The effects of anxiety on competitive swimming performance

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THE EFFECTS OF ANXIETY ON COMPETITIVE SWIMMING PERFORMANCE

A Thesis
Presented to the
School of Health, Physical Education and Recreation
and the
Faculty of the Graduate College
University of Nebraska

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
University of Nebraska at Omaha

by
Christie Hunt
July, 1981
THESIS ACCEPTANCE

Accepted for the faculty of the Graduate College, University of Nebraska, in partial fulfillment of the requirements for the degree Master of Arts, University of Nebraska at Omaha.

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Chairman

Date July 27, 1981
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CHAPTER I

INTRODUCTION

It has been determined that anxiety plays an important role in maintaining the internal balance of an individual. Stressful situations may cause an increased amount of anxiety in an individual. Athletic competition can be classified as a stressful situation.

A relationship has been found in a series of studies (Martens and Landers, 1970; Martens, 1971; Martens and Landers, 1971; Martens, et al., 1975; Martens and Simon, 1976; Martens and Gill, 1976; Martens, 1978; Landers, 1980) between anxiety and performance in competition. The mental and emotional state of an athlete just prior to competition is of prime concern to those interested in maximum athletic performance.

According to Cratty (1975) athletes have several fears: 1) fear of success (success phobia), 2) fear of failure, 3) fear of crowds, 4) fear of expressing their aggressions, and 5) fear of physical harm to their bodies. All of these fears can lead to anxiety which will have an effect on performance. According to Cratty, "The effect of anxiety level on performance, therefore, is a function of the amount of stress perceived by the performer, his habitual
manner of reacting to stress, and the complexity of the task."

Landers (1980) states that a common psychological problem encountered by athletes is their inability to cope with the pressure of competition or that their fears or anxiety levels become too great.

Further studies are needed to learn the effect of anxiety on athletic performance. The optimum level of anxiety to improve athletic performance has yet to be determined. It could be beneficial to find the levels of anxiety that would improve performance and the levels that would hinder or hurt performance. It also could be beneficial to find the levels of anxiety that would improve a certain athletic task yet possibly impede another such as complex motor skills and simple motor skills. This study is designed to find the level of anxiety needed for optimum competitive swimming performance.
THE PROBLEM

The Purpose

The purpose of this investigation was to measure anxiety levels in swimmers prior to competition to find their effect on competitive swimming performance.

Assumptions

1. Anxiety plays an important role in maintaining the internal balance of an individual.

2. Stressful situations, such as competition, cause differing levels of anxiety.

Definition of Terms

The following terms are defined as follows for this study:

1. Anxiety: is the general fear of foreboding. It is a personality trait marked by a lower threshold of stressful events.

2. Inverted-U Hypothesis: suggests that as the arousal level of subjects increases from drowsiness to alertness, there is a progressive increase in performance efficiency. However, once arousal increases beyond, for example, alertness to a state of high excitement, there is a progressive decrease in a task performance.

3. Drive-Theory Hypothesis: suggests that performance is a multiplicative function of habit and drive
(P + H x D).

4. Trait Anxiety (A - Trait): is the tendency of an individual to perceive competitive situations as threatening or nonthreatening.

5. State Anxiety (A - State): is a transitory emotional state which responds to the varying levels of an individual's A-Trait.

The Hypothesis

Subjects with moderate anxiety levels will tend to have superior competitive swimming performances over subjects with either high or low anxiety levels. Sub-hypotheses are:

1. Experience of the swimmers will have no effect upon anxiety levels.

2. Sex of the swimmers will have no effect upon anxiety levels.

3. Days of the week prior to competition that the inventory is given will have no effect upon the anxiety levels of the subjects.

Delimitations

This study involved 133 male and female swimmers who participated on varsity swimming teams in the Omaha, Nebraska, Metropolitan Schools. The ages of the subjects were between fifteen and eighteen.

Significance of the Study

This study may aid coaches and teachers by showing the relationship between anxiety and athletic performance. Because of so much "pressure on the athletes" it is
important for coaches and teachers to understand and be able to help their students through anxious competitions.
CHAPTER II

THE REVIEW OF RELATED LITERATURE

In this study, consideration was given to the review of related literature. The literature was organized into background information and two existing theories on anxiety and performance, the drive theory and the inverted-U theory.

