (BIT, BET, and NAR) should display a positive relationship with batting performance, and the subscales measuring ineffective deployment

of attention (OIT, OET, and RED) should display a negative association with batting performance. Data from this study were not consistent with past research. Effective attentional styles displayed nonsignificant, negative associations with OPS, and ineffective attentional styles also revealed nonsignificant, positive associations to OPS (with the exception of the OIT subscale), suggesting a reverse, nonsignificant relationship between OPS and attentional style as measured by the B-TAIS. This reverse relationship may have resulted from internal consistency errors on B-TAIS subscales, or an insufficient amount of participant data. Past studies have chosen not to include the RED and INFP subscales of the B-TAIS because of such internal consistency problems (Albrecht & Feltz, 1987; Burke, 1990). B-TAIS internal consistency correlations also displayed a significant, positive association between the NAR and RED subscales, further suggesting the inability of the B-TAIS to distinguish between narrow directions of attention (internal and external). Although research (Albrecht & Feltz, 1987) utilizing the B-TAIS did not consider the INFP subscale a relevant method of effective attentional style, past research using sport specific versions of the TAIS have found positive relationships between INFP and performance (Summers, Miller, & Ford, 1991; Van Schoyck & Grasha, 1981).

Collegiate Softball

Results from collegiate softball participants displayed a more consistent theme with the attention to performance relationship. Although INFP was not positively associated to OPS for collegiate baseball participants, there was a significant, positive association between these two variables among collegiate softball participants. Supporting past assumptions and theories (Albrecht & Feltz, 1987; Van Schoyck & Grasha, 1981; Nideffer, 1976a, 1989a) OPS increased as effective attentional styles increased, and OPS

decreased as ineffective attentional styles increased. This suggests that for softball participants the B-TAIS was able to effectively associate with corresponding attentional styles. Compared to baseball participants, such results may suggest irregularities within the baseball participant group. However, no significant differences were found in OPS and B-TAIS correlations for gender. Within collegiate softball, internal consistency correlations once again displayed a positive association among the RED and NAR subscales of the B-TAIS. This corresponded with baseball participants, concluding that for all participants in this study, the B-TAIS was not able to delineate between narrow directions of attention (internal and external). Therefore supporting past research and its decision to omit the RED subscale from data collection due to internal consistency concerns (Burke, 1990; Van Schoyck & Grasha, 1981).

Research Question 2

Collegiate Baseball

According to Nideffer's theories regarding attention and competitive sport anxiety (Nideffer, 1976a, 1989a, 1990), as competitive sport anxiety increases (somatic and cognitive) attention narrows, and the ability to effectively move in and out of concentration styles may be limited. Therefore, it was expected the B-TAIS and SCAT would display positive relationships with ineffective attentional styles (OIT, OET, and RED), and negative relationships would exist between the BIT, BET, INFP, and NAR subscales of the B-TAIS. Positive relationships were found between the SCAT and OIT, OET, NAR, and RED subscales. Once again the NAR and RED subscales were both positively associated to the SCAT, reinforcing the subscales inability to measure what they were intended to measure. The SCAT displayed negative relationships with the BIT, BET,

and INFP subscales. OPS was also associated with the SCAT, and revealed a negative relationship between the two variables, suggesting that as OPS increased sport competition anxiety decreased. Past research was partially supported in that as effective attentional style deployment increased sport competition anxiety decreased (Burke, 1990; Nideffer, 1976a, 1989a). Nideffer's assumptions (Nideffer, 1976a, 1989a), which stated that when sport competition anxiety increases, attention narrows internally, and distractions may occur due to focusing on irrelevant stimuli, were not completely supported because of a positive association between the SCAT and NAR subscale.

Collegiate Softball

The SCAT was negatively correlated to effective attentional style subscales of the B-TAIS, and positive relationships existed between the SCAT and ineffective attentional style subscales. Sport competition anxiety displayed a negative relationship to OPS for collegiate softball participants. Both relationships (baseball and softball) were consistent with each other; therefore displaying a slight negative relationship between batting performance and sport competition anxiety. These results related to previous research suggesting the negative relationship between sport competition anxiety and effective attention/concentration techniques (Burke, 1990; Ryska, 1998; Van Schoyck & Grasha, 1981). Data from this study partially supported research findings that positively associated athletic ability (elite athletes) to anxiety management (Meyers & Bourgeois, 1999; Meyers & Sterling, 1994; Meyers & Leunes, 1996). Due to the negative relationship between OPS and sport competition anxiety in this study, participants that were able to manage, or decrease sport competition anxiety had higher OPS scores; therefore coinciding with the

statement that elite/advanced athletes have the ability to more effectively manage sport competition anxiety.

Research Question 3

Collegiate Baseball

The B-TAIS and SCAT were unable to explain variance and predict batting performance. Possible explanations may involve the population pool. Collegiate softball participant data predicted OPS from a multiple combination of subscales, suggesting that certain discrepancies may have existed within the B-TAIS (internal consistency) and collegiate baseball participants (sample size). Due to the number of variables utilized it may be necessary to have a greater amount of participants to more accurately explain batting performance from B-TAIS subscales and the SCAT. Additionally, data was combined and revealed that the gender variable was the only variable that explained variance (10.2%) in OPS.

Collegiate Softball

The INFP subscale best predicted OPS, and the RED subscale was the second best predictor of OPS. B-TAIS subscales from softball participants were able to explain variance and predict OPS; however, the B-TAIS was unable to accomplish any such results within the baseball participant group. This raises concern regarding baseball participants and the ability of the B-TAIS to be a valid measure of attentional style in batting. Additionally, OPS might not accurately reflect batting performance, therefore possibly disabling the ability of the B-TAIS to predict or be associated with batting performance.

Question 4

Collegiate Baseball

The B-TAIS was not able to detect any variance or contributions to predicting OPS. The resulting data may relate to the sample of collegiate baseball participants utilized in the study. Other explanations may include B-TAIS and OPS validity.

Collegiate Softball

The combination of subscales on the B-TAIS that best explained the variance in OPS were the INFP and RED subscales, which explained 17.3% (SE = .164) of the variance in OPS. Although one other variable combination did account for more variance in OPS (RED, OET, NAR, and INFP; 21.5%, SE = .160), it included a greater amount of variables, and the difference in variance was minimal. Therefore, using a smaller combination of subscales with nearly as much variance adds greater significance to variable contribution. Although variance was explained in OPS by combinations of subscales from the B-TAIS, the variance was minimal, and such contributions may hinder the accuracy in predicting or explaining OPS. A possible explanation for these results may involve the INFP subscale's contribution to the B-TAIS. The INFP subscale consists of 19 questions, the most of any subscale; therefore possibly inflating statistical value to the subscale. Nideffer (1976a) proposed that as competitive anxiety increases, attention narrows and is directed towards insignificant, unimportant stimuli. This form of attention is reflected in the RED subscale of the B-TAIS. Softball participants mean sport competition anxiety score was higher than the baseball group, therefore possibly explaining the ability of the RED subscale to predict OPS.

