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Jean L. Foss	August 2, 1968
THESIS COMMITTEE MEMBER	DATE
[signature]	August 2, 1968
THESIS COMMITTEE MEMBER	DATE

THIS THESIS IS APPROVED FOR THE GRADUATE COLLEGE.

James H. McErlean	August 2, 1968
DEAN, GRADUATE COLLEGE	DATE

THE RELATIONSHIP BETWEEN MANIFEST ANXIETY LEVEL AND SKILL PERFORMANCE IN STRESSFUL AND NON-STRESSFUL SITUATIONS

A THESIS

PRESENTED TO

THE FACULTY OF THE GRADUATE COLLEGE

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OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF SCIENCE

BY

PETER JON VAN HANDEL

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ABSTRACT

THIS STUDY WAS DESIGNED TO EXPLORE THE RELATIONSHIP BETWEEN MANIFEST ANXIETY LEVEL AND SKILL PERFORMANCE IN STRESSFUL AND NON-STRESSFUL SITUATIONS. A SUBPROBLEM WAS TO MEASURE THE EFFECTS OF STRESS ON PERFORMANCE.

109 SOPHOMORE WOMEN PHYSICAL EDUCATION MAJORS WERE CHOSEN AS SUBJECTS BECAUSE THEY MET SEVERAL CRITERIA INCLUDING AVAILABILITY. THE FOUR CLASSES OF WOMEN WERE SPLIT INTO TWO GROUPS: (1) EXPERIMENTAL (STRESS), AND (2) CONTROL (NO STRESS).

THE TESTS CHOSEN TO CARRY OUT THE DESIGNATED PURPOSES OF THE STUDY WERE THE IPAT ANXIETY SCALE QUESTIONNAIRE AND THE LA CROSSE A-B WALL TEST-FOR MEASURING BALL HANDLING ABILITY.

THE FIRST CLASS PERIOD OF THE SEMESTER THIS INVESTIGATOR ADMINISTERED THE ANXIETY SCALE. THE SAME PERIOD, THE REGULAR CLASS INSTRUCTOR CONDUCTED THE SKILL TEST-UNDER THE PRETENSE OF IT BEING A PRE-TEST. SEVEN WEEKS LATER THE SKILL TEST WAS AGAIN GIVEN-EXCEPT THE EXPERIMENTAL GROUP WAS GIVEN STRESSFUL INSTRUCTIONS.

RELATED LITERATURE SUGGESTS THAT: (1) THE DIFFICULTY OF THE TASK BE DESCRIBED, (2) STRESS CAN BE EITHER FACILITATING OR IMPAIRING, AND (3) THERE SEEMS TO BE AN OPTIMAL LEVEL OF ANXIETY FOR EFFICIENT PERFORMANCE.

THE RESULTS INDICATED: (1) THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN THE TWO GROUPS FOR ANY OF THE SCORES, (2) WITHIN GROUPS THERE WAS A SIGNIFICANT DIFFERENCE BETWEEN THE SKILL TRIALS, (3) THERE WERE NO SIGNIFICANT DIFFERENCES IN PERFORMANCE BETWEEN THE HIGH AND LOW-ANXIETY SUBJECTS, AND (4) AS ANXIETY LEVEL INCREASED, SKILL PERFORMANCE DECREASED.

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CHAPTER I

INTRODUCTION TO THE PROBLEM

THE ADVENT IN RECENT YEARS OF INCREASINGLY VALID AND RELIABLE MEASURES OF PERSONALITY FACTORS HAS BROUGHT ABOUT AN UPSURGE IN THE NUMBER OF INVESTIGATIONS CONCERNED WITH THESE PERSONALITY FACTORS AND DIFFERENT MEASURES OF PERFORMANCE.

COMPARATIVE STUDIES INVOLVING PERSONALITY FACTORS AND VARIOUS MEASURES OF PERFORMANCE HAVE GONE IN SEVERAL DIRECTIONS, ONE OF WHICH IS THE STUDY OF THE RELATIONSHIP BETWEEN A PERSONALITY FACTOR AND SUCCESS IN SELECTED PHYSICAL EDUCATION ACTIVITIES.

I. THE PROBLEM

STATEMENT OF THE PROBLEM. IT WAS THE PURPOSE OF THIS INVESTIGATION TO STUDY THE RELATIONSHIP BETWEEN AN INDIVIDUAL'S MANIFEST ANXIETY LEVEL AND HIS ABILITY TO PERFORM A SELECTED MOTOR SKILL UNDER A STRESSFUL OR NON-STRESSFUL SITUATION. A SUBPROBLEM WAS TO MEASURE THE EFFECT OF THE STRESSFUL SITUATION ON THE SKILL PERFORMANCE.

HYPOTHESIS. THE HYPOTHESIS WAS THAT THERE IS A DEFINITE RELATIONSHIP BETWEEN AN INDIVIDUAL'S ANXIETY LEVEL AND HIS ABILITY TO PERFORM A MOTOR SKIL IN DIFFERENT TEST SITUATIONS. IT WAS ASSUMED THAT THE GROUP TESTED UNDER STRESSFUL CONDITIONS WOULD HAVE A DECREMENT IN PERFORMANCE AS COMPARED TO THE GROUP TESTED IN THE NON-STRESSFUL SITUATION, DEPENDING ON THE TYPE OF TASK INVOLVED AND THE SOCIAL CONTEXT IN WHICH THE INVESTIGATION TOOK PLACE. (1)

SIGNIFICANCE OF THE PROBLEM. OF THE NUMEROUS STUDIES THAT HAVE BEEN DONE FOLLOWING THE FORMAT OF COMPARING ANXIETY LEVEL TO SKILL PERFORMANCE, NONE, AS FAR AS THIS INVESTIGATOR CAN DETERMINE, HAVE STUDIED THIS RELATIONSHIP IN INDIVIDUALS WHO ARE PLANNING TO MAKE SKILL PERFORMANCE THEIR CAREER, THAT IS, PHYSICAL EDUCATION MAJORS.

THIS IS MENTIONED BECAUSE THIS INVESTIGATOR BELIEVES THAT THESE INDIVIDUALS ARE MORE HIGHLY MOTIVATED TO PERFORM WELL SINCE THEIR CAREERS DEPEND ON THEIR PERFORMANCE IN THE MAJOR PROGRAM. SINCE THE GRADING OF PHYSICAL EDUCATION MAJORS AT LA CROSSE IS BASED ON SKILL PERFORMANCE, THIS STUDY COULD BE SIGNIFICANT IN A RE-EVALUATION OF THE PURPOSES AND RESULTS OF THIS TYPE OF GRADING.

THESE STUDENTS ARE HIGHLY MOTIVATED TO PERFORM WELL--THEIR GRADE DEPENDS ON IT--BUT IN THESE STRESSFUL TESTING SITUATIONS, ARE THEIR CHANCES OF PERFORMING WELL INCREASED OR DECREASED BY THE NATURE OF THE TESTING PROGRAM ITSELF?

LIMITATIONS OF THE STUDY. THE LIMITATIONS OF THE STUDY CAN BE POSED IN THE FORM OF QUESTIONS TO BE ANSWERED.

1. IS THE SAMPLE REPRESENTATIVE OF WOMEN PHYSICAL EDUCATION MAJORS AS A WHOLE? THE NATURE OF THE PROBLEM REQUIRED THAT THE SUBJECTS BE ENROLLED IN THE SAME PHYSICAL EDUCATION CLASSES AND HAVE THE SAME COLLEGE INSTRUCTIONAL BACKGROUND AS FAR AS PHYSICAL EDUCATION IS CONCERNED. THIS MEANT CHOOSING DIFFERENT SECTIONS OF ONE SKILL CLASS ON ONE GRADE LEVEL. IN THIS CASE, THE SAMPLE CONSISTED OF ALMOST THE ENTIRE SOPHOMORE CLASS OF WOMEN PHYSICAL EDUCATION MAJORS. WITH A SAMPLE THIS SIZE, AND CONSISTING OF AN ENTIRE CLASS,

THIS INVESTIGATOR FELT THAT THE SAMPLE WOULD BE REPRESENTATIVE OF ALL THE MAJORS AT LA CROSSE.

2. WHAT EFFECT WILL INSTRUCTION AND PRACTICE HAVE ON THE SUBJECTS BETWEEN THE FIRST AND SECOND APPLICATION OF THE SKILL TEST? THESE ARE FACTORS THAT MAY INFLUENCE THE SECOND SKILL SCORE, BUT SINCE ALL THE SUBJECTS WILL HAVE HAD THE SAME AMOUNT OF INSTRUCTION, THEY WILL NOT BE EVALUATED IN THE FINAL ANALYSIS OF DATA.

3. THE SUBJECTS WERE PLACED IN ONE OF THE FOUR SECTIONS OF BASKETBALL ACCORDING TO THEIR SWIMMING ABILITY. AN IMPORTANT FACTOR HERE COULD BE THE RELATIONSHIP BETWEEN SWIMMING ABILITY AND BASKETBALL ABILITY. IF THERE IS A RELATIONSHIP, ALL OF THE POOR BASKETBALL PLAYERS WILL BE IN ONE CLASS, AND THE BEST ONES IN ANOTHER CLASS.(2)

II. BASIC ASSUMPTIONS

THERE WERE SEVERAL ASSUMPTIONS INHERENT IN THE STUDY, THE MOST BASIC OF WHICH WAS THAT THE STRESSFUL CONDITION APPLIED TO THE EXPERIMENTAL GROUP BEFORE THE SECOND SKILL TRIAL WAS INDEED STRESSFUL, AND THAT IT WAS STRESSFUL FOR ALL THE SUBJECTS. IN ORDER TO UNDERSTAND THE PROBLEM INVOLVED, IT IS NECESSARY TO KNOW SOMETHING ABOUT THE CONCEPT OF STRESS.

BASICALLY, STRESS CAN BE THOUGHT OF IN TWO DIFFERENT WAYS, (1) IN TERMS OF THE SITUATION (STIMULUS), AND (2) IN TERMS OF THE REACTION OF THE INDIVIDUAL (RESPONSE).(3)

1. AN EXAMPLE OF STRESS CONSIDERED IN TERMS OF THE SITUATION IS THE FINAL EXAMINATION GIVEN TO A CLASS. THIS SITUATION IS STRESSFUL TO THE PARTICIPANTS. THE PROBLEM WITH THIS TYPE OF STRESS IS THAT IT DOES NOT

EVOKE A UNIFORM RESPONSE FROM ALL SUBJECTS, AND THUS MAKES PREDICTION OF BEHAVIOR BY DESCRIBING THE SITUATION NEARLY IMPOSSIBLE. INDIVIDUALS IN A SITUATION SUCH AS THIS MAY SHOW NO MEASURABLE EFFECTS, MAY TREMBLE, SWEAT, EXPERIENCE EXTREME DISCOMFORT, HAVE DISORGANIZED BEHAVIOR, OR THEY MAY SHOW AN IMPAIRMENT IN PERFORMANCE WITH NO OTHER SIGNS. IN ANY CASE, THE VARIOUS TYPES OF REACTIONS TO THE SITUATION MAKES PREDICTION, WHICH IS THE PURPOSE OF EXPERIMENTAL STUDIES, DIFFICULT.

IN MOST TYPES OF RESEARCH ON STRESS, THE EXPERIMENTER SELECTS A SITUATION WHICH, FROM PAST EXPERIENCE, SEEMS TO BE THREATENING TO THE MOST PEOPLE. LAZARUS SAYS THAT:

> IMPLICIT IN THIS SELECTION IS THE NECESSITY OF IDENTIFYING STRESS WITH THE MOTIVATIONS OF THE PEOPLE WHO ARE BEING TESTED. HOWEVER, BECAUSE PEOPLE DIFFER IN MOTIVATIONS AND IN THE WAYS THEY DEAL WITH THEM, IT IS NEVER REALLY POSSIBLE TO DEFINE A GENERAL STRESS SITUATION. THE SITUATION WILL BE MORE OR LESS STRESSFUL FOR THE INDIVIDUAL MEMBERS OF THE GROUP, AND IT IS LIKELY THAT THESE DIFFERENCES IN THE MEANING OF THE SITUATION WILL APPEAR IN TERMS OF PERFORMANCE.(4)

2. THE SECOND WAY OF CONSIDERING STRESS IS IN TERMS OF REACTIONS OR RESPONSES OF THE INDIVIDUAL RATHER THAN THE SITUATION. THE PROBLEM WITH THIS IS SIMILAR TO THAT INVOLVED WITH SITUATIONAL STRESS. WHAT KIND OF REACTIONS SHOULD BE MEASURED? OBVIOUSLY, ALL THE REACTIONS TO A STRESSFUL SITUATION CANNOT BE RECORDED IF YOU CONSIDER ALL THE PHYSIOLOGICAL AND EMOTIONAL CHANGES THAT COULD TAKE PLACE, MUCH LESS THOSE OF PERFORMANCE. THIS LEADS TO THE QUESTION OF WHETHER OR NOT CHANGES IN SKILLED PERFORMANCE ARE TO BE USED AS THE MEASURE OF STRESS.

THE TROUBLE IS THAT CHANGES IN PERFORMANCE COULD BE A FUNCTION OF DIFFERENT VARIABLES IN DIFFERENT INDIVIDUALS WHO ARE SUBJECTED TO THE STRESSFUL CONDITIONS. FOR EXAMPLE, SKILLED PERFORMANCE MAY BE AFFECTED BY

A CHANGE IN MOTIVATION IN ONE INDIVIDUAL, AND BY A CHANGE IN THE APPROACH TO THE TASK IN ANOTHER INDIVIDUAL. THUS IT COULD BE QUITE MEANINGLESS TO ATTRIBUTE CHANGES IN SKILLED PERFORMANCE TO THE EFFECTS OF STRESS.(5)

IT IS DIFFICULT THEN, TO DEFINE STRESS IN TERMS OF EITHER STIMULUS OR RESPONSE. FROM THIS IT BECOMES NECESSARY TO THINK OF STRESS AS AN INTERVENING VARIABLE BETWEEN THE TWO. THIS ALSO REQUIRES THAT AN ADDITIONAL CONCEPT BE INCLUDED--THAT OF MOTIVATION.

STRESS THEN BECOMES AN INTERVENING STAGE BETWEEN THE SITUATION AND THE PERFORMANCE. IT IS BASED ON A RELATIONSHIP BETWEEN MOTIVATION AND THE SITUATION IN WHICH MOTIVATED BEHAVIOR APPEARS.(6) ONE COULD ASSUME THEN, THAT STRESS OCCURS WHEN A PARTICULAR SITUATION THREATENS THE ATTAINMENT OF SOME GOAL.(7)

IMPORTANT IN THIS VIEW IS THE CONCEPT OF MOTIVATION. HOWEVER, IT IS DIFFICULT TO ESTIMATE FROM MEASURES OF BEHAVIOR IN A LABORATORY, THE KIND AND DEGREE OF MOTIVATION PRESENT IN A PARTICULAR SITUATION.

"THE SOLUTION OF MOST EXPERIMENTERS WHO HAVE STUDIED THE RESPONSES OF GROUPS UNDER STRESS," SAYS LAZARUS, "HAS BEEN TO PRODUCE SITUATIONS WHICH ARE THOUGHT TO THWART THE MOTIVES OF MOST PEOPLE." (8) THE PROBLEM WITH THIS TYPE OF INDUCED STRESS IN A LABORATORY SITUATION IS THAT INITIALLY, THE ASSUMPTION MUST BE MADE THAT THE INDUCED STRESSOR IS AS UPSETTING TO THE SUBJECTS AS IT WOULD BE TO THE EXPERIMENTER, AND AS HAS BEEN MENTIONED, THIS IS NOT ALWAYS THE CASE DUE TO THE GREAT VARIETY OF PHYSIOLOGICAL AND PSYCHOLOGICAL REACTIONS TO STRESS.(9)

IN THIS TYPE OF SITUATION, FAILURE OR THREAT OF FAILURE AT A TASK IS

MOST FREQUENTLY USED AS THE STRESS VARIABLE. THIS INVOLVES THE PRODUCTION OF A REALISTIC STRESS SITUATION AND IS LIMITED BY CONTROL OF THE SUBJECT'S MOTIVATION.

THIS LEADS TO THE SECOND BASIC ASSUMPTION OF THE STUDY WHICH WAS THAT THE SUBJECTS WERE MOTIVATED TO PERFORM AS BEST THEY COULD UNDER THE CONDITIONS IN THE TWO TEST SITUATIONS.

LAZARUS STATES THAT "IN ORDER FOR THE FAILURE SITUATION TO BE STRESSFUL, IT IS NECESSARY FOR THE INDIVIDUAL TO BE MOTIVATED TO SUCCEED, OR AT LEAST TO AVOID FAILURE." (10) IT CAN BE ASSUMED THAT MOST SUBJECTS ARE ANXIOUS TO SUCCEED, BUT NOT AT THE SAME LEVEL. AS IS SHOWN IN THE RESULTS OF THE ANXIETY SCALE SCORES, TABLE IV, PAGE 44, CERTAINLY THERE ARE A NUMBER OF SUBJECTS THAT WILL BE HIGHLY MOTIVATED IN A STRESS SITUATION WHILE OTHERS WILL HARDLY RECOGNIZE THE STRESSFUL CONDITIONS. IN ANY CASE, THE ASSUMPTION IS THAT ENOUGH OF THE SUBJECTS WILL BE STRESSED BY THE CONDITIONS IN THE TEST SITUATION. THIS ASSUMPTION IS VALID AS LONG AS ONE DOES NOT ATTEMPT TO ACCOUNT FOR THE REACTIONS OF ANY ONE INDIVIDUAL.

ONE PROBLEM HERE IS THAT THERE IS NO RELIABLE WAY OF ASSESSING TO A HIGH DEGREE OF CONFIDENCE, THE AMOUNT OF MOTIVATION IN THE SUBJECTS. ONE CANNOT TAKE THE EFFECT OF STRESS ON PERFORMANCE ITSELF AS AN INDICATOR OF THE LEVEL OF MOTIVATION BECAUSE, AS HAS BEEN POINTED OUT, MOTIVATION IS NOT THE ONLY DETERMINER OF THE REACTION TO THE STRESSFUL SITUATION. THUS AS EXPECTED AND POINTED OUT IN CHAPTER II, PAGE 10, MOTIVATION WILL PRODUCE BETTER PERFORMANCE IN SOME AND IMPAIRED PERFORMANCE IN OTHERS.

ANOTHER DIFFICULTY WITH THE FAILURE OR THREAT OF FAILURE SITUATION AND

MOTIVATION IS THAT OF THE DEGREE OF REALISM THAT CAN BE PRODUCED TO MOTIVATE THE SUBJECTS. IN ORDER FOR THE SUBJECTS TO BE GENUINELY STRESSED, THE INFORMATION AND INSTRUCTIONS GIVEN MUST BE CONVINCING. THE SITUATION MUST PRODUCE A REALISTIC THREAT TO SOME GOAL-ORIENTED BEHAVIOR.

THIS WAS ONE OF THE PRIMARY REASONS WHY SOPHOMORE PHYSICAL EDUCATION MAJORS WERE CHOSEN AS SUBJECTS AND THE REGULAR INSTRUCTOR FOR THE CLASS CONDUCTED THE TESTS. THE THOUGHT WAS THAT MAJORS WOULD BE MORE HIGHLY MOTIVATED TO PERFORM WELL UNDER THE STRESSFUL SITUATION THAN WOULD ORDINARY STUDENTS. IT WAS ALSO THOUGHT THAT BY HAVING THE TEACHER CONDUCT THE TESTS AND GIVING THE INSTRUCTIONS, A REALISTIC STRESS SITUATION COULD BE PRODUCED. (11)

FOR THE ABOVE REASONS THEN, IT WAS FELT THAT THESE FIRST TWO BASIC ASSUMPTIONS (1) THAT THE STRESSFUL CONDITIONS APPLIED TO THE EXPERIMENTAL GROUP WERE INDEED STRESSFUL, AND THAT THEY WERE STRESSFUL FOR ALL OF THE SUBJECTS, AND (2) THAT THE SUBJECTS WERE MOTIVATED TO PERFORM AS BEST THEY COULD, ARE VALID.