Landers (1980) completed a review of arousal and anxiety and their effect on performance. He suggests that when arousal levels are high, an unpleasant emotional reaction may be experienced by the individual. This condition is often referred to as state anxiety. Responses to this condition may be cognitive, behavioral, physiological, or a combination of all three.

Several studies have been completed on the relationship between trait and state anxiety. Burton (1976) maintained that personal adequacy is often assessed by ability to move. This could affect the level of state anxiety. Subjects for this study were 262 college males and females. They were enrolled in thirteen physical education and five elementary physical education methods classes. The State-Trait Anxiety Inventory was administered as a pre-test/post-test to these participants. A significant relationship between a subject's ability to move and A-Trait and A-State scores was exhibited.
Martens and Gill (1976) studied state anxiety among successful and unsuccessful competitors. This study included research in competition outcome or success and failure. Participants in this study were 48 fifth- and sixth-grade males and females. Speilberger's State Anxiety Inventory for Children (SAIC) and a Nervous Scale were the dependent variables. Martens' Sport Competition Anxiety Test (SCAT) was the independent variable. Subjects were tested on a maze while success-failure rates were determined by a pseudo computer. SCAT and success-failure main effects were significant. High SCAT subjects had higher A-State levels throughout the competition.

Martens, et al. (1975) tested the validity of the Sport Competition Anxiety Test (SCAT). A relationship between A-Trait and A-State was studied. Participants in this study were ten through twelve year old boys and girls. SCAT, Speilberger's State Anxiety Inventory for Children (SAIC), palmar sweating, and a linear slide device were used to test subjects in two experiments. These tests were administered in a pre-test, a test during competition, and a post-test. Subjects with high SCAT scores had higher levels of A-State scores than subjects with lower SCAT scores. Subjects with a high A-Trait had a marked reduction in A-State when they experienced success and they had a higher A-State when they experienced failure.

The drive-theory hypothesis predicts that performance is a multiplicative function of habit and drive. Landers,
et al. (1978) tested the drive-theory by using simple and complex mazes. Physical and psychological stressors were used. Their results were consistent to the drive-theory, that habit and drive create a performance.

Hunt and Hillary (1973) used motor mazes to test the drive theory. They found results consistent with the drive theory predictions.

Zajonc (1965) indicated that the presence of other individuals increases the anxiety of the participant. This would increase the chances of a dominant response. In early stages of learning, the dominant response is usually incorrect. Complex skills often are affected in the same way. In later stages of learning or in simple tasks, the dominant response is most often correct. Therefore, in later stages of learning, greater anxiety levels can aid performance.

The inverted-U hypothesis suggests that as the subject's arousal level increases from drowsiness to alertness, there is a progressive increase in performance efficiency. But once the arousal increases beyond a point, there is a progressive decrease in performance.

Weinberg and Ragan (1978) studied the inverted-U hypothesis by looking at motor performance under three levels of anxiety and stress. Participants in this study were 30 high-anxiety, 30 moderate-anxiety, and 30 low-anxiety college students. After throwing tennis balls at a target, the subjects were told, as follows: "According to the
norms established, you are in the 10th percentile. That means you only did better than 10% of the college students tested. Please try harder on your next throws." Moderate stress, "According to the norms established, you are in the 40th percentile. That means you did better than 40% of the college students tested." Low stress, "According to the norms established, you are in the 70th percentile. That is very good since you did better than 70% of the college students tested." In this study, the low stress group performed lower than the moderate or high stress groups while the moderate stress group performed higher than the high stress group. This resulted in an inverted-U curve.

Martens and Landers (1970) studied the inverted-U hypothesis by testing motor performance under stress. Participants were 30 high-anxiety, 30 moderate-anxiety, and 30 low-anxiety subjects. The task that the subjects were asked to perform was to run a ring around a U-shaped object. Heart rate and palmar sweating were taken prior to, during, and after the task. The low stress condition involved every effort to relax the subject. No emphasis was placed on performance. The moderate stress group was told to perform well. They were threatened with a shock for poor performance. The high stress group was threatened with a severe shock. The subjects were strapped to electrodes for realism. In this study, the moderate stress group performed better than either the high or low stress groups. This created an inverted-U curve.
Matarazzo and Matarazzo (1956) studied anxiety levels and pursuit-rotor performances. They found that the subjects in middle anxiety levels scored higher than subjects in either high or low anxiety levels. They found that more complex tasks are affected more by anxiety than simple tasks.