Past literature examining the B-TAIS and batting performance (Albrecht & Feltz, 1987) found that when batting performance was correlated to effective attentional styles (BIT, BET, and NAR), positive correlations resulted. When batting performance was correlated to ineffective attentional styles (OIT, OET, and RED) negative relationships were found. These results coincide with Nideffer's assumptions on attentional style and performance. Since batting in baseball and softball emphasizes a narrow-external focus of attention, batting performance should positively correlate to the NAR subscale, and also possibly the other effective attentional style subscales (BIT, BET, and INFP). Thus, the ineffective attentional styles (OIT, OET, and RED) should display negative correlations with batting performance. The results from this study partially supported these assumptions. Collegiate softball participant data did coincide with these theories. Effective attentional styles were positively correlated to OPS, while all of the ineffective attentional styles were negatively correlated to OPS; therefore, supporting Albrecht and Feltz (1987) hypotheses regarding batting performance and the B-TAIS subscales. However, results from the collegiate baseball participants did not follow such assumptions. Effective attentional subscales displayed nonsignificant, low, negative correlations with OPS, and ineffective attentional styles displayed mixed results. OPS was negatively correlated to OIT, but was positively correlated to the OET and RED subscales; therefore, not supporting the findings of Albrecht and Feltz (1987).

Nideffer (1976a) contends that as competitive anxiety increases, attention narrows, becomes internally focused, and is directed towards internal thoughts not conducive to performing. From this assumption scores on the SCAT should be positively correlated to ineffective attentional styles, and negatively correlated to effective attentional styles. Both

baseball and softball participant data coincided with this assumption, with few exceptions. Baseball participants displayed SCAT scores which were positively associated in all three of the ineffective attentional styles, and negatively associated to three of four effective attentional styles. This supports Nideffer's assumption that not only does attention narrow when sport competition anxiety exists, but that it may also be related to all other ineffective attentional styles (OIT and OET). Nideffer also contends that attention shifts to an internal state as it narrows. This was also supported by the relationship between the OIT subscale (overload of internal information) and the SCAT. Both baseball and softball participant data revealed that when correlated to the SCAT; OIT had a stronger, positive relationship to the SCAT than OET (overload of external information). In both cases the SCAT-OIT correlation was significant at the .05 level.

Collegiate softball data suggested that effective attentional styles were positively associated to batting performance, that the INFP subscale was the best predictor of OPS. The combination of the INFP and RED subscales explained 17.3% of the variance in OPS. Sport competition anxiety and OPS also sustained a medium to low negative relationship, suggesting that sport competition anxiety and batting performance may have a negative relationship.

Future studies may want to utilize a larger, more diverse participant population. These changes may improve the study's external validity, reliability of statistics, and may show more accurate differences or similarities between attentional style and batting performance. Additional studies are also needed to accurately assess the B-TAIS and its ability to measure what it purports to measure (internal validity). Also, subscale quality and quantity may need to be adjusted, and directions of narrow attention (internal and

external) should be included as separate subscales, and the number of questions pertaining to each subscale may need to be adjusted to establish consistent, level findings among B-TAIS subscales. The batting statistic OPS, although statistically accounting for on base percentage and slugging percentage, does not factor in "solid contact" percentages, nor does it account for what coaches call a "good at-bat," where a batter may have struck out, or fouled out, but fought off numerous pitches, and worked the pitch count.

The SCAT has been widely used and is considered a valid, reliable inventory measuring sport competition anxiety. However, the SCAT does not account for perceived sport competition anxiety. Sport competition anxiety may be perceived as either facilitative or debilitative (Gordon, 1998). Based on this conclusion and previous research (Albrecht & Feltz, 1987; Burke, 1990; Mallett & Hanrahan, 1997; Meyers & Bourgeois, 1999; Meyers & Leunes, 1996; Meyers & Sterling, 1994; Nideffer, 1976a, 1989a; Ryska, 1998; Van Schoyck & Grasha, 1981), future investigations should utilize a narrow-external form of attention training to baseball and/or softball athletes to improve concentration ability, anxiety management/control, sport-confidence, and batting performance. The most effective method to measure such cognitive behaviors would be to get the athletes' perceptions, then a realistic, relevant intervention may be utilized that coincides with the participants' needs. More sensitive performance measures should be utilized to calculate changes in batting performance and changes in perceived sport competition anxiety, sport-confidence, and concentration ability. Relaxation and arousal training may also be beneficial to improving sport performance (Ryska, 1998). Controlling competitive anxiety may improve concentration ability, and relaxation training could be another method for controlling competitive anxiety.

This study may also be replicated using different sports, and different sport specific attentional inventories, along with a sport competition anxiety inventory measuring perceived sport competition anxiety. Such studies might incorporate a position-specific version of the TAIS to assess attentional style of various positions in sports, and to also assess perceived sport competition anxiety while comparing such data to performance (pass completion, touchdown to interception ratio, passer rating, etc.). Results from this study, and other studies (Burke, 1990; Mallett & Hanrahan, 1997; Meyers & Bourgeois, 1999; Meyers & Leunes, 1996; Meyers & Sterling, 1994) displayed a common theme that anxiety and concentration significantly effect performance.

Coaches and athletes may want to learn more about these performance enhancement strategies (relaxation, arousal control, and concentration training). Specifically, using progressive muscle relaxation and breathing control techniques to adjust sport competition anxiety to a level that is conducive to performance. Arousal control training may allow athletes to adjust sport competition anxiety that is facilitative to the sport-situation/task, and concentration training may not only positively effect perceived sport competition anxiety, but it may also enable athletes to effectively maneuver concentration style conducive to the sport-situation/task.

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Table 1

B-TAIS, SCAT, and OPS Correlations, Baseball

Subscale		BIT	BET	OIT	OET	INFP	NAR	RED	SCAT	OPS
BIT	Pearson Correlation	1								
	Significance	---								
BET	Pearson Correlation	.710**	1							
	Significance	.000	---							
OIT	Pearson Correlation	-.208	-.019	1						
	Significance	.320	.929	---						
OET	Pearson Correlation	-.318	-.395	.379	1					
	Significance	.122	.051	.062	---					
INFP	Pearson Correlation	.869**	.686**	.066	-.210	1				
	Significance	.000	.000	.755	.314	---				
NAR	Pearson Correlation	.320	.454*	.075	-.046	.413*	1			
	Significance	.119	.023	.722	.827	.040	---			
RED	Pearson Correlation	.010	.163	.399*	.346	.157	.552**	1		
	Significance	.961	.436	.048	.091	.452	.004	---		
SCAT	Pearson Correlation	-.321	-.064	.432*	.324	-.003	.058	.382	1	
	Significance	.118	.762	.031	.114	.988	.781	.060	---	
OPS	Pearson Correlation	-.099	-.067	-.083	.049	-.090	-.071	.132	-.103	1
	Significance	.638	.749	.695	.816	.668	.736	.529	.624	---