THE THIRD BASIC ASSUMPTION WAS THAT THE SUBJECTS DID NOT DELIBERATELY DISTORT THEIR ANSWERS ON THE ANXIETY SCALE QUESTIONNAIRE. THIS ASSUMPTION IS BASED ON THE SAME PRINCIPLES AS THE PREVIOUS TWO IN THAT IT WAS FELT THAT THE DISGUISED PURPOSE OF THE STUDY AND THE NATURE OF THE INSTRUCTIONS GIVEN DID IN FACT MOTIVATE THE SUBJECTS TO CO-OPERATE IN TAKING THE QUESTIONNAIRE.

THE FOURTH BASIC ASSUMPTION WAS THAT THE PRACTICE VARIABLE WOULD NOT BE SIGNIFICANTLY DIFFERENT FOR THE TWO GROUPS. IT WAS FELT THAT SINCE NONE OF THE SUBJECTS WOULD KNOW THAT A RETEST OF THE SKILL WOULD TAKE PLACE,

THERE WOULD NOT BE ANY SPECIFIC PRACTICE OF THAT SKILL. THUS THE ONLY PRACTICE INVOLVED WOULD BE THAT OF BEING PRESENT IN CLASS AND ABSORBING WHATEVER INSTRUCTION WAS GIVEN. IT WOULD HAVE BEEN POSSIBLE TO DETERMINE THE ACTUAL EFFECT OF THIS "PRACTICE" BY HAVING A THIRD GROUP OF SUBJECTS THAT WOULD HAVE TAKEN ONLY THE SKILL TESTS WITHOUT ATTENDING CLASS, BUT THIS WAS NOT FEASIBLE IN THIS STUDY.

III. PREVIEW OF THESIS ORGANIZATION

THE REMAINDER OF THE PAPER WILL BE BROKEN DOWN INTO FOUR SECTIONS, CHAPTER II-REVIEW OF RELATED LITERATURE, CHAPTER III-METHODS AND PROCEDURES, INCLUDING A DESCRIPTION OF THE TESTS AND THE SAMPLE, AND THE PROCEDURE USED IN THE APPLICATION OF THESE TESTS, CHAPTER IV-ANALYSIS OF DATA, INCLUDING THE RESULTS AND THEIR INTERPRETATION, AND CHAPTER V-SUMMARY AND CONCLUSIONS.

CHAPTER II

REVIEW OF RELATED LITERATURE

THIS CHAPTER DEALS WITH LITERATURE RELEVANT TO THE STUDY AND INCLUDES DISCUSSION OF BOTH RELATED STUDIES, AND ARTICLES CENTRAL TO UNDERSTANDING THE PRINCIPLES INVOLVED IN THE STUDIES.

SINCE AN UNDERSTANDING OF CERTAIN PRINCIPLES IS NEEDED BEFORE ONE CAN CONCERN HIMSELF WITH THE RELATED STUDIES, THIS INVESTIGATOR FEELS THAT THE FOLLOWING POINTS NEED TO BE MENTIONED AT THIS TIME.

1. A COMPARISON OF RELATED STUDIES SHOWS CONTRADICTORY RESULTS. SOME STUDIES INDICATE POORER PERFORMANCE OF HIGH-ANXIETY SUBJECTS ON DIFFICULT TASKS AS COMPARED TO LOW-ANXIETY SUBJECTS, SOME FIND NO SIGNIFICANT DIFFERENCE BETWEEN HIGH-ANXIETY AND LOW-ANXIETY SUBJECTS, AND STILL OTHERS FIND LOW-ANXIETY SUBJECTS SUPERIOR IN PERFORMANCE.(12)

2. IN TASKS OF RELATIVELY EASY DIFFICULTY, IT HAS BEEN FOUND THAT THE HIGH-ANXIETY SUBJECTS PERFORM CONSISTENTLY BETTER THAN THE LOW-ANXIETY SUBJECTS OR THERE IS NO RELATIONSHIP BETWEEN THE TWO.

3. THIS SEEMS TO INDICATE THAT IN ORDER FOR THE STUDIES TO BE MEANINGFUL, THE CONDITIONS UNDER WHICH THE PERFORMANCE TOOK PLACE MUST BE UNDERSTOOD, ESPECIALLY THE NATURE OF THE TASK AND THE INSTRUCTIONS GIVEN PRIOR TO PERFORMANCE.

4. THERE IS A GREAT VARIANCE OF SCORES IN STRESS AND NON-STRESS SITUATIONS AMONG THE SAME SUBJECTS. IT IS POSSIBLE THAT A CONDITION WHICH IS STRESSFUL FOR ONE SUBJECT MAY BE NON-STRESSFUL FOR ANOTHER.(13)

5. STRESS WHICH IS BROUGHT INTO A SITUATION AND WHICH CONTRIBUTES TO THE INDIVIDUALS DISCOMFORT IS REFERRED TO AS INDUCED ANXIETY. THIS STRESS RESULTS IN VARIATIONS IN DRIVE (D) AND STUDIES INDICATE BOTH A POSITIVE AND NEGATIVE INFLUENCE OF THIS ANXIETY ON DRIVE AS FAR AS PERFORMANCE IS CONCERNED. IT IS KNOWN THOUGH, THAT AN INCREASE IN ANXIETY LEVEL OR STIMULUS INTENSITY MAY PRODUCE A SIGNIFICANT INCREASE IN DRIVE. (14) STUDIES HAVE ALSO SHOWN THAT INDIVIDUAL PERFORMANCES IN VARIOUS TEST SITUATIONS CAN BE GREATLY AFFECTED BY THE PRESENCE OF THIS ANXIETY. THE EXTENT TO WHICH IT WILL INFLUENCE THE INDIVIDUAL'S PERFORMANCE WILL VARY ACCORDING TO THE AMOUNT OF ANXIETY (MANIFEST) ALREADY PRESENT IN THE INDIVIDUAL. (15)

THE CONCEPTS PRESENTED IN POINT FIVE ABOVE ARE IMPORTANT IN THAT THEY NEED TO BE UNDERSTOOD IF THE DATA IN CHAPTER IV IS TO BE MEANINGFUL TO THE READER. THEREFORE, A SLIGHT EXPANSION OF THE ABOVE IDEAS IS NEEDED.

WHEN DISCUSSING DRIVE (D), ONE INCLUDES IN THIS THE IDEA OF SOME TYPE OF MOTIVATION OR THE GENERAL LEVEL OF AROUSAL TO ACTION. CRATTY SUGGESTS THAT THIS GENERAL READINESS OF THE INDIVIDUAL TO ACT CAN BE PLACED ON A CONTINUUM--FROM A DEEP TRANCE-LIKE SLEEP TO THE HYPERACTIVITY CHARACTERISTIC OF THE MENTALLY ILL OR THE EXTREMELY NERVOUS. (16) MOST INDIVIDUALS FUNCTION IN A RANGE SOMEWHERE NEAR THE MIDPOINT WITH FLUCTUATIONS OCCURRING ALMOST CONSTANTLY.

AN AROUSAL CURVE CAN BE CONSTRUCTED SO THAT WHEN IT IS PLOTTED IN RELATIONSHIP TO PERFORMANCE IT ASSUMES A U-SHAPED PATTERN, INDICATING THAT THERE IS AN OPTIMAL LEVEL OF AROUSAL WITHIN WHICH THE MOST EFFICIENT MOTOR PERFORMANCE MAY OCCUR. THIS OPTIMAL LEVEL IS GENERALLY DEPENDENT UPON

THE NATURE OF THE TASK.

> THE EXTENT TO WHICH THIS INDUCED ANXIETY (STRESS) MAY AFFECT PERFORMANCE DEPENDS DIRECTLY UPON THE POINT ON THE AROUSAL CURVE AT WHICH THE INDIVIDUAL MAY BE MOMENTARILY FUNCTIONING. THE HIGHER HIS STATE OF AROUSAL, TO A POINT, THE MORE SUSCEPTIBLE HE IS TO VARIOUS KINDS OF ENVIRONMENTAL CONDITIONS WHICH MAY ENCOURAGE HIM TO ACT. A POINT IS REACHED HOWEVER, AT WHICH THE INDIVIDUAL MAY BE THOUGHT OF AS OVER-AROUSED (MOTIVATED), AND TO PRESERVE THE STATUS QUO HE MAY EITHER BLOT OUT THE ENVIRONMENTAL STIMULI OR BE UNABLE TO ACT EFFICIENTLY BECAUSE OF EXCESS TENSION. (17)

THIS HYPOTHESIS OF AN AROUSAL CURVE WOULD SUGGEST A REASON FOR THE POOR PERFORMANCE OF HIGH-ANXIETY SUBJECTS COMPARED TO LOW-ANXIETY SUBJECTS ON COMPLEX TASKS--THE HIGH-ANXIETY SUBJECTS WERE PAST THE OPTIMUM LEVEL FOR EFFICIENT PERFORMANCE. IT WOULD ALSO SUGGEST WHY STRESS MIGHT INHIBIT HIGH-ANXIETY SUBJECTS AND HELP LOW-ANXIETY SUBJECTS ON VARIOUS TASKS--THE HIGHS WERE PUSHED PAST THE OPTIMUM LEVEL, WHILE THE LOW-ANXIETY SUBJECTS WERE BROUGHT CLOSER TO IT.

WITH A BASIC UNDERSTANDING OF WHAT MIGHT BE HAPPENING IN A LABORATORY SITUATION AS FAR AS AROUSAL LEVEL AND PERFORMANCE ARE CONCERNED, WE CAN NOW TURN TO SOME OF THE RELATED STUDIES THAT HAVE BEEN CONDUCTED THUS FAR.

BASICALLY, THE HISTORY OF RELATED LITERATURE CAN BE DIVIDED INTO TWO ERAS, NEITHER CLEARLY DEFINED OR DISTINCTLY SEPARATE. THE FIRST BEGINS WITH THE DEVELOPMENT OF VALID AND RELIABLE INSTRUMENTS FOR MEASURING ANXIETY BY JANET TAYLOR IN 1951, THE SECOND WITH THE INTRODUCTION OF STRESS INTO THE ANXIETY RESEARCH IN ABOUT 1956.

PRIOR TO 1951, MEASUREMENT OF ANXIETY IN AN INDIVIDUAL WAS DONE BY OBSERVATION OF THE INDIVIDUAL BY PSYCHOLOGISTS AND PSYCHIATRISTS, AND BY MEASUREMENTS OF PHYSIOLOGICAL RESPONSES IN THE INDIVIDUAL. NEEDLESS TO SAY, THESE MEASURES WERE HARDLY VALID OR RELIABLE ENOUGH TO JUSTIFY ANY

CONCLUSIONS REACHED IN ANXIETY-PERFORMANCE RESEARCH.

BY 1951 JANET TAYLOR HAD DEVELOPED A VALID AND RELIABLE PAPER AND PENCIL MEASURE OF AN INDIVIDUAL'S ANXIETY LEVEL.(18) WITH THIS INSTRUMENT IT WAS POSSIBLE TO DETERMINE THE ANXIETY LEVEL OF A GREAT NUMBER OF INDIVIDUALS AT THE SAME TIME, THUS OPENING THE DOORS FOR ANXIETY-PERFORMANCE RESEARCH.

THESE FIRST STUDIES BY TAYLOR AND BY OTHERS LATER WERE CONCERNED MERELY WITH THE DIFFERENCES IN PERFORMANCE AS EXPRESSED BY THOSE MEASURING EITHER HIGH OR LOW IN ANXIETY ACCORDING TO HER SCALE.

TAYLOR (1951) IN A PIONEERING STUDY COMPARED THE RATE OF ACQUISITION OF A CONDITIONED EYELID RESPONSE IN TWO GROUPS LABLED "HIGH" AND "LOW" ANXIETY.(19) SHE FOUND THAT THE "HIGH" GROUP CONDITIONED MUCH MORE RAPIDLY THAN DID THE "LOW" ANXIETY GROUP.

TWO IMPORTANT CONSIDERATIONS CAME OUT OF THIS INITIAL ANXIETY STUDY.

1. TAYLOR INTERPRETED ANXIETY AS A DRIVE, AND
2. SHE ALSO SAW THE POSSIBLE IMPORTANCE OF THE NATURE OF THE TASK ON THE PERFORMANCE RESULTS.

IN ANOTHER STUDY, TAYLOR AND SPENCE (1952) COMPARED HIGH AND LOW-ANXIETY SUBJECTS WITH RESPECT TO PERFORMANCE ON A KIND OF VERBAL MAZE.(20) THE TASK WAS MORE COMPLEX THAN IN THE PREVIOUSLY MENTIONED STUDY AND THE RESULTS WERE REVERSED. THE LOW-ANXIETY GROUP HAD SUPERIOR PERFORMANCE AS INDICATED BY MORE RAPID LEARNING AND FEWER ERRORS. SHE INTERPRETED THIS AS BEING THE RESULT OF THE OPPORTUNITY FOR INTERFERENCE ALLOWED IN THE MULTIPLE-RESPONSE SITUATION OF THE MAZE. SHE POSTULATED THAT THE HIGHER DRIVE IN

THE ANXIOUS SUBJECTS RESULTED IN A DECREMENT IN PERFORMANCE BECAUSE ANXIETY INCREASES THE STRENGTH OF ALL RESPONSES, INCLUDING COMPETING ONES. THE STUDY ALSO STRENGTHENED HER IDEA OF THE IMPORTANCE OF THE NATURE OF THE TASK IN REPORTING RESULTS.

MANDLER AND SARASON (1952) COMPARED TWO GROUPS--HIGH VERSUS LOW-ANXIETY--WHILE STUDYING THE INFLUENCE OF ANXIETY EVOKED BY A TESTING SITUATION ON THE PERFORMANCE OF TYPICAL INTELLIGENCE TEST ITEMS.(21) THEY FOUND THAT (1) THE LOW-ANXIETY SUBJECTS HAD BETTER MEAN SCORES IN THE BEGINNING, (2) THE VARIABILITY OF THE HIGH-ANXIETY GROUPS SCORES WAS SIGNIFICANTLY LARGER THAN THAT OF THE LOW-ANXIETY GROUP, (3) AS LEARNING PROCEEDED, THE ANXIETY DRIVE OF THE HIGH-ANXIETY GROUP TENDED TO IMPROVE PERFORMANCE SCORES, AND (4) INTERVENING REPORTS OF SUCCESS OR FAILURE ELICITED IMPROVED PERFORMANCE FROM THE LOW-ANXIETY SUBJECTS BUT CAUSED A DECREMENT IN PERFORMANCE FOR THE HIGH-ANXIETY SUBJECTS.

THIS STUDY WAS IMPORTANT IN THAT NOT ONLY DID IT BEGIN TO DISTINGUISH BETWEEN MENTAL AND PHYSICAL PERFORMANCE, BUT IT ALSO SAW THE POSSIBLE EFFECTS OF LEARNING ON THE RESULTS. THEY FOUND THAT DEPENDING ON THE DEGREE OF LEARNING IN THE TASK, THE RESULTS COULD BE VARIOUSLY AFFECTED.

FARBER AND SPENCE (1953) IN AN EXPERIMENT SIMILAR TO THE MAZE STUDY OF TAYLOR AND SPENCE, INVESTIGATED THE PERFORMANCE OF ANXIOUS AND NON-ANXIOUS SUBJECTS ON A TASK INVOLVING RESPONSE COMPETITION.(22) THEY FOUND THAT ON THIS RELATIVELY COMPLEX TASK THE MAZE PERFORMANCE OF THE ANXIOUS SUBJECTS WAS SIGNIFICANTLY POORER THAN THAT OF THE NON-ANXIOUS SUBJECTS, WITH THE MORE DIFFICULT POINTS OF CHOICE PROVIDING THE GREATEST DIFFERENCE BETWEEN

THE TWO GROUPS. THIS IMPLIED TO THEM THAT AN INCREASE IN DIFFICULTY IMPAIRED THE PERFORMANCE OF THE ANXIOUS SUBJECTS TO A GREATER EXTENT THAN THAT OF THE NON-ANXIOUS SUBJECTS. THEY CONCLUDED THAT THE ANXIOUS AND NON-ANXIOUS GROUPS DIFFERED WITH RESPECT TO DRIVE LEVEL RATHER THAN GENERAL LEARNING ABILITY AND THAT THE EFFECTS OF VARIATIONS IN THIS DRIVE LEVEL UPON PERFORMANCE IS A FUNCTION OF THE SPECIFIC CHARACTERISTICS OF THE GIVEN TASK. THESE FINDINGS GAVE SUPPORT TO TAYLOR'S IDEA OF ANXIETY AS A DRIVE AND THE IMPORTANCE OF THE NATURE OF THE TASK.

1955-56 BROUGHT MORE SOPHISTICATED ANXIETY STUDIES AND AN INCREASE IN THE STRESS-ANXIETY TYPE STUDY, MARKING THE BEGINNING OF THE SECOND ERA IN ANXIETY-PERFORMANCE RESEARCH.

MATARAZZO (1955) HYPOTHESIZED THAT ANXIETY AS AN ACQUIRED DRIVE WOULD FACILITATE LEARNING (IN LINE WITH TAYLOR'S FINDINGS) UP TO A POINT, AND BEYOND THIS LEVEL, INCREASED ANXIETY WOULD BE ASSOCIATED WITH A DECREMENT IN PERFORMANCE.(23) HE OBTAINED SEVEN GROUPS OF SUBJECTS FROM SCORES ON THE TAYLOR MANIFEST ANXIETY SCALE AND PLOTTED THEIR PERFORMANCE ON A MAZE AGAINST THEIR ANXIETY LEVEL. TWO MEASURES OF LEARNING WERE USED: (1) TIME, AND (2) TRIALS TO REACH THE CRITERION. THE RESULTS, WITH TIME USED AS THE MEASURE OF LEARNING, SUPPORTED THE HYPOTHESIS SINCE THE SUBJECTS IN THE MIDDLE RANGE OF ANXIETY WERE SIGNIFICANTLY SUPERIOR TO THE SUBJECTS AT BOTH ENDS OF THE ANXIETY SCALE. THE DATA USING THE NUMBER OF TRIALS GAVE SOMEWHAT DIFFERENT THOUGH RELATED RESULTS.(24)

THE EARLY STUDIES CONCERNED WITH STRESS AND PERFORMANCE DID NOT INCLUDE THE ANXIETY LEVEL VARIABLE FOR THE SIMPLE REASON THAT THERE WAS

NO WAY TO MEASURE THIS LEVEL. THESE STUDIES DID HOWEVER, ATTEMPT TO MEASURE THE EFFECTS OF STRESS ON SUCH THINGS AS SPEED, ACCURACY, OR THE TOTAL EFFICIENCY OF PERFORMANCE OF PSYCHOMOTOR TASKS. IN GENERAL, THESE STUDIES FOUND THAT THE STRESSED GROUP HAD (1) AN INCREASED VARIABILITY IN PERFORMANCE, (2) AN INCREASE IN THE NUMBER OF ERRORS, (3) AN INCREASE IN SPEED, (4) AN OVER-ALL IMPAIRMENT OF ABILITY, AND (5) A REDUCTION IN TOTAL EFFICIENCY OF PERFORMANCE.(25)

THE ADVENT OF TAYLOR'S SCALE OPENED A NEW DOOR IN STRESS-PERFORMANCE RESEARCH IN THAT THE ANXIETY LEVEL VARIABLE COULD BE INCLUDED IN INTERPRETING RESULTS.

DEESE (1953) EXPLORED THE RELATIONSHIP BETWEEN ANXIETY AS A PERSONALITY VARIABLE AND LEARNING UNDER VARIOUS CONDITIONS OF STRESS.(26) THE RESULTS INDICATED THAT THE HIGH-ANXIETY SUBJECTS GAVE CONSISTENTLY MORE CORRECT RESPONSES THAN DID THE LOW-ANXIETY GROUP. THERE WAS ALSO A HIGHLY SIGNIFICANT DIFFERENCE BETWEEN LEARNING SCORES OF THE HIGH AND LOW-ANXIETY GROUPS. THE DIFFERENCE BETWEEN GROUPS HOWEVER, WAS LARGELY ACCOUNTED FOR BY AN APPARENT DECREMENT IN PERFORMANCE ON THE PART OF THE LOW-ANXIETY GROUP. THE IMPORTANCE OF THIS STUDY LIES IN THE REALIZATION THAT OVER-ALL THERE WAS A MARKED DIFFERENCE IN PERFORMANCE BETWEEN THE ANXIOUS AND THE NON-ANXIOUS GROUPS.