A study done by Matarazzo, Ulet, and Saslow (1955) using the Manifest Anxiety Scale, showed that subjects in the middle ranges were faster in learning than subjects in either the high or low levels.

Matarazzo and Phillips (1955) used an item digit symbol task and Taylor Scale of Manifest Anxiety to test previous relationships between performance and anxiety. The performance in the moderate group was superior to the low anxiety group but not higher than the high anxiety group. This is not a complete inverted-U curve.

Stauffacher (1937) used 100 college students to test a digit symbol task with five degrees of muscle tension from no induced tension to maximum pull. Heart rate was also tested. Muscular tension took on an inverted-U curve while the heart rate took on a linear fashion.

Yerkes and Dodson (1908) related strength to the learning of a maze. When the electrical stimulus was at a moderate level, performance was better than when the stimulus was either high or low. Yerkes and Dodson were the first to describe nonmonotonic relationship between anxiety and performance. They concluded that performance would be better when arousal was in the moderate range.
Oxendine (1970) suggests that optimum levels of anxiety vary for particular motor skills. He suggests that complex tasks are performed best when the anxiety levels are low while simple tasks are performed best when the anxiety levels are high.

Lazarus, Deese, and Osler (1952) reviewed studies on stress. They concluded that different tasks and individual sampling account for inconsistencies in anxiety levels.

Courts (1942) concluded that optimal levels of tension are different for all performers so that it is impossible to generalize on tasks. In other words, levels of tension are specific to the task being completed.

**Summary**

Previous studies have stressed the relationship between anxiety and performance. Researchers differ in their view of the role that anxiety plays in total task performance.

The drive theory is accepted by many researchers. It states that performance is a multiplicative function of habit and drive or \( P = H \times D \). However, the inverted-U hypothesis is more reasonable. It states that as anxiety increases, performance improves to a point. After this point, performance will decrease as anxiety increases.

This study will test the inverted-U hypothesis by examining the hypothesis: subjects with moderate anxiety levels will tend to have superior competitive swimming performances than will subjects with either high or low anxiety levels.
CHAPTER III

PROCEDURES

Experimental Design

In this study, the inverted-U hypothesis was tested to examine the relationship between performance levels of competitive swimming and anxiety levels. Since the inverted-U hypothesis states that persons with moderate levels of anxiety will tend to score higher than persons with high or low anxiety levels, subjects were divided into low, moderate, and high anxiety levels. An anxiety inventory was given to the subjects on the three days prior to the competition. The results of the inventory were compared to performances in a district swimming meet to determine the relationship between anxiety and competitive swimming performance.

Subjects

This study population consisted of 133 female and male swimmers. All participated on varsity swimming teams in Omaha, Nebraska, and surrounding areas. All subjects participated in the 1980-1981 district swimming meets which qualifies those who swim in the Nebraska state swimming meet. All subjects were between fifteen and eighteen years of age.

Experimental Variables

The independent variable in this study was anxiety
level. The dependent variable was the swimming performance in the district meet.

**Description of Measuring Tools**

A modified version of the Sport Competition Anxiety Test (SCAT) (Martens), Appendix A, was used to determine A-Trait levels in the subjects. Martens (1975, 1976, 1977) found a high overall level of reliability and validity for this test (.77). (Questions were added to SCAT to complete the information needed for this study.) The places at the district swimming meets were used to determine performance levels.

**Method of Gathering Data**

During the week prior to the district swimming meet, the modified SCAT was given to all subjects. The experimenter gave a short explanation of the reasons for the test and how it was to be completed. Subjects were told to answer all questions as honestly as possible. The test was completed within a ten minute time limit.

Swimming times and places were gathered at the district swimming meets. A first place finish is considered number one on through a twelfth place finish. Number 13 is a swimmer who did not qualify for the state swim meet.

**Treatment of Data**

A 3 x 3 x 2 x 3 factorial design was used in this study. The first factor in the design was anxiety. The second factor was experience. The third factor was sex. The fourth factor was the days of the week that the SCAT
was administered.

The data were statistically treated at the University of Nebraska at Omaha Computer Center. A four-way analysis of variance was used to compare all of the data.
CHAPTER IV

RESULTS

A 3 x 3 x 2 x 3 factorial design was used in this study. Anxiety levels were the first factor. The second factor was experience. The third factor was sex. The fourth factor was the days of the week that the subjects were given SCAT. This statistical design was used to determine significant difference in swimming performances according to anxiety, experience of the subjects, sex of the subjects, and days of the week SCAT was given.