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 2

B-TAIS, SCAT, and OPS Correlations, Softball

Subscale		BIT	BET	OIT	OET	INFP	NAR	RED	SCAT	OPS
BIT	Pearson Correlation	1								
	Significance	---								
BET	Pearson Correlation	.691**	1							
	Significance	.000	---							
OIT	Pearson Correlation	-.519**	-.646**	1						
	Significance	.002	.000	---						
OET	Pearson Correlation	-.430*	-.712**	.678**	1					
	Significance	.012	.000	.000	---					
INFP	Pearson Correlation	.744**	.606**	-.386*	-.334	1				
	Significance	.000	.000	.027	.057	---				
NAR	Pearson Correlation	.547**	.636**	-.645**	-.582**	.314	1			
	Significance	.001	.000	.000	.000	.075	---			
RED	Pearson Correlation	.039	-.109	.220	.080	-.064	.104	1		
	Significance	.829	.548	.219	.660	.724	.563	---		
SCAT	Pearson Correlation	-.368*	-.367*	-.367*	.243	-.119	.459**	.023	1	
	Significance	.035	.036	.036	.172	.509	.007	.897	---	
OPS	Pearson Correlation	.351*	.290	-.162	-.016	.383*	.223	-.304	-.300	1
	Significance	.045	.101	.367	.931	.028	.212	.086	.090	---

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Table 3

Fisher's Z_r Scores

Subscale		*OPS*
BIT	Fisher's Z_r score	$Z_r = -1.66$
BET	Fisher's Z_r score	$Z_r = 1.31$
OIT	Fisher's Z_r score	$Z_r = .28$
OET	Fisher's Z_r score	$Z_r = .95$
INFP	Fisher's Z_r score	$Z_r = 1.06$
NAR	Fisher's Z_r score	$Z_r = 1.77$
RED	*Fisher's Z_r score*	$Z_r = 1.60$

* Significant difference between group correlations if Z_r scores > 1.96

APPENDICES

Appendix A

Limitations and Delimitations

A. *Research Questions*

1. What is the relationship between OPS and the B-TAIS subscales?
2. What is the relationship between the B-TAIS subscales and the SCAT scores?
3. Which subscales of the B-TAIS are most important for predicting OPS?
4. How much variance in OPS can be explained by combinations of B-TAIS subscales?

B. *Limitations*

1. A small, limited sample size was used which may decrease power and generalizability.
2. A non-randomized selection process was used to select participants which may have affected internal validity.
3. Statistical performance (OPS) may not most accurately reflect athletes' batting performances.
4. The time differential between the statistics utilized (from previous season) and participants' completion of the inventories may not accurately reflect current batting performance.
5. The level of competition was restricted to collegiate baseball and softball programs.
6. The perception of the direction (positive or negative) of sport competition anxiety was not measured.

C. *Delimitations*

1. Male and female baseball and softball players from southeastern universities were chosen for this study because of the convenient sample.

2. All participants chosen had at least one year of playing experience, and must have had at least 40 at-bats during the year for which data was collected.
3. The B-TAIS was utilized to assess attentional style, as was the SCAT-A, which assessed sport competition anxiety.

D. *Assumptions*

1. Participants honestly answered questions on the B-TAIS and SCAT.
2. The B-TAIS and SCAT are reliable and valid measures of concentration and sport competition anxiety.
3. Previous batting statistics were accurate and are an accurate reflection of batting performance.
4. Participants' concentration style and levels of sport competition anxiety would not change during a one-year period.

E. *Definitions*

1. The B-TAIS is a sport-specific form of Nideffer's TAIS. The B-TAIS is specifically designed to measure athletes' concentration styles within the game of baseball.
    a. Broad-External Attention (BET), high scores indicate good environmental awareness and assessment skills (baseball sense). Ability to attend to multiple external objects. There are six questions that account for this variable on the B-TAIS.
    b. Overloaded by External Information (OET), high scores are associated with errors because attention is inappropriately focused on irrelevant external stimuli. There are 12 questions that account for this variable on the B-TAIS.

c. Broad-Internal Attention (BIT), high scores indicate good analytical planning skills. Ability to focus on a single thought or idea. There are eight questions that account for this variable on the B-TAIS.

d. Overloaded by Internal Information (OIT), high scores are associated with errors due to distractions from irrelevant internal sources (thoughts and feelings). There are nine questions that account for this variable on the B-TAIS.

e. Narrow-Focused Attention (NAR), high scores indicate the ability to remain task orientated, to avoid distractions, and to stay focused on a single external job and/or object (i.e., a baseball). There are 12 questions that account for this variable on the B-TAIS.

f. Reduced Attention (RED), high scores are associated with errors due to a failure to shift attention from an external focus to an internal focus, or vice-versa. There are 15 questions that account for this variable on the B-TAIS.

g. Information Processing (INFP), high scores are associated with a desire for, and enjoyment of a diversity of activity. Ability to effectively process information and ideas. There are 19 questions that account for this variable on the B-TAIS.

2. Sport competition anxiety can be defined as a personality disposition that describes a person's tendency to perceive competitive sport situations as threatening or nonthreatening. (Martens & Gill, 1976) The Sport Competition Anxiety Test (SCAT) was utilized to measure sport competition anxiety.

3. Trait anxiety refers to a predisposition to perceive certain environmental stimuli as threatening or nonthreatening and to respond to these stimuli with varying levels of state anxiety (Martens, Vealey, & Burton, 1990).
4. Concentration can be defined as the ability to focus attention on the task at hand and thereby not be disturbed or affected by irrelevant external and internal stimuli (Burke, 1992).
5. Attention can be conceptualized at two dimensions; breadth of focus (narrow to broad) and direction (internal to external). Most people shift from one form of attention to another, knowingly and unknowingly (Nideffer, 1976a).
6. Narrow-external focus of concentration(1) is one of four elements of Nideffer's (1978) sport concentration explanation, and occurs when one focuses or concentrates on one or two primary targets, while blocking out distractions (Burke, 1992).
7. Narrow-internal focus of concentration(2) requires the athlete to focus on a single thought or idea (Burke, 1992).
8. Broad-external form of concentration(3) focuses on assessing the situation, and utilizes cues in the environment to make decisions and/or react to situations (Burke, 1992).
9. Broad-internal focus of concentration(4) involves dealing with multiple thoughts or ideas at the same time (Burke, 1992).
10. On Base Percentage plus Slugging Percentage (OPS) is calculated by adding the on-base percentage and slugging percentage, treating both numbers as integers.