A STUDY BY DAVIDSON, ANDREWS, AND ROSS (1956) EXPLORED THE RELATIONSHIP BETWEEN ANXIETY AND PERFORMANCE UNDER STRESSFUL CONDITIONS.(27) THE RESULTS OF HIGH-SPEED COLOR NAMING UNDER STRESS SHOWED THAT THE STRESS HAD SOME EFFECT ON PERFORMANCE WHILE ANXIETY CLASSIFICATION DID NOT PRODUCE

DIFFERENTIAL EFFECTS ON PERFORMANCE. HOWEVER, SEVERAL SIGNIFICANT INTERREACTIONS BETWEEN ANXIETY AND THE EXPERIMENTAL CONDITIONS INDICATED A POSSIBLE "PRIMING" FUNCTION OF ANXIETY FOR OTHER STRESS EFFECTS.(28) IN OTHER WORDS, ANXIETY WOULD TEND TO INCREASE THE SUBJECTS SUSCEPTIBILITY TO THE EFFECTS OF STRESSFUL CONDITIONS.

SARASON AND PALOLA (1960) CONDUCTED AN INTERESTING EXPERIMENT INVOLVING THREE VARIABLES: (1) TEST ANXIETY VERSUS GENERAL ANXIETY, (2) MOTIVATIONAL VERSUS NEUTRAL INSTRUCTIONS, AND (3) DIFFICULTY OF THE TASK.(29) THEY FOUND THAT TEST ANXIETY WAS RELATED TO PERFORMANCE MORE FREQUENTLY THAN WAS GENERAL ANXIETY AND THAT, IN GENERAL, IT APPEARED THAT HIGH DIFFICULTY OF TASK AND HIGHLY MOTIVATING INSTRUCTIONS COMBINED TO AFFECT DETRIMENTALLY THE PERFORMANCE OF THE HIGH-ANXIETY SUBJECTS. THIS STUDY IS IMPORTANT BECAUSE IN USING THE SAME SUBJECTS IT COMBINED VARIABLES PREVIOUSLY STUDIED SEPARATELY.

IN ANOTHER EXPERIMENT SIMILAR TO THE ABOVE, SARASON HYPOTHESIZED THAT INSTRUCTIONS AND DEGREE OF ANXIETY INTERACT IN AFFECTING PERFORMANCE.(30) THE STUDY WAS CONCERNED WITH THE PERFORMANCE OF SUBJECTS DIFFERING IN ANXIETY SCALE SCORES ON A CONCEPT FORMATION TASK KNOWN TO BE A VERY DIFFICULT ONE. THE SUBJECTS DIFFERED NOT ONLY IN ANXIETY SCALE SCORES, BUT IN THE INSTRUCTIONS GIVEN TO THEM. THE RESULTS SHOWED THAT THREAT AND NON-THREAT CONDITIONS DIFFERENTIALLY AFFECTED HIGH, MIDDLE, AND LOW ANXIOUS SUBJECTS. UNDER THREAT CONDITIONS, THE PERFORMANCE OF HIGH-ANXIETY SUBJECTS WAS ON A SIGNIFICANTLY LOWER LEVEL THAN THE PERFORMANCE OF THE SUBJECTS IN THE REST OF THE ANXIETY SCORE DISTRIBUTION. THE NON-THREAT GROUP SHOWED

JUST THE OPPOSITE RESULTS.

THIS STUDY MAY BE SAID TO SHOW RESULTS TYPICAL OF THOSE DONE ON ANXIETY, STRESS, AND PERFORMANCE. IT INDICATES DIFFERENT RESULTS FOR THE DIFFERENT GROUPS AND ALSO INDICATES THE IMPORTANCE OF THE DIFFICULTY OF THE TASK IN EVALUATING THE RESULTS.

NASH (1966) FOUND AN INTERACTION OF MANIFEST ANXIETY LEVEL AND THE PRESENCE OR ABSENCE OF STRESS ON SIMPLE REACTION TIME.(31) HE HAD ALSO FOUND THAT THE SIMPLE REACTION TIME OF A PERSON SUBJECTED TO INDUCED ANXIETY (STRESS) WAS SLOWER THAN THAT OF A PERSON NOT SO SUBJECTED. THERE WERE NO SIGNIFICANT DIFFERENCES IN EFFECTS OF MANIFEST ANXIETY ON REACTION TIME. WITH THESE FACTORS IN MIND, HE DEVELOPED ANOTHER STUDY USING THOSE VARIABLES AND FOUND: (1) UNDER STRESS, SIMPLE REACTION TIME IS SLOWER THAN UNDER NO STRESS, (2) NO INTERACTION IN REACTION TIME DATA AMONG LEVELS OF MANIFEST ANXIETY AND THE PRESENCE OR ABSENCE OF STRESS, AND (3) SIMPLE REACTION TIME NOT AFFECTED BY LEVEL OF MANIFEST ANXIETY.(32)

IN A NUMBER OF STUDIES, RYAN (1961; 1962) EXPLORED THE RELATIONSHIP BETWEEN STRESS AND PERFORMANCE.(33) HE FOUND THAT STRESS WOULD EITHER IMPROVE OR IMPAIR PERFORMANCE DEPENDING ON VARYING EXPERIMENTAL CONDITIONS. THESE TWO CONDITIONS, IMPORTANT IN DETERMINING THE EFFECTS OF STRESS ARE: (1) THE RELATIVE DIFFICULTY OF THE SKILL, AND (2) THE DEGREE OF PROFICIENCY IN THE SKILL WHEN STRESS IS INTRODUCED. THEY FOUND THAT STRESS HAD ITS MOST DISRUPTIVE EFFECT EARLY IN LEARNING WHEN PERFORMANCE APPEARED MOST DIFFICULT, THEN BECAME LESS DISRUPTIVE AS LEARNING PROGRESSED.

IN SUMMARY, THE STUDIES INDICATE: (1) THE NEED FOR DEFINITION OF THE

TYPE AND DIFFICULTY OF THE SKILL OR TASK TO BE USED, (2) THE EFFECTS OF STRESS CAN BE EITHER FACILITATING OR IMPAIRING, (3) MANIFEST ANXIETY LEVEL MAY OR MAY NOT BE RELATED TO PERFORMANCE OF A TASK, (4) MANIFEST AND INDUCED ANXIETY (STRESS) CAN HAVE MOTIVATIONAL PROPERTIES, AND AN INDIVIDUAL OPERATING UNDER EITHER OR BOTH MAY HAVE INCREASED DRIVE LEVEL, AND (5) THERE SEEMS TO BE AN OPTIMAL LEVEL OF ANXIETY OR STRESS FOR A GIVEN TASK, AND ABOVE THAT LEVEL THERE IS A DECREMENT IN PERFORMANCE.

ONE THING THAT WAS NOTICED BY THIS INVESTIGATOR IN READING THE RELATED STUDIES IS THE FACT THAT ALL OF THEM WERE CONDUCTED IN A LABORATORY SITUATION BY THE INVESTIGATOR HIMSELF. THIS IS ESPECIALLY TRUE OF THE PHYSICAL PERFORMANCE-ANXIETY-STRESS STUDIES. IT SEEMS QUESTIONABLE TO PLACE SUBJECTS IN AN UNNATURAL SETTING WITH A STRANGE INVESTIGATOR, AND EXPECT TO PRODUCE A REALISTIC TESTING SITUATION. FOR THIS REASON, THIS INVESTIGATOR FELT THAT THE STUDY COULD BE BEST CONDUCTED IN THE NATURAL CLASSROOM SETTING WITH THE ACTUAL INSTRUCTORS IN CHARGE. IN THIS WAY, THE STRESS AND NON-STRESS CONDITIONS COULD BE MADE MORE REAL TO THE SUBJECTS, AND THE RESULTS COULD BE VALIDLY APPLIED TO THE CLASSROOM LEARNING SITUATION.

IT WAS ALSO OBSERVED THAT THE RELATED STUDIES WERE CONCERNED ONLY WITH THE PERFORMANCE OF THE HIGH AND LOW-ANXIETY SUBJECTS. THEY IGNORED THE MIDDLE-ANXIETY GROUPS. HOWEVER, IF THERE IS AN OPTIMAL LEVEL OF ANXIETY OR STRESS FOR EFFICIENT PERFORMANCE, THEN THE MIDDLE GROUPS SHOULD BE CONSIDERED IN THE TESTING AND EVALUATION OF DATA.

CHAPTER III

METHODS AND PROCEDURES

THIS CHAPTER DEALS WITH THE SELECTION OF THE SAMPLE, SELECTION OF THE ANXIETY SCALE AND THE SKILL TEST, AND THE APPLICATION OF THE TESTS TO THE SAMPLE.

THE SAMPLE CONSISTED OF 109 WOMEN PHYSICAL EDUCATION MAJORS-COMPRISING MOST OF THE SOPHOMORE CLASS IN THAT FIELD. THEY WERE ALL ENROLLED IN BASKETBALL AND DIVIDED INTO FOUR SECTIONS AT THE TIME OF THE EXPERIMENT. THE ANXIETY SCALE SELECTED WAS THE IPAT ANXIETY SCALE QUESTIONNAIRE (SELF ANALYSIS FORM), A FORTY QUESTION, PAPER AND PENCIL TEST FOUND TO BE BOTH VALID AND RELIABLE IN NUMEROUS STUDIES. THE SKILL TEST CHOSEN WAS A FORM OF THE EDGREN BALL HANDLING TEST CALLED THE LA CROSSE A-B WALL TEST. IT WAS DEVELOPED TO MEET THE PARTICULAR NEEDS OF THE INSTRUCTORS AT WISCONSIN STATE UNIVERSITY-LA CROSSE IN THE TESTING OF PHYSICAL EDUCATION MAJORS' BASKETBALL HANDLING ABILITY.

THE SECOND PART OF THIS CHAPTER DEALS WITH THE APPLICATION OF THE TESTS TO THE SAMPLE. THE METHODS AND PROCEDURES WILL BE THOROUGHLY DISCUSSED.

I. SELECTION OF THE SAMPLE

THE NATURE OF THE PROBLEM REQUIRED THAT A SAMPLE BE CHOSEN THAT WOULD BE LARGE ENOUGH TO GET A WIDE SPREAD OF SCORES ON BOTH THE ANXIETY SCALE AND SKILL TESTS, BUT SMALL ENOUGH TO BE EASILY HANDLED BY ONE INVESTIGATOR, THUS MAKING POSSIBLE THE SECURING OF MORE INFORMATION FROM ONE

STUDY, WITH MORE ACCURACY IN THE PROCESSING AND PRESENTATION OF DATA.

THE PROBLEM ALSO REQUIRED THAT THE ELEMENTS OF THE SAMPLE BE APPROXIMATELY THE SAME AGE, HAVE APPROXIMATELY THE SAME BACKROUND IN SKILL DEVELOPMENT, AND ALL BE OF THE SAME SEX-TO PREVENT THE PROBLEM FROM COMPOUNDING.

DUE TO THESE LIMITATIONS, PLUS THE ELEMENTS OF TIME AND THE LACK OF A WIDE VARIETY OF POSSIBLE SUBJECTS, IT WAS NECESSARY TO BEGIN WITH THE IDEA OF USING A CLUSTER SAMPLE RATHER THAN A TRUE RANDOM SAMPLE. THIS MEANT THAT THE SUBJECTS WOULD BE MEMBERS OF VARIOUS CLASSES MEETING THE FOLLOWING CRITERIA: (1) EACH CLASS MUST BE AT THE SAME LEVEL (YEAR), (2) ALL CLASSES MUST BE OF THE SAME SEX, (3) EACH CLASS MUST BE STUDYING THE SAME THING, AND (4) EACH CLASS MUST MEET DURING THE SAME QUARTER PERIOD.

WITH THESE CRITERIA IN MIND, IT WAS SIMPLY A MATTER OF OBTAINING A CLASS SCHEDULE FOR THE FOLLOWING SEMESTER AND APPLYING THE CRITERIA TO THE CLASSES LISTED.

FOR OBVIOUS REASONS, THE GLEANING OF CLASSES WAS BEGUN WITH THE PHYSICAL EDUCATION OFFERINGS, AND SINCE MOST OF THE SKILL COURSES AT LA CROSSE ARE TAKEN IN THE SOPHOMORE AND JUNIOR YEAR, THE INVESTIGATOR CONCENTRATED ON THESE TWO YEARS.

THROUGH THE ABOVE PROCESS FOUR CLASSES OF WOMEN'S BASKETBALL WERE CHOSEN. THE SUBJECTS WERE ALL SOPHOMORE PHYSICAL EDUCATION MAJORS AND MET THE CRITERIA AS STATED. THE CO-OPERATION OF THE INSTRUCTORS OF THESE CLASSES WAS NEEDED AND READILY GIVEN.

THE SAMPLE CONSISTED OF FOUR SECTIONS OF SOPHOMORE WOMEN'S BASKETBALL

IN THE PHYSICAL EDUCATION MAJOR PROGRAM. A TOTAL OF 109 WOMEN WERE INVOLVED. THESE SECTIONS WERE HANDLED BY TWO TEACHERS--MRS. OZBURN AND MISS MOE. THE CLASSES MET FOR TWO HOURS PER WEEK FOR BASKETBALL INSTRUCTION-IN ONE HOUR BLOCKS. THUS MRS. OZBURN HAD CLASSES AT 8 AND 9 A.M. ON MONDAY AND WEDNESDAY, AND MISS MOE HAD CLASSES AT 8 AND 9 A.M. ON TUESDAY AND THURSDAY (TABLE I, PAGE 22).

ALL THE SUBJECTS HAD BEEN AT LA CROSSE FOR THE PREVIOUS YEAR AND HENCE HAD THE SAME AMOUNT OF COLLEGE INSTRUCTION IN BASKETBALL. THEIR PLACEMENT IN ONE OR THE OTHER OF THE DIFFERENT CLASSES DEPENDED ON THEIR SWIMMING ABILITY AS SWIMMING WAS THE OTHER ACTIVITY BEING TAUGHT CONCURRENTLY IN THE MAJOR PROGRAM. THUS, POOR SWIMMERS WERE IN ONE CLASS AND THE BETTER SWIMMERS IN ANOTHER. THE ASSUMPTION HERE IS THAT SWIMMING ABILITY AND BASKETBALL ABILITY ARE NOT RELATED.

THIS TECHNIQUE OF CLUSTER SAMPLING LENDS ITSELF WELL TO EXPERIMENTATION WHERE WHOLE CLASSES ARE USED, AS IS THE CASE IN THIS INVESTIGATION, THOUGH SOME PRECISION IS LOST AND THE SAMPLING IS NOT RANDOM. (34)

II. SELECTION OF THE ANXIETY SCALE

IT IS ACCEPTED BY PSYCHOLOGISTS THAT PERSONALITY FACTORS SUCH AS ANXIETY ARE MOST IDEALLY MEASURED BY DIFFICULT-TO-FAKE BEHAVIORAL OR PHYSIOLOGICAL TESTS. SINCE THESE METHODS REQUIRE A GOOD DEAL OF TIME, EQUIPMENT, AND SOME SPECIAL SKILLS ON THE PART OF THE ADMINISTRATOR, IN MOST SITUATIONS INVESTIGATORS INTERESTED IN MASS APPLICATION PREFER A VALID, BRIEF, EASY TO ADMINISTER QUESTIONNAIRE.

TABLE I

MEETING DAYS, HOURS, AND TEACHERS FOR THE BASKETBALL CLASSES

	DAY			
	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
8 A.M.	MRS. O-1	MISS M-3	MRS. O-1	MISS M-3
9 A.M.	MRS. O-2	MISS M-4	MRS. O-2	MISS M-4

NOTE: MRS. O - SECTIONS 1 AND 2
MISS M - SECTIONS 3 AND 4

USING THE FACTORS OF TIME, EQUIPMENT, AND SPECIAL SKILLS AS CRITERIA, THE NUMBER OF POSSIBLE SCALES WAS NARROWED DOWN TILL ONE REMAINED--THE IPAT ANXIETY SCALE QUESTIONNAIRE (SELF ANALYSIS FORM) DEVELOPED BY RAYMOND B. CATTELL AND IVAN H. SCHEIER OF THE INSTITUTE FOR PERSONALITY AND ABILITY TESTING, CHAMPAIGN, ILLINOIS.

THIS SCALE WAS PRIMARILY DESIGNED TO MEASURE FREE-FLOATING, MANIFEST ANXIETY LEVEL, WHETHER IT BE SITUATIONALLY-DETERMINED OR RELATIVELY INDEPENDENT OF THE IMMEDIATE SITUATION. IT DOES NOT PURPORT TO BE PRIMARILY A MEASURE OF ANY OF THE OTHER FORMS OF ANXIETY DISCUSSED CLINICALLY, FOR EXAMPLE, "BOUND" OR "UNCONSCIOUS" ANXIETY. IT IS BRIEF, NON-STRESSFUL, CLINICALLY VALID, AND APPLICABLE TO ALL BUT THE LOWEST EDUCATIONAL LEVELS. THE SCALES FORTY QUESTIONS REQUIRE ONLY FIVE TO TEN MINUTES TO ANSWER AND THE TEST IS EASILY ADMINISTERED AND SCORED.

COMPONENTS OF THE SCALE. THE TEST QUESTIONS ARE DISTRIBUTED AMONG THE FIVE ANXIETY MEASURING FACTORS (OR COMPONENTS) ACCORDING TO EACH PERSONALITY COMPONENTS CENTRALITY AS A SOURCE OR EXPRESSION OF ANXIETY. (THESE FIVE COMPONENTS WERE SELECTED OUT OF THOUSANDS OF FACTORS THAT "LOOKED" LIKE" ANXIETY THROUGH REPEATED RESEARCH INVOLVING CORRELATIONS AND FACTOR ANALYSIS). THESE COMPONENTS ARE: (35)

1. DEFECTIVE INTEGRATION, LACK OF SELF SENTIMENT--Q_3 (-). AN INDIVIDUAL MOTIVATED TO INTEGRATE HIS BEHAVIOR ABOUT AN APPROVED, CONSCIOUS SELF-SENTIMENT, AND SOCIALLY APPROVED STANDARDS WILL BE NON-ANXIOUS AND RECEIVE A LOW SCORE ON THIS SECTION. FAILURE TO INTEGRATE BEHAVIOR ABOUT A CLEAR SELF-CONCEPT (HIGH SCORE) IS ONE OF THE MAJOR CAUSES AND SYMPTOMS OF ANXIETY.

THIS SCORE MAY THEN BE SAID TO MEASURE THE EXTENT TO WHICH ANXIETY HAS BECOME BOUND [ITALICS IN THE ORIGINAL] IN SOCIALLY APPROVED HABITS AND CHARACTER STRUCTURES, WITH MORE BINDING INDICATED BY A LOWER COMPONENT AND LOWER TOTAL ANXIETY SCORE.

2. EGO WEAKNESS--C(-). AN INDIVIDUAL WITH THE CAPACITY TO CONTROL AND EXPRESS FRUSTRATIVE TENSIONS IN A SUITABLY REALISTIC WAY IS CONSIDERED TO HAVE EGO STRENGTH AND WILL BE NON-ANXIOUS (LOW SCORE) ON THIS COMPONENT. THE RELATION OF EGO WEAKNESS (HIGH SCORE) TO ANXIETY MIGHT THEN MEAN THAT AN INSECURE EGO, WITH MANY EGO DEFENSES, GENERATES ANXIETY. AN ALTERNATE HYPOTHESIS IS THAT HIGH ANXIETY TENSION HAS CAUSED SOME REGRESSION AND PREVENTED THE NORMAL GROWTH OF EGO STRENGTH.

3. SUSPICIOUSNESS, PARANOID-TYPE INSECURITY--L. AN INDIVIDUAL SUFFERING FROM PARANOID-TYPE FEELINGS DEVELOPS SOCIAL DIFFICULTIES THAT MAY LEAD TO ISOLATION AND ANXIETY. THE OPPOSITE MIGHT HAPPEN AS ANXIETY MIGHT SOMETIMES OCCUR FIRST AND THE PARANOID BEHAVIOR DEVELOPS AS A DEFENSE AGAINST IT. IN EITHER CASE, THIS ANXIETY IS REPRESENTED AS A HIGH SCORE ON THIS COMPONENT.

4. GUILT PRONENESS--O. A HIGH SCORE ON THIS COMPONENT REPRESENTS FEELINGS OF UNWORTHINESS, DEPRESSION, AND GUILT IN AN INDIVIDUAL. IN FREUDIAN TERMS, IT SUGGESTS THE CONCEPT OF ANXIETY AS GENERATED BY SUPER EGO PRESSURES, AND IN EXTREME FORM, THE PATTERN CLINICALLY RESEMBLES DEPRESSIVE REACTIONS AND OTHER TYPES OF NEUROSIS.