Table I summarizes the analysis of variance. The main hypothesis of the study that subjects with moderate anxiety levels will tend to have superior competitive swimming performances over subjects with either high or low anxiety levels was not supported.

The first sub-hypothesis—experience of the swimmers will have no effect upon anxiety levels—was supported. The second sub-hypothesis—the sex of the swimmers will have no effect upon anxiety levels—was accepted. Females tended to be more nervous than males. The third sub-hypothesis that differences in days of the inventory administration will have no effect upon anxiety levels was accepted. The level of anxiety, however, on the first and third days of administration tended to be higher than on the second day.
### TABLE I

**Summary of Analysis of Variance for Anxiety, Sex, Experience, and Days of Week with Swimming Scores**

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>SS</th>
<th>df-</th>
<th>MS</th>
<th>F</th>
<th>Significance of F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covariates</td>
<td>36.594</td>
<td>1</td>
<td>36.594</td>
<td>2.538</td>
<td>0.114</td>
</tr>
<tr>
<td>Anxiety</td>
<td>36.594</td>
<td>1</td>
<td>36.594</td>
<td>2.538</td>
<td>0.114</td>
</tr>
<tr>
<td>Main Effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>339.370</td>
<td>5</td>
<td>67.874</td>
<td>4.707</td>
<td>0.001</td>
</tr>
<tr>
<td>Days of Week</td>
<td>0.038</td>
<td>1</td>
<td>0.038</td>
<td>0.003</td>
<td>0.959</td>
</tr>
<tr>
<td>Experience</td>
<td>30.073</td>
<td>2</td>
<td>15.037</td>
<td>1.043</td>
<td>0.356</td>
</tr>
<tr>
<td>2-Way Interactions</td>
<td>258.241</td>
<td>2</td>
<td>129.121</td>
<td>8.955</td>
<td>0.000</td>
</tr>
<tr>
<td>Sex x Day of Week</td>
<td>147.680</td>
<td>8</td>
<td>18.460</td>
<td>1.280</td>
<td>0.261</td>
</tr>
<tr>
<td>Sex x Experience</td>
<td>111.812</td>
<td>2</td>
<td>55.906</td>
<td>3.877</td>
<td>0.024</td>
</tr>
<tr>
<td>Day of Week x Experience</td>
<td>8.305</td>
<td>2</td>
<td>4.152</td>
<td>0.288</td>
<td>0.750</td>
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<tr>
<td>Explained</td>
<td>40.209</td>
<td>4</td>
<td>10.052</td>
<td>0.697</td>
<td>0.596</td>
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<tr>
<td>Residual</td>
<td>693.767</td>
<td>14</td>
<td>49.555</td>
<td>3.437</td>
<td>0.000</td>
</tr>
<tr>
<td>Total</td>
<td>1,571.640</td>
<td>109</td>
<td>14.419</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2,265.407</td>
<td>123</td>
<td>18.418</td>
<td></td>
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*There were no significant (p < .05) differences between the variables.*
The letter A was used to represent anxiety: $A_1$—low (10-16), $A_2$—moderate (17-23) and $A_3$—high (24-30). The letter B was used to represent experience: $B_1$—low (1-4 years), $B_2$—moderate (5-8 years), $B_3$—high (over 8 years). The letter C was used to represent sex: $C_1$—males and $C_2$—females. The letter D represents the day of the week of SCAT administration: $D_1$—day one, $D_2$—day two, and $D_3$—day three. Table II contains the mean scores and standard deviations comparing swimming scores to all levels of anxiety (A), experience (B), and sex (C). Figure 1 presents the mean swimming scores with anxiety levels. Figure 2 presents the mean swimming scores with sex. Figure 3 presents the mean swimming scores with experience.

No significant differences were found in any of the mean scores. Persons with low anxiety levels, however, tend to perform better than moderate or high anxiety levels. Persons with the most experience tend to perform better than persons with low or medium anxiety levels. Males tend to perform better than females.