11. The backward selection method is a regression analysis technique for entering variables into an equation. All variables are initially entered into the equation, then each variable that contributed the least to explaining variance in the dependent variable is removed from the equation. This process continues until a combination of variables are left that best explain variance in the dependent variable.
12. Nideffer's (1989) assumptions regarding concentration:
    a. Athletes need to be able to engage in at least four different types of concentration.
    b. Different sport situations will make different attentional demands on an athlete. Accordingly, the athlete must be able to shift to the appropriate type of concentration to match changing attentional demands.
    c. Under optimal conditions, the athlete can meet the concentrational demands of a wide variety of performance situations.
    d. Attentional characteristics are at times trait like, having predictive utility in any number of situations. At other times they are state like, situationally determined and modifiable through training. Factors that determine the extent to which a given individual's attentional skills are trait like include biological or genetic predispositions and alterations in arousal. As arousal moves out of the moderate range, the habit strength of the individual's more dominant attentional focus or style increases. Thus, the individual's dominant attentional style becomes more trait like and more predictive of behavior when arousal levels are high.

e. The individual's ability to perform effectively as the dominant concentration style becomes more trait like depends on two factors: the appropriateness of the dominant attentional style, and the level of confidence within the particular performance situation.

f. The phenomenon of choking, of having performance progressively deteriorate; occurs as physiological arousal increases, causing attention to involuntary narrow and become more internally focused. This results in alterations in perception (time is speeded up) and interference with weight transfer (timing and coordination is disturbed).

g. Alterations in physiological arousal affect concentration. Thus, the systematic manipulation of physiological arousal is one way of gaining some control over concentration.

h. Alterations in the focus of attention will also affect physiological arousal. Thus, the systematic manipulation of concentration is one way to gain control over arousal (i.e., muscular tension levels, heart rate, and respiration rate).

Appendix B

Batting-specific Test of Attention and Interpersonal Style

Batting-specific Test of Attentional and Interpersonal Style

B-TAIS

Richard R. Albrecht and Deborah L. Feltz

Instructions

Read each item carefully and then answer according to the frequency with which it describes you or your behavior. For example, item 10 is:

Never	**Rarely**	**Sometimes**	**Frequently**	**All the Time**
N	**R**	**S**	**F**	**A**

10. When I'm batting, I find myself distracted by the sights and sounds around me. N R S F A

If your answer to the item 10 is "*Sometimes*," you would place a mark (X) in the box corresponding to that choice. Be sure that you answer EVERY item.

N = Never R = Rarely S = Sometimes F = Frequently A = All the Time

1. I am good at glancing at the positioning of the defense, and quickly picking out where the ball should be hit.	N	R	S	F	A
2. It is easy for me to focus on a number of things at the same time while I bat.	N	R	S	F	A
3. When I bat, I have so many things on my mind that I get confused and forget my instructions.	N	R	S	F	A
4. When batting, I keep changing back and forth from one stance and grip to another.	N	R	S	F	A
5. When in the batter's box my mind is going a mile a minute.	N	R	S	F	A
6. I find myself in the batter's box just looking at the pitcher with my mind a complete blank.	N	R	S	F	A
7. I tend to focus on one small part of the pitcher's delivery, and miss those things that might give me a better idea of what (s)he is throwing me.	N	R	S	F	A
8. When I get anxious or nervous while hitting, my attention becomes narrow and I fail to see important cues that are going on around me.	N	R	S	F	A
9. When hitting, I can keep track of several things at the same time, such as the count, the coaches' instructions, and the type of pitch that I am most likely to see.	N	R	S	F	A
10. When I'm batting, I find myself distracted by the sights and sounds around me.	N	R	S	F	A
11. When batting, I only think about one thing at a time.	N	R	S	F	A
12. When asked by my teammates what a given pitcher is throwing, my answers are too narrow, and I don't give them the information they are looking for.	N	R	S	F	A
13. I need to have all information regarding a certain pitcher before I know how to hit against him/her.	N	R	S	F	A

N= Never R=Rarely S= Sometimes F=Frequently A=Always

14. My interests in hitting are narrower than are those of most players.	N	R	S	F	A
15. I make mistakes while batting because my thoughts get stuck on one idea or feeling.	N	R	S	F	A
16. I have a lot of energy for a hitter my age.	N	R	S	F	A
17. I have difficulty telling what a pitcher is thinking by watching his/her moves.	N	R	S	F	A
18. When batting, I have a tendency to listen to the catcher or the infield's chatter, and forget about the upcoming pitch.	N	R	S	F	A
19. When I get up to bat, I get anxious and forget what it was I was going to try against this particular pitch.	N	R	S	F	A
20. Pitchers can fool me by throwing a type of pitch that I'm not expecting, or by using an unorthodox motion.	N	R	S	F	A
21. With so much going on around me when I bat, it is difficult for me to keep my concentration for any length of time.	N	R	S	F	A
22. When up to the plate, I know what everyone in the field is doing.	N	R	S	F	A
23. While batting, my thoughts are limited to just the pitcher and the ball.	N	R	S	F	A
24. I am good at picking up the rotation of the ball after it leaves the pitcher's hand.	N	R	S	F	A
25. While hitting, my thoughts are coming to me so fast that I can hardly keep up with them.	N	R	S	F	A
26. Hitting a baseball is a skill which involves a wide variety of seemingly unrelated tasks and strategies.	N	R	S	F	A
27. It is easy for me to consider the various aspects of the game such as the score, the number of base runners, the outs, and the count, and from this, get a good idea of what to do when I get up to the plate.	N	R	S	F	A
28. It is easy for me to keep my mind on a single thought of hitting the ball.	N	R	S	F	A

N= Never R=Rarely S= Sometimes F=Frequently A=Always

29. Just by watching a pitcher warm-up, or throw to one of my teammates, I can figure out how to hit him/her.	N	R	S	F	A
30. While batting, I make mistakes because I get too involved with what one player is doing, and forget about the others.	N	R	S	F	A
31. I approach the mental aspects of hitting in a focused, narrow, and logical fashion.	N	R	S	F	A
32. While batting, outside happenings or objects tend to grab my attention.	N	R	S	F	A
33. I think a lot about different batting strategies and tactics.	N	R	S	F	A
34. After I bat, and my teammates ask me about what the pitcher has thrown me, my answers are too broad, and I tell them more than they really need to know.	N	R	S	F	A
35. When I'm batting, the diamond seems to be a booming, buzzing, brilliant flash of color and confusion.	N	R	S	F	A
36. My interests in hitting are broader than those of most players.	N	R	S	F	A
37. I am good at quickly analyzing a pitcher and assessing his/her strengths and weaknesses.	N	R	S	F	A
38. It is easy for me to keep my mind on the single sight of the ball approaching the plate.	N	R	S	F	A
39. When I am preparing to bat, I am good at analyzing complex situations such as what should be done given the score, the number of outs, runners on base, etc.	N	R	S	F	A
40. It is easy for me to keep outside sights and sounds from interfering with my thoughts while hitting.	N	R	S	F	A
41. When batting, I get so caught up in my own thoughts I forget what's going on around me.	N	R	S	F	A
42. When a pitcher is trying to "set me up" I can think several moves ahead, and see what (s)he's doing.	N	R	S	F	A
43. I am socially outgoing, talking to the catcher and/or umpire while I bat.	N	R	S	F	A