5. FRUSTRATION TENSION, AND ID PRESSURE--Q4. A HIGH SCORE ON THIS COMPONENT SEEMS TO REPRESENT THE DEGREE TO WHICH ANXIETY IS GENERATED BY

ID PRESSURE--EXCITED DRIVES AND UNSATISFIED (FRUSTRATED) NEEDS OF ALL KINDS. SOME OF THESE DRIVES MAY BE SEX DRIVE EXCITATION, NEED FOR RECOGNITION, AND SITUATIONAL FEARS. IT SHOWS ITSELF DESCRIPTIVELY IN PRONENESS TO EMOTIONALITY, TENSION, IRRITABILITY, AND JITTERINESS. ACTUAL CORRELATIONS AND FACTOR ANALYSIS SHOWS THIS TO BE ONE OF THE LARGEST AND MOST CENTRAL COMPONENTS IN ANXIETY.

THE DISTRIBUTION OF THE TEST ITEMS WITHIN THE FIVE COMPONENTS IS SUMMARIZED IN TABLE II, PAGE 26. THE TABLE ALSO GIVES A DIVISION OF THE ITEMS INTO (A) THOSE WHICH MANIFESTLY REFER TO ANXIETY--THE SCORE FROM WHICH CAN BE CALLED OVERT OR CONSCIOUS ANXIETY--THE LAST TWENTY ITEMS OF THE TEST, AND (B) THE COVERT OR HIDDEN ANXIETY FACTOR--THE FIRST TWENTY ITEMS OF THE TEST.

VALIDITY. TWO TYPES OF VALIDITY ARE REPORTED FOR THIS SCALE, (1) CONSTRUCT OR INTERNAL VALIDITY, AND (2) EXTERNAL OR CONCRETE VALIDITY.(36)

1. CONSTRUCT OR INTERNAL VALIDITY. THIS IS THE CORRELATION OF THE THE TEST ITEMS AND COMPONENTS WITH THE ANXIETY FACTOR ESTABLISHED AS THE PRIMARY OPERATIONAL CONSTRUCT IN THE ANXIETY AREA. THIS VALIDITY IS ESTIMATED AT +.85 TO +.90 FOR THE TOTAL SCALE.(37)

THERE ARE THREE METHODS OF ESTIMATING THIS CONSTRUCT VALIDITY.

A. ONE OF THESE IS FROM THE CORRELATION OF THE FIVE COMPONENT FACTORS ON THE SECOND-ORDER ANXIETY FACTOR, AS ESTIMATED IN REPEATED RESEARCH. THUS FOR THE INDIVIDUAL COMPONENTS, EACH ALONE, THE CORRELATION WITH THE SECOND-ORDER FACTOR RANGES FROM +.45 TO +.67, BUT WHEN THESE ARE COMBINED IN MULTIPLE CORRELATION, THE ESTIMATE OF TOTAL SCALE CONSTRUCT

TABLE II

ITEM COMPOSITION OF THE IPAT ANXIETY SCALE*

THE FIVE FACTORS WHICH GROUPED TOGETHER AS ANXIETY COMPONENTS		NUMBER OF ITEMS	IDENTIFICATION OF ITEMS BY NUMBER ON THE TEST FORM	
			COVERT	OVERT
Q_3 (-)	DEFECTIVE INTEGRATION	8	1 - 4	21 - 24
C (-)	EGO WEAKNESS	6	5 - 7	25 - 27
L	PARANOID INSECURITY	4	8 - 9	28 - 29
O	GUILT PRONENESS	12	10 - 15	30 - 35
Q_4	ID PRESSURE	10	16 - 20	36 - 40

*FROM CATTELL, AND SCHEIER, HANDBOOK, P. 6.

VALIDITY IS +.85. (38)

B. ANOTHER METHOD OF ESTIMATING CONSTRUCT VALIDITY IS FROM THE CORRELATION OF THE FORTY ACTUAL SCALE ITEMS WITH THE TOTAL SCORE ON THE SCALE. THUS THE AVERAGE CORRELATION BETWEEN INDIVIDUAL ITEMS AND TOTAL TEST SCORE IS ALMOST +.40, AND THE MULTIPLE CORRELATION BETWEEN ALL ITEMS AND THE TOTAL SCORE EXCEEDS +.92.

C. A THIRD METHOD IS BY ASSUMING THAT THE SCALE ITEMS HAVE NO SPECIFICS BUT ONLY SOME COMMON FACTOR, IN WHICH CASE, VALIDITY BECOMES THE SQUARE ROOT OF THE SPLIT-HALF RELIABILITY. THE BEST ESTIMATE OF SPLIT-HALF RELIABILITY, AS SHOWN IN TABLE III, PAGE 28, IS +.84. THUS THE ESTIMATED CONSTRUCT VALIDITY BECOMES $\sqrt{.84}$ OR +.92.

THE ABOVE THREE METHODS THEN, GIVE THE CONSTRUCT OR INTERNAL VALIDITY AS A VALUE OF +.85 TO +.90 (ESTIMATED).

2. EXTERNAL, CONCRETE VALIDITY. THIS SECOND TYPE OF VALIDITY IS BASED ON THE CORRELATION OF THE TOTAL SCORE WITH PSYCHIATRIC EVALUATIONS OF ANXIETY. IN OTHER WORDS, THE VALIDITY ASKS WHETHER OR NOT THE TEST MEASURES ANXIETY AS IT IS COMMONLY DEFINED AND EVALUATED BY EXTRA-TEST MEANS, ESPECIALLY CLINICAL RATINGS. THERE ARE FOUR SOURCES OF CONFIRMATION FOR THIS VALIDITY, BUT NOT ALL OF THEM ARE EXPRESSIBLE NUMERICALLY. THESE ARE: (39)

A. THE MANIFEST CONTENT OF THE QUESTIONS TEND TO "LOOK LIKE" CLASSICAL PSYCHIATRIC SYMPTOMS OF ANXIETY, MORE THAN DO QUESTIONS FROM ANY OTHER SET OF PERSONALITY FACTORS.

B. CORRELATIONS ARE SUBSTANCIAL WITH PHYSIOLOGICAL AND BEHAV-

TABLE III

RELIABILITY OF THE ANXIETY SCALE

VALUE	TYPE OF COEFFICIENT	SAMPLE
DEPENDABILITY-RELIABILITY		
+.93	TEST-RETEST ONE WEEK INTERVAL	87 MALE AND FEMALE ADULTS
+.87	TEST-RETEST TWO WEEK INTERVAL	277 JAPANESE UNIV. STUDENTS
HOMOGENEITY		
+.91	SPLIT-HALF, CORRECTED TO FULL LENGTH BY SPEARMAN-BROWN METHOD	120 NORMALS AND NEUROTICS
+.84		240 NORMAL ADULTS
+.83	G. A. FERGUSON S VARIATION OF KUDER-RICHARDSON FORMULA 20	3 SEPARATE STUDIES BY DR. A. W. BENDIG, EACH ON 200 COLLEGE STUDENTS (100 MALE-100 FEMALE)
+.81		
+.80		
DEPENDABILITY-RELIABILITY		
+.89	TEST-RETEST COVERT (1 WEEK)	70 ADULTS, MIXED
+.82	TEST-RETEST OVERT (1 WEEK)	70 ADULTS, MIXED

*FROM CATTELL, AND SCHEIER, HANDBOOK, P. 8.

IORAL LABORATORY TESTS OF ANXIETY. PSYCHOPHYSIOLOGICAL AND BEHAVIORAL MEASURES OF ANXIETY FALL LARGELY IN A FACTOR IDENTICAL WITH THE PRESENT QUESTIONNAIRE MEASURE.

C. SCORES ON THE FACTOR MEASURED BY THE SCALE WERE CORRELATED DIRECTLY WITH PSYCHIATRIC EVALUATIONS OF ANXIETY IN THE SAME PEOPLE. IN TWO DIFFERENT STUDIES IT WAS SHOWN THAT THE "CONSENSUS OF PSYCHIATRISTS' DIAGNOSIS AS TO ANXIETY LEVEL CORRELATES HIGHER WITH SCORES ON THIS ANXIETY TEST FACTOR THAN WITH ANY OTHER KNOWN PERSONALITY FACTOR." (40) DUE TO LOW INTER-CLINICIAN RELIABILITY, THE MAXIMUM VALUE BETWEEN THE IPAT SCORES AND CLINICAL CONSENSUS IS RATHER LOW-+.30 TO +.40. HOWEVER, IF CORRECTED FOR ATTENUATION, THE VALUE MIGHT HAVE REACHED +.60 TO +.70. (41)

D. IT HAS BEEN FOUND THAT SCORES ON THE SCALE DISTINGUISH SHARPLY BETWEEN NORMALS AND HIGH-ANXIETY SUBJECTS (ANXIETY HYSTERICS AND NEUROTICS). THESE WERE CHOSEN BECAUSE THEY EPITOMIZE ANXIETY AS IT OCCURS IN CLINICAL DIAGNOSTIC JUDGMENT. THIS IS THEN, A TWO-STEP VERSION (HIGH-ANXIETY VS. NORMAL) OF THE PROCESS DESCRIBED IN C. ABOVE, VALIDATING THE TEST AGAINST CLINICAL PSYCHIATRIC JUDGMENT. (42)

RELIABILITY. DATA ON THE RELIABILITY FOR THE TOTAL SCORE IS SUMMARIZED IN TABLE III, PAGE 28. THE DATA DISTINGUISHES BETWEEN DEPENDABILITY (IMMEDIATE RETEST), STABILITY (TEST-RETEST AFTER A LONG INTERVAL), AND HOMOGENEITY COEFFICIENTS (SPLIT-HALF OR ALPHA COEFFICIENT, MEASURING GENERAL HOMOGENEITY). ONLY DEPENDABILITY MEASURES THE RELIABILITY OF THE SCALE AS SUCH, AS STABILITY IS BASED MORE ON A FUNCTION FLUCTUATION

OF THE TRAIT ITSELF AND HOMOGENEITY DEPENDS ON THE CHOICE OF PRINCIPLES OF TEST CONSTRUCTION.

USING TABLE III, IT CAN BE SEEN THAT THE RELIABILITY IS HIGHLY SATISFACTORY, ESPECIALLY THE DEPENDABILITY VALUES WHICH ARE +.93 AND +.87 FOR TOTAL SCALE SCORE. (THE TEST-RETEST STABILITY OVER A LONG INTERVAL OF TWO YEARS IS NOT ENTERED IN THE TABLE SINCE ITS VALUE IS NOT PRIMARILY A MEASURE OF TEST UNRELIABILITY, BUT OF FUNCTION FLUCTUATION IN ANXIETY ITSELF, AS A <u>STATE</u> [ITALICS IN ORIGINAL]. ON 170 MEDICAL STUDENTS, TWO-YEAR RETESTS HAVE CENTERED ON A VALUE OF +.60 (RANGE +.47-+.71). SINCE MEDICAL STUDENTS TEND TO HAVE A RESTRICTED, SELECTED RANGE OF ANXIETY RELATIVE TO THE GENERAL POPULATION, THIS VALUE CORRECTED TO NORMAL RANGE WOULD BE ABOUT +.70. THIS MEANS THAT OVER TWO YEARS, APPRECIABLE CHANGES CAN OCCUR IN A PERSONS ANXIETY LEVEL, THOUGH THERE IS STILL A STRONG TENDENCY FOR INDIVIDUALS TO PERSIST AT THEIR EARLIER LEVELS). (43)

FROM THE ABOVE DISCUSSION IT CAN BE SEEN THAT BOTH THE VALIDITY AND RELIABILITY OF THE IPAT ANXIETY SCALE ARE QUITE SUITABLE FOR THE INTENDED USE OF THE SCALE IN THIS STUDY.

ONE THING THAT MIGHT BE MENTIONED AT THIS TIME IN REFERENCE TO THE SCALE IS THE FACT THAT ANY PAPER AND PENCIL MEASURE OF A PERSONALITY TRAIT MAY BE SUBJECT TO OCCASIONAL DELIBERATE DISTORTION BY EXAMINEES IN SOME TESTING SITUATIONS (E.G., JOB-SEEKING). HOWEVER, IN MOST SITUATIONS, IT MAY BE ASSUMED THAT THE SUBJECTS ARE CONCERNED AND WILLING TO CO-OPERATE. THIS WOULD BE ESPECIALLY TRUE IN THIS INVESTIGATOR'S SITUATION, WHERE THE REAL PURPOSE OF THE EXPERIMENT HAS BEEN DISGUISED AND THE PARTICIPANTS ARE

URGED TO CO-OPERATE BECAUSE OF THEIR "PROFESSIONAL ATTITUDE."

ALSO, AS FAR AS THE RELATIONSHIP BETWEEN DELIBERATE DISTORTION AND ANXIETY IS CONCERNED, IT HAS BEEN FOUND THAT NO MATTER WHAT SITUATION ANXIETY IS MEASURED IN, "THE WILLINGNESS TO ADMIT DEFECTS IN ONESELF TENDS TO BE AN INTRINSIC PART OF THE SYNDROM EXPRESSION. REACTION TENDENCIES ON A SOCIAL DESIRABILITY-UNDESIRABILITY CONTINUUM ARE THUS AN ESSENTIAL PART OF ANXIETY MEASUREMENT AND A QUESTIONNAIRE CATCHES THEM WELL."(44) THUS, IN THE IPAT SCALE, HIGH-SCORE-KEYED RESPONSES ARE SOMEWHAT MORE FREQUENTLY ACQUIESCENT ("YES," OR "TRUE") RATHER THAN DISAGREEING ("NO," OR "FALSE"), BUT THIS ACTUALLY ADDS TO THE VALIDITY OF THE SCORE SINCE ACQUIESCENCE (TENDENCY TO AGREE) HAS BEEN ESTABLISHED EMPIRICALLY AS ITSELF AN EXPRESSION OF ANXIETY.(45)

III. SELECTION OF THE SKILL TEST

IT MUST BE REMEMBERED THAT MOTOR SKILL REFERS TO THAT QUALITY INVOLVING REASONABLY COMPLEX ADJUSTMENTS IN PERFORMANCE ACQUIRED THROUGH THE LEARNING PROCESS.(46) IT IS SO SUBJECTIVE AND VAGUE THAT ANY COMPLETE DEFINITION OF IT MUST REFER TO THE <u>NATURE</u> [ITALICS NOT IN THE ORIGINAL] OF THE TASK AND THE STATUS OF THE LEARNER. THE TERM SKILL THEN, DENOTES THAT SOME LEARNING HAS TAKEN PLACE AND AN INTEGRATION OF BEHAVIOR HAS RESULTED SO THAT EXTRANEOUS MOVEMENTS HAVE BEEN ELIMINATED, AND THE PERFORMANCE IS EXECUTED WITH INCREASED SPEED AND ACCURACY, A DECREASE IN ERRORS, AND POSSIBLY WITH GREATER FORCE.

IF THE RELATIONSHIP OF SOME PERSONALITY TRAIT SUCH AS ANXIETY IS TO BE COMPARED TO PERFORMANCE, THE EFFECT OF THAT TRAIT WILL BE DIRECTLY

DEPENDENT UPON THE TYPE OF TASK PERFORMED.(47) THUS, A HEIGHTENED ANXIETY STATE CAN FACILITATE SIMPLE PERFORMANCES, BUT WHEN THE ANXIETY REACHES A CERTAIN LEVEL, PAST THE OPTIMUM FOR THAT TASK, [ITALICS NOT IN THE ORIGINAL] THERE IS A RESULTING BREAKDOWN OF PHYSIOLOGICAL AND PSYCHOLOGICAL MECHANISMS AND A LESS EFFICIENT PERFORMANCE IN MORE COMPLEX TASKS [ITALICS NOT IN THE ORIGINAL].(48) THIS MEANS THAT THERE NEEDS TO BE AN EXACT DEFINITION OF THE TYPE OF ACTIVITY, SIMPLE OR COMPLEX, IF THE RESULTS ARE TO BE VALID.

THE SELECTION OF THE SKILL TEST DEPENDED ON A NUMBER OF CRITERIA. THEY WERE AS FOLLOWS:

1. THE TASK HAD TO BE EASY ENOUGH TO PREVENT A COMPLETE BREAKDOWN OF PHYSIOLOGICAL AND PSYCHOLOGICAL MECHANISMS THAT WOULD RESULT IN POOR PERFORMANCE BY ALL SUBJECTS.

2. THE TASK HAD TO BE HARD ENOUGH TO PREVENT A GROUPING OF HIGH SCORES.

3. THE TASK HAD TO BE RELATED TO THE TYPE OF ACTIVITY BEING STUDIED IN THE CLASSES.

4. THE TASK HAD TO BE EASILY ADMINISTERED AND SCORED.

5. THE TASK HAD TO PROVIDE SCORES THAT WOULD BE STATISTICALLY USABLE.

6. THE TASK HAD TO BE NON-TIME CONSUMING SO THAT ALL THE SUBJECTS IN ONE CLASS COULD BE TESTED IN ONE PERIOD WITH AS LITTLE LOSS OF INSTRUCTION TIME FOR THE TEACHER AS POSSIBLE.

7. THE TASK HAD TO BE CONSTRUCTED SO THAT THE PURPOSE OF THE EXPERIMENT WOULD NOT REVEAL ITSELF.

WITH THESE CRITERIA IN MIND, IT WAS THEN A MATTER OF SEARCHING THE

LITERATURE CONCERNED WITH BASKETBALL, PHYSICAL EDUCATION, AND TESTS AND MEASUREMENTS. AFTER THIS WAS DONE, WITH NO SATISFACTORY RESULTS, THE INVESTIGATOR CONSULTED WITH THE INSTRUCTORS OF THE FOUR BASKETBALL CLASSES TO DETERMINE WHAT TESTS WERE USED IN THE CLASSES FOR THEIR OWN TESTING PROGRAM. AFTER CONSIDERABLE DISCUSSION, A TEST WAS SUGGESTED THAT WOULD MEET THE ABOVE CRITERIA AND HAD BEEN USED AT LA CROSSE FOR A NUMBER OF YEARS IN THE BASKETBALL TESTING PROGRAM. IT WAS A FORM OF THE EDGREN BALL HANDLING TEST THAT WAS DEVELOPED FOR USE IN THE FACILITIES AT LA CROSSE, AND WAS CALLED THE LA CROSSE A-B WALL TEST.(49)

THIS TEST WOULD MEASURE THE SUBJECT'S ABILITY IN BALL HANDLING AND WAS ALREADY SET UP IN THE GYMNASIUM WHERE THE BASKETBALL SECTIONS WOULD MEET. IT WAS DEVELOPED FROM EDGREN'S TEST TO MEET THE REQUIREMENTS OF THE LA CROSSE GYMNASIUM. AT LA CROSSE, FOUR STATIONS WERE SET UP FOR TESTING USING THE A-B TEST, ALL ALONG ONE WALL OF THE GYMNASIUM. THE INSTRUCTORS WERE FAMILIAR WITH THE TEST, AND IT WAS EASILY ADMINISTERED AND SCORED.

IN ORDER TO GET EACH CLASS TESTED IN ONE PERIOD AND MAKE THE TESTING SITUATION AS NATURAL AS POSSIBLE, IT WAS DECIDED TO HAVE THE INSTRUCTOR ADMINISTER THE TEST. SEVEN GRADUATE STUDENTS IN PHYSICAL EDUCATION SCORED AND RECORDED THE SCORES MADE BY THE SUBJECTS. THE GRADUATE STUDENTS WERE GIVEN THE BACKGROUND INFORMATION ON THE STUDY, AND WERE TRAINED IN THE SCORING AND EVALUATION OF THE TEST. ONE SCORER WAS ASSIGNED TO WATCH THE WALL TO SEE IF THE HITS WERE GOOD, AND THE OTHER WAS ASSIGNED TO WATCH FOR FOOT FOULS AND DRIBBLING VIOLATIONS.(50) IF A FOUL OCCURRED, THE PERSON WATCHING FOR IT WOULD CALL "FOUL" AND THAT HIT WOULD NOT BE COUNTED. THE GRADUATE STUDENT

WATCHING THE WALL WAS THE RECORDER.

A SCORE SHEET ON WHICH COULD BE RECORDED THE NAME OF THE SUBJECT, THE FIRST AND SECOND SKILL SCORES, THE NAMES OF THE RECORDERS, AND THE DATE AND HOUR OF THE CLASS, WAS NEEDED. FOUR OF THESE WOULD BE NEEDED FOR EACH CLASS--ONE FOR EACH STATION. A TOTAL OF SIXTEEN WERE USED, FOUR FOR EACH CLASS--FOUR CLASSES. THIS SCORE SHEET CAN BE SEEN IN FIGURE 1, PAGE 35.