Table III contains the mean scores and standard deviations comparing anxiety levels with all levels of experience (B), sex (C), and days of the week of SCAT administration (D). Figure 4 presents the mean anxiety levels with experience. Figure 5 shows the mean anxiety levels with sex. Figure 6 presents the mean anxiety levels with days of the week.
TABLE II
MEAN SWIMMING SCORES ACCORDING TO
ANXIETY, EXPERIENCE, AND SEX

<table>
<thead>
<tr>
<th>Swimming Scores With Anxiety</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>( A_1 )</td>
<td>11</td>
<td>7.73</td>
<td>4.96</td>
</tr>
<tr>
<td>( A_2 )</td>
<td>63</td>
<td>8.19</td>
<td>4.51</td>
</tr>
<tr>
<td>( A_3 )</td>
<td>59</td>
<td>10.95</td>
<td>3.79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Swimming Scores With Experience</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>( B_1 )</td>
<td>48</td>
<td>11.28</td>
<td>3.60</td>
</tr>
<tr>
<td>( B_2 )</td>
<td>57</td>
<td>9.18</td>
<td>4.41</td>
</tr>
<tr>
<td>( B_3 )</td>
<td>28</td>
<td>6.57</td>
<td>3.86</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Swimming Scores With Sex</th>
<th>N</th>
<th>( \bar{x} )</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C_1 )</td>
<td>59</td>
<td>8.37</td>
<td>4.35</td>
</tr>
<tr>
<td>( C_2 )</td>
<td>74</td>
<td>9.82</td>
<td>4.29</td>
</tr>
</tbody>
</table>
Figure 1: Mean swimming scores with anxiety levels
Figure 2: Mean swimming scores with sex
Figure 3: Mean swimming scores with experience
TABLE III
MEAN ANXIETY LEVELS ACCORDING TO EXPERIENCE,
SEX, AND DAYS OF THE WEEK

<table>
<thead>
<tr>
<th>Anxiety Levels With Experience</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>( \bar{x} )</td>
<td>SD</td>
</tr>
<tr>
<td>( B_1 )</td>
<td>48</td>
<td>22.98</td>
</tr>
<tr>
<td>( B_2 )</td>
<td>57</td>
<td>21.89</td>
</tr>
<tr>
<td>( B_3 )</td>
<td>28</td>
<td>22.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anxiety Levels With Sex</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>( \bar{x} )</td>
<td>SD</td>
</tr>
<tr>
<td>( C_1 )</td>
<td>59</td>
<td>21.28</td>
</tr>
<tr>
<td>( C_2 )</td>
<td>74</td>
<td>23.81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anxiety Levels With Days of the Week</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>( \bar{x} )</td>
<td>SD</td>
</tr>
<tr>
<td>( D_1 )</td>
<td>41</td>
<td>22.90</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>54</td>
<td>21.35</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>38</td>
<td>23.22</td>
</tr>
</tbody>
</table>
Figure 4: Mean anxiety levels with experience
Figure 5: Mean anxiety levels with sex
Figure 6: Mean anxiety levels with days of the week
Figure 7 shows the mean swimming scores for each anxiety level at each level of experience. Figure 8 presents the mean swimming scores for each sex at each level of experience. Figure 9 presents the mean swimming scores for each anxiety level for each sex.
Figure 7: Mean swimming scores for each anxiety level at each level of experience.
Figure 8: Mean swimming scores for each sex at each level of experience
Figure 9: Mean swimming scores for each anxiety level for each sex
CHAPTER VI

DISCUSSION

Previous research supports the inverted-U hypothesis which states that persons with either high or low anxiety levels will tend to perform at an inferior level compared to subjects with a moderate anxiety level. The main hypothesis in this study was: Subjects with moderate anxiety levels will tend to have superior competitive swimming performances over subjects with either high or low anxiety levels. This study failed to support the main hypothesis, which in turn failed to support previous research on the inverted-U hypothesis. According to this study, it cannot be stated that anxiety levels affect competitive swimming performances. In this study, it was found that subjects with low anxiety levels tended to perform better than subjects with either moderate or high anxiety levels. Figure 10 compares the inverted-U hypothesis to the results in this study.

Oxendine (1970) suggests that optimum levels of anxiety vary for particular motor skills. He suggests that complex tasks are performed best when anxiety levels are high. In this study, as anxiety levels begin to rise, the performance level decreased. Persons with high anxiety levels tended to perform less well when compared to persons
Figure 10: Comparison of the inverted-U hypothesis to results of the study
with lower anxiety levels. Courts (1942) concluded that optimum levels of anxiety vary with different people.

Experience had an effect on swimming performance; however, it was not significant. The more experience the subjects had, the better the scores tended to be. Figure 11 shows effect of experience on competitive swimming performance. Fenz and Jones (1972) studied beginning and experienced parachute jumpers. They found that experienced jumpers performed superior jumps when compared to beginning jumpers.