N= Never R=Rarely S= Sometimes F=Frequently A=Always

44. When I'm batting, I find myself distracted by my own thoughts and ideas.	N	R	S	F	A
45. Batting is exciting, and keeps me interested.	N	R	S	F	A
46. I am always on the move in the batter's box.	N	R	S	F	A
47. It is easy to forget about an error that I have made in the field when I am hitting.	N	R	S	F	A
48. When I am hitting, if the coach doesn't give me a signal, I can't make up my mind what strategy to use.	N	R	S	F	A
49. It is easy for me to direct my attention and focus narrowly while I bat.	N	R	S	F	A
50. I seem to work on my hitting in "fits and starts" and "bits and pieces."	N	R	S	F	A
51. All I need is a little information about opposing pitchers, and I can think of a number of ways I can go about trying to hit them.	N	R	S	F	A
52. When I bat, it is easy for me to block out everything except the ball.	N	R	S	F	A
53. When hitting, I have difficultly clearing my mind of a single thought or idea.	N	R	S	F	A
54. Sometime while hitting, the developments in the game come so fast that it makes me light headed or dizzy.	N	R	S	F	A
55. It is easy for me to keep my thoughts from interfering with my hitting while I am at the plate.	N	R	S	F	A
56. When the pitcher has a wide variety of different pitches, I get confused as to which one to expect.	N	R	S	F	A
57. I sometimes have to step out of the batter's box because I get distracted by irrelevant sights and sounds.	N	R	S	F	A
58. I get confused trying to bat with so many things happening all at the same time.	N	R	S	F	A
59. The coach has to repeat the signs because I get distracted by my own irrelevant thoughts when I prepare to bat.	N	R	S	F	A

Appendix C

Sport Competition Anxiety Test

ILLINOIS COMPETITION QUESTIONNAIRE

Form A

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, circle the box labeled **A**, if your choice is SOMETIMES, circle the box labeled **B**, and if your choice is OFTEN, circle the box 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 demands a lot of 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**

Appendix D

Extended Literature Review

Test of Attentional and Interpersonal Style

Nideffer's (1976) Test of Attentional and Interpersonal Style (TAIS) was developed to gain insight and statistical evidence regarding behaviorally relevant attentional and interpersonal characteristics. The TAIS was developed to predict behavior from physiological arousal, and interactions between attentional and interpersonal processes. Nideffer defined attentional focus as having two dimensions, breadth of focus and direction of focus. Therefore, attention can change from that of a narrow focus to having a broad width of focus. Direction of focus may also shift from an internal perspective to an external perspective. Using this conceptualization Nideffer constructed the TAIS, which consisted of 17 subscales designed to measure different aspects of attentional and interpersonal style. Six of the subscales reflected attentional processes, two reflected behavioral and cognitive controls, and nine described interpersonal style. The subscales purpose was to predict performance and provide treatment recommendations to those taking the TAIS. Upon completion and finalization of TAIS construction, Nideffer tested the TAIS's reliability, group difference norms, construct validity, and predictive validity. College students in an introductory psychology class were utilized as the participants in which the TAIS's constructural framework was tested. Test-retest reliability for the TAIS was acceptable in that participants retaking the TAIS over a two-week interval received similar scores. Group difference studies were then conducted to examine any differences within the 17 subscales. Differences were found between male and female groups on five of the subscales. Nideffer explained that the differences are due to social learning discrepancies, men were described as possessing higher physical orientation, increased competitiveness, and less expressive of positive affection than females. Attentional differences in men may stem from the need to

be in control and competitive, which may explain higher scores on the NAR (narrow focus) and BIT (broad-internal focus) subscales of the TAIS. Another group difference study was conducted using police applicants from a large metropolitan area and college students (all participants were male). TAIS results displayed that the two groups differed significantly on 15 of the 17 subscales. The differences were expected/predicted between the two groups. Police applicants saw themselves as more in control of both attentional and interpersonal processes, more extroverted, less intellectually expressive, less negatively expressive and more expressive of positive affect (Nideffer, 1976). Results from the two-group difference studies suggest that groups who are identifiably different on the basis of sex and occupational/attitudinal variables do respond differently to TAIS items (Nideffer, 1976). Correlating scores on the TAIS with other psychological inventories was necessary to attain construct validity of the TAIS. The TAIS was correlated with a number of widely used personality inventories, two different anxiety scales, and other recognized inventories which measured similar aspects of personality and attention. Concluding data revealed that attentional and interpersonal scales of the TAIS did measure what it intended to measure. Knowing that the TAIS did measure what it was intended to measure, Nideffer (1976) needed to establish the TAIS's predictive validity. This was done by having a coach and teacher rate their athletes/students based on performance parameters. The ratings were then compared and correlated to the athletes'/students' responses to TAIS questions. Results revealed that most of the TAIS subscales were significantly positively correlated to the coach's/teacher's ratings. Therefore, within these two studies the TAIS proved to be a valid measure of attentional ability and interpersonal style.

The TAIS's reliability and ability to accurately measure (validity) intended constructs has been criticized (Dewey et al. 1989; Vallerland 1983; Van Schoyck & Grasha 1981). Furthermore, suggestions of combining the subscales of the TAIS into two to three scales were encouraged to increase validity. Nideffer (1990) responded to such claims of insufficient validity and reliability by stating that the conclusions drawn were not justified on the basis of the research (Nideffer 1990). Nideffer further suggested that by reducing the amount of scales used by the TAIS, the full potential or usefulness in explaining/measuring attentional focus and/or attentional abilities may not be achieved. To further argue the TAIS's validity and reliability Nideffer discussed the results of a study (Nideffer & Bond, 1989) that involved using 814 Australian Olympic athletes, divided into three categories according to the type of sport (closed-skill, open-skill, and team sports). Closed-skilled sports included diving, gymnastics, golf, archery, shooting, and skating, while open-skilled/individual sports consisted of tennis, wrestling, judo, fencing, squash, and other one-on-one competitions. Team sports included baseball, basketball, soccer, hockey, lacrosse, netball, and volleyball. Results concluded that 12 of the 17 TAIS scales were significant in predicting athletes on the basis of the type of sport ($p < .0001$ for the 12 significant scales). Over 50% of the grouped cases were correctly classified as either open-skilled, closed-skilled, or in a team sport group (50.5%). As predicted by Nideffer (1976a, 1981, 1989a) athletes involved in closed-skilled sports were introverted and had a narrower focus of attention, and also were less externally distractible. Open-skilled athletes were predicted to be more competitive and score higher on the TAIS control scale, and athletes involved in team sports scored high on extroversion.