IT WAS ALSO NECESSARY TO TO DEVELOP A SCORE SHEET ON WHICH THE NAME AND ANXIETY SCORE, AND SKILL SCORES OF EACH INDIVIDUAL COULD BE RECORDED. A SEPARATE SHEET FOR EACH INDIVIDUAL WAS USED. THIS SHEET CAN BE SEEN IN FIGURE 2, PAGE 36.

IV. APPLICATION OF THE TESTS TO THE SAMPLE

ONCE THE SAMPLE AND THE TESTS WERE CHOSEN AND THE CO-OPERATION OF THE INSTRUCTORS WAS SECURED, A DEFINITE SCHEDULE WAS NEEDED FOR THE TESTING PROCEDURE.

IT WAS DECIDED THAT THE ANXIETY SCALE AND THE FIRST TRIAL OF THE SKILL TEST WOULD BE GIVEN DURING THE FIRST CLASS MEETING. THE SECOND TRIAL OF THE SKILL TEST WOULD BE GIVEN DURING THE SEVENTH WEEK OF THE SEMESTER ON THE FOURTEENTH CLASS MEETING.

THE FIRST CLASS MEETING. IN EACH CLASS THE SUBJECTS CAME IN EARLY AND WERE ALLOWED TO WARM-UP WITH THE BASKETBALLS. THE CLASS WAS CALLED TO ORDER BY THE INSTRUCTOR AND THE STUDENTS WERE ASKED TO SIT DOWN IN FRONT OF HER. THE INSTRUCTOR THEN TOOK ROLL AND EXPLAINED THAT THEY (THE STUDENTS) WERE GOING TO TAKE TWO TESTS DURING THE PERIOD, ONE SHE DIDN'T KNOW ABOUT, AND

FIGURE 1

GROUP SCORE SHEET

SCORERS ---------- TEACHER ----------

---------- DAY ----------

HOUR ----------

NAME				

FIGURE 2

INDIVIDUAL SCORE SHEET

NAME ---------- SCORERS ----------

TEACHER ---------- DAY ---------- HOUR ----------

ANXIETY LEVEL	A-B 1	A-B 2

THE OTHER A SKILL PRE-TEST. THIS INVESTIGATOR WAS THEN INTRODUCED AND THE CLASS TURNED OVER TO HIM.

THE INVESTIGATOR PASSED AROUND THE ANXIETY SCALES, ASKING THE SUBJECTS TO "PLEASE TAKE ONE AND PLACE IT FACE-DOWN ON THE FLOOR IN FRONT OF YOU." WHEN THE EXTRAS WERE COLLECTED AND EVERYONE HAD A SCALE, THE FOLLOWING MONOLOGUE WAS GIVEN BY THE INVESTIGATOR.

> GOOD MORING. AS MRS. O OR MISS M HAS SAID, MY NAME IF PETER VAN HANDEL AND I AM A GRADUATE STUDENT HERE AT LA CROSSE. I AM HERE THROUGH THE COMBINED EFFORTS OF THE PSYCHOLOGY AND PHYSICAL EDUCATION DEPARTMENTS ON CAMPUS.
>
> WE WOULD LIKE TO ASK YOUR CO-OPERATION IN AN EXPERIMENT BEING CONDUCTED ON PHYSICAL EDUCATION MAJORS ALL OVER THE NATION. A LARGE MIDWESTERN UNIVERSITY IS INTERESTED IN FINDING OUT IF PHYSICAL EDUCATION MAJORS REACT THE SAME WAY TO SITUATIONS AS DO MAJORS IN OTHER FIELDS AND PEOPLE IN OTHER PROFESSIONS. THEY HAVE DEVELOPED THE QUESTIONNAIRE WHICH YOU HAVE BEFORE YOU, AND IT HAS BEEN GIVEN TO THOUSANDS OF STUDENTS AND PROFESSIONAL PEOPLE OVER THE PAST FEW YEARS. AS I HAVE SAID, THEY WISH TO COMPARE THE REACTIONS OF DIFFERENT GROUPS. I AM THEIR REPRESENTATIVE ON CAMPUS AND IT IS MY JOB TO ADMINISTER THE QUESTIONNAIRE AND THEN SEND THEM BACK TO THE SCHOOL.
>
> SOME OF THE STATEMENTS OR QUESTIONS MIGHT SEEM A LITTLE PERSONAL, HOWEVER, YOU DON'T HAVE TO WORRY THAT SOMEONE WILL SEE THESE OR YOU WILL HAVE TO ACCOUNT FOR AN ANSWER. THESE ARE SENT BACK TO THE SCHOOL AND SCORED BY MACHINE, SO THAT NO ONE WILL EVER SEE YOUR PAPER. THE ONLY SCORES THEY ARE INTERESTED IN ARE THOSE OF YOU AS A GROUP OF PHYSICAL EDUCATION MAJORS. IT IS IMPORTANT THEN, TO EMPHASIZE TWO THINGS, (1) THAT YOU ANSWER ALL THE QUESTIONS OR STATEMENTS, AND (2) THAT YOU ANSWER THEM THE WAY YOU HONESTLY FEEL ABOUT THEM, AS THEY ARE NOT TRYING TO TRICK YOU IN ANY WAY, BUT THEY MERELY WISH TO MEASURE YOUR REACTIONS.(51)
>
> IF YOU WILL TURN YOUR QUESTIONNAIRES OVER, YOU MAY FILL IN THE INFORMATION REQUESTED AT THE TOP. YOUR NAME--FIRST, MIDDLE, LAST, TODAYS DATE, YOUR SEX AND AGE, AND FOR OTHER FACTS PUT YOUR INSTRUCTORS NAME AND THE HOUR. IF YOU WILL CHECK THE TWO EXAMPLES, YOU'LL NOTICE THAT THERE ARE THREE POSSIBLE RESPONSES--YES, NO, OCCASIONALLY, OR A, B, AND IN BETWEEN. THE FORTY STATEMENTS OF THIS QUESTIONNAIRE WILL FOLLOW THIS PATTERN OF THREE POSSIBLE RESPONSES.
>
> AGAIN, ANSWER ALL THE STATEMENTS, AND ANSWER THEM THE WAY YOU HONESTLY FEEL ABOUT THEM--NOW. MOST PEOPLE WILL FINISH WITHIN FIVE TO TEN MINUTES, BUT YOU MAY TAKE AS MUCH TIME AS NECESSARY. WHEN YOU ARE FINISHED, BRING

YOUR QUESTIONNAIRE UP HERE AND RETURN TO YOUR PLACE UNTIL EVERYONE IS FINISHED. THANK YOU. YOU MAY BEGIN IF THERE ARE NO QUESTIONS.

WHEN ALL THE SCALES WERE COMPLETED, THE INVESTIGATOR THANKED THE SUBJECTS AGAIN FOR THEIR CO-OPERATION, GAVE THE CLASS BACK TO THE INSTRUCTOR, AND LEFT THE GYMNASIUM.

THE INSTRUCTOR THEN ASKED THE SUBJECTS TO GO TO THE OPPOSITE SIDE OF THE GYMNASIUM WHERE THE A-B WALL TESTS WERE LOCATED. THEY WERE REQUESTED TO SIT DOWN AND THE INSTRUCTOR READ THE FOLLOWING: (52)

THIS MORNING YOU ARE GOING TO TAKE A BASKETBALL PRE-TEST THAT MEASURES YOUR ABILITY IN BALL HANDLING. IT IS BASED ON EDGREN'S BALL HANDLING TEST AND IS CALLED THE A-B WALL TEST.

LISTEN CAREFULLY TO THE FOLLOWING INSTRUCTIONS.

THE PLAYER STANDS IN AREA A WITH A BALL IN HER HANDS. ON THE SIGNAL--GO, SHE THROWS THE BALL TO AREA A ON THE WALL AND RUNS OR SLIDES TO AREA B TO RECEIVE THE BALL ON THE REBOUND. (53)

FROM AREA B, SHE THROWS THE BALL TO B ON THE WALL AND MOVES BACK TO A TO RECEIVE IT ON THE REBOUND. THIS PROCEDURE CONTINUES AS RAPIDLY AS POSSIBLE FOR THIRTY SECONDS WHEN THE COMMAND TO STOP WILL BE GIVEN.

SHE MUST STAY BEHIND THE RESTRAINING LINE AT ALL TIMES AND THE BALL MUST BE PASSED FROM THE CORRECT AREA ON THE FLOOR TO THE CORRESPONDING AREA ON THE WALL. IF ONE OR BOTH FEET ARE OUT OF THE FLOOR SECTION OR ON THE LINE WHILE THE PASS IS BEING MADE, THAT PASS WILL NOT COUNT.

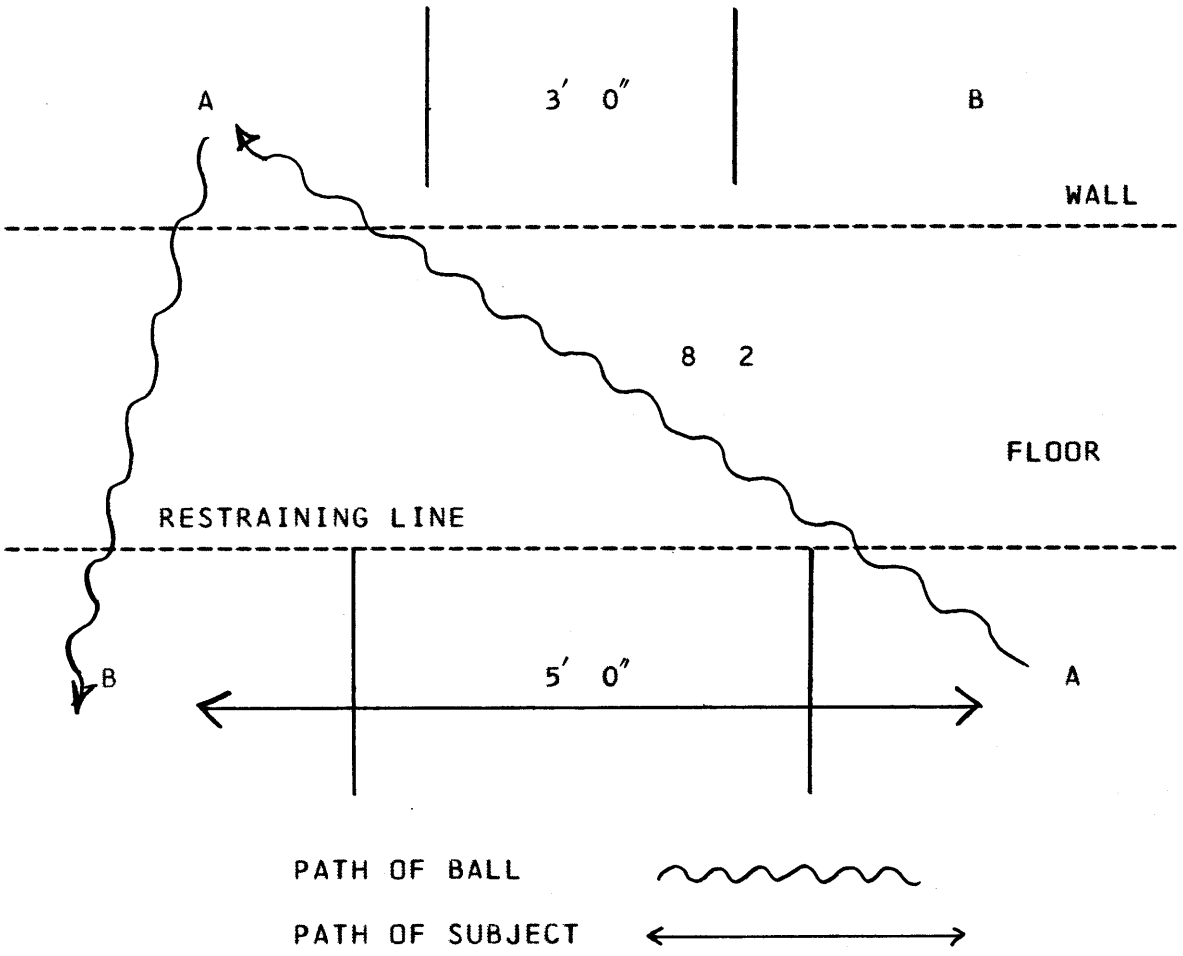
THE PASS MUST NOT HIT THE 3-FOOT SECTION BETWEEN A AND B ON THE WALL OR THE LINES BORDERING THAT SECTION. ANY TYPE OF PASS OR THROW MAY BE USED, BUT IF THE BALL HITS THE SECTION OR THE LINES, IT DOES NOT COUNT.

ANY TYPE OF RUN OR SLIDE MAY BE USED TO RECEIVE THE REBOUND, BUT THE RULES REGARDING TRAVELING MUST BE OBEYED. YOU MAY NOT TAKE THREE STEPS WITH THE BALL WITHOUT A DRIBBLE, THE PIVOT FOOT CANNOT BE DRAGGED, AND YOU MAY NOT TAKE MORE THAN TWO STEPS WITH THE BALL WHEN STOPPING. IF THE REBOUND GETS AWAY FROM YOU, YOU MUST DRIBBLE BACK INTO POSITION FOR THE NEST PASS.

YOUR SCORE IS THE NUMBER OF SUCCESSFUL HITS UPON THE WALL IN THIRTY SECONDS.

FIGURE 3

THE A-B WALL TEST



IF FOOT FAULTS, MISSING THE TARGET AREA, OR A DRIBBLING VIOLATION OCCUR, THAT HIT UPON THE WALL DOES NOT COUNT.

DO THE BEST YOU CAN SINCE THIS SCORE WILL BE RECORDED. THERE ARE NO PRACTICE PASSES.

SPLIT UP INTO FOUR GROUPS AND GO TO ONE OF THE TEST STATIONS WHERE A GRADUATE STUDENT WILL RECORD YOUR NAMES AND YOUR SCORE. THEY ARE RECORDING AND JUDGING SO THAT YOU DON'T HAVE TO WORRY ABOUT WATCHING FOR FOULS, AND THAT WAY EVERYONE WILL BE JUDGED THE SAME.

I WILL GIVE THE STOP AND GO COMMANDS. THE INSTRUCTOR THEN DEMONSTRATED THE PROCEDURE AND ASKED IF THERE WERE ANY QUESTIONS.

THE INSTRUCTOR THEN CALLED THE FIRST SUBJECT TO THE LINE AND THE TEST WAS BEGUN. FOUR SUBJECTS WERE TESTED EACH THIRTY SECONDS, WITH THE GRADUATE STUDENTS RECORDING THE SCORES AND THE NAMES, AND THE INSTRUCTOR TIMING. THIS PROCEDURE WAS USED FOR ALL SECTIONS. THE SAME WATCH WAS USED, AND THE SAME TWO GRADUATE STUDENTS WORKED TOGETHER FOR THE FOUR SESSIONS.

AT THE END OF EACH TESTING PERIOD, THE INSTRUCTOR COLLECTED THE SHEETS ON WHICH THE SKILL SCORES HAD BEEN RECORDED, AND PROCEEDED TO THE NORMAL BUSINESS OF THE CLASS.

THE FOURTEENTH CLASS MEETING. IT WAS DECIDED TO HAVE THE TWO SECTIONS MEETING ON TUESDAY-THURSDAY ACT AS THE EXPERIMENTAL GROUP. THIS WAS DONE BECAUSE IT WAS FELT THAT THE NATURE OF THE EXPERIMENTAL INSTRUCTIONS WOULD CAUSE SOME DISCUSSION AMONG THE STUDENTS AFTER THE CLASS PERIOD. WITH THE EXPERIMENTAL GROUPS BEING TESTED LAST, THERE WOULD BE NO "LEAK" ABOUT THE EXPERIMENT. THUS THE SECTIONS MEETING MONDAY-WEDNESDAY WERE SELECTED AS THE CONTROL GROUP.

ON THE FOURTEENTH CLASS MEETING THE SECOND TRIAL OF THE SKILL TEST

WAS GIVEN. THE SAME PROCEDURE WAS FOLLOWED IN THAT THE SAME STUDENTS SCORED THE SECOND TRIAL AS DID THE FIRST. THE ONLY DIFFERENCE WAS IN THE INSTRUCTIONS GIVEN TO THE TWO GROUPS.

1. THE CONTROL GROUP. THE TWO SECTIONS MAKING UP THE CONTROL GROUP WERE TOLD THAT THE PURPOSE OF THE TEST WAS TO COMPARE THEIR FIRST SCORE WITH THE SECOND--TO SEE IF ANY IMPROVEMENT HAD TAKEN PLACE, AND TO SEE IF THE INSTRUCTION THAT THEY HAD HAD MADE ANY DIFFERENCE ON THEIR ABILITY TO PERFORM. EMPHASIS WAS MADE ON THE FACT THAT THIS WAS A RE-TEST AND NOT A TEST FOR A GRADE. THE INSTRUCTOR AGAIN WENT OVER THE INSTRUCTIONS FOR THE TEST AND DEMONSTRATED. THE SAME PROCEDURE WAS USED IN THE RUNNING OF THE TEST AS WAS USED IN THE FIRST TRIAL.

2. THE EXPERIMENTAL GROUP. THE TWO SECTIONS MAKING UP THE EXPERIMENTAL GROUP WERE TOLD THAT A LARGE MAJORITY OF THEIR SEMESTER GRADE WOULD DEPEND UPON THEIR PERFORMANCE. IT WAS EMPHASIZED THAT NO PRACTICE WOULD BE ALLOWED AND THAT IN THIS WAY, A TRUE EVALUATION OF THEIR BASKETBALL ABILITY COULD BE MADE. THEY WERE TOLD THAT THE TEST TO BE USED WAS THE A-B WALL TEST--THE SAME ONE THEY HAD TAKEN THE FIRST DAY OF CLASS. THIS WAS REPEATED FOR BOTH CLASSES MAKING UP THE EXPERIMENTAL GROUP.

NO INDICATION OF THE REAL PURPOSES OF THE TEST WAS GIVEN UNTILL AFTER THE FIRST CLASS OF EXPERIMENTAL SUBJECTS HAD MET. SINCE THEY WOULD SEE THE SECOND CLASS OF EXPERIMENTAL SUBJECTS IN THE LOCKER ROOM, IT WAS NECESSARY TO ASK THEIR CO-OPERATION BY REMAINING SILENT CONCERNING THE TIME SPENT CLASS THAT DAY.

CHAPTER IV

ANALYSIS OF DATA

THIS CHAPTER DEALS WITH THE ANALYSIS OF DATA AND IS DIVIDED INTO TWO SECTIONS--ANALYSIS OF THE ANXIETY SCALE SCORES, AND ANALYSIS OF THE SKILL SCORES.

THE GREAT MASS OF DATA (109 INDIVIDUALS WITH THREE SCORES FOR EACH) MADE HAND CALCULATIONS FOR ANALYSIS VERY IMPRACTICAL. FORTUNATELY A COMPUTER CENTER WAS AVAILABLE AND AN IBM 1130 HAD BEEN PROGRAMMED FOR THE NECESSARY MATHAMATICAL COMPUTATIONS. THIS MADE THE ANALYSIS OF DATA QUITE SIMPLE AND PROVIDED A NEW EXPERIENCE FOR THE INVESTIGATOR.

THE MECHANICS OF THE COMPUTING PROCESS REQUIRED THAT A CARD BE PUNCHED FOR EACH SCORE OF EVERY INDIVIDUAL. THEY WERE THEN GROUPED AS FOLLOWS: CONTROL GROUP-ANXIETY SCORE, CONTROL-SKILL I, CONTROL-SKILL II, EXPERIMENTAL-ANXIETY, EXPERIMENTAL-SKILL I, AND EXPERIMENTAL-SKILL II. THE ADDITION OF A FEW CONTROL AND PROGRAM CARDS MADE THE PACKAGE COMPLETE. THIS "DECK" WAS THEN RUN THROUGH THE COMPUTER AND THE ANALYSIS WAS PRINTED OUT AS THE CARDS WENT THROUGH. THIS PROCESS YIELDED THE MEAN, STANDARD DEVIATION, AND THE STANDARD ERROR OF THE MEAN FOR EACH GROUP AS WELL AS A T SCORE FOR EACH POSSIBLE COMBINATION OF TWO GROUPS.