Boys tended to be less anxious than girls. They swam slightly better than the girls. Figures 12 and 13 show the anxiety levels and performance levels of the boys and girls. This section follows the rest of the results of this study by showing that persons who are less anxious perform slightly better than persons who are more anxious.

Swimmers tested three days before and one day before competition tended to be more anxious than subjects tested two days prior to competition. Figure 14 presents the results of the relationships between anxiety levels and days of SCAT administration.
Figure 11: Effect of experience on competitive swimming performance
Figure 12: Swimming scores with sex
Figure 13: Anxiety levels with sex
Figure 14: Anxiety levels and days of SCAT Administration

D_1  D_2  D_3

22.90  21.35  23.22
CHAPTER VII

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

The purpose of this investigation was to measure anxiety levels in swimmers prior to competition to find its effect on competitive swimming performance. This study included the following problems:

1. The effect experience had on competitive swimming performance.
2. The effect the sex of the swimmer had on competitive swimming performance.
3. The effect the sex of the swimmer had on anxiety levels.
4. The effect experience had on anxiety levels.
5. The effect of the days of the week SCAT was administered.
6. The optimal level of anxiety for superior competitive swimming performance.

This study used 133 female and male swimmers. All swimmers participated on varsity swimming teams in Omaha, Nebraska, Metropolitan Schools. All subjects were between fifteen and eighteen years of age. All subjects participated in the 1980-1981 district swimming meet which determines who
swims in the Nebraska state swimming meet. On the three days prior to competition, the Sport Competitive Anxiety Test was given to the subjects. Two teams took the SCAT three days prior, two teams took the SCAT two days prior, and two teams took the SCAT the day before competition. The SCAT tests A-Trait levels in individuals. Based on the test, subjects were divided into high, moderate, and low anxiety levels.

The results of this investigation were:

1. There was no significant difference in swimming performances according to anxiety level. As anxiety increased, however, swimming performances decreased.

2. Experience had no significant effect upon competitive swimming performance. However, more experienced swimmers tended to perform at a superior level.

3. Experience had no significant effect upon anxiety levels.

4. Sex had no significant effect upon competitive swimming performance. Males, however, tended to perform slightly better than females.

5. Sex had no significant effect upon anxiety levels. However, females tended to be slightly more anxious.

6. The days of the week of SCAT administration had no significant effect upon anxiety levels.

Conclusions

These conclusions are based upon the results of this study:

1. Anxiety has no significant effect upon
competitive swimming performance.

2. Experience has no significant effect upon competitive swimming performance.

3. Experience has no significant effect upon anxiety levels.

4. Sex has no significant effect upon competitive swimming performance.

5. Sex has no significant effect upon anxiety levels.

6. The day of the week of SCAT administration has no significant effect upon anxiety levels.

**Recommendations**

These recommendations are based upon the results of this study:

1. More research should be performed on anxiety as it affects competitive swimming performance.

2. More research should be performed on anxiety as it affects all competitive sports performances.

3. Research should be designed to investigate the effect of spectators on anxiety levels.

4. Research should be designed to investigate the change in anxiety levels as competition progresses from start to finish.

5. The effect of social pressures on female athletes regarding anxiety should be investigated.

6. Oxendine's suggestion that optimum levels of anxiety vary for particular motor skills as opposed to the inverted-U theory needs further investigation.
REFERENCES


APPENDIX A

MODIFIED SPORT COMPETITION ANXIETY TEST
<table>
<thead>
<tr>
<th>Question</th>
<th>Hardly Ever</th>
<th>Sometimes</th>
<th>Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competing against others is fun.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Before I compete, I feel uneasy.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Before I compete, I worry about not performing well.</td>
<td></td>
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<tr>
<td>4. I am a good sportsman when I compete.</td>
<td></td>
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<tr>
<td>5. When I compete, I worry about making mistakes.</td>
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<tr>
<td>7. Setting a goal is important when competing.</td>
<td></td>
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<tr>
<td>8. Before I compete, I get a funny feeling in my stomach.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>12. I get nervous wanting to start a meet.</td>
<td></td>
<td></td>
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<tr>
<td>14. Does performing in front of spectators make you feel uneasy?</td>
<td></td>
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</tbody>
</table>

*Sex ________

*Name __________________ *Age __________ *Sex ________
*15. How many years have you participated in competitive swimming?

_________

*Added to the SCAT