Batting-specific Test of Attentional and Interpersonal Style

To effectively and accurately measure concentration as it relates to batting performance in baseball and softball, Albrecht and Feltz (1987) developed a specific version of Nideffer's TAIS (B-TAIS). The purpose was to assess the reliability advantages of utilizing a sport-specific measure of attentional style, and comparing the sport-specific version to the original/general (TAIS) measure of attention styles. An additional investigation of this experiment was to compare the construct validity of the TAIS and the B-TAIS. Also, the relationship between attentional processes while batting and the competitive sport anxiety the batter was experiencing while batting was investigated. According to Nideffer's assumptions/theories (Nideffer, 1976) regarding concentration and competitive sport anxiety, a high level of competitive sport anxiety would correspond to high levels in reduced-attention (RED) and internal-overload (OIT) on TAIS subscales. Participants included 15 collegiate baseball players and 14 collegiate softball players. After the completion of the TAIS and the sport-specific B-TAIS, measures of competitive trait anxiety were taken using the Sport Competition Anxiety Test (SCAT; Martens, 1977) and the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump & Smith, 1982). Contact percentage data was also collected from all participants to measure performance. Contact percentage was defined as the percentage of official plate appearances in which the participant made contact with the ball in such a manner that the ball was put into play. Results displayed generally high test-retest reliability in both the TAIS and B-TAIS; however, only one significant difference was found in the OIT subscale measuring the tendency to become overloaded with internal stimuli. Although there was only one significant difference, the other five subscales measuring concentration

were higher on the B-TAIS. Internal consistency results revealed no significant differences. However, it was noted that all six subscales on the B-TAIS were higher than those on the TAIS. As hypothesized there should have been a positive relationship between competitive sport anxiety and the RED and OIT subscales on both the TAIS and B-TAIS. A significant relationship was found in the TAIS and B-TAIS for RED and competitive sport anxiety. Although no other significant relationships were found between trait anxiety and the TAIS, competitive sport anxiety was found to be significantly correlated with each B-TAIS subscale measuring ineffective deployment of attention. Therefore, the hypothesis was supported for the B-TAIS but not fully supported for the TAIS. The B-TAIS displayed higher construct validity measuring competitive sport anxiety and ineffective deployment of attention. The second measure for construct validity involved the relationship between effective and ineffective styles of attention for both the TAIS and B-TAIS, and participants' contact percentage. Corresponding to Nideffer's theories regarding attentional style and performance, there should be a positive relationship for the effective attentional styles within the TAIS and B-TAIS and contact percentage; and a negative correlation for the ineffective attentional styles within the TAIS and B-TAIS and contact percentage. Results revealed positive relationships between all of the effective attentional subscales and contact percentage on the B-TAIS. Positive relationships for the TAIS regarding this relationship were not found. Both the TAIS and B-TAIS displayed negative relationships between ineffective attentional subscales and contact percentage. Therefore, the hypothesis was partially proven, and it was concluded that the B-TAIS was a more accurate measure (construct validity) for attentional styles as related to batting performance.

Tennis Test of Attentional and Interpersonal Style

Another sport-specific version of the TAIS is the Tennis Test of Attentional and Interpersonal Style (T-TAIS; Van Schoyck & Grasha, 1981), which was designed to measure attentional style as related to the sport of tennis. A total of 90 tennis playing participants were used in the experiment to determine the TAIS and T-TAIS relationship to attentional style and tennis ability. Levels of ability ranged from recreational tennis players to collegiate varsity tennis players (beginner, intermediate, and advanced). Match play ranking were given only to male participants in the advanced group, this was done to test the T-TAIS's ability to accurately measure tennis ability. The assembly of the T-TAIS was based on a rational approach by which two item writers converted the seven attentional subscales of the TAIS to tennis-specific statements which reflected the same idea only now it was related to a tennis-specific situation. Participants completed both the TAIS and the T-TAIS, and as predicted test-retest reliability coefficients were higher for all seven subscales on the T-TAIS, and internal consistency was also higher on six of the seven subscales for the T-TAIS. Attentional dimensions (narrow-broad and internal-external) tested using interscale correlations. Discrepancies were found in that subscales BET and BIT were positively correlated to each other. Direction of attention (internal-external) should be negatively correlated; therefore, as broad-external ability increases, broad-internal ability should decrease. The same also occurred for the OIT and OET subscales, which measure overload of internal and external stimuli. Both the TAIS and T-TAIS displayed positive correlations between these subscales. The INFP scale (measuring how complex an individual saw the environment) was positively correlated to the BET, BIT, and the NAR subscales of the TAIS and T-TAIS. This finding corresponds to what the

BET and BIT scales represent (broad dimension of focus), but does not represent the meaning of the NAR scale (narrow attention of focus). These correlations between the BET, BIT and INFP subscales suggest the capacity to handle information deals with how the information is handled and the source of the information. To measure tennis ability mean scores for each of the seven subscales on both the TAIS and T-TAIS were compared to participants in each of the three level of tennis playing ability groups (beginner, intermediate, and advanced). Although the T-TAIS did show greater changes depending on skill function and level, it was not as apparent as predicted. Only four of the seven subscales on the T-TAIS accurately differentiated between tennis skill levels. Subscales NAR, OET, and OIT did not properly differentiate between skill groups. This leads to a conclusion that the T-TAIS may not be sensitive enough to measure attention of focus among tennis athletes; it however displayed the potential to differentiate between skill levels regarding the scan factor of attention. This suggests that superior tennis athletes may be characterized by the ability to attend to increasing amounts of information.

Burke (1990) investigated the effectiveness of a concentration/meditation training technique on concentration ability, anxiety control, and tennis serve performance. Participants were randomly placed into an experimental or control group. To measure concentration the T-TAIS was administered on three occasions. The SCAT was utilized to measure sport competition anxiety, and was also administered three times to all participants. To measure tennis serve performance, The Burke Accuracy Tennis Test for Serving (BATTS; Burke, 1990) was implemented where participants were instructed to warm up for five minutes and then attempt 40 serves, 20 on each side of the court. Points were earned according to service location, the more effective placement of a serve, the

more points earned. There were four divided areas in each service box, and participants were aware that services landing in areas farther from the net were worth more points. Participants within the experimental group were given a Likert-type questionnaire at the end of the study that measured the participants' perceptions about the interventions and the perceived impact on performance. According to the hypothesis, those in the experimental group would exhibit improved T-TAIS scores, lower sport competition anxiety scores, and higher tennis serving scores. Results did not support any of the hypotheses, in that there were no significant differences between the two groups for T-TAIS scores, SCAT scores, and tennis serving scores. Although none of the hypotheses were confirmed, 75% of the participants in the experimental group reported that the concentration training did help their tennis game; therefore, the majority of the participants perceived the interventions as beneficial and advantageous to their tennis game. Through qualitative data it may be concluded that cognitive attentional training (meditation) may enhance or alter athletes' subjective experiences regarding their tennis ability (Burke, 1990). Further conclusions resulted from this study was that the T-TAIS may not be sensitive enough in measuring differences in attentional style. Although T-TAIS scores did not display any significant differences before, during, and after interventions, participants did believe that the interventions improved concentrational abilities and tennis game playing abilities.