A SIMILAR PROCESS WAS USED FOR CORRELATIONS EXCEPT THAT THE TWO SCORES TO BE CORRELATED FOR EACH INDIVIDUAL WERE PUT ON ONE CARD. THESE CARDS WERE AGAIN PACKAGED IN GROUPS. THE "DECK" RUN THROUGH GAVE THE CORRELATION BETWEEN THOSE TWO SCORES FOR THAT ENTIRE GROUP.

I. ANALYSIS OF THE ANXIETY SCORES

AN ANALYSIS OF THE ANXIETY SCORES REVEALED THAT THE CONTROL GROUP WAS SLIGHTLY HIGHER IN ANXIETY THAN WAS THE EXPERIMENTAL GROUP. THIS DIFFERENCE IS SHOWN GRAPHICALLY IN TABLE IV, PAGE 44. TABLE V, PAGE 45, SHOWS THIS DIFFERENCE STATISTICALLY. COMPARISON OF THE TWO GROUPS SHOWED THAT THE CONTROL GROUP HAD A SMALLER RANGE OF SCORES, A MEDIAN OF 29.5, A MEAN OF 28.92, AND A STANDARD DEVIATION OF 9.34 ALL OF WHICH ARE HIGHER THAN THE 26.5, 26.26, AND 8.43 RESPECTIVELY FOR THE EXPERIMENTAL GROUP. A T BETWEEN THESE GROUPS GAVE A VALUE OF 1.54 WHICH MEANS THAT THE NULL HYPOTHESIS CAN BE ACCEPTED (TABLE X, PAGE 51).(54) THIS MEANS THAT THE DIFFERENCE BETWEEN THE MEANS ($\bar{X}$) IS NOT SIGNIFICANT AND COULD HAVE OCCURRED FROM CHANCE VARIATION IN THE SELECTION OF SAMPLES FROM THE SAME POPULATION.

IT IS INTERESTING TO NOTE THAT WHILE THE CONTROL GROUP HAD A MEAN SCORE OF 28.92 WHICH IS 2.65 POINTS HIGHER THAN THE EXPERIMENTAL GROUP MEAN, IT IS STILL 0.78 POINTS BELOW THE NORM FOR COLLEGE WOMEN (TABLE VI, PAGE 46). THIS PUTS THE EXPERIMENTAL GROUP MEAN 3.44 POINTS BELOW THE NORM. WHILE THESE SCORES ARE FROM A RATHER LIMITED SAMPLE COMPARED TO THE NATIONAL NORMS, THIS COULD POINT TO A TREND THAT MIGHT BE INVESTIGATED FURTHER. COULD IT BE THAT PHYSICAL EDUCATION STUDENTS (MAJORS) ARE CONSISTENTLY AND SIGNIFICANTLY BELOW THE NORM IN FREE-FLOATING MANIFEST ANXIETY?

IMPORTANT IN THE RELATIONSHIPS TO BE DEVELOPED LATER IS THE DETERMINATION OF THE HIGH AND LOW-ANXIETY SUBJECTS. CATTELL AND SCHEIER IN THEIR HANDBOOK POINT OUT THAT SCORES OF 19 AND BELOW (STENS 1-3) INDICATE AN UNUSUALLY SECURE, PHLEGMATIC, TOUGH, PLACID, OR RELAXED PERSON. SCORES OF 40

TABLE IV

TALLY AND FREQUENCY DISTRIBUTION
OF ANXIETY SCALE SCORES

INTERVAL	EXPERIMENTAL TALLY	EXPERIMENTAL F	CONTROL TALLY	CONTROL F
48-50		0	/	1
45-47	/	1	/	1
42-44	/	1	///	3
39-41	///	3	//	2
36-38	////	4	𝍸 ///	8
33-35	///	3	𝍸	5
30-32	𝍸 /	6	𝍸 //	7
27-29	𝍸 𝍸 /	11	𝍸	5
24-26	𝍸	5	𝍸 /	6
21-23	𝍸 𝍸 /	11	////	4
18-20	///	3	////	4
15-17	///	3	/	1
12-14	///	3	////	4
9-11		0	//	2
6- 8	/	1		0
3- 5	/	1		0
0- 2		0		0
		N - 56		N - 53

TABLE V

MEASURES OF CENTRAL TENDENCY AND DEVIATION IN THE ANXIETY SCALE SCORES

EXPERIMENTAL	MEASURE*	CONTROL
56	N	53
40	RANGE	37
23	MODE	31
26.5	MEDIAN	29.5
26.2678	$\bar{X}$	28.9245
8.4356	SD	9.3462
1.1374	$SE_{\bar{X}}$	1.2960

*THE FIGURES FOR THE RANGE, MODE, AND MEDIAN CAME FROM A FREQUENCY DISTRIBUTION WITH INTERVALS OF ONE.

TABLE VI

CONVERSION OF TOTAL ANXIETY RAW SCORES
TO STENS AND PERCENTILES*

RAW SCORE	STEN	%-ILE**	SPAN
0 - 9	1	1	0-2
10 - 14	2	4	3-7
15 - 19	3	11	8-16
20 - 24	4	23	17-31
25 - 29	5	40	32-50
30 - 34	6	60	51-68
35 - 39	7	77	69-83
40 - 44	8	89	84-92
45 - 50	9	96	93-97
51 - 80	10	99	98-100

RAW SCORE MEAN - 29.7

STANDARD DEVIATION - 10.2

*FROM CATTELL AND SCHEIER, HANDBOOK, P. 11.

**THE VALUE FOR THE CENTER OF THE STEN INTERVAL IS GIVEN FOLLOWED IN PARENTHESES BY THE RANGE OF VALUES FROM THE BOTTOM TO THE TOP OF THAT INTERVAL. ALL PERCENTILE VALUES ARE ROUNDED.

AND ABOVE (STENS 8-10) INDICATE A HIGH DEGREE OF ANXIETY.(55)

A COMPARISON OF THE TALLY AND FREQUENCY DISTRIBUTION IN TABLE IV, PAGE 44, WITH THE NORM TABLE FOR COLLEGE WOMEN, PAGE 46, SHOWS THAT THERE ARE FIVE HIGH-ANXIETY STUDENTS IN THE EXPERIMENTAL GROUP AND SEVEN IN THE CONTROL GROUP, WHILE THERE ARE EIGHT LOW-ANXIETY STUDENTS IN THE EXPERIMENTAL GROUP AND SEVEN IN THE CONTROL GROUP.(56) THESE GROUPS WILL BE FULLY DISCUSSED LATER.

II. ANALYSIS OF THE SKILL SCORES

ANALYSIS OF THE SKILL SCORES FOR TRIAL I SHOWED THE EXPERIMENTAL GROUP TO HAVE A SLIGHTLY HIGHER MEDIAN AND MEAN, AND A WIDER DISTRIBUTION. THIS CAN BE SEEN GRAPHICALLY IN TABLE VII, PAGE 48. TABLE VIII, PAGE 49, PRESENTS THIS DATA STATISTICALLY. AS CAN BE NOTED, THE DIFFERENCE IN THE MEANS FAVORS THE EXPERIMENTAL GROUP BY 0.72. A T VALUE OF -0.87 TABLE X, PAGE 51, INDICATES THAT THIS DIFFERENCE IS NOT SIGNIFICANT AND COULD HAVE OCCURRED FROM CHANCE VARIATION IN THE SELECTION OF SAMPLES FROM THE SAME POPULATION.(57)

ANALYSIS OF THE SCORES FOR TRIAL II AGAIN SHOWED THE EXPERIMENTAL GROUP TO HAVE A SLIGHTLY HIGHER MEDIAN AND MEAN, BUT A SMALLER RANGE. A GRAPHIC PICTURE IS GIVEN IN TABLE IX, PAGE 50. A COMPARISON OF THE DATA IN TABLE VIII, PAGE 49 SHOWS THAT THE DIFFERENCE IN THE MEANS IS 0.80. A T BETWEEN THE TWO GROUPS FOR THIS SKILL TRIAL GIVES A VALUE OF -1.64 (TABLE X, PAGE 51).

IN SUMMARY, IT CAN BE NOTED FROM TABLE X, PAGE 51 THAT THERE WAS NO

TABLE VII

TALLY AND FREQUENCY DISTRIBUTION
OF SKILL SCORES-TRIAL I

INTERVAL	EXPERIMENTAL TALLY	EXPERIMENTAL F	CONTROL TALLY	CONTROL F
20.5-21.5		0		0
19.5-20.5		0		0
18.5-19.5	/	1		0
17.5-18.5		0	///	3
16.5-17.5	///	3	///	3
15.5-16.5	𝍸 //	7	//	2
14.5-15.5	𝍸 𝍸 //	12	𝍸 /	6
13.5-14.5	////	4	𝍸 ///	8
12.5-13.5	𝍸 ////	9	𝍸 /	6
11.5-12.5	///	3	////	4
10.5-11.5	/	1	///	3
9.5-10.5	/	1	////	4
8.5- 9.5	///	3	/	1
7.5- 8.5	////	4	//	2
6.5- 7.5	/	1	//	2
5.5- 6.5	//	2	/	1
4.5- 5.5	/	1	///	3
3.5- 4.5	/	1	//	2
2.5- 3.5	//	2		0
1.5- 2.5		0	//	2
0.5- 1.5	/	1	/	1
- 0.5		0		0
		N - 56		N - 53

TABLE VIII

MEASURES OF CENTRAL TENDENCY AND DEVIATION
IN THE SKILL SCORES-TRIALS I & II

EXPERIMENTAL			CONTROL	
TRIAL I	TRIAL II	MEASURE*	TRIAL I	TRIAL II
56	56	N	53	53
18	10	RANGE	17	12
15	15.5	MODE	14	14.5
13.38	15.41	MEDIAN	12.75	14.00
12.2500	15.1785	$\bar{X}$	11.5283	14.3773
4.1285	2.2843	SD	4.4237	2.7072
0.5566	0.3080	$SE_{\bar{X}}$	0.6134	0.3754

*THE FIGURES FOR THE RANGE, MODE, AND MEDIAN CAME FROM A FREQUENCY DISTRIBUTION WITH INTERVALS OF ONE.

TABLE IX

TALLY AND FREQUENCY DISTRIBUTION
OF SKILL SCORES-TRIAL II

INTERVAL	EXPERIMENTAL TALLY	F	CONTROL TALLY	F
20.5-21.5		0	/	1
19.5-20.5	/	1		0
18.5-19.5	///	3	//	2
17.5-18.5	////	4	////	4
16.5-17.5	𝍸 //	7	𝍸 ///	8
15.5-16.5	𝍸 𝍸 //	12	////	4
14.5-15.5	𝍸 𝍸 //	12	𝍸 /	5
13.5-14.5	///	3	𝍸 /	6
12.5-13.5	𝍸 /	6	𝍸 ///	8
11.5-12.5	////	4	𝍸 ///	8
10.5-11.5	//	2	///	3
9.5-10.5	//	2	///	3
8.5- 9.5		0	/	1
7.5- 8.5		0		0
6.5- 7.5		0		0
5.5- 6.5		0		0
4.5- 5.5		0		0
3.5- 4.5		0		0
2.5- 3.5		0		0
1.5- 2.5		0		0
0.5- 1.5		0		0
- 0.5		0		0
		N - 56		N - 53

TABLE X

T SCORES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS FOR THE ANXIETY SCORE AND THE SKILL SCORES

		CONTROL GROUP		
		ANXIETY	SKILL I	SKILL II
EXPERIMENTAL GROUP	ANXIETY	1.5406		
	SKILL I		-0.8711	
	SKILL II			-1.6498

SIGNIFICANT DIFFERENCE BETWEEN THE GROUPS FOR THE ANXIETY SCORE OR EITHER OF THE SKILL SCORES, YET AS INDICATED IN TABLE XI, PAGE 53, THERE WAS A SIGNIFICANT DIFFERENCE AT THE .01 LEVEL OF CONFIDENCE BETWEEN THE FIRST AND SECOND SKILL TRIALS FOR BOTH GROUPS, INDICATING THAT SOMETHING OCCURRED BETWEEN THE TRIALS TO CAUSE A SIGNIFICANT INCREASE IN PERFORMANCE. HOWEVER, THE INCREASE FOR ONE GROUP WAS NOT GREAT ENOUGH TO CAUSE A SIGNIFICANT DIFFERENCE BETWEEN GROUPS--THOUGH THERE WAS A TREND IN THAT DIRECTION AS INDICATED BY THE T VALUES OBTAINED BETWEEN GROUPS FOR BOTH SKILL TRIALS-- -0.87 TO -1.64 --TABLE X, PAGE 51.

THE HIGH-ANXIETY SUBJECTS. THE NATURE OF THE PROBLEM REQUIRED THAT THE DATA ALSO BE ANALYZED IN TERMS OF THE HIGH AND LOW-ANXIETY SECTIONS OF EACH GROUP. AS HAS BEEN PREVIOUSLY INDICATED, THE RANGE OF ANXIETY SCORES CAN BE SPLIT INTO HIGHS AND LOWS.(58) TABLE IV, PAGE 44 GIVES A GRAPHIC PRESENTATION OF THE SCORES. THOSE IN THE INTERVALS FROM 39-41 AND UP ARE CONSIDERED HIGH, AND SCORES IN INTERVALS FROM 15-17 AND BELOW ARE CONSIDERED LOW. TABLE XII, PAGE 54, GIVES THE MEASURES OF CENTRAL TENDENCY AND DEVIATION FOR THE ANXIETY SCORES OF THE HIGH-ANXIETY GROUPS. ONE CAN NOTE THAT THE MEAN FOR THE CONTROL GROUP IS 43.28 COMPARED TO 40.80 FOR THE EXPERIMENTAL GROUP. HOWEVER, AS INDICATED IN TABLE XIII, PAGE 55, THE T VALUE BETWEEN THE TWO GROUPS IS -1.58, MEANING THAT THERE IS NO SIGNIFICANT DIFFERENCE BETWEEN THE GROUPS. THE TABLE ALSO POINTS OUT THAT FOR THE HIGH-ANXIETY SUBJECTS THERE IS NO SIGNIFICANT DIFFERENCE BETWEEN THE GROUPS FOR EITHER OF THE SKILL TRIALS. THIS IS CONSISTENT WITH THE SCORES OF THE EXPERIMENTAL AND CONTROL GROUPS AS A WHOLE AS WAS MENTIONED EARLIER IN THIS

TABLE XI

T SCORES BETWEEN SKILL TRIALS FOR THE EXPERIMENTAL GROUP AND FOR THE CONTROL GROUP

		EXPERIMENTAL GROUP SKILL II	CONTROL GROUP SKILL II
EXPERIMENTAL GROUP	SKILL I	-4.6030*	
CONTROL GROUP	SKILL I		-3.9612**

*SIGNIFICANT BEYOND THE .01 LEVEL OF CONFIDENCE. (D. F. - 55).

**SIGNIFICANT BEYOND THE .01 LEVEL OF CONFIDENCE. (D. F. - 52).

TABLE XII

MEASURES OF CENTRAL TENDENCY AND DEVIATION IN THE ANXIETY SCALE SCORES FOR THE HIGH-ANXIETY SUBJECTS

EXPERIMENTAL	MEASURE*	CONTROL
5	N	7
6	RANGE	8
39	MODE	-
39.0	MEDIAN	43.0
40.8000	$\bar{X}$	43.2857
2.4000	SD	2.4907
1.2000	$SE_{\bar{X}}$	1.0168

*THE FIGURES FOR THE RANGE, MODE, AND MEDIAN CAME FROM A FREQUENCY DISTRIBUTION WITH INTERVALS OF ONE.

TABLE XIII

T SCORES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS (HIGH-ANXIETY S'S) FOR THE ANXIETY SCORE AND THE SKILL SCORES

		CONTROL GROUP		
		ANXIETY	SKILL I	SKILL II
EXPERIMENTAL GROUP	ANXIETY	-1.5803		
	SKILL I		0.0825	
	SKILL II			-0.7438

CHAPTER.

TABLE XIV, PAGE 57, GIVES THE T VALUES BETWEEN THE FIRST AND SECOND SKILL TRIALS FOR BOTH GROUPS IN THIS HIGH-ANXIETY SECTION. IT IS IMPORTANT TO NOTE THAT WHILE THE EXPERIMENTAL GROUP HAS A T VALUE OF -1.17 BETWEEN THE TWO TRIALS, THE CONTROL GROUP HAS A T VALUE OF -2.08 WHICH APPROACHES SIGNIFICANCE AT THE .05 LEVEL OF CONFIDENCE. THIS INDICATES THAT THE STRESSFUL INSTRUCTIONS GIVEN TO THE EXPERIMENTAL GROUP PRIOR TO THE SECOND SKILL TRIAL POSSIBLY INHIBITED THEIR PERFORMANCE ENOUGH TO PREVENT A SIGNIFICANT INCREASE IN THEIR SCORES, WHILE THE ABSENSE OF STRESS ALLOWED THE CONTROL GROUP TO INCREASE THEIR SCORES AT NEARLY A SIGNIFICANT LEVEL. IT CAN BE ASSUMED FROM THIS THAT A HIGH-ANXIETY SUBJECT WILL NOT PERFORM WELL UNDER STRESSFUL CONDITIONS IN THIS TYPE OF SITUATION.

LOW-ANXIETY SUBJECTS. THE SAME TYPE OF ANALYSIS CAN BE DONE WITH THE LOW-ANXIETY SUBJECTS OF EACH GROUP. TABLE XV, PAGE 58, GIVES THE MEASURES OF CENTRAL TENDENCY AND DEVIATION FOR THE LOW-ANXIETY SCORES. AS CAN BE NOTED, THERE IS VERY LITTLE DIFFERENCE BETWEEN THE GROUPS. THIS IS CONFIRMED STATISTICALLY IN THE T VALUES GIVEN IN TABLE XVI, PAGE 59.

THERE ALSO IS NO SIGNIFICANT DIFFERENCE BETWEEN THE FIRST AND SECOND SKILL TRIALS FOR EITHER GROUP IN THIS LOW-ANXIETY SECTION. TABLE XVII, PAGE 60, INDICATES THAT THE CONTROL GROUP HAD A SLIGHTLY HIGHER T, BUT NEITHER OF THESE APPROACH THE LEVEL NEEDED FOR SIGNIFICANCE. IT CAN BE IMPLIED FROM THIS DATA THAT THE LOW-ANXIETY SUBJECT IN THE NON-STRESSFUL SITUATION (CONTROL GROUP) WAS NOT MOTIVATED ENOUGH TO IMPROVE PERFORMANCE, WHILE THE SAME MAY BE SAID FOR THE LOW-ANXIETY SUBJECT IN THE STRESSFUL SITUATION.

TABLE XIV

T SCORES BETWEEN THE SKILL TRIALS OF THE HIGH-ANXIETY S'S FOR THE EXPERIMENTAL GROUP AND THE CONTROL GROUP

		EXPERIMENTAL GROUP	CONTROL GROUP
		SKILL II	SKILL II
EXPERIMENTAL GROUP	SKILL I	-1.1747	
CONTROL GROUP	SKILL I		-2.0801

TABLE XV

MEASURES OF CENTRAL TENDENCY AND DEVIATION IN THE ANXIETY SCALE SCORES FOR THE LOW-ANXIETY SUBJECTS

EXPERIMENTAL	MEASURE*	CONTROL
8	N	7
11	RANGE	6
13.5	MODE	14
12.5	MEDIAN	14.0
12.0000	$\overline{X}$	13.4285
3.5355	SD	1.9166
1.3363	$SE_{\overline{X}}$	0.7824

*THE FIGURES FOR THE RANGE, MODE, AND MEDIAN CAME FROM A FREQUENCY DISTRIBUTION WITH INTERVALS OF ONE.

TABLE XVI

T SCORES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS (LOW-ANXIETY S'S) FOR THE ANXIETY SCORE AND THE SKILL SCORES

		CONTROL GROUP		
		ANXIETY	SKILL I	SKILL II
EXPERIMENTAL GROUP	ANXIETY	-0.9225		
	SKILL I		0.3209	
	SKILL II			0.2352

TABLE XVII

T SCORES BETWEEN THE SKILL TRIALS OF THE LOW-ANXIETY S'S FOR THE EXPERIMENTAL GROUP AND THE CONTROL GROUP

		EXPERIMENTAL GROUP SKILL II	CONTROL GROUP SKILL II
EXPERIMENTAL GROUP	SKILL I	-0.8978	
CONTROL GROUP	SKILL I		-1.1481

IMPORTANT IN THIS DISCUSSION OF HIGH AND LOW-ANXIETY SUBJECTS AND THEIR PERFORMANCE IS THE FACT THAT OVER-ALL, THE CONTROL AND EXPERIMENTAL GROUPS BOTH IMPROVED SIGNIFICANTLY FROM THE FIRST SKILL TRIAL TO TO THE SECOND (TABLE XI, PAGE 53). OF THE HIGH AND LOW-ANXIETY SECTIONS, ONLY THE HIGH-ANXIETY SUBJECTS IN THE CONTROL GROUP EVEN REFLECTED THIS TREND BY APPROACHING A SIGNIFICANT DIFFERENCE BETWEEN THE SKILL SCORES. THIS MEANS THAT THE SIGNIFICANT DIFFERENCES MUST HAVE COME IN THE GROUP THAT WOULD BE LABELED MIDDLE-ANXIETY.

IT IS ALSO INTERESTING TO NOTE THAT T VALUES BETWEEN SCORES OF THE HIGH VERSUS THE LOW-ANXIETY SUBJECTS SHOW NO SIGNIFICANT DIFFERENCES EXCEPT NATURALLY, THE ANXIETY SCORES. TABLES XVIII AND XIX, PAGES 62 AND 63, GIVE THESE VALUES FOR BOTH GROUPS. THIS DATA INDICATES THAT POSSIBLY THE SKILL TASK WAS NOT DIFFICULT ENOUGH TO ALLOW FOR A WIDER RANGE OF SCORES BETWEEN THE HIGH AND LOW-ANXIETY SUBJECTS FOR BOTH TRIALS. THIS CAN BE SEEN GRAPHICALLY IN TABLE XX, PAGE 64. THE SKILL SCORE DIFFERENCES ARE QUITE CLUSTERED AROUND ONE POINT. THIS MIGHT REFLECT THE GENERAL HOMOGENEITY OF PHYSICAL EDUCATION MAJORS.

MIDDLE-ANXIETY SUBJECTS. ONE WILL NOTICE IN READING THE REVIEW OF RELATED LITERATURE THAT THE GREAT MAJORITY OF THE STUDIES WERE CONCERNED WITH AN ANALYSIS OF DATA FOR THE EXTREMES ON THE ANXIETY SCALE QUESTIONNAIRE. HOWEVER, THIS INVESTIGATOR CONSIDERED IT ESSENTIAL TO EVALUATE THE DATA OBTAINED FROM THE SUBJECTS SCORING IN THE MIDDLE RANGE ON THE ANXIETY SCALE.

THE IMPORTANCE OF THIS CAN BE SEEN IF ONE CONSIDERS THAT FOR BOTH THE EXPERIMENTAL AND CONTROL GROUPS AS A WHOLE, THERE WAS A SIGNIFICANT

TABLE XVIII

T SCORES BETWEEN THE HIGH AND LOW-ANXIETY S'S OF THE EXPERIMENTAL GROUP FOR THE ANXIETY SCORES AND THE SKILL SCORES

		LOW-ANXIETY		
		ANXIETY	SKILL I	SKILL II
HIGH ANXIETY	ANXIETY	16.0353*		
	SKILL I		-1.1866	
	SKILL II			-1.2454

TABLE XIX

T SCORES BETWEEN THE HIGH AND LOW-ANXIETY S'S OF THE CONTROL GROUP FOR THE ANXIETY SCORES AND THE SKILL SCORES

		LOW-ANXIETY		
		ANXIETY	SKILL I	SKILL II
HIGH ANXIETY	ANXIETY	23.2701*		
	SKILL I		-1.1927	
	SKILL II			-0.2830

*SIGNIFICANT BEYOND THE .05 LEVEL. (D. F. - 6)

TABLE XX

TALLY AND FREQUENCY DISTRIBUTION
OF SKILL SCORE DIFFERENCES

	EXPERIMENTAL		CONTROL	
INTERVAL	TALLY	F	TALLY	F
14.5-15.5		0	//	2
13.5-14.5	/	1		0
12.5-13.5	/	1		0
11.5-12.5		0	//	2
10.5-11.5	/	1		0
9.5-10.5	/	1	/	1
8.5- 9.5	/	1	//	2
7.5- 8.5	///	3	///	3
6.5- 7.5		0	//	2
5.5- 6.5	////	4	/	1
4.5- 5.5	//	2	/	1
3.5- 4.5	𝍸	5	//	2
2.5- 3.5	𝍸 /	6	𝍸 /	6
1.5- 2.5	𝍸 ///	8	////	4
.5- 1.5	𝍸 /	6	𝍸 𝍸	10
-.5- .5	𝍸 𝍸 /	11	𝍸 ///	8
-1.5- .5	///	3	////	4
-2.5- 1.5	/	1	/	1
-3.5- 2.5	//	2		0
-4.5- 3.5		0	/	1
-5.5- 4.5		0	///	3
		N - 56		N - 53

DIFFERENCE BETWEEN THE FIRST AND SECOND SKILL TRIALS AT THE .01 LEVEL OF CONFIDENCE.(59) HOWEVER, AFTER THE BREAKDOWN OF THE ANXIETY SCORES INTO HIGHS AND LOWS, IT WILL BE NOTICED THAT NEITHER THE HIGH-ANXIETY SUBJECTS NOR THE LOW-ANXIETY SUBJECTS OF EITHER GROUP REFLECTED THIS SIGNIFICANT DIFFERENCE BETWEEN THE TRIALS.(60)

IT CAN BE CONCLUDED FROM THIS THAT THE SIGNIFICANT IMPROVEMENT IN PERFORMANCE MUST HAVE OCCURRED IN THE GROUP LABELED MIDDLE-ANXIETY.

AN ANALYSIS OF THE SCORES CONFIRMS THIS CONCLUSION. THE RESULTS ARE PRESENTED IN TABLE XXI, PAGE 66, AND INDICATE THAT BOTH THE EXPERIMENTAL AND THE CONTROL GROUP SHOWED A SIGNIFICANT IMPROVEMENT IN PERFORMANCE AT THE .01 LEVEL OF CONFIDENCE. AS TABLE XXII, PAGE 67, INDICATES, THERE WAS A DIFFERENCE BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS FOR THE SECOND SKILL TRIAL. THE EXPERIMENTAL GROUP HAD A MEAN SCORE OF 15.2 COMPARED TO 14.1 FOR THE CONTROL GROUP, AND THIS DIFFERENCE WAS SIGNIFICANT AT THE .05 LEVEL OF CONFIDENCE.

THESE RESULTS SEEM TO CONFIRM THE IDEA OF AN OPTIMAL LEVEL OF AROUSAL FOR EFFICIENT PERFORMANCE OF A TASK AS EXPLAINED BY CRATTY.(61) ACCORDING TO THIS THEORY, THE HIGH-ANXIETY SUBJECTS WERE PAST THE OPTIMAL LEVEL, WHILE THE LOW-ANXIETY SUBJECTS WERE FUNCTIONING AT A LEVEL BELOW THE OPTIMAL.

THESE RESULTS WOULD ALSO SEEM TO SUGGEST THAT THE STRESSFUL CONDITIONS HELPED THE EXPERIMENTAL GROUP INCREASE THEIR PERFORMANCE AT A LEVEL GREATER THAN THAT OF THE CONTROL GROUP, SINCE THE TWO GROUPS SHOWED NO SIGNIFICANT DIFFERENCES BETWEEN THEM FOR THE FIRST TRIAL.

IMPORTANT IN THIS DISCUSSION OF IMPROVEMENT IS THE CONSIDERATION OF

TABLE XXI

T SCORES BETWEEN THE SKILL TRIALS OF THE MIDDLE-ANXIETY S'S FOR THE EXPERIMENTAL GROUP AND THE CONTROL GROUP

		EXPERIMENTAL GROUP	CONTROL GROUP
		SKILL II	SKILL II
EXPERIMENTAL GROUP	SKILL I	-4.5144*	
CONTROL GROUP	SKILL I		-3.1391*

*SIGNIFICANT AT BETTER THAN THE .01 LEVEL OF CONFIDENCE.

TABLE XXII

T SCORES BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS (MIDDLE-ANXIETY S'S) FOR THE ANXIETY SCORE AND THE SKILL SCORES

		CONTROL GROUP		
		ANXIETY	SKILL I	SKILL II
EXPERIMENTAL GROUP	ANXIETY	1.4825		
	SKILL I		-0.7189	
	SKILL II			-2.0786*

*SIGNIFICANT AT THE .05 LEVEL. (D. F. - 38)

WHERE THE DIFFERENT ANXIETY LEVEL GROUPS SCORED TO BEGIN WITH. THIS IMPLIES AN ANALYSIS OF THE RELATIONSHIP BETWEEN THE ANXIETY LEVEL AND THE SKILL PERFORMANCE. FIGURE 4, PAGE 69, GIVES A GRAPHIC PICTURE OF THIS RELATIONSHIP. IT WILL BE NOTICED IMMEDIATELY THAT AS THE ANXIETY LEVEL INCREASES, THE ABILITY TO PERFORM DECREASES. THE ONLY EXCEPTION HERE IS IN THE CONTROL GROUP--THE SECOND SKILL TRIAL--WHERE THERE WAS AN IMPROVEMENT IN PERFORMANCE BY THE HIGH-ANXIETY SUBJECTS OVER THAT OF THE MIDDLE-ANXIETY SUBJECTS. IT WILL ALSO BE NOTICED THAT THE HIGH-ANXIETY SUBJECTS IN THE EXPERIMENTAL GROUP--SECOND SKILL TRIAL--HAD A SHARP DECLINE IN MEAN SCORE COMPARED TO THE OTHER TWO LEVELS OF ANXIETY.

IT IS APPARENT THAT THERE WAS IMPROVEMENT FROM THE FIRST SKILL TRIAL TO THE SECOND SKILL TRIAL FOR ALL THE SUBJECTS, BUT AS WAS MENTIONED PREVIOUSLY, ONLY THE MIDDLE-ANXIETY GROUP HAD SIGNIFICANT IMPROVEMENT.(62)

THIS RELATIONSHIP OF ANXIETY LEVEL TO SKILL PERFORMANCE CAN ALSO BE EXPRESSED THROUGH CORRELATIONS. TABLE XXIII, PAGE 70, GIVES THESE CORRELATIONS FOR THE TOTAL GROUPS AND THE T SCORE OBTAINED AFTER TESTING THE SIGNIFICANCE OF THE CORRELATION COEFFICIENT.(63) IT CAN BE SEEN THAT THE RELATIONSHIP BETWEEN ANXIETY LEVEL AND SKILL PERFORMANCE FOR THE FIRST TRIAL GIVES A COEFFICIENT OF -.21 FOR BOTH GROUPS. THIS RELATIONSHIP IS NOT SIGNIFICANT. COEFFICIENTS FOR THE SECOND SKILL TRIAL GIVE SIMILAR RESULTS.

THE MOST IMPORTANT OBSERVATION TO MAKE HERE IS TO NOTE THE RELATIONSHIP BETWEEN THE FIRST AND SECOND SKILL TRIALS. THIS GIVES AN INDICATION OF THE EFFECTS OF THE STRESSFUL CONDITIONS ON THE EXPERIMENTAL GROUP. IT WILL BE NOTICED THAT THE COEFFICIENT FOR SKILL I-SKILL II FOR THE EXPER-

FIGURE 4

RELATIONSHIP OF ANXIETY LEVEL TO SKILL PERFORMANCE-TRIALS I AND II

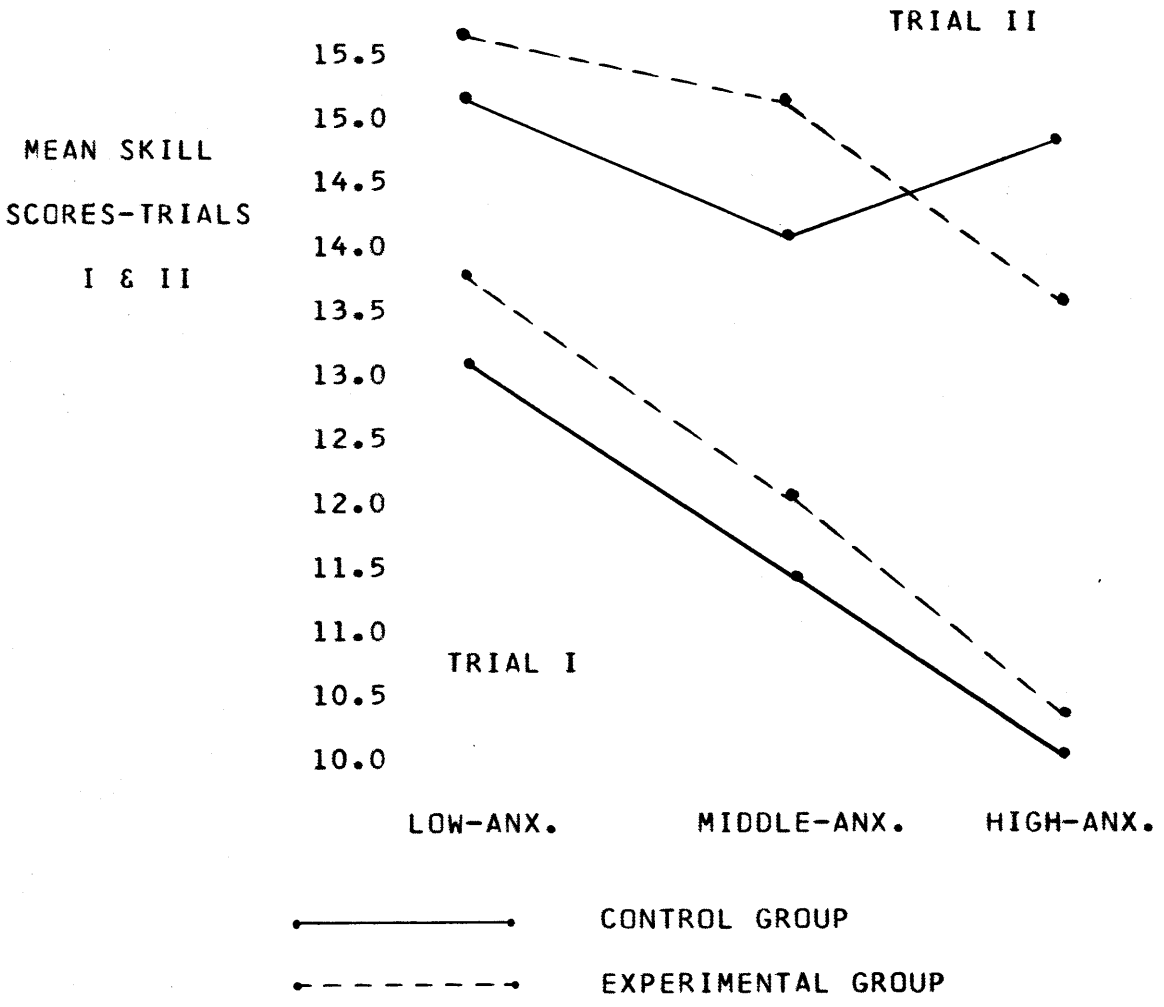


TABLE XXIII

CORRELATIONS BETWEEN ANXIETY LEVEL
AND SKILL PERFORMANCE

	EXPERIMENTAL		CONTROL	
ANXIETY-SKILL I	-.21	T- -1.59	-.21	T- -1.54
ANXIETY-SKILL II	-.20	T- -1.51	-.13	T- -0.94
SKILL I-SKILL II	+.45	T- 3.74 *	+.22	T- 1.72

*SIGNIFICANT BEYOND THE .01 LEVEL OF CONFIDENCE.

IMENTAL GROUP IS +.45 AND THAT THIS IS SIGNIFICANT BEYOND THE .01 LEVEL OF CONFIDENCE, WHILE THE CONTROL GROUP HAD A COEFFICIENT OF +.22 AND WAS NOT SIGNIFICANT. THIS WOULD SEEM TO INDICATE THAT THE STRESSFUL CONDITIONS KEPT THOSE SCORING LOW ON THE FIRST TRIAL-LOW ON THE SECOND TRIAL, WHILE KEEPING THOSE WHO SCORED HIGH ON THE FIRST TRIAL-HIGH ON THE SECOND TRIAL.

IN LIGHT OF THE FACT THAT ONLY THE MIDDLE-ANXIETY LEVEL GROUP SHOWED SIGNIFICANT IMPROVEMENT ON THE SECOND SKILL TRIAL, IT IS INTERESTING TO NOTE IN A BREAKDOWN OF THE CORRELATION COEFFICIENTS FOR SKILL I-SKILL II RELATIONSHIPS INTO HIGH-ANXIETY--LOW-ANXIETY COMPARISIONS, THAT THE COEFFICIENTS ARE EITHER SIGNIFICANT OR APPROACH SIGNIFICANCE, EXCEPT FOR THOSE FOR THE MIDDLE AND HIGH-ANXIETY SUBJECTS IN THE CONTROL GROUP (TABLE XXIV, PAGE 72).

THIS INDICATES THAT THE STRESSFUL CONDITIONS APPLIED TO THE EXPERIMENTAL GROUP DID INDEED KEEP THOSE SCORING LOW THE FIRST TRIAL-LOW THE SECOND TRIAL, WITH THE SAME RESULTS ON THOSE SCORING HIGH THE FIRST TRIAL. IN LINE WITH THIS, THE ABSENCE OF STRESS IN THE CONTROL GROUPS' SITUATION ALLOWED THEM TO VARY THEIR SCORES AND WOULD ACCOUNT FOR THE NEARLY SIGNIFICANT INCREASE IN MEAN SCORE IN THE HIGH-ANXIETY SECTION.

IN SUMMARY, THE ANALYSIS OF DATA INDICATED THAT: (1) FOR TOTAL GROUPS THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN THE EXPERIMENTAL AND CONTROL SUBJECTS FOR ANY OF THE SCORES REPORTED, (2) WITHIN GROUPS, THERE WAS A SIGNIFICANT DIFFERENCE BETWEEN THE SKILL TRIALS, AND THIS DIFFERENCE WAS REFLECTED ONLY IN THE MIDDLE-ANXIETY SUBJECTS, (3) THERE WERE NO SIGNIFICANT DIFFERENCES IN PERFORMANCE BETWEEN THE HIGH AND LOW-ANXIETY SUBJECTS, (4)

TABLE XXIV

CORRELATIONS BETWEEN SKILL SCORES
FOR ANXIETY LEVEL GROUPS

	EXPERIMENTAL		CONTROL	
LOW-ANXIETY SKILL I-SKILL II	.62	T- 2.09	.80	T- 3.26*
MIDDLE-ANXIETY SKILL I-SKILL II	.33	T- 2.26**	.21	T- 1.32
HIGH-ANXIETY SKILL I-SKILL II	.71	T- 2.01	-.06	T--0.14

*SIGNIFICANT AT BETTER THAN THE .02 LEVEL OF CONFIDENCE.

**SIGNIFICANT AT BETTER THAN THE .05 LEVEL OF CONFIDENCE.

THERE WAS A SIGNIFICANT DIFFERENCE BETWEEN GROUPS FOR THE MIDDLE-ANXIETY SUBJECTS ON TRIAL II, (5) AS ANXIETY LEVEL INCREASES--SKILL PERFORMANCE DECREASES, (6) THE STRESSFUL INSTRUCTIONS FOR THE EXPERIMENTAL GROUP SEEMED TO KEEP THOSE SCORING LOW ON TRIAL I-LOW ON TRIAL II, AND THOSE SCORING HIGH-HIGH, AS INDICATED BY THE SIGNIFICANT CORRELATION OF +.45 (TABLE XXIII, 70), AND (7) THERE SEEMS TO BE AN OPTIMAL LEVEL OF ANXIETY OR STRESS FOR EFFICIENT PERFORMANCE OF THE TASK. THE LOW-ANXIETY SUBJECTS WERE NEAR THAT LEVEL AND NO IMPROVEMENT COULD TAKE PLACE--AS INDICATED BY THEIR NON-SIGNIFICANT T'S AND HIGH CORRELATIONS.

THE MIDDLE-ANXIETY SUBJECTS WERE SLIGHTLY BELOW THE OPTIMAL AND INCREASED THEIR PERFORMANCE SIGNIFICANTLY. THE STRESSFUL CONDITIONS KEPT THOSE SCORING LOW ON TRIAL I-LOW ON TRIAL II, AND THOSE SCORING HIGH ON I-HIGH ON II AS INDICATED BY THE SIGNIFICANT CORRELATION OF +.33 BETWEEN THE TRIALS.