Basketball-specific Test of Attentional and Interpersonal Style

Summers, Miller, and Ford (1991) utilized a basketball-specific version (BB-TAIS) of the TAIS to measure attentional ability and competitive trait anxiety of basketball players. Another goal of the experiment was to determine the TAIS's validity in measuring attentional style and also to examine the BB-TAIS and its ability to predict athletic ability

and measure attentional ability in basketball players. A total of 110 male and female basketball players participated in the study. Depending on skill level the participants were placed into one of three groups (beginners, intermediate, and advanced). Using the TAIS and its constructs the researchers modified and restructured questions on the TAIS to fit basketball situations, and thereby reflected attentional situations within the sport of basketball. Participants were then instructed to complete the TAIS, BB-TAIS, and SCAT before practice sessions. To assess test-retest reliability 43 of the 110 participants completed the TAIS and BB-TAIS for a second time, and in place of the SCAT the participants completed the CTAI-2. Test-retest results displayed significant coefficients for both the TAIS and the BB-TAIS. Internal consistency results were also significant for both attentional tests; however, the BB-TAIS displayed higher scores for each of the seven subscales. Overall, the BB-TAIS demonstrated adequate reliability. Correlational results showed strong positive relationships between subscales BET and BIT, and between OIT and OET. Such results suggest that width of attention was accurately measured (broad attention), but direction of attention (internal-external) was not differentiated. Similar evidence was found using other sport-specific TAIS inventories measuring attentional abilities. These measurement redundancies may raise cause for concern regarding sport-specific TAIS inventories. Correlations between BET and OET; and between BIT and OIT were significantly negative, demonstrating that the BB-TAIS does in fact accurately distinguish between internal/external overload and effective broad-internal/external attention. Also, INFP displayed significant-positive relationships with BET, BIT, and NAR; and INFP showed significant negative relationships with subscales OET, OIT, and RED. Therefore, participants that scored high on the INFP subscale may

have strong tendencies to effectively attend to multiple stimuli (broad width of attention) both internally and externally. TAIS and BB-TAIS subscales scores as a function of skill level concluded that the TAIS and BB-TAIS could not differentiate, or predict basketball skill level. However, subscales were grouped and combined to form two categories (BET, BIT and INFP formed the "scan" group; and OET, OIT and NAR formed the "focus" group). The "scan" and "focus" groups were used as dependant variables and MANOVA's were performed using the TAIS and BB-TAIS, and all three skill level groups. There were no significant skill effect differences for the TAIS, but there was a significant main effect of skill level for the "scan" and "focus" scales on the BB-TAIS. Although there were significant differences between all three skill level groups within the "scan" focus scale. Post hoc results displayed significantly higher scores in the advanced group. Because there were no differences found between beginners and intermediates, such results suggest that advanced basketball players were more capable of scanning the environment and dealing with a variety of information, processing it, and reacting to it in a more effective, efficient manner than lesser skilled players. As predicted increases in competitive sport anxiety lead to increases in narrowing the width of attention and also lead to an internal focus of attention. The BB-TAIS proved to be an effective tool in displaying significant results regarding competitive sport anxiety and attentional ability. Both somatic and cognitive measures of competitive sport anxiety were positively correlated to RED, OET, and OIT (ineffective deployment of attention) subscales of the BB-TAIS, and negative correlations were discovered among the BET, BIT, NAR, and INFP (effective deployment of attention) subscales. As a specific measure of attention and competitive sport anxiety, the BB-TAIS may be an effective, reliable measurement tool within the sport of basketball.

Sport Competition Anxiety Test

The adult version of the SCAT (SCAT-A) was developed by Martens (1977), and was designed to measure the trait characteristic of sport competition anxiety while participating in sports. Therefore, the SCAT measures one's general level of competitive sport anxiety when engaging in sports. The SCAT's development occurred out of a necessity to create a reliable, valid measure of trait anxiety in sport. The SCAT consists of 15 questions, using a three-point Likert scale ranging from one to three (hardly ever, sometimes, and often). The process of choosing valid questions for the SCAT utilized multiple expert raters, which sorted through potential questions eliminating those that failed to meet selection criteria. In order to test item discriminability the SCAT was administered to 153 male and female university students. Results concluded that all 15 items on the SCAT met and/or exceeded selection criteria. Test-retest reliability revealed that the SCAT was a reliable measure of trait anxiety (reliability coefficient, $r = .85$). Internal consistency, which was measured to ensure the homogeneity of test items ranged from .95 to .97 among adults. Content and concurrent validity were both tested, and both measures of validity measured what they intended to measure. Therefore, test items accurately conveyed what they intended to ask; and the SCAT, when correlated to similar inventories accurately matched theoretical hypotheses to empirical relationships. Construct validity was attained by testing the SCAT on six specific theoretical hypotheses from the construct validation model of the SCAT. Results of the six hypotheses were that high SCAT participants will manifest higher state anxiety than low SCAT participants in competitive but not in noncompetitive situations. The SCAT will predict precompetitive but not noncompetitive state anxiety better than other people, tasks, and situation variables. The SCAT will correlate more strongly with

state anxiety in competitive than in noncompetitive situations. Also, the SCAT will correlate more strongly with competitive state anxiety as the level of situational threat increases. In addition, the SCAT will predict competitive but not noncompetitive state anxiety better than other trait anxiety inventories. The sixth theoretical hypothesis states that high SCAT participants will perform poorer than low SCAT participants in competitive but not in noncompetitive situations.

Attention Styles

Attention styles vary across sports. The sport's tasks and demands impact attentional style(s) that may be conducive to superior performances. McGowan, Talton and Tobacyk (1990) conducted a study to assess attentional style in a closed sport of powerlifting and used an abbreviated form of the TAIS to measure attentional style and ability and to compare these findings to performance. Participants consisted of 78 men and 31 women who competed in the 1989 United States Powerlifting Federation's National Collegiate Powerlifting Championships. After each participant's final lift, they were escorted to private areas where they completed the brief version of the TAIS. Participants were placed into one of two groups based upon performance. Those who finished first to fourth place were placed into group one, others who placed lower than fourth were placed into group two. Although it was predicted that superior performers would score higher on the BIT (broad-internal) and NAR (narrowing) subscales of the abbreviated TAIS, participants in group one scored lower on each subscale. Becoming over aroused may have affected superior performing participants' ability to narrow the focus of attention; therefore partially explaining the statistical results found. Though there was no performance/behavioral explanation for lower level athletes scoring higher on the BIT

scale, the validity of the abbreviated TAIS must come into question. This "short" version of the TAIS may be measuring scanning and focus instead of direction and width of attention.

Unrelated to sports, attentional ability and the ability to process cues/stimuli in the environment were tested by Reis and Bird (1982). The questions asked were whether those who scored high on the TAIS subscales BET, BIT, and INFP would perform better on peripheral processing tasks than participants the TAIS identified as narrow attenders. Therefore, broad attenders should perform at superior levels than narrow attenders when engaged in peripheral tasks. The first of two experiments consisted of 22 participants. Those scoring high on the BET subscale and low on the RED subscale were classified as broad attenders, and participants scoring low on the BET subscale and high on the RED subscale were classified as narrow attenders. The device utilized in the first experiment was a photoelectric rotary pursuit. Participants were tested on reaction time, and were questioned on whether or not certain lights were illuminated in the background while they were engaged in tracking the rotary target. Points were awarded for participants who noticed the lights illuminated in the background, and extra points were awarded if the participants could identify the order of illumination. Although no significant differences were found between broad and narrow attenders regarding light recognition and sequence, the broad attenders mean was higher than the narrow attenders mean. No significant differences were found between the groups regarding reaction time, but once again the broad attenders mean reaction time was lower than the narrow attenders group. Both results suggest that broad attenders were able to attend more effectively to multiple stimuli, and also had quicker reaction times than narrow attenders. The second experiment

began with false positive and negative feedback after completion of the first experiment. The rationale behind this was that participants receiving false negative feedback would experience more state anxiety because it posed as a threat to self-esteem, those receiving false positive feedback would experience low amounts of state anxiety. Using the 20 of the original 22 participants, half the participants in each group received either false positive feedback or false negative feedback regarding the previous performance. Upon receiving feedback participants repeated the tasks in the first experiment using the photoelectric rotary pursuit. Results displayed no significant differences between groups on the mean time for rotary pursuit performance (not measured in experiment one). Then adjusted reaction time mean for broad attenders was lower than that of the narrow attenders, and this difference was significant. There were no significant differences found between the four feedback groups, but as predicted the broad/false positive group performed the best, followed by the broad/false negative group. Therefore, the broad attending groups once again outperformed the narrow attending groups in reaction time. Results from both experiments demonstrate that broad attenders may have greater abilities to process multiple cues faster and more accurately than those who use the narrow attention of focus.

Attentional Strategies

Concentrational techniques and styles vary, however, there are three widely used styles utilized by athletes. The first style, total concentration (Burke, 1992), exists when an athlete maintains concentration throughout the entire duration of the athletic event. A perceived advantage of this style may be that the athlete does not have to constantly rest, and then regain concentration. However, using this technique may be mentally tiring, and the athlete risks losing concentration. An example of this technique would be a football

player maintaining concentration throughout the entire game from start to finish. The second concentration style is referred to as concentration with many breaks (Burke, 1992). This style requires the athlete to take many concentration breaks during an event. Therefore, the athlete would be less likely to suffer any mental fatigue due to maintaining constant concentration. Utilizing this technique may allow the athlete to concentrate for extended periods of time because the mind received many breaks in between. The disadvantage of this strategy involves the athlete having difficulty regaining concentration after each break. This attentional strategy would entail the football player to take concentration breaks after every play, and thus regaining his concentration before the next play starts. The third concentration strategy, concentration with few breaks (Burke, 1992), involves the athlete taking only a limited number of concentration breaks during a competition. This may potentially decrease the risk of having trouble regaining concentration after numerous breaks. This style would have the football player take a concentration break after each quarter during the game, therefore, taking a total of only three concentration breaks throughout the game.

An athlete performs best when using a concentration strategy that best suits the situation or sport. However, most people typically utilize one of the concentration strategies the majority of the time when engaged in a sporting activity. This may be detrimental because different sporting situations require different concentration strategies. Therefore, there is no best strategy, but to have the ability to change or alter concentration strategies may give athletes the best opportunities to perform at high levels. Flexibility (Burke, 1992) and adaptability may serve as the difference between an average performance and a peak performance.

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Appendix E

Coaches Instructions Form

Coaches Instructions for Administering Questionnaires

Thesis title: Concentration Characteristics and Batting Performance

in Collegiate Baseball and Softball

Daniel Samess

Only have players who had at least 40 or more at-bats last season (2003) participate in the study!

1) Have players taking the questionnaires sit in a quiet place. They will need a pencil or pen, and a place to write.

2) The packet contains three items:

→ Two consent forms which each player will voluntarily complete and sign. One copy is for the participants to keep for their records.

→ There are 2 different questionnaires in the packet. The first is about concentration style while batting (baseball or softball). The second asks about the players' anxieties while playing a sport.

→ Do not separate any of the pages (except for your copy of the consent form), and turn in the packet.

3) It will probably take each player about 15-25 minutes to complete both questionnaires.

4) Please make sure all packets are collected upon completion and placed into stamped envelope provided by the researcher.

Thank you very much for helping in my thesis project! If you should have any questions related to my thesis or area of study, please do not hesitate to contact me via phone or email.

Sincerely,

Daniel Samess
Sport Psychology Masters Program-Georgia Southern University
dan1fsu@aol.com
(954) 254-9376 (cell)
(912) 764-3692 (home)

Appendix F

Institutional Review Board Approval

Georgia Southern University
Office of Research Services & Sponsored Programs

Institutional Review Board (IRB)

Phone: 912-681-5465
Fax: 912-681-0719
Ovrsight@gasou.edu
4 College Plaza,
P.O. Box 8005
Statesboro, GA
30460-8005

To: Mr. Daniel Samess
Public Health
Faculty Advisor: Dr. Kevin Burke

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees
(IACUC/IBC/IRB)

Date: March 11, 2004

Subject: Status of Application for Approval to Utilize Human Subjects in Research

After a review of your proposed research project number H04092 titled "A Comparative Study of Concentration Characteristics and Batting Performance in Baseball and Softball" it appears that (1) the research subjects are at minimal risk, (2) appropriate safeguards are planned, and (3) the research activities involve only procedures which are allowable.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your proposed research.

This IRB approval is in effect for one year from the date of this letter. If at the end of that time, there have been no changes to the research protocol, you may request an extension of the approval period for an additional year. In the interim, please provide the IRB with any information concerning any significant adverse event, **whether or not it is believed to be related to the study**, within five working days of the event. In addition, if a change or modification of the approved methodology becomes necessary, you must notify the IRB Coordinator **prior** to initiating any such changes or modifications. At that time, an amended application for IRB approval may be submitted. Upon completion of your data collection, you are required to complete a *Research Study Termination* form to notify the IRB Coordinator, so your file may be closed.

Sincerely,

Julie B. Cole
Director of Research Services and Sponsored Programs

cc: Dr. Kevin Burke