THE HIGH-ANXIETY SUBJECTS WERE FAR BELOW THE OPTIMAL AND INCREASED PERFORMANCE-THOUGH NOT SIGNIFICANTLY. AGAIN, THE STRESSFUL CONDITIONS KEPT THE LOW SCORERS-LOW, AND THE HIGH SCORERS-HIGH, WHILE THE ABSENCE OF STRESS FOR THE CONTROL GROUP POSSIBLY ALLOWED THEM TO ACHIEVE A NEARLY SIGNIFICANT INCREASE IN PERFORMANCE. THE NEGATIVE .06 CORRELATION BETWEEN SKILL TRIALS ALSO REFLECTS THE ABSENCE OF STRESS.

CHAPTER V

SUMMARY AND CONCLUSIONS

THE PURPOSE OF THIS STUDY WAS TO EXPLORE THE RELATIONSHIP OF MANIFEST ANXIETY LEVEL AND SKILL PERFORMANCE IN STRESSFUL AND NON-STRESSFUL SITUATIONS. A SUBPROBLEM WAS TO MEASURE THE EFFECTS OF STRESS UPON PERFORMANCE.

LITERATURE ON STUDIES CONCERNED WITH THE EFFECT OF ANXIETY AND STRESSFUL CONDITIONS UPON PERFORMANCE INDICATE THAT THERE ARE SEVERAL FACTORS INVOLVED THAT MUST BE CONSIDERED IN THE FINAL ANALYSIS OF RESULTS.

IN GENERAL, IT HAS BEEN FOUND THAT THE EFFECT OF ANXIETY LEVEL AND STRESSFUL CONDITIONS UPON PERFORMANCE IS A FUNCTION OF THE TASK, OF THE GENERAL ANXIETY LEVEL OF THE INDIVIDUAL, AND OF PRIOR PRACTICE OR EXPERIENCE IN THE TASK.

IT HAS ALSO BEEN FOUND THAT THE PERFORMANCE OF HIGH AND LOW-ANXIETY SUBJECTS IS NOT SIGNIFICANTLY DIFFERENT UNTIL A STRESSFUL CONDITION IS INDUCED, THEN, DEPENDING ON THE PREVIOUSLY MENTIONED FACTORS, THE HIGHS MAY SHOW A DECREMENT IN PERFORMANCE.

ONE OF THE MOST IMPORTANT OBSERVATIONS TO COME OUT OF THESE STUDIES IS THAT THERE SEEMS TO BE AN OPTIMAL LEVEL OF ANXIETY OR STRESS FOR EFFICIENT PERFORMANCE OF A GIVEN TASK. THIS WOULD SUGGEST THAT POSSIBLY THE HIGH ANXIETY SUBJECTS ARE PAST THE OPTIMAL LEVEL FOR PERFORMANCE WHILE THE LOW-ANXIETY SUBJECTS ARE BELOW THE OPTIMAL LEVEL.

A GROUP OF 109 SOPHOMORE WOMEN PHYSICAL EDUCATION MAJORS WAS CHOSEN AS SUBJECTS BECAUSE THEY MET THE FOLLOWING CRITERIA: (1) THEY WERE ALL IN

THE SAME YEAR OF COLLEGE STUDY, (2) THEY WERE ALL INVOLVED IN THE SAME PROGRAM OF STUDY AND WERE CURRENTLY INVOLVED IN ONE SKILL AREA, (3) THEY MET IN THE SAME BUILDING AT APPROXIMATELY THE SAME TIME--ONLY ON DIFFERENT DAYS, AND (4) THEY WERE ALL OF THE SAME SEX.

THE SUBJECTS WERE SPLIT INTO FOUR SEPARATE CLASSES, EACH STUDYING BASKETBALL. TWO CLASSES MET MONDAY-WEDNESDAY WITH ONE INSTRUCTOR, AND THE OTHER TWO CLASSES MET TUESDAY-THURSDAY WITH A DIFFERENT INSTRUCTOR. TO PREVENT A "LEAK" IN INFORMATION CONCERNING THE EXPERIMENTAL INSTRUCTIONS THAT WOULD BE GIVEN THE EXPERIMENTAL GROUP, THE LATTER TWO CLASSES WERE NAMED AS THE EXPERIMENTAL SUBJECTS.

TESTS WERE SELECTED THAT WOULD BE EASY TO ADMINISTER AND SCORE, AND WOULD NOT GIVE AWAY THE PURPOSES OF THE STUDY. IN ORDER TO ALLOW FOR THE GREATEST POSSIBLE AMOUNT OF REALISM IN THE ADMINISTRATION OF THE TESTS, THE REGULAR CLASS INSTRUCTORS CONSENTED TO ADMINISTER THE SKILL TRIALS TO THEIR STUDENTS AS A PART OF THE REGULAR CLASS INSTRUCTION.

THE TESTS SELECTED WERE THE IPAT ANXIETY SCALE QUESTIONNAIRE (SELF ANALYSIS FORM) TO MEASURE THE ANXIETY LEVEL OF THE SUBJECTS, AND THE LA CROSSE A-B WALL TEST, A FORM OF THE EDGREN BALL HANDLING TEST, USED TO MEASURE GENERAL BALL HANDLING ABILITY IN BASKETBALL.

THE FIRST CLASS PERIOD OF THE SEMESTER THIS INVESTIGATOR GAVE THE ANXIETY SCALE UNDER THE PRETENSE OF HAVING THEM PARTICIPATE IN A NATIONAL STUDY BEING CONDUCTED BY A LARGE MIDWESTERN UNIVERSITY. THEY WERE TOLD THAT THE QUESTIONNAIRE WAS TO MEASURE THEIR REACTION TO CERTAIN STATEMENTS AND THAT THE PURPOSE OF THE STUDY WAS TO COMPARE THEIR REACTIONS TO THOSE OF

PHYSICAL EDUCATION MAJORS ALL OVER THE COUNTRY, ALONG WITH THE REACTIONS OF MAJORS IN OTHER FIELDS. IT WAS EMPHASIZED THAT THEIR PAPERS WOULD BE CONFIDENTIAL AND SCORED BY COMPUTER--SO THAT THEY WOULD NOT HAVE TO WORRY ABOUT SOMEONE SEEING THEIR ANSWERS. THUS IT WAS FELT THAT THE SUBJECTS WOULD BE HONEST IN ANSWERING THE STATEMENTS AS THERE WOULD BE LESS CHANCE OF DELIBERATE DISTORTION DUE TO FEAR OF SOMEONE SEEING THE SCALES.

AFTER THE ADMINISTRATION OF THE ANXIETY SCALE, THE INSTRUCTOR TOOK OVER THE CLASS AND EXPLAINED THAT THEY WERE ALSO GOING TO HAVE A SIMPLE SKILL TEST TO SEE WHAT THEIR PRE-INSTRUCTION ABILITY LEVEL WAS. THEY WERE TOLD NOT TO WORRY ABOUT THE TEST, BUT TO DO THE BEST THEY COULD AS THE SCORES WOULD BE RECORDED. THEY WERE ALSO TOLD THAT A NUMBER OF GRADUATE STUDENTS WOULD BE SCORING THEM SO THAT EVERYONE WOULD BE JUDGED THE SAME, AS SCORING WAS QUITE DIFFICULT.

EACH OF THE FOUR CLASSES WERE TREATED IN THE SAME WAY.

SEVEN WEEKS LATER THE SECOND TRIAL OF THE SKILL WAS GIVEN. THE SAME PROCEDURE WAS USED AS FOR THE FIRST TRIAL EXCEPT THAT THE INSTRUCTIONS GIVEN TO THE TWO GROUPS WERE DIFFERENT. THE CONTROL GROUP WAS TOLD THAT IT WAS SIMPLY A RE-CHECK OF THE TEST THEY HAD BEEN GIVEN THE FIRST CLASS PERIOD OF THE SEMESTER. THE EXPERIMENTAL GROUP WAS TOLD THAT THROUGH RESEARCH IT HAD BEEN DETERMINED THAT THE A-B WALL TEST WAS ONE OF THE BEST MEASURES OF ALL-AROUND BASKETBALL ABILITY AND THUS TO SAVE TIME IN THE ADMINISTRATION OF TESTS, THEY WOULD TAKE THIS TEST AND THAT IT WOULD COUNT A MAJOR PORTION OF THEIR FINAL GRADE. TO BE FAIR TO EVERYONE, NO PRACTICING WOULD BE ALLOWED AND THE TEST WOULD BE GIVEN IMMEDIATELY. THE SAME GRADUATE

STUDENTS WHO SCORED THE FIRST DAY WOULD AGAIN SCORE SO THAT EVERYONE WOULD BE JUDGED ALIKE. IT WAS EMPHASIZED THAT A MAJOR PORTION OF THEIR FINAL GRADE WOULD DEPEND UPON THEIR PERFORMANCE.

THE RESULTS OF THE STUDY INDICATED: (1) THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN THE STRESSED AND NON-STRESS GROUPS FOR EITHER OF THE SKILL TRIALS, (2) WITHIN GROUPS THERE WAS A SIGNIFICANT DIFFERENCE BETWEEN THE SKILL TRIALS, (3) THERE WERE NO SIGNIFICANT DIFFERENCES IN PERFORMANCE BETWEEN THE HIGH AND LOW-ANXIETY SUBJECTS, (4) THE SIGNIFICANT DIFFERENCE BETWEEN SKILL TRIALS WAS REFLECTED ONLY IN THE MIDDLE-ANXIETY GROUP, (5) AS ANXIETY LEVEL INCREASED--SKILL PERFORMANCE DECREASED, (6) THE STRESSFUL INSTRUCTIONS FOR THE EXPERIMENTAL GROUP SEEMED TO KEEP THOSE SCORING LOW ON TRIAL I-LOW ON TRIAL II, AND THOSE SCORING HIGH ON TRIAL I-HIGH ON TRIAL II, AND (7) THERE SEEMS TO BE AN OPTIMAL LEVEL OF ANXIETY FOR EFFICIENT PERFORMANCE OF THE TASK.

IT CAN BE CONCLUDED THAT: (1) THERE IS A RELATIONSHIP BETWEEN ANXIETY LEVEL AND SKILL PERFORMANCE FOR THIS TASK IN THE TYPE OF SITUATION WHICH WAS USED--THOUGH IT WAS NOT A SIGNIFICANT RELATIONSHIP, (2) STRESS HAS SOME EFFECT ON PERFORMANCE IN THAT IT MAY EITHER FACILITATE OR INHIBIT THE INDIVIDUAL, (3) STRESS TENDS TO KEEP LOW SCORING INDIVIDUALS-LOW, AND HIGH SCORING INDIVIDUALS-HIGH, AND (4) THERE SEEMS TO BE AN OPTIMAL LEVEL OF ANXIETY FOR EFFICIENT PERFORMANCE OF THE TASK. THE INDIVIDUALS FUNCTIONING AT THAT LEVEL WILL SHOW NO SIGNIFICANT INCREASE IN PERFORMANCE, WITH THE GREATEST INCREASE COMING FROM THOSE FUNCTIONING JUST BELOW THE OPTIMAL LEVEL.

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APPENDIX

ORIGINAL DATA

EXPERIMENTAL GROUP

NAME	ANXIETY SCORE	TRIAL I	TRIAL II
JAB	36	13	19
AJB	37	10	15
JEB	23	13	15
KMB	18	16	16
JMB	31	11	11
CEB	13	15	12
CAB	26	8	11
LAC	12	19	19
RMD	28	15	17
KRF	8	15	19
BRG	27	17	14
SRG	35	15	15
SLG	5	15	16
MJG	22	17	20
CJG	25	16	16
PAH	23	12	15
CLH	36	14	16
CAH	32	9	17
SLH	15	6	15
RLH	45	14	13
SJI	18	7	13
MAJ	31	15	18
JMK	23	13	17
SML	33	14	14
CML	16	8	10
JMM	33	13	13
DLM	23	16	16
PAM	23	13	12
DLMY	19	15	16
JRN	28	13	15
MHO	23	8	16
CFO	21	13	15
RMP	42	5	13
KAP	28	8	12
MLR	39	13	17
JER	30	1	15
JKR	28	15	15
SAR	29	3	16
MLRI	25	12	18
EKR	29	16	16

NAME	ANXIETY SCORE	TRIAL I	TRIAL II
MER	27	9	14
SSR	29	14	12
SJS	39	16	15
KAS	22	15	16
JES	12	16	17
SKS	25	15	16
CAS	28	12	15
KMS	26	6	17
SAS	39	4	10
PET	38	13	15
LLT	30	16	18
CJW	21	9	13
MAW	21	15	18
LLW	15	17	17
CAZ	32	15	16
JLZ	29	3	13

CONTROL GROUP

NAME	ANXIETY SCORE	TRIAL I	TRIAL II
LAA	37	7	12
CJA	21	14	12
INB	31	14	14
PEB	37	12	12
CAB	33	14	15
MEB	24	14	15
KLB	26	14	10
PRB	11	17	18
DMB	14	5	13
MMC	21	15	10
CKC	35	8	9
CLC	18	18	17
JAD	31	13	14
DKD	31	14	14
SLE	34	1	16
KMF	11	15	15
BMG	40	6	21
VLH	29	13	17
LEH	43	12	13
MAH	14	13	13
WWH	31	15	17

NAME	ANXIETY SCORE	TRIAL I	TRIAL II
LJH	26	17	19
GEH	17	17	18
KAH	18	9	18
CAH	23	2	12
RCH	42	2	14
MAK	38	10	11
CAK	37	7	11
DKK	13	10	13
JHK	19	14	14
VAL	30	13	16
LML	27	5	15
SEL	34	16	15
SCM	25	5	13
KIM	29	15	17
MMM	14	15	17
GSM	24	11	17
KHM	41	10	12
JCN	34	4	13
LMN	38	8	16
LMO	27	4	11
LLO	44	11	12
JAP	31	16	19
LDP	25	18	13
JAR	27	10	13
LMS	36	13	12
BMS	37	15	10
KAS	23	14	14
DLS	20	13	16
KFS	38	11	18
MES	34	12	12
SLV	48	12	15
SLZ	45	18	17

FOOTNOTES

1. BRYANT J. CRATTY, MOVEMENT BEHAVIOR AND MOTOR LEARNING (PHILADELPHIA. LEA AND FEBIGER, 1964), P. 172.

2. INFRA, TABLES IV AND V, PP. 44-45.

3. RICHARD S. LAZARUS, AND OTHERS, THE EFFECTS OF PSYCHOLOGICAL STRESS UPON PERFORMANCE, PSYCHOL. BULL., 49.294, 1952.

4. IBID.

5. IBID., P. 295.

6. CRATTY, OP. CIT., P. 173.

7. LAZARUS, LOC. CIT.

8. IBID.

9. SUPRA, P. 4.

10. LAZARUS, AND OTHERS, OP. CIT., P. 296.

11. INFRA, P. 38.

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13. INFRA, PP. 17-20.

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17. IBID.

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24. MATARAZZO'S HYPOTHESIS CONCERNING THE POSSIBILITY OF AN OPTIMUM LEVEL OF ANXIETY FOR EFFICIENT PERFORMANCE AND HIS SUPPORTING RESULTS LAID THE BASIS FOR FURTHER STUDY. THE IMPORTANCE OF THIS HYPOTHESIS AND AN EXPLANATION OF IT CAN BE FOUND ON PAGES 10 AND 11.

25. R. S. LAZARUS, AND C. W. ERICKSON, EFFECTS OF FAILURE STRESS UPON SKILLED PERFORMANCE, J. EXP. PSYCHOL., 43.100-105, 1952, AND LAZARUS, AND OTHERS, THE EFFECTS OF PSYCHOLOGICAL STRESS UPON SKILLED PERFORMANCE, PSYCHOL. BULL., 49.293-317, 1953.

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28. IBID., P. 16.

29. I. G. SARASON, AND E. G. PALOLA, THE RELATIONSHIP OF TEST AND GENERAL ANXIETY, DIFFICULTY OF TASK, AND EXPERIMENTAL INSTRUCTIONS TO PERFORMANCE, J. EXP. PSYCHOL., 59.185-191, 1960.

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32. IBID.

33. E. D. RYAN, EFFECTS OF STRESS ON MOTOR PERFORMANCE AND LEARNING, RES. QUART., 33.111-119, 1962, AND RYAN, MOTOR PERFORMANCE UNDER STRESS AS A FUNCTION OF THE AMOUNT OF PRACTICE, PERCEPT. MOTOR SKILLS, 13.103-106, 1961.

34. AAHPER, RESEARCH METHODS IN HEALTH, PHYSICAL EDUCATION, AND RECREATION, (SECOND EDITION, WASHINGTON, D. C.. AAHPER, 1959), P. 92.

35. RAYMOND B. CATTELL, AND IVAN H. SCHEIER, HANDBOOK FOR THE IPAT ANXIETY SCALE QUESTIONNAIRE (SELF ANALYSIS FORM), CHAMPAIGN, ILLINOIS, INSTITUTE FOR PERSONALITY AND ABILITY TESTING, 1963 , P. 16.

36. IBID., P. 7.

37. IBID.

38. CATTELL, AND SCHEIER, THE MEANING AND MEASUREMENT OF NEUROTICISM AND ANXIETY (NEW YORK. THE RONALD PRESS, 1961), P. 440.

39. CATTELL, AND SCHEIER, LOC. CIT.

40. CATTELL, AND SCHEIER, HANDBOOK, P. 8. THE STUDIES REFERRED TO ARE MENTIONED IN THEIR BOOK, THE MEANING AND MEASUREMENT OF NEUROTICISM AND ANXIETY.

41. IBID.

42. IBID. IN SCORES OF 795 NORMALS AND 59 ANXIETY HYSTERICS, THE ANXIETY CASES AVERAGED TWENTY POINTS HIGHER ON THE SCALE THAN DID THE NORMALS, AND THEIR SUPERIORITY REACHED STATISTICAL SIGNIFICANCE AT THE 1/10 OF ONE PER CENT LEVEL.

43. IBID., P. 9.

44. IBID., P. 6.

45. IBID., P. 16.

46. SUPRA, P. 13.

47. CRATTY, OP. CIT., P. 169.

48. IBID.

49. H. D. EDGREN, AN EXPERIMENT IN THE TESTING OF ABILITY AND PROGRESS IN BASKETBALL, RES. QUART., 3.159-171, MARCH, 1932. TEST 8, BALL HANDLING, PP. 169-170

50. INFRA, P. 38.

51. THE SCALE WAS GIVEN TO TWO RANDOMLY PICKED PHYSICAL EDUCATION CLASSES APPROXIMATELY 10 WEEKS PREVIOUSLY TO DETERMINE IF A WIDE ENOUGH RANGE OF SCORES WAS POSSIBLE WITH THAT TYPE OF TEST. OUT OF 100 WHO TOOK THE TEST AT THAT TIME, EIGHT LATER APPEARED AS SUBJECTS IN THE STUDY. THE RHO CORRELATION OF THEIR SCORES YIELDED A +.875.

52. AS HAS BEEN MENTIONED, THIS INVESTIGATOR FELT THAT A MORE REALISTIC TEST SITUATION COULD BE ESTABLISHED IF THE ACTUAL CLASSROOM TEACHER ADMINISTERED THE TESTS.

53. ILLUS., FIGURE 3, P. 39.

54. THROUGHOUT THE PAPER THE .05 LEVEL OF CONFIDENCE HAS BEEN CHOSEN AS BEING SIGNIFICANT.

55. CATTELL, AND SCHEIER, OP. CIT., P. 10.

56. THE INVESTIGATOR INCLUDED ALL THE SCORES IN THE 39-41 INTERVAL AND DISREGARDED THE SCORES IN THE 18-20 INTERVAL.

57. THERE IS NO DIFFERENCE BETWEEN A NEGATIVE AND A POSITIVE T VALUE AS THE TABLES ARE SYMMETRICAL.

58. SUPRA, P. 43.

59. TABLE XI, P. 53.

60. TABLES XIV AND XVII, PP. 57 AND 60.

61. SUPRA, PP. 10-11.

62. TABLE XXI, P. 66.

63. THE FORMULA $T = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$ WAS USED. G. MILTON SMITH, A SIMPLIFIED GUIDE TO STATISTICS FOR PSYCHOLOGY AND EDUCATION (NEW YORK. HOLT, RINEHART AND WINSTON, INC., 1967), P. 